Disentangling 'social supply': a personal network study into the social world of recreational cannabis use and its supply

by

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ABSTRACT

[English]

In the past decades it became clear that not only *different* types of drug markets exist, but also that within these drug markets a wide diversity of *dealers* and *suppliers* is present. Throughout the years, mainly within studies into cannabis markets, a multitude of typologies has been described to capture this horizontal complexity. In the 2000s the concept of 'social supply' was developed to capture this grey area of supply. 'Social supply' then reflects forms of supply that are *not-commercial* and that happen between *non-strangers*. Though empirical studies point to this more *social* way of providing and obtaining cannabis, to date 'social supply' remains a vague and unclear concept.

This study contributes to the (theoretical) debate surrounding *social supply*. This debate is twofold. On the one hand the extent to which supply is *social* and on the other hand the extent to which it is *non-commercial.* The boundaries between what is 'commercial' and what is 'non-commercial' appear difficult to delineate. Furthermore, the concept 'non-strangers' seems to be too broad as well as too narrow to be useful in empirical studies.

Furthermore, it remains unclear as to why supply is described as *social* by users and suppliers. This study aims to further explore this issue as well. The study starts from the *normalisation* thesis, within which 'social supply' finds its origins. To further study the insights in *supply theory* this thesis is put against theoretical insights concerning group processes (social learning, subcultural theory) as well as more individualistic perspectives about risk and stigma management.

A personal network perspective then allows exploring the social world of networks in which cannabis is used and supplied. As such, 'social supply' is disentangled layer by layer. To this end, a computer-assisted interview was developed to explore 50 personal networks where cannabis is present (methodological contribution). Using the technique of participatory mapping these young recreational cannabis users were asked to draw their own personal network in a software programme (VennMaker).

Based on my findings, a two-dimensional definition of (social) supply is put forward. The interaction between these dimensions (strength of social relation and the extent to which money is exchanged) show the continued relevance of group process theories. The findings however indicate that an explanation as to why supply is described as social, is

situated in a more individual perspective. That said, instead of a normalisation process, specifically in the case of supply, a process of *normification* is found.

[Dutch]

Onderzoek naar de horizontale complexiteit van drugsmarkten suggereert niet alleen dat er *verschillende* drugsmarkten zijn, maar ook dat binnen deze drugsmarkten uiteenlopende types van *dealers* of *suppliers* opereren. Doorheen de jaren werden, vooral binnen onderzoek naar cannabismarkten, verschillende typologieën beschreven om deze complexiteit te vatten. Om dit vage sociale aspect te benoemen werd in de jaren 2000 het concept *social supply* ('sociale bevoorrading') ontwikkeld. 'Sociale bevoorrading' verwijst dan naar vormen van bevoorrading tussen *niet-vreemden* die *niet-commercieel* zijn. Empirisch onderzoek wijst op deze meer *sociale* vorm van dealen, blijft tot op heden het concept desalniettemin een vaag en onduidelijk begrip.

Deze studie draagt bij aan het debat rond de conceptualisering van 'sociale bevoorrading' (theoretische bijdrage). Dit debat is tweeledig en focust zich enerzijds op het al dan niet *commerciële* karakter van de transactie en de *sociale* relatie tussen gebruiker en bevoorrader. De grenzen tussen commerciële en 'niet-commerciële' bevoorrading blijken moeilijk af te bakenen. Daarnaast blijkt ook het concept 'niet-vreemden' een te beperkt maar tegelijk ook te breed concept om bruikbaar te zijn in empirisch onderzoek.

Bovendien blijft onduidelijk waarom bevoorrading door gebruikers en bevoorraders zo wordt omschreven. Deze studie wil ook dit aspect verder verkennen en vertrekt daarbij vanuit het *normaliseringsperspectief,* waarin het bestudeerde concept zijn oorsprong vindt. Om de theoretische inzichten rond sociale bevoorrading verder uit te bouwen wordt dit perspectief geconfronteerd met theoretische inzichten die het belang van groepsprocessen benadrukken alsook met meer individualistische theoretische perspectieven die de aanwezigheid van risico en stigma centraal stellen.

Een persoonlijke netwerkstudie die zowel kwantitatieve als kwalitatieve methoden gebruikt, laat toe om de sociale wereld van recreatief cannabisgebruik- en bevoorrading uiteen te rafelen vanuit het oogpunt van een *insider*. Hiervoor werd een *computer-assisted interview* ontworpen (methodologische bijdrage). Via de techniek van *participatory mapping* tekenden 50 recreatieve cannabis gebruikers hun persoonlijke netwerk in een software programma (VennMaker).

Op basis van de resultaten wordt een tweedimensionale definitie van (sociale) bevoorrading ontwikkeld. De interactie tussen deze dimensies (sterkte van de sociale relatie en de mate waarin geld wordt uitgewisseld) toont het blijvende belang van theorieën rond groepsprocessen aan. De verklaring voor deze beschrijving blijkt een individueel element in zich dragen. Sociale bevoorrading lijkt daarbij deel uit te maken van een proces van *normifiëring*.

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PUBLICATIONS ARISING FROM THIS WORK

Vlaemynck, M. (2014a). Cannabisbevoorrading bij jongeren: een sociale netwerkanalyse van 'social supply'. In L. Pauwels & G. Vermeulen (Eds.), *VII Actuele ontwikkelingen inzake EU-justitiebeleid, cannabisbeleid, misdaad en straf, jongeren en jeugdzorg, internationale vrede, veiligheid en gerechtigheid, gewelddadig extremisme & private veiligheid en zelfregulering* (pp. 108-132). Antwerpen: Maklu.

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Background

Is there something like a 'dealer'? Is this 'dealer' different from suppliers that are 'friends doing each other a favour'? Or is this apparent dichotomy not a dichotomy at all? The origins of this study are situated in an apparent shift in ideological approach towards supply. In the past decades, a range of studies revealed what Coomber (2006) called a 'pusher's myth'. By referring to sellers as 'friends', descriptions of retail-level 'dealers' seem to move away from the traditional definition of 'dealing' towards a more nuanced view which situates suppliers and users in the same social universe (Coomber, 2006; Pearson, 2007).

'**Social supply**' tries to grasp this grey area of forms of supply that are 'not-dealing'. It is not the first attempt to describe retail-level supply. Suppliers at this level of the drug market are also described as 'user-dealers' or 'not *real* dealers' (Pearson, 2007). The concept of 'social supply' originates in a view of drug markets as characterised by not only vertical but also a wide horizontal complexity (Taylor & Potter, 2013). Cannabis markets as such are conceived as flexible, dynamic and variable in shape. 'Social supply' then reflects forms of supply in these flexible markets that are 'not-commercial' and that happen between 'non-strangers'. During the past two decades, more and more European as well as Australian studies confirm the existence of something that users and suppliers describe as 'social supply' (Coomber & Turnbull, 2007; Duff, 2005; Hough et al., 2003; Parker, 2000; Potter, 2009; Werse, 2008). This 'social supply' is considered different from a more traditional form of 'dealing', which is associated with a commercial transaction between strangers.

As a concept, 'social supply' is developed within a **normalisation** perspective of recreational cannabis use. Based on longitudinal research, Parker, Aldridge and Measham (1999) argue recreational cannabis use is 'normal' nowadays. This idea provoked controversy, not only in the scientific community but also in broader society. One of the main criticisms is formulated by Shildrick (2002) who argues normalisation is not only too expansive as a concept, but also misrepresents personal experiences of young people with illicit drugs. Others consider it as an attempt to rethink existing responses through the provision of more culturally sensitive accounts of this behaviour, which can facilitate a more effective harm reduction strategy. As drug use becomes 'normalised', policies of

harm reduction and drug education should try to adapt by broadening their perspective (Duff, 2005).

However, it is unclear **how** social supply should be **defined**. One way of describing the social aspect is to consider suppliers as 'friends' or 'friends of friends' who supply cannabis. A definition of who these 'friends' or 'friends of friends' are is very subjective (Crossley, 2010). Therefore, it is particularly difficult to compare different accounts of the social aspect of supply. The concept is further complicated because of different interpretations of the goal of supply. There is a wide range of possible rewards that can be exchanged, ranging from cannabis, money or other material goods to even immaterial rewards (e.g. Coomber & Turnbull, 2007; Hough et al., 2003; Potter, 2009). This leads to different interpretations on what social supply is and what is considered commercial supply. For example, Coomber and Moyle (2014) suggest to extend 'social' supply to 'minimally commercial' supply.

There is little information as to **why** these recreational cannabis users are describing their supply as 'social'. Research specifically assessing the structure of drug markets is criticised for being atheoretical, ahistorical and descriptive in nature (Curtis & Wendel, 2000; Griffin & Rodriguez, 2011). Existing drug theories mainly focus on the meaning attributed to *use*. The meaning attributed to use is, according to some theories, the result of an individual risk management strategy, either a rational decision or a neutralisation technique, while others argue use is defined within the borders of a group, subculture or network (Papachristos, 2011). While the first range of theories would argue users are 'insiders' to society, who adhere the same values as what they refer to as 'the wider society', the second range of theories position users more on the 'outside', adhering to (slightly) different social norms than 'wider society'.

Criminological relevance

I aim to provide a **theoretical** contribution to criminological literature and more specifically drug market research. My study starts from the theoretical framework in which the current understanding of social supply is rooted, namely the *normalisation* perspective. The aim is not to confirm or falsify normalisation of cannabis *use*. *Normalisation* is founded in an understanding of cannabis *use* as an individual cost-benefit analysis (Parker et al., 1999). This accent on agency seems to contradict existing social learning and subcultural theories, which stress structural influences (i.e. group processes) (Goode, 2004; Gourley, 2004; Becker, 1963). While the *normalisation* thesis

might aid in exploring use as well as *supply* from a more individual perspective, the latter group of theories suggests *supply* takes place and is defined through a group process. By adopting a network perspective I aim to contribute to research into overcoming this apparent agency and structural divide (Mische, 2011).

I am not the first criminologist nor the first drug market researcher to adopt a network perspective to study existing topics. Criminological studies adopting a social networks approach focus on a wide range of topics. Nodal governance studies explore how policy institutes and society are linked (Crawford, 2006; Shearing & Johnston, 2010), network between police and neighbourhoods (Roberts & Roberts, 2009; Virta, 2002), prevention management (Urjadko & Setchell, 1992). The aspect of victim support through a social network (Morrison, Luchok, Richter, & Parra-Medina, 2006; Schreck, Fisher, & Miller, 2004) as well as crime prevention through community networks (Bellair, 1997) has also been explored using network analysis. Finally, several longitudinal studies focus on the influence of age on the formation and dissolution of delinquent social networks (Giordano, Cernkovich, & Holland, 2003; Piquero, Brezina, & Turner, 2005).

However, the majority of these studies either focuses on the *use* of cannabis (e.g. by studying *peer influences*) or zoom in on the formal description of drug trafficking networks (Papachristos, 2011). Social network tools and theory can assist in rethinking criminological theories, for example differential association theories, social learning theories, self-control theories and the social capital perspective (Bauman & Ennett, 1996; Papachristos, 2011; Sarnecki, 2001). However, as Papachristos (2011) argues, and even before that some 'social supply' researchers as well (Coomber & Turnbull, 2007), the merit of social network analysis in supply studies lies in the study of existing concepts, like social supply, and providing theoretical frameworks and tools for exploration of the composition and structure of cannabis markets.

My study is part of the structuralist tradition in network research because I aim to disentangle an existing concept by examining it from a different perspective (e.g. Bauman & Ennett, 1996; Pearson & Michell, 2000; Morselli, 2009). My study thereby follows three principles that guide any kind of network research (Marin & Wellman, 2011). First, behaviour is not only shaped by individual attributes but is always interdependent of social structures. Second, members of networks do not belong to mutually exclusive groups. Third, relations are also shaped by their relational context. More specifically, to study social supply in all its richness, this study adopts an interactionist definition of

social networks. I thus see a social network as a social world of shared meanings, purposes, knowledge, understandings and identities which affect the way in which those actors in the network act.

By using *social network analysis* my study also aims to provide input to the development of **methodological** tools in criminological research. This study reflects on the merits of using social network analysis to study personal networks where cannabis is present in an attempt to provide further insights into how supply is defined and why. In order to do this I develop and test an instrument and reflect the additional value of using this instrument and wider techniques of network analysis in drug market studies.

Key concepts and methods

I assume cannabis use and supply is situated in a **networked cannabis market**. This dynamic and fluid cannabis market is shaped by the individual attributes of its members (e.g. gender) but also by the local context (e.g. domestic cultivation of cannabis) (e.g. Dorn, Murji, & South, 1992; Lupton, Wilson, May, Warburton, & Turnbull, 2002; May & Hough, 2004; Pearson, 2007; Potter, 2009). I define **networks** where cannabis is present in an interactionist sense, as **embedded in multiple network domains** that interact with each other (Crossley, 2010; Mische & White, 1998; Mische, 2003). These network domains are where use, supply and social relations are formed and dissolved. During this process shared meanings and informal controls about supply and use are created. Inherent to supply in these domains is the balance between trust and secrecy (e.g. to decrease the risk of getting apprehended) on the one hand and efficiency (e.g. getting 'good cannabis' without having to go through a range of intermediate suppliers) on the other.

'Social supply' as a concept is rooted in empirical studies starting from an 'insiders' perspective. It follows that supply is inherently defined in the eye of the beholder. This idea of subjectivity is a crucial part of 'social supply' definitions to date. It also follows that 'being a supplier' is not a fixed role, and can change. To capture this apparent fluidity and subjectivity I study **personal networks** and not *whole* networks (Hanneman & Riddle, 2011). These personal networks belong to an *ego* (i.e. the respondent, the focal node of the study) who has ties with a set of *alters* (i.e. the other members of the network). By doing this, the social world as perceived by the respondent can be explored in all its complexity and multiplexity. I aim to explore how the composition and structure of networks might shape definitions of supply. I am thus more interested in cognitive schemes than *true* networks (Brashears, 2013; Fiske, 1995). It follows that I do not aim to

study the *true* network but rather the **network as perceived by ego**. I consider the present ties in these networks as reflecting the past and/or expectations for the future (Crossley, 2010). The goal of my study is not to study change or transition, but rather to explore the present; therefore I study **active** networks.

Supply definitions in these networks are part of a continuous interaction. Therefore, supply relations are not part of a passive, uniform relation. Supply is tentatively defined as *"a transaction moment which is the result of an exchange process and can take multiple forms. Supply is part of multiplex ties between two individuals, embedded in multiple social circles, part of a collaborative setting and shaped by the wider relational context"*. This exchange process might include a range of **middlemen** that are situated between the actual source of the cannabis and the end-user. Different outcomes of this exchange are discerned. '**Social supply'** is thereby seen as an exchange process where social relations tend to be strong, rather than weak, and the goal of the exchange is non-commercial rather than commercial. Rewards can then be both tangible as well as intangible. Based on the review of drug market and social network literature, two research goals are defined. Both are specified by a further subset of questions:

1. **How are personal networks of young people in which cannabis use and supply is present composed and structured?**
   a. How are active *leisure-time networks* of young people in which cannabis use and supply is present composed and structured?
   b. How are active *cannabis networks* of young people composed and structured?
   c. How are active *supply networks* of young people composed and structured?
   d. How are suppliers and middlemen positioned in active *supply networks* of young people?
2. **What is the nature of the supply tie between young cannabis users and their suppliers?**
   a. To what extent is the supply tie between young cannabis users and their suppliers perceived as 'social'?
   b. To what extent is the supply tie between young cannabis users and their suppliers perceived as 'non-commercial'?

Introduction

Methodology

My study is characterised by a **pragmatist** design. Capturing multiplex and evolving networks and ties is a matter of developing a flexible and pragmatic methodology. The inherently complex nature of networks requires a methodology that allows the research problem to be described from different points of view to create an overarching picture. Network analysis is rooted in both qualitative and quantitative research. Moreover, social supply studies often mix methods in an attempt to provide a richer understanding of 'what is going on' (e.g. Harrison, Erickson, Korf, Brochu, & Benschop, 2007; Lenton, Grigg, Scott, Barratt, & Eleftheriadis, 2015; Parker, Williams, & Aldridge, 2002; Werse, 2008). The qualitative and quantitative results in my study are used to enrich each other. I assume that the qualitative findings might not only corroborate quantitative findings, but also contradict them. In my case, networks are studied from an interactionist point of view, namely as embedded in 'domains' (e.g. family domain, friendship domain). A cross-sectional study which compares the shape and structure of these networks across different 'domains' aids in our understanding of how current networks are created based on past interactions as well as possible expectations about the future.

Data is collected through a **computer-assisted personal interview** I developed based on existing and validated instruments used in supply and network studies. Being novel, the instrument was piloted thoroughly. Through the technique of participatory mapping, respondents could draw their own personal network in a software programme named VennMaker. I was present the whole time to guide the respondent through the process and to ask additional qualitative questions.

In order to be able to draw theoretical conclusions and provide a methodological contribution, I studied a similar sample of respondents as in in other social supply studies (Coomber & Turnbull, 2007; Harrison et al., 2007; Hough et al., 2003; Parker, 2000; Potter, 2009; Werse, 2008). Therefore, I opted to include only **recreational** cannabis users. I did not recruit through institutionalised settings. Cannabis use is most popular among young adults, so I further limited the study to **young** cannabis users (e.g. EMCDDA, 2011; Melis, 2016; Gisle, 2014). Furthermore, as I am looking at the *perception* of networks rather than the *true* network, the definition of what is 'recreational' was left to the respondents. I recruited **active** users to limit memory effects. Likewise, I only included **cannabis** users, because this group is at the core of most 'social supply' research.

Structure of the report

In the first six chapters of this report I draw upon drug market and network literature to make theoretical and methodological choices. **Chapter 1** is where I present the structure of cannabis markets, which supply side studies argue to be characterised by some form of vertical stratification. 'Social supply' is situated at the lowest level of these cannabis markets but is shaped by the wider social organisation of this market (Dorn, Levi, & King, 2005; Paoli, 2002). In order to understand the roots of 'social supply' it is therefore important to situate this concept in broader drug market literature. In **chapter 2** I explore the horizontal stratification of the lower levels of drug markets. More particularly, it appears that within these vertical levels a greater deal of horizontal complexity is present than Pearson and Hobbs initially suggested (Pearson & Hobbs, 2001; Taylor & Potter, 2013). This second chapter first explores how gender and growers shape the cannabis market. Second, different types of suppliers within this cannabis markets are presented.

In **chapter 3** I develop 'social supply' theoretically. To understand and explore the grey area of retail-level supply, it is not only important to examine how supply takes place but also why supply is perceived in this particular way. In this chapter I place 'social supply' within the normalisation hypothesis, where its first notions were developed. Additionally, in this chapter underlying theoretical notions of cost-benefit analysis, neutralisation theory and structural influences are discussed. In **chapter 4** I present the building blocks necessary to apply a network perspective to a study of supply. Existing theoretical frameworks explain social supply by looking into structural aspects (i.e. social influence) or adopt an individualistic perspective. This chapter argues that a relational perspective, where the relation between individuals serves as unit of analysis rather than only individual attributes, might overcome this thinking in terms of either structure or agency (Mische, 2011). In **chapter 5** I develop the conceptual framework that guides the empirical part of my study. In **chapter 6** the research design, methods of data collection and techniques of analysis are presented. I thereby describe initial methodological choices as well as adjustments made after analysis of the test data. Also, the final sample of 50 respondents (not including the 14 initial ones) is described.

The empirical section of this study explores three aspects which aid our understanding of supply: the individual, the dyadic relation between egos and alters, and the network of relations among alters. In **chapter 7** individual attributes of egos and alters in personal networks where cannabis is used are considered. The social roles of users and suppliers in personal networks where cannabis use are identified and their subjectivity is discussed.

Additionally, the extent to which alters tend to associate with alters who have the same age, gender and user and/or supplier experiences is analysed. In **chapter 8** I examine the relational aspects of personal networks where cannabis use is present. First, the strength of social relations in these personal networks is analysed. Emotional closeness, emotional and practical support is then linked to the social roles as described in chapter 7. Third, I reflect the issue of strong versus weak social relations in a context where cannabis is exchanged. Building further upon the discussion about the quality of social relations, I look into mechanisms of exchange (i.e. reciprocated exchange, one-way exchange, or a combination of both) across very weak to very strong social relations. In **chapter 9** the position of suppliers and the wider structure of the personal network surrounding supplier and user are explored. Structural holes measures inform about the closed or open nature of the broader social network the respondent is part of (Burt, 1992). These measures also help to sketch the different ways supply networks are structured. In **chapters 10 and 11** I put these relations and individual attributes in their social, use (chapter 10) and collaborative settings (chapter 11). In chapter 10, the influence of use on the social relation is discussed. In chapter 11, the extent the meaning attributed to supply is rooted in this collaborative setting is examined.

In **chapter 12**, I present the general conclusions of my study. In this part I first develop, based on the empirical results, a definition of social supply as a two-dimensional concept. Second, I look into why supply is perceived as such. I thereby evaluate the continued relevance of social learning and subcultural theories in a theoretical context that tends to emphasise agency. Third, I reflect on a broader practical relevance of my findings in developing legal, prevention and aid strategies. I conclude with a final reflection on further pathways for network research in drug market studies.

Chapter 1   Social supply in a dynamic cannabis market

1.1   Introduction

In this chapter, the debate on the extent of a vertical stratification of cannabis markets is described. Social supply is said to be a grey area of supply, where supply is not totally commercial but also characterised by some sort of social aspect. In order to understand the broader world view of social supply, it is therefore important to elaborate on the way drug markets are perceived. More specifically, a study of social supply is framed within a view of drug markets as dynamic, or, as is further argued in chapter 4, *networked.*

A traditional view of drug markets in general, and cannabis markets more specifically, describes these markets as characterised by a distribution system which includes an upper level (§1.2.1), a wide variety of brokers in a middle level (§1.2.2) and a retail level (§**Fout! Verwijzingsbron niet gevonden.**.3). Drug markets are then seen as one big social network, where social supply takes place at the lowest level, often referred to as the *retail level* (Dorn et al., 2005).

Though it is recognised that markets are to a certain extent organised, as far back as the 1970s qualitative research stressed the fluid and dynamic character of drug markets (Dorn et al., 1992; Lupton et al., 2002; May & Hough, 2004; Pearson, 2007) (§**Fout! Verwijzingsbron niet gevonden.**). Rather than being strictly organised in levels, cannabis markets are described as *disorganised* and consist of small networks and short-term collaborations (Reuter, 1985) (§1.3.1). These fluid and dynamic networks are shaped by a range of factors (§1.3.2) such as gender (§1.3.2.1) and technological evolutions (§ 1.3.2.2). A look at how these markets are shaped in Belgium further illustrates their locality (§ 1.3.2.3).

This dynamic perspective of drug markets also makes it possible to shed light on the possibility of multiple patterns of supply. In chapter 2 the different ways supply is defined within this wider dynamic of drug markets are discussed in more detail.

1.2   Cannabis markets as centralised supply chains

In terms of drug market organisation, an economic view incorporates two images: the low-level dealer providing to users (the archetypal "pusher", see chapter 2), and the

pyramid of organised traffickers that sit on top of this lower level dealer, controlled by one or more 'Mr. Big' (Pearson, 2007). This imagery describes drug markets as a form of *organised crime*, where operations are centralised around one individual or a small group of people (Coomber, 2006; Pearson, 2007).

The earliest conception of *organised crime* is from the 1950s, when media as well as major investigative bodies defined organised crime as a nationwide, centralised criminal organisation. This alien conspiracy model was supported through the scientific research of Donald Cressey, who described the Cosa Nostra as hierarchical and built on kinship and family ties but at the same time functioning as a rational organisation (Cressey, 1969). Since the sixties, however, this model of one big conspiracy threatening society has been refuted by American sociologists. A different model was put forward, which focused on the most visible aspect of organised crime, namely the supply of illegal products and services. Illegal markets are considered comparable to legal markets, and are considered to be illegal enterprises. It is further suggested that these enterprises are strongly centralised and have a clear internal organisation. This model of illegal enterprises became dominant in Europe during the seventies. Since the eighties, this model of organised crime has been an important topic in several countries' legislation and policy (Desroches, 2007).

Both the alien conspiracy model and model of illegal enterprises suggest a strict hierarchy and are sometimes linked with kinship or family (Desroches, 2007; Pearson, 2007; Reuter, 1985). Drug markets have been described in a similar way, and are pictured as a pyramid, with large-scale importers and traffickers at the top, and retail dealers at the bottom. In addition, drug markets are perceived as large and highly disciplined (May & Hough, 2004, Pearson, 2007).

Supply studies into this model of illegal enterprises suggest that supply in drug markets, much like legal markets, has an underlying economic dynamic (Brownstein, 1999; Coomber, 2006). Supply involves interaction between buyers with a particular demand and sellers who supply and are in competition with each other. This view presents a homogenised view of drug markets, that there is in other words 'a' drug market model that can be used to understand all drug markets (Brownstein, 1999; Coomber, 2006). Drug supply and its distribution are often described as a marketplace similar to other legal markets. A drug dealer is then described as motivated by profit, and a stranger to their clients. Drug markets are often understood in terms of supply chains, where distribution

largely follows the same economic principles as the sale of any other product (Brownstein, 1996; Pearson & Hobbs, 2001; Potter, 2009).

Although drug market research points out that illicit drug markets do not intend to follow the same economic principles as legal markets (e.g. demand-control interventions—prevention and treatment—do not lead to lower prices due to declining demand) (Caulkins & Reuter, 2006; Nell, 1994; Ritter, 2006), these studies do recognise that drug markets are characterised by some level of organisation through which cannabis is distributed. The following sections first explore the distribution system behind the retail level (see §1.2.1 and §1.2.2), before focusing on this retail level (see §1.2.3). The retail level is most commonly defined as the final step of drug distribution, which is the point where the drugs are obtained by the user. Research into the structure and form of this particular point of drug distribution reveals a highly complex system of not only users and suppliers but also a range of brokers.

1.2.1   Upper level

The distribution system encompasses what is generally considered the middle and upper level of a drug market. As Desroches (2007) has remarked, only a few studies worldwide focus on upper-level drug distribution. Almost all of these studies are qualitative in nature and restricted to a particular country, time and region, making generalisations difficult. Examples of upper-level drug market studies are found in the United States of America (Adler, 1985; Natarajan & Belanger, 1998), Great Britain (Dorn et al., 1992), the Netherlands (Zaitch, 2002), and Canada (Desroches, 2007).

There is no clear consensus as to what the upper level of a drug market entails. Adhering to a hierarchical view of drug markets, Desroches (2007) argues that drug trafficking involves social networks because of the nature in which people engage in illegal activity for commercial gain. Desroches defines the involved actors as follows:

> *Traffickers refer to suppliers or sources as the one above them in the distribution chain from whom they buy drugs.* **Importers** *typically have connections in source countries and smuggle drugs such as cocaine, heroin, hashish and marijuana into host countries.* **Growers** *produce marijuana crops… while* **manufacturers** *produce designer drug in laboratories. The terms* **distributor** *and* **wholesaler** *describe dealers who purchase drugs in large quantities and sell them to other distributors or dealers down the chain.* (Desroches, 2007, p. 828, emphasis added)

Dorn, Levi & King (2005) reviewed English, French, Belgian, Dutch, German, Italian and Spanish literature in order to develop a typology of the upper-level drug market. Four types of criminal organisation are distinguished: politico-military traffickers, business criminals, adventurers, and mixed groups (Dorn et al., 2005). *Politico-military traffickers* aim to restructure a political field or try to establish/maintain a position within existing political structures/failed states. *Business criminals* are driven by financial motivations, and do not seek political change but may attempt limited corruption for defensive reasons. *Adventurers* consider a high level of risk-taking as the norm, either because they feel they have no alternative (e.g. debt), or because they have not yet fully understood the risks, as they are in a state of excitement. A fourth category, *mixed groups*, is groups that were originally politically motivated, but later partially transformed into business criminals (Dorn et al., 2005).

A classic example of a typology based on vertical stratification is developed by Pearson and Hobbs (2001), who interviewed 51 prisoners, and conducted 46 interviews with law enforcement personnel, three interviews with lawyers and eight with drug agency personnel. Together, these interviews provided enough data to analyse 70 criminal networks. Pearson and Hobbs (2001) developed a four-tier classification of the supply chain: importers, wholesalers, middle-market drug brokers, and retail-level dealers. *Importers* and *wholesalers* are actors usually situated at the top level of the supply chain.

1.2.2 Middle level

Together with the *middle-market brokers*, the importers and wholesalers form the distribution system which supports the retail level. Pearson and Hobbs (2001) do not describe the position of importers and wholesalers in detail as their study aims mainly at examining middle-market brokers. They suggest that importers and wholesalers usually deal in a single commodity. Furthermore, ethnic and kinship links seem to be important at this level. However, it remains unclear how many interconnected levels of brokerage there are among importers through wholesale dealers, retail sellers and consumers. Therefore there is no clear definition or consensus on what this 'middle market' actually consists of (Pearson, 2007; Pearson & Hobbs, 2001). Furthermore, research suggests that, based on the quantities bought or sold, dealers do not only move between different levels (Adler, 1985), but can also occupy different roles in different markets and at different times. The position of a dealer is thus ambiguous in terms of the market level (Pearson & Hobbs, 2001).

What then is the 'middle'? There are three different ways to perceive the 'middle', each of them leading to a different definition. Firstly, if the drug business is understood as a truly global market, one might say that the 'middle' is the point of importation. Secondly, from the perspective of someone higher up the chain, the middle market consists of networks that join up systems of cultivation and production with systems of global distribution, for example, where heroin is being routed to North America or Europe via Balkan or African routes. Thirdly, when defined in terms of domestic systems of supply and demand, 'the middle' is something that happens between importation and retail supply to consumers. All of these definitions are equally valid, and depend on the individual's point of view. Consequently, perceptions of drug markets are always fragmented (Pearson & Hobbs, 2001).

Middlemen serve different functions. Firstly, some of them take on the classic brokerage role, connecting different links for payment. They set up a meeting between two people. Secondly, some brokers exploit the fact that they know a possible client/supplier. They put themselves strategically between the two and use this for financial gain. It is crucial for the two parties not to meet, in order for the broker to make a profit. Thirdly, middlemen also function as a measure of concealment, preventing transactions between two people from being discovered (Pearson & Hobbs, 2001).

Furthermore, the relation between broker and runner can take several forms (Pearson & Hobbs, 2001). A first variant includes runners who are paid per transaction, on a weekly basis or in quantities of drugs. The runner has no independence, and is merely a wage labourer. A second variant is where runners have more independence in their actions. This kind of relationship can take different forms. For example, a runner might be a real entrepreneur, creating a demand network through 'friends' and 'friends of friends' in which they act as a go-between for purchasers. A third variant of this relationship is when a runner functions as a supplier to customers they know. In some of these cases the relationship even takes the form of a partnership.

Despite the difficulty of defining the middle level of a drug market, it is common knowledge that middlemen are almost always present in drug markets and can play a key role in connecting several levels. The only case they are not involved is when a producer directly sells to their customers, for example in a small-scale market. Drug brokers are positioned directly between wholesale and retail levels of drug markets. Although of great importance, middle-market poly-drug networks are often small with one, sometimes two,

people responsible for the finances and contacts. These leading figures are accompanied by a small team of runners who are in charge of the collection and delivery of drugs (Pearson & Hobbs, 2001). Sometimes their operations are part of a simple vertical supply chain from importation to retail. However, in the case of multi-commodity drug brokers, operations involve massive horizontal complexity.

1.2.3 Retail level

The retail level is the most popular topic in drug market research as dealers at this level are easily accessible (Pearson, 2007) (see chapter 2). As one of the extremes of the supply chain, its definition is straightforward. Retail-level dealers are those who supply drugs to the actual consumers. They operate either alone or through intermediaries, who negotiate for discount prices when making a bulk purchase (Pearson, 2007). Within the context of vertical stratification, different classifications of the retail level are proposed.

A common starting point to study this level is through an analysis of the open or closed nature of a particular market. Drug market researchers identify open markets, closed markets and some hybrid forms (May & Hough, 2004; Pearson, 2007; Potter, 2009). Open markets are usually formed by street dealers, and are easy to access. They are open to any buyer, without any prior introduction. This major advantage is at the same time its major flaw, as both supplier and consumer become vulnerable to detection. The exact location depends on the spatial pattern of demand, as well as the protection a particular place can offer against law-enforcement actions. Open markets tend to transform into closed markets under the influence of perceived risks of law enforcement as well as the lack of quality control. Closed markets are more difficult to access. Dealers supply only to users they know and trust; or for whom a third party vouches. This way, they create a small group of reliable customers rather than unknown people. The sale mostly takes place in a rented hotel room or in the apartment of the dealer. The strength of a closed market lies in the trust between buyer and seller. Disadvantages like being unable to maximise profits as a seller, as well as being limited in choice as a buyer, do not outweigh the increased protection from law enforcement. Some dealers combine both methods, thus creating a hybrid form. The distinction between open and closed markets, therefore, is quite blurry (Pearson, 2007).

A second typology is proposed by Curtis, Wendel and Spunt (2002), who distinguish between the social organisation and technical organisation of a particular market. Social organisation entails an analysis of issues of cooperation, differential responsibility, power

and authority among actors. Technical organisation on the other hand refers to the physical location, policies, procedures, technology and equipment employed within a drug market. A further means of analysis is provided by Dorn et al. (1992), who develop a temporal model of retail drug markets (see §1.3.1). A final way to study this bottom level of a drug market is by analysing its horizontal complexity. A specific way to study retail markets from this perspective is through analysis of the relationship between supplier and end-user (see chapter 2).

1.3   Cannabis markets as fluid, dynamic and disorganised

Drug markets can also be described as a sum of small groups of individuals, sometimes called *disorganised crime*, and sometimes networks. The existence of larger criminal organisations is then doubted. The concept of disorganised crime challenges the traditional hierarchical view of drug markets in exchange for a networked view (Paoli, 2002). A third perspective refers to drug markets as *fluid networks*. The concept of networks is then used as a way to describe the durability and locality of the organisation. As opposed to fixed structures which last over time, fluid networks refer to ever-changing markets (Dorn et al., 2005).

1.3.1   Disorganised crime

The model of illegal enterprises is challenged by sociological research, which pleads for more attention for the horizontal complexity of drug markets. Pearson (2007), for example, argues that markets might be shaped like a pyramid, but this pyramid is often very flat or shallow. Pearson (2007) asserts that the vertical dimension of the market is relatively simple, involving few links in the chain. However, in between the upper and retail level there is often a whole scale of operations. This so-called middle level is constantly mutating, depending on market conditions and law enforcement actions. Furthermore, specific structures are often only 'alive' during one operation. This leads to a considerable amount of horizontal complexity in terms of how suppliers are linked to multiple retail-level dealers.

The attention for horizontal complexity fits nicely within a view of drug markets as *disorganised,* which defines the relation between different actors as part of a network, rather than within a strict hierarchy. Reuter (1985) develops the concept of *disorganised crime* in an effort to sketch the diversity and flexibility of drug markets. This paradigm was developed during the eighties, when research started to describe drug markets as fluid, where individuals on the street could easily climb up the ladder without any specific

knowledge or skills. Reuter (1985) found that under the influence of several economic factors, illegal markets were more likely to consist of networks, and short-term collaborations rather than a large-scale, durable illegal enterprise. Reuter and Haaga (1989) for example conclude that the upper-level market is more like a network between independent traders rather than a strict vertical organisation. These trading relationships are neither durable nor hierarchical (Natarajan & Belanger, 1998; Pearson, 2007).

Dorn et al. (1992) further elaborated this idea of complexity. Their aim was to contradict the popular idea of drug markets being organised in a top-down hierarchy controlled by a *Mr Big*. European drug markets, in contrast to American ones, have more features of Reuters' *disorganised crime* than of organised crime. To this end, Dorn, Murji and South (1992) interviewed police officers about trafficking cases, 55 individuals who had in the past been active in the drug market, and 25 convicted male and female drug traffickers in prisons. Based on these interviews, they developed a temporal model of six different types of traffickers. During the sixties and seventies, two main types of traffickers played an important role: trading charities and mutual societies. *Trading charities* were enterprises primarily motivated by ideology, rather than financial gain. A typical example of this was the sixties' hippie passing around cannabis joints to people to share love and peace. The financial motive was subsidiary to the social and cultural aspects of using the drug and the context in which this was done. *Mutual societies* shared a part of this ideology, but differed in the sense that they were much more reciprocal. Members of mutual societies were often referred to as user-dealers. As this type of dealer is still present today, one might question whether mutual societies are really 'of the past'.

During the eighties and nineties, drug markets became more financial than social because of market dynamics as well as law enforcement actions. Due to increasing policing, drug dealing became a more risky business. At the same time, more 'money-minded' people got involved. Traffickers were left with three options: quit, cover illegal activities with a legal business (sideliners), or get more deeply involved and become a professional (criminal diversifiers). A lot of them chose to quit, but some chose the other options (Dorn et al., 1992). *Sideliners* set up a legal business (for example transport) with a 'sideline' in illegal trafficking. Most of the time these traffickers are only temporarily involved in drug trade. *Criminal diversifiers* on the other hand are described as "rogue entrepreneurs who will deal in anything" (Dorn et al., 1992). This kind of rational and calculated trafficker is the opposite of the hedonistic consumer of the sixties. During the eighties, a number of

unstable organisations arose at the retail level (Dorn et al., 1992). Two types of retail traffickers can be distinguished: *opportunistic irregulars,* and *retail specialists*. The first is described as the younger and less experienced version of a criminal diversifier. They operate alone or in small groups and respond to short-term market opportunities whenever they arise. *Retail specialists,* on the other hand, run a fairly stable and hierarchical organisation. They are commercially orientated and mimic legal businesses, for example through their managerial structure.

Since the nineties, however, this position has again become nuanced. Most researchers suggest two main types of organisational structures: one highly hierarchical, and one loosely structured. Ruggiero and South (1994) for example distinguish two organisational types: *crime in association* and *crime in organisation*. The former is characterised by a non-hierarchical style while the latter follows a business style. In 2000, May and 'colleagues' confirm this picture through ethnographic fieldwork within two British market systems. They conclude that two different types of market systems exist: a highly structured pyramidal system, and a fragmented, non-hierarchical entrepreneurial market (May, Harocopos, Turnbull, & Hough, 2000).

1.3.2   Shaping factors of a fluid cannabis market

1.3.2.1   A gendered cannabis market?

Besides the local context (Potter, 2009), drug market studies argue that individual characteristics like social class, gender, race and ethnicity give shape to a cannabis market (Maher & Hudson, 2007; Murji, 2007). I fully acknowledge there might be cannabis markets in Belgium that are shaped to a large extent by the race, ethnicity or social class of its members. However, drug market studies into social supply (see chapter 3) as well as network studies (see chapter 4) suggest that gender might influence the way cannabis is obtained more strongly than the other just-mentioned socio-demographic characteristics.

Studies into the retail market of cannabis suggest that female cannabis users are more likely to obtain cannabis through sharing than male users (Harrison et al., 2007; Werse, 2008). A recent Australian social supply study suggests that race, ethnicity or social class might not play a role in explaining the way respondents acquire cannabis (Lenton et al., 2015). Other social supply studies found gender was, compared to race and ethnicity, the strongest influencing factor concerning the way cannabis is obtained (Harrison et al., 2007; Werse, 2008).

Early studies into the role and function of female dealers in cocaine and crack markets depict women as passive and helpless victims (Adler, 1985; Maher, 2000; Maher & Daly, 1996; Maher & Hudson, 2007; Steffensmeier, 1983). Some researchers emphasised the forced entry of women in the drug market through victimisation, economic marginalisation and necessity for survival. Adler (1985) for instance indicates that the most active role for women was that of the employee for a male drug dealer. Women in these studies were mostly seen as marginalised in drug culture, forced to rely on sex work, and earning less than their male counterparts. Women were said to perceive themselves as lacking the potential to commit such crimes. Others saw them as untrustworthy, gossip-prone and more likely to succumb to the pressure of police interrogation. Much of this research tended to position drug use by men as normative and embedded in masculine cultures of risk-taking and violence, while female users were seen as deviant and compromising gender, family and domestic roles (Maher & Hudson, 2007).

Studies during the 1990s and 2000s, however, have challenged this victim role and instead stress women's achievements and competence (Anderson, 2005; Denton, 2001; Denton & O'Malley, 1999; Mieczkowski, 1994; Morgan & Joe, 1996). Some authors do this by interpreting the 'supporting role of women' (e.g. cookers, sex workers) as female competence, which is fundamental to an illegal drug economy. Some studies argue that few female dealers are successful because females are excluded from street culture (Dunlap & Johnson, 1996; Maher, 2000; Maher & Hudson, 2007). Others started to analyse the logic of female participation. For example, Denton and O'Malley (1999) found that women are not marginalised in a male-dominated world but rather they use their smartness, including trustworthiness and resourcefulness, to be a successful dealer. For example, women use "feminine attributes" like communication skills, family resources and being less conspicuous than their male counterparts (Maher & Hudson, 2007).

Studies into the gendered nature of drug markets argue that most drug markets are dominated by men (Dahl & Sandberg, 2015; Grundetjern & Sandberg, 2012). It is illustrative that most female dealers stress the need to enact "masculinity" in order to be successful as a dealer; in other words by behaving just like 'one of the guys'. Studies into female dealers however distinguish between drug markets based on the type of drug involved. In small-scale, private cannabis markets for instance, violence is not as present as it is in public or "hard-drug" markets. This relative absence of violence facilitates female drug dealing. Norwegian researchers, placed in a Scandinavian context characterised by

gender equality and an anti-drugs culture, found cannabis to be associated with more androgynous values. Based on interviews with 19 female users, they discern four cannabis-using practices as 'feminine': not providing cannabis, being less involved in cannabis user networks, not handling the drug effects, and being concerned with control. However, the authors argued that some women challenged gendered expectations and presented themselves as 'rebellious', 'alternative' and 'tough' (Dahl & Sandberg, 2015; Grundetjern & Sandberg, 2012).

Ethnographic research, though differing in social contexts and the type of drugs involved,[1] points to the importance of links with male 'partners' (e.g. as sponsors, protectors, gatekeepers) and the importance of strong social networks including family and kinship ties (Mayer & Hudson, 2007) (see chapter 4). Mayer & Hudson (2007) performed a meta-analysis on ethnographic studies focusing on the role of women in drug markets. Whether social networks are seen as a way to minimise risk or to create more opportunities to find cannabis, recent research confirms that personal networks seem to shape the way an individual participates in the drug market (Griffin & Rodriguez, 2011).

Besides exploring the gendered nature of the drug trade, a second body of research focused on personal networks as a means to access drug markets (Marsden, 1987) (see chapter 4). Griffin & Rodriguez (2011) used national (US) data from the Arrestee Drug Abuse Monitoring program (data from 2002–2003, n = 50,991) to explore the ways female arrestees acquire cannabis, crack and cocaine. The findings suggest that female arrestees obtain cannabis in a different way than male arrestees, though the difference found is not consistent across different ways of obtaining cannabis. The authors argue that the differences reflect the gendered nature of street-level drug markets and the ways personal networks of female suppliers shape the way they take part in the drug markets.

Social network studies suggest these social networks act to minimise the risk associated with buying and selling cannabis by acting as a screening mechanism, so the seller only sells to people they know or to a person someone can vouch for (Eck, 1995) (see chapter 4). This allows for increased levels of security and communication. Social network studies suggest that while the size of female networks does not differ, the composition of female networks does, in the sense that they are likely to be more kin-oriented while male networks include more ties to non-kin and co-workers (Fischer, 1982; Marsden, 1987)

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[1] The meta-analysis of Mayer & Hudson (2007) included 15 ethnographic studies in English-speaking countries, which focused mainly on heroin or crack markets, between 1981 and 2004.

(see chapter 4). This might cause male suppliers to have more opportunities to find sources of drugs. Studies suggest that risk minimisation for women is more critical than for men, because women who participate in a male-dominated drug market tend to be looked at as easy targets and are less likely to rely on violence when physically or verbally victimised (Murphy & Arroyo, 2000 as referred to by Griffin & Rodriguez, 2011). Some women also use these personal networks as a means to ensure quality. They opt to sell from a small group of known sellers only. Such dynamics highlight the importance of trust and the value of using fewer but more reliable sources (Murphy & Arroyo, 2000).

Gender influences the way women obtain cannabis. Griffin & Rodriguez (2011) explored drug acquisition behaviour through measures of exchange processes that involved both cash transactions and non-cash transactions, the latter of which included buying on credit, receiving cannabis as a gift or receiving cannabis upfront[2]. To identify the effect of gender, the authors used several control variables, including socio-demographic variables, offence characteristics and community characteristics. Gender had a significant influence on all acquisition methods of cannabis: women were more likely than men to obtain cannabis directly, and also more likely to obtain cannabis from regular sources within their own neighbourhood.

Women are more likely to obtain cannabis as a gift. Non-cash transactions, more specifically cannabis upfront and on credit, which men are more likely to get, require a greater level of trust between buyer and seller than direct cash transactions (Coomber, 2003). This suggests that women are often limited in their ability to engage in drug transactions because they are perceived to be unreliable, untrustworthy and unable to handle violence (Fagan, 1994; Maher & Daly, 1996). However, women are more likely to receive cannabis as a gift, supporting studies that women, more than men, are in networks in which drugs are provided as gifts (Harrison et al., 2007; Maher, 2000; Werse, 2008).

1.3.2.2   Local context and technical evolutions

Drug markets nowadays are generally assumed to be multiple, context-bound and flexible (Curtis et al., 2002). This implies that there are multiple drug markets that show distinct characteristics, which depend on the local context (Coomber, 2006; Lupton et al., 2002; Valdez & Kaplan, 2007). Some studies show that for one type of drug several markets can

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[2] 'Cannabis upfront' refers to when a seller of drugs gives the drugs to a buyer on credit with the understanding that when the buyer resells the drugs to customers, the proceeds of those sales are to be used to pay the suppliers, "putting drugs upfront in expectation of receiving money" (Griffin & Rodriguez, 2011).

co-exist geographically close to each other (Curtis et al., 2002). Lupton et al. (2002) studied drug markets within eight disadvantaged residential neighbourhoods in six different regions in England. In all eight neighbourhoods heroin was easily available, and in six of them crack as well. All of them were vibrant and busy, but selling structures varied between markets, indicating that for the same type of drug, different forms of markets can co-exist in geographically close neighbourhoods.

As Pearson (2007) argued, the shape and structure of a drug market also depends on the type of drug. Cannabis markets have undergone significant changes due to technological evolutions, a rise in demand as well as law enforcement actions (see also §2.3.1). Supply side studies for example suggest that markets tend to become more closed due to technological evolutions, e.g. the use of mobile phones have reduced the need for open markets (May & Hough, 2004; Natarajan, Clarke, & Johnson, 1995), as well as law enforcement actions (Pearson, 2007; May & Hough, 2004).

Cannabis markets have changed heavily in the wake of technological evolutions. More specifically, the technology to grow cannabis in colder climates influenced the shape and structure of the market in two ways: stronger strains have been developed, and the technology to grow cannabis indoors with the use of hydroponic techniques has been refined (Potter, Bouchard, & Decorte, 2011). As a result, the domestic production of cannabis in Europe has intensified. Much of it is said to be for personal use or for use with 'friends' (Hough et al., 2003).

This rise in domestic cultivation is traditionally referred to in terms of *import substitution* (Jansen, 2002; Reuter, Crawford, & Cave, 1988). Twenty-five years ago, the majority of cannabis was produced in Morocco, Lebanon and Afghanistan. In the past few decades cannabis markets, from Africa for example, have been substituted by domestic cultivation due to a rise in demand and technological evolutions (Hough et al., 2003).

Increasing domestic cultivation has stimulated the growth of many small-scale operations. Growers, or producers, are typically placed at the upper level of a drug market. With this rise of domestic cultivation, large-scale importers are no longer dominant, as a growing amount of small networks have started to appear and opportunities for young people to get involved have increased.

Today, cannabis cultivation in Europe is widespread and seems to be increasing. All 29 countries reporting to the European Monitoring Centre for Drugs and Drug Addiction

(EMCDDA), Belgium included, mentioned domestic cultivation. However, a significant proportion of cannabis is still delivered through interregional networks. Herbal cannabis is imported mostly from Africa and sometimes the Americas, while Morocco and Afghanistan are the biggest exporters of cannabis resin (EMCDDA, 2011). Still, also outside of Europe a large share of cannabis supplies are produced domestically: for example in the United States (Gettman, 2006; Weisheit, 1992), Canada (Bouchard, 2007; Plecas, Malm, & Kinney, 2005), and New Zealand (Wilkins & Casswell, 2003).

The motivation for import substitution seems twofold. First, the image and function of cannabis seem to have altered (Decorte, Muys, & Slock, 2003; Parker et al., 2002). For instance, Parker et al. (2002) argues that cannabis use has nowadays become 'normalised' (see chapter 3), stripped of its subcultural and ideological connotations (Jansen, 1993). Together with an increased tolerance by some countries towards cannabis use, this makes it easier for cultivation to flourish.

Secondly, several studies point to economic incentives behind cannabis cultivation (e.g. Weisheit, 1992; Nguyen & Bouchard, 2010; Jansen, 2002). Cannabis is still a popular illegal substance, as according to the EMCDDA cannabis users account for 38% of the total retail market for illicit drugs (EMCDDA & Europol, 2016; Gisle, 2014) (see chapter 6). The illegal status of the product raises its price and makes it an economically interesting alternative to an import-based market (Jansen, 2002). Moreover, cannabis cultivation can be profitable even on a small scale (Kilmer, Caulkins, Pacula, MacCoun, & Reuter, 2010).

1.3.2.3   Shape of cannabis market in Belgium

In Belgium, two studies focused on the shape of cannabis markets. Decorte and Tuteleers (2007) interviewed 89 small-scale growers and surveyed 659 small-scale home growers. In 2014 a mixed method study explored the patterns and organisation of cannabis growers in Belgium and the harms associated with cannabis production and related findings (Decorte, Paoli, Kersten, Heyde, Van Dun, & Vlaemynck, 2014). Data was collected through in-depth interviews with 20 imprisoned cannabis growers and 32 criminal justice experts, case analysis of 34 criminal proceedings, and a web survey which reached 1,293 small-scale cannabis growers (2 to 49 plants).

Decorte et al. (2014) found a cannabis market characterised by associations between growers that are not part of an extensive organisation. Although many survey respondents reported that they work alone, most of them had contacts with other growers to rely on their networks and expertise. Criminal proceedings and interviews

provided further information about the variety of network structures (Decorte et al., 2014). In both studies, 2007 and 2014, most respondents indicated that they grew alone (in 2014, 66.3 %). Those who do not grow alone generally grow with only one other grower (21 %). This suggests that cultivation practices are not backed by an extensive organisation. Apart from collaboration, both studies found that growers did tend to know several other growers face-to-face. More than a third of respondents in the 2014 study know 3 to 5 other growers (37.6 %). Criminal proceedings and interviewees in the 2014 study revealed that the network of growers also includes other contacts (e.g. grow shops, coffee-shops) where they buy seedlings and equipment and sell their harvests. However, it was very difficult to assess whether the network found in the criminal proceedings constitutes the complete organisation or if they are even an organisation to begin with.

The 2014 study found different forms of collaborations, which could sometimes be considered *criminal collaborations*, but in many cases were described as an "*informal business network amongst friends, family and acquaintances*" (Decorte et al., 2014, p. 101). Mainly growers with a larger crop mentioned it was not possible to work alone, because one needs help with preparing locations for cultivation, tending to the crop and selling the harvest. Although they recognised that some sort of structure was needed, they refrained from describing this collaboration as a criminal organisation (Decorte et al., 2014). Furthermore, the interviewed growers argued that the strength of the relation shaped the structure of these networks. Growers associate this relational strength with the level these people work at. Fellow growers were seen as friends, caretakers are acquaintances, and cutters are usually unknown. Decorte et al. (2014) suggest that whereas at the highest level, people cooperate in a sustainable way, for many specific tasks such as drying, cutting and transport, people are recruited by organisers and mediators. In many criminal proceedings there are also family ties among the suspects. As Paoli (2000) noted, high social capital, meaning having a lot of strong social relations, results in a network of reliable consumers which influences the move towards a more closed market.

1.4   Conclusion

To study social supply, I need to take the surrounding cannabis market into account. This chapter illustrated two main ways to look at cannabis markets, both of which have their merit in exploring the Belgian cannabis market.

The first view, which adheres to an economic perspective, describes a distribution system where cannabis is imported, from Africa for example, sold by wholesalers to middle-

market dealers and brokers who sell it to the end-customer through retail-level dealers. The second view argues that markets are disorganised, contingent upon the local context and shaped by the characteristics of their participants. As such, supply studies note that multiple cannabis markets exist in one and the same location (Curtis et al., 2002; Lupton et al., 2002).

Whereas women used to be described as victims in cannabis markets (e.g. Adler, 1985; Steffensmeier, 1983), more recent studies argue that women are not marginalised, but rather use a set of specific attributes (e.g. trustworthiness, communication skills, family resources) to become successful dealers (e.g. Anderson, 2005; Denton, 2001). Cannabis markets are now suggested to be gendered in nature, with female dealers stressing the need to act like 'one of the boys' (Dahl & Sandberg, 2014). Women tend to be dependent on male 'partners' as sponsors, protectors or gatekeepers.

Besides this gendered nature, women rely on their personal networks to obtain cannabis in a different way than men (Fischer, 1982; Marsden, 1987; Griffin & Rodriguez, 2011) (see also chapter 4). Size-wise these personal networks are similar, but in terms of composition they differ. Women's personal networks are more likely to include kin, while male personal networks more often include non-kin and co-workers. This suggests that men have more opportunities to find sources of drugs.

Studies of cannabis markets further suggest that female cannabis users obtain cannabis in a different way than their male counterparts (Griffin & Rodriguez, 2011). Women are more likely to obtain cannabis through sharing than men. Quantitative research into different ways of obtaining cannabis (non-cash and cash transactions) found that men are more likely to obtain cannabis on credit or up-front. As non-cash transactions require a greater level of trust, this suggests that women tend to be less trusted. However, the same study also found that women are more likely to obtain cannabis as a gift, which suggests that they are in networks where 'gift-giving' is common more than male users.

The shape of the Belgian cannabis market illustrates this dynamic character as well (Decorte et al., 2014). Technological innovations seem to have caused a change in supply from mainly imported cannabis towards mainly domestically cultivated cannabis. The classical supply chain seems to have vanished, as growers who are typically situated at the level of import and wholesale are now part of the middle or retail level. A Belgian study into small-scale cannabis cultivation suggests growers rely on connections not only to find locations or look after their crops, for instance, but also for distributing their cannabis.

However, Belgian growers seem to be involved in small rather than large networks (Decorte et al., 2014).

Belgium's cannabis market seems to have a closed rather than an open structure (Decorte et al., 2014). Previous research suggests that this evolution can push a market towards being a closed market rather than an open market (Paoli, 2000). Furthermore, as social capital and trust among network members grow, drug markets tend to become more closed as well. Belgian growers for instance stress the importance of trust between network members and associate the strength of social relations with specific functions in their network (e.g. fellow growers are considered 'friends', while those who cut leaves are often 'acquaintances').

Though it is generally recognised that drug markets are characterised by some sort of organisation, distribution is described by small-scale growers as *"informal business networks among friends, family and acquaintances"* (Decorte et al., 2014, p. 101). A description of cannabis markets in terms of *informal business networks* seems to be in line with how Ruggiero and South (1994) define drug markets as *crime in association* rather than *crime in organisation*. This particular cannabis market would then consist of loose networks, be non-hierarchical and based on trust. In other words, these kinds of collaborations seem to lean more towards ''friends' that smoke together' than towards searching for the most financial gain. Taking these conclusions into account, it can be questioned to what extent Dorn's *mutual societies* and *trading charities* might still exist today.

This dynamic perspective of drug markets also makes it possible to shed light on the possibility of multiple patterns of supply. Drug market studies argue that more attention should be paid to this horizontal complexity within specific drug markets. Drug markets, and thus cannabis markets, exist in many shapes that change constantly. This horizontal complexity is presented in chapter 2.

Chapter 2 Social supply empirically defined

2.1 Introduction

The classical view of cannabis markets as structured in a vertical way is nuanced to the extent markets are now seen as *associations*, characterised by loose partnerships rather than a clear upper, middle and retail level (see chapter 1). More particularly, it appears that within these levels a greater deal of horizontal complexity is present than Pearson and Hobbs initially suggested (Pearson & Hobbs, 2001; Taylor & Potter, 2013). It is this horizontal variety that is the subject of this second chapter.

Horizontal complexity also involves exploring different types of suppliers (see §2.2). Instead of involving only 'real dealers', cannabis supply is rather a 'benign affair', in comparison to for instance crack markets (Hamid, 1991). Friendship and family bonds between users are key. Whether social networks are seen as a way to minimise risk or to create more opportunities to find cannabis, several recent studies suggest that personal networks seem to shape the way an individual participates in the drug market (Griffin & Rodriguez, 2011).

Traditionally, dealers are depicted as motivated by financial gain. Retail markets are however more diverse than initially thought (see §2.2). Actors in this final stage of supply are often described as 'not *real* dealers' or user-dealers (see §2.2.1). These conceptualisations try to grasp supply patterns that are not organised around financial gain, but are rather part of a friendship relation (Goode, 1970). Besides *user-dealers*, a term also used by Dorn, Levi & King (2005), these retail-level suppliers are often referred to as 'not *real* dealers'. Grower typologies further illustrate the multiple faces of supply in cannabis markets. As is discussed below, many of these typologies refer to small-scale growers, motivated by ideology or friendship bonds rather than mere financial gain (see §2.2.2). Social supply as an empirical concept is first defined in §2.2.3.

In the past two decades, the concept of *social supply* has gained ground as a way to incorporate both the non-commercial and social aspect of cannabis supply (see §2.3). However, to date there is no single accepted definition of social supply, with academics offering a range of classification criteria. In a general sense, the concept is used to describe a *non-commercial* supply of cannabis among *non-strangers* (§2.3.1). A discussion of these

different classification criteria gives insight into the lacunae of this concept and sheds a light on what the difference is with 'dealing'? (§2.3.2 and §2.3.3).

Based on the discussion of social supply as an empirical concept, chapter 3 zooms in on its theoretical background. This way I aim to look into not only *how* social supply is described by users and suppliers but also *why* they describe it like that.

2.2 From 'dealers' to 'not *real* dealers'

2.2.1 Traditional 'dealers' versus 'user-dealers' and 'not *real* dealers'

The modern idea of the 'drug dealer' dates back to around the turn of the twentieth century, when supply of substances such as opium and cocaine first became heavily restricted in the United States of America. This image did not appear in a vacuum, as it is rooted in a range of historical events, spiritual and scientific movements and particular prejudices that produced a specific view of drug use. These histories of scapegoating and demonisation go along with the development of drug control (Coomber, 2006).

Early accounts of popular imagery of people that sell any kind of drugs refer to these people as 'pushers'. The following description is illustrative: "*a strange looking man, employed by a complex criminal apparatus, who seduced innocent youngsters into a life of dissipation by giving away drugs under false pretences. His victims would unwittingly 'get hooked' and have to pay vast sums to support their uncontrollable habit*" (Langer, 1976, p. 377).

However, many of these beliefs are problematic because there is little evidence of the existence of the effects or behaviours as they are commonly conceptualised, or they are unreasonably exaggerated or overly homogenised (Coomber, 2006). As far back as the 1970s, sociologists studying the cannabis market from the perspective of those involved began to nuance this societal stereotype (Goode, 1970; Young, 1971). For instance, Goode (1970) showed that cannabis is not sold by a small number of highly organised criminals but distributed among friends, often without payment and unsystematically. Goode situates users and sellers in the same social universe, as user and seller seem to be indiscernible from each other. Selling and using, according to Goode (1970), are parallel activities.

By referring to sellers as *friends*, descriptions of retail-level *dealers* seem to move away from the traditional definition of *dealing* towards a more nuanced view situating suppliers and users in the same social universe (Coomber 2006; Goode, 1970; Pearson, 2007).

Retail-level dealers are sometimes referred to as *user-dealers*. Situated at the bottom of the supply chain, user-dealers only sell drugs in order to maintain their own drug-using habit (Pearson, 2007). Retail-level dealers often consume the drug they sell (Pearson, 2007). Parker (2000) further indicates that these user-dealers serve a specific function as they protect users from direct contact with 'real dealers', thereby minimising the risk of apprehension.

In the context of cannabis markets, retail-level dealers are also described as 'not *real* dealers'*.* Users prefer to describe their supplier as a 'friend' rather than a 'dealer', thereby distancing themselves from the real deal. For example, Duffy, Schaefer, Coomber, O'Connell, and Turnbull (2008) found that most of their interviewees distanced themselves from the description of a drug dealer, defining a 'drug dealer' as someone who sells a considerable quantity of cannabis to a sizable customer base, making a significant profit. Duffy et al. (2008) conducted 182 interviews with 11 to 19 years olds who had at least used cannabis during the three months prior to the interview and/or brokered access or sold cannabis during the six months prior to the interview. These interviewees were recruited through youth centres, colleges, school exclusion units and Youth Offending Teams. A fifth of the interviewees reported brokering access to cannabis for others and described it as an essentially altruistic activity to help out friends. Four types of sellers are distinguished: infrequent sellers, light sellers, moderate sellers, and heavy sellers. Forty-five per cent of the sample reported being involved in cannabis transactions, of which 37 % had brokered and 22 % only sold once or twice. Generally, those who only sold cannabis only once or twice, or who had only brokered access, did not perceive themselves as dealers but recognised that they could be 'seen' as dealers by the criminal justice system.

2.2.2   Grower typologies: from commercial to social motivation

With a stable level of demand there is an obvious financial motivation for domestic cultivation. However, some researchers also point to non-financial but ideological motivation, which complicates the picture. The following paragraphs describe five typologies of home growers, all of which were developed along the lines of different motivations or more quantitative indicators like the number of plants.

A first typology of growers was developed by Weisheit (1992) based on public records and interviews with 31 domestic growers, 33 officials familiar with domestic cultivation as well as 12 people with expert knowledge. He distinguished three types of *commercial*

growers: hustlers, pragmatists, and communal growers. These *commercial growers* are men in their late thirties, predominantly white, and long-term residents of the United States. Most of them were employed: one third were farmers, and the others held a variety of jobs. Although most of them had a decent income, financial motivations often drove them to shift from personal growing to commercial growing.

Although many growers fit into one of the three categories (hustlers, pragmatists, communal growers), Weisheit (1992) adds that some have traits of one or both of the other categories. *Hustlers* are the 'real entrepreneurs' who consider marijuana growing as a real business challenge, and the risks involved as merely part of the attraction. It is the challenge, rather than money, that is the main motivator for cultivation. Use or previous dealing is not a prerequisite for this type of grower. The author does not consider them to be a large group, but because of their quest for success their operations are generally vast. Moreover they develop strong networks, which may continue to exist after they have left.

Pragmatists enter the business out of economic necessity, and feel there is not really another option left for them. Financial gain is again not the main driver, but getting through tough times is. Similar to hustlers, pragmatists are not necessarily users. The author indeed argues that growing marijuana for some kind of financial profit does not require one to have a drug lifestyle or even have a liberal attitude towards the drug.

Communal growers are the largest in numbers, although their operations are often small. For them, cannabis cultivation is part of their lifestyle. Nearly all of them start growing for their own consumption, to finance their own use, or as a hobby. The business side of cultivation is only of secondary interest, as cannabis cultivation is regarded as a personal statement of independence or rebellion. Businesses can become larger in times of economic necessity, but in good times tend to shrink again. Furthermore, most communal growers are indistinguishable from "ordinary" citizens. Their prices are often way below market prices, and they give a large part of the harvest away. Other growers are not considered competition but rather "kindred spirits". They get together and share information on production as well as on how to avoid the law. Finally, Weisheit (1992) notes that several commercial growers described their activities as having political and economic implications, though this might be nothing more than rationalisations to justify their illegal activities to themselves.

Bovenkerk and Hogewind (2003) developed a second typology in a study on the Netherlands. They included not only commercially motivated growers, but also those who mainly grow for personal use. Four types of producers are found: small home growers, large independent commercial home growers, entrepreneurial large-scale producers, and single home growers working for commissioners. *Small home growers* keep themselves within the limits of the drug policy, which is less than five plants per person in the Netherlands, although they might sell their surplus to friends. They exist in every social class, all over the country. *Large independent commercial home growers* produce mostly for coffee-shops, wholesalers or their own networks. They grow between tens and hundreds of plants per person. This type is more limited to the poor urban neighbourhoods and trailer parks. *Entrepreneurial large-scale producers* cultivate up to a few tens of thousands of plants on large surfaces in between other crops or in disused factories. The bigger the size of their operation, the more professionally organised it tends to be. They do not deliver to coffee-shops due to their limited potential market but focus on export instead. Because they almost never get caught, it is impossible to determine their social background. The final category, *single home growers,* enter into contracts with multiple individuals, who agree to provide the necessary room to grow. Both grower and location provider often already have a criminal career, and are often part of the lower social class.

A third typology is found in the study of Hough et al. (2003). Based on 37 interviews with cannabis growers, the researchers developed a typology based on motivation as well as numbers of plants cultivated. Accordingly, they describe *sole-use growers, medical growers, social growers, social-commercial growers and commercial growers*. *Sole-use growers* have between one and a dozen plants at a time and grow their own cannabis to secure good quality. *Medical growers* want to secure a cheap and reliable supply of high-quality cannabis with little legal risk. *Social growers*, though having the same motivation as *sole-use growers*, are also motivated by social rewards. They give cannabis to their 'friends or ask a very low price for it. Like the first type, they seem to get a great deal of satisfaction from the process. Hough et al. argue this category to be similar with the work of Weisheit (1992, referred to by Hough et al., 2003, p. 9), as *social growers, or social suppliers*, also getting satisfaction in the status they achieve within their social networks by producing a high-quality and highly valued product. Growers that cultivate for profit but only sell cannabis to their social networks fit into the category of *social/commercial*

growers. Their orientation was originally the same as social growers, but over time this changed towards a supplementation of their income. *Commercial growers*, to conclude, supply cannabis to anyone presenting themselves as a customer.

A fourth typology is put forward by Potter (2006), who situated growers' motives on a spectrum from purely altruistic to purely financial motives. He conducted an ethnographic study into home growers in 2006 and concluded that no 'unique' demographic type exists, as home growers tend to be of all ages and all socio-demographic backgrounds. Yet, certain personal traits are common to most cannabis growers. Present or past cannabis use is a major common trait, although there is no strict relationship between one another. Potter further describes two general attitudes towards cannabis use. Some growers consider the decision to use all drugs, soft as well as hard, to be a personal choice. They are in favour of tolerance, as long as it does not bother 'other people' too much. Others however make a very strict distinction between cannabis use and all other drugs, arguing cannabis is 'pure nature' and therefore fundamentally different. Opinion on use is linked to attitudes to growing, as those who grow for personal use are most likely to be the ones with experience in social supply of cannabis and other 'soft' drugs. To conclude, the often-assumed link to other criminality is according to Potter (2006) related to ideological motivations. Growers generally consider their own activity as benign and justifiable. Involvement in petty crimes is often ideologically motivated. If growers are involved in more serious criminality, then it mostly relates to properties rather than against people.

Many growers are ideologically motivated and show a profound interest in ecology (Potter, 2006). The balance between ideological/motivational elements is a useful way to distinguish different types of growers. Growers' motives are then placed on a continuum from purely altruistic to purely financial motives. In between is a large middle ground where financial motives only count as part of the driving force. At the altruistic end of the spectrum there are ideological growers who do not consider profit as their main motive but welcome money as an extra incentive. Potter discusses four types of ideological growers: *medical marihuana growers, activist growers, growers for personal use* and *accidental growers*. *Growers for personal use* are the majority, and are an expanding group. This type of growers comes from a wide variety of backgrounds, and has limited financial motive, as their main goal is achieving good quality or other intangible rewards of growing.

Potter (2006) concluded that the general assumption that financial gain is part of the reason why people get involved in growing is not necessarily true. He therefore suggests that motivation can be one or a combination of three drivers: Greed, Weed and Need. *Greed* represents the traditional goal of making money. However 'greed' is not a necessary motivation. The growers in Potter's study were also motivated by elements of 'weed', which symbolises an ideological position towards the drug, and 'need', which indicates for example a medical necessity. These motivational drivers work in different combinations, creating different types of dealers. For example, true altruism can be seen with medical growers while others have almost solely financial motives. Still others have a financial incentive but are also driven by ideological or social and cultural representations of the plant and consider the intangible rewards (for example pleasure, political statement, hedonistic lifestyle, hippie ideologies) as more important than the commercial gain. Whereas 'greed' and 'need' are the dominant motivators in cannabis markets, more people are motivated by elements of 'weed'. This forms a significant challenge to the idea of a purely financially driven drug market (Potter, 2006).

A fifth and final typology was developed in study of the patterns of youth participation in outdoor domestic cannabis cultivation (Bouchard, Alain, & Nguyen, 2009; Nguyen & Bouchard, 2010). Bouchard et al. (2009) administered a self-report delinquency survey to 1,262 adolescents between the ages of 13 and 17 who were attending one of the purposively selected secondary schools in an agricultural region in Quebec, Canada. Their findings show that 15 % of the respondents had participated in cannabis cultivation in the past year. This is higher than any other type of crime reported in the survey (except for general mischief) and is comparable to the prevalence rates found for drug dealing. Not all of them were connected to organised crime, nor were they high-profile drug users themselves. Drug use was one of the most significant predictors for involvement. Gang membership increased the odds of involvement in cannabis cultivation but not in drug dealing (Bouchard et al., 2009).

Nguyen and Bouchard (2010) refer to the aforementioned variety of typologies developed based on the commercial versus non-commercial motivation of adult participants of cannabis cultivation, and conclude that a similar pattern of motivation exists among juvenile participants. Cluster analysis revealed three main motivators among juvenile participants: 'making money', 'fun, risk and thrill', and 'financing personal consumption'. Depending on the scores of an individual on a particular motivator, four types of

participants are described: *generalists*, *hobbyists*, *helpers* and *entrepreneurs*. *Generalists* form the largest and most delinquent group of the sample. Cannabis cultivation is just one of their many delinquent activities. This group is financially motivated but also cultivates for personal use. *Hobbyists* are similar to Potter's (2006) growers for personal use and Hough et al.'s (2003) sole-use grower. This group cultivates as a pastime, and has a small number of plants. Other than cultivation-related activities, they are rarely involved in criminal activities. Most of these hobbyists claim to be financially motivated, but indicate at the same time that they earn little money and share most of their harvest with one person. *Helpers* are mainly 'ordinary' young people, who are rarely involved in other criminal activities, and who are mainly financially motivated. Half of this group indicates money as the main motivator, but none of them stated financing personal use as a motivator. Often they work as hired labourers, and show a higher level of experience than members of other groups. The final group, *entrepreneurs*, are motivated by making money and typically own large commercial sites. This group is the most successful of all groups. Nguyen and Bouchard (2010) compare the entrepreneurs with Hough et al.'s (2003) commercial growers.

2.2.3   Social supply as an empirical concept

The concept of social supply was primarily developed in European drug research, mainly from the UK. Inspired by a sharp increase in illicit drug use, particularly cannabis, drug researchers studied the complexity of the end-distribution of cannabis and dance drugs. Although diverse in set-up, methodology and goals, all agree on the fact that user and supplier describe their relationship in social terms rather than commercial terms (Coomber & Turnbull, 2007; Harrison et al., 2007; Hough et al., 2003; Parker, 2000; Potter, 2009; Werse, 2008).

Howard Parker (2000) was the first author who concluded that illicit drug users tend to describe supply in social terms, from an analysis of the qualitative data derived from three studies of drug transactions at the point of consumption. These three studies were developed while looking for an explanation of the sharp increase in cannabis use, especially among young users. The first was the *North West Longitudinal study* (NWLS) was a 5-year study (1991 to 1996) into the role of alcohol and illicit drugs among 700 fourteen- to eighteen-year-olds in two regions of north-west England. The data collection involved five annual, confidential self-report surveys and interviews with 86 of the cohort in Year 4, plus several case studies of "critical incidents". The second was the *Integrated*

Prevention Programme Evaluation (IPPE), a four-year investigation in which more than 3,000 13-16 and 15-18 year olds were tracked by annual, confidential self-report questionnaires exploring their use of alcohol and drugs in the context of their lifestyles. A small cohort (n = 19) of initially 15-year-olds from the panel was interviewed three times between 1996 and 1998 by the same interviewers. Whereas the two other studies mainly investigated cannabis use, the third study addressed the health and safety of clubbers. The *Dance Drugs, Nightclubs* study included 21 nights of fieldwork in three nightclubs in north-west England. A team of eight researchers conducted nearly 2,000 brief and 300 in-depth interviews with customers.

Recreational drug use is described in all three studies as a social event. For instance, in the *Dance Drug, Nightclubs* study Parker (2000, p. 59) describes *"supply transactions take place in their own semi-private social space where they are largely condoned"*. All three studies questioned, among other things, how respondents obtained illicit drugs. Respondents (13- to 17-year-olds) of both the *NWLS* and *IPPE* described that drug initiations take place in social settings where their friends or acquaintances offer drugs to try. Even beyond first use, recreational users rely on friendship networks to obtain cannabis (Parker, 2000). Results from the *Dance Drug, Nightclubs* study indicate around one-fifth of the clubbers obtained dance drugs for free from friends, 'partner' or relatives. Moreover, of those who said they had paid for their drugs, only a small percentage obtained dance drugs from an unknown dealer. Around two-thirds of the sample regularly procured drugs via friends or relatives or from a dealer well-known to them. Almost three-quarters of the sample said they had sold drugs to friends.

Comparable conclusions were drawn in the Drugs, Alcohol and Violence International (DAVI) study (Harrison et al., 2007). From 2000 till 2003, a comprehensive cross-section of 14- to 17-year-olds was questioned in four cities (Philadelphia, Amsterdam, Toronto and Montreal). The final sample included a representative sample of school students and detained young people as well as a diverse sample of school dropouts. Next to a self-administered questionnaire, there were also one-on-one interviews. The results provide some insight into drug acquisition among school pupils as well as more deviant young people (school dropouts and detainees). Among school student populations, it appears *sharing of drugs* is very common. When asked how they obtained their drugs, they mentioned friends as the most frequent source, followed by fellow pupils. Detainees and

dropouts, on the other hand, were more likely to report that they got their marijuana themselves and not through friends or relatives.

Coomber & Turnbull (2007) noted that initial exposure, as well as continued use and supply, is mediated via friendship networks. They conducted a qualitative study in which they used semi-structured interviews with purposively selected cannabis users (n = 182). 'Buying cannabis with friends' was considered by just over a quarter as a social activity. Friendship networks seemingly have very little to do with the established illicit drug market. Contact with that market is facilitated by friends and/or friends of friends, or family. Consequently, this market is situated in a transitional place, distinct from the wider market. Only at the margins are there young people connected with the wider market. The authors describe the above-mentioned relation between a young user and supplier in terms of 'social supply', when trying to grasp the 'social aspect' of drug dealing. Social supply is then defined as: "*a separate category of dealing whereby friends supply or facilitate supply to other friends*" (Coomber & Turnbull, 2007, p. 16).

Werse (2008) concluded that a significant part of the German drug market exists in a non-monetary manner, mainly by sharing joints. The database for the study entailed two studies. First, quantitative data was derived from a representative school survey of about 1,500 fifteen-year-olds. Second, qualitative data was collected from 169 occasional and regular adult drug users. All of the adult respondents were socially integrated users, as they all had a professional education and a steady job. Pupils tended to be occasional users, and reported friends and acquaintances as their main source. Two-thirds received their cannabis from friends or friends of friends, whereas only 20 % bought their drugs from what they described as private dealers or street dealers. Very few reported getting cannabis at school or growing it themselves. Furthermore, the extent of sharing cannabis was significantly related to the level of cannabis experience. Experimental users and occasional users were more likely to get their cannabis through sharing than more experienced users. The results of the school pupil survey also indicated that a substantial proportion of small-scale cannabis sales take place within peer group networks.

Based on the first part of the database, Werse (2008) concludes that a considerable proportion of moderate users never buy cannabis themselves and only share joints others have rolled. Therefore, he argues that a "*substantial part of cannabis distribution, monetary as well as non-monetary, takes place within networks of friends and acquaintances*" (Werse, 2008, p. 110). The assumption that moderate users are most likely

to obtain cannabis through sharing or for free is largely confirmed by the qualitative data. Both quantitative and qualitative data furthermore show a significant gender difference concerning the rates of social cannabis use. Significantly more female than male users reported never paying for the drug. Finally, both networks of 15-year-olds as well as adult moderate users tend to include more intensive users who are brokers between moderate users and private dealers.

Hough et al. (2003) refer to the conclusions Parker (2000) made concerning the social aspect of cannabis supply, and designed a small exploratory study into the role of home cultivation in the cannabis distribution process in England and Wales. The study started from the observation that recent developments in the technology for growing cannabis have made it possible to cultivate cannabis in temperate climates. Much of this is produced for personal use or use with friends. Thirty-seven cannabis cultivators, mainly in their twenties and thirties, were recruited primarily using the internet. The respondents were divided into categories based on their motivations for growing. Ten were identified as social growers, as they grew cannabis for personal use and gave the excess to their friends for free, or charged a little to cover their expenses. The researchers concluded that this type of grower took great satisfaction from the status they achieved within their social networks by producing a high-quality product. This finding led to a definition of *social supply* as *"non-commercial/non-profit-making distribution of cannabis to non-strangers"* (Hough et al., 2003, p. 36). In contrast with the above-discussed demand-side studies, Hough et al. (2003) prefer to limit social supply to non-commercial or non-profit-making distribution of cannabis. Parker (2000), Werse (2008), Coomber & Turnbull (2007) and Harrison et al. (2007) stress the social aspect of the supply relationship and acknowledge that this relationship can include an exchange of money.

2.3   Social suppliers

2.3.1   "Social" supply

The concept of social supply relies heavily on the social aspect. What is key to the motivation is that cannabis is distributed amongst "non-strangers"**.** It seems there is a grey area that is difficult to define and is subject to debate. Potter (2009) agrees that a social aspect exists but suggests that the definition of Hough et al. (2003) is both too vague and too strict:

> *Social supply should not be considered differently to other forms of 'real' dealing purely on the grounds of a social relationship which is after all the essential difference between an open and closed market.* (Potter, 2009, p. 62)

Potter (2009) argues that Hough et al. (2003)'s proposal of 'non-strangers' is too vague to be useful. The *social* part of social supply seems to exist in the recognition of a relationship between supplier and user that goes beyond the drug-transaction relationship. This could include anyone without specification of how they know each other. This definition is according to Potter (2009) of little use in many drug scenes, where drug use is considered to be a social activity. 'Sharing' cannabis joints is part of a ritual, and even hard drug use is seen as a social affair. Even if the use evolves into being problematic, the first use is often socially. Therefore, for most drug users their first drug supplier is a social contact or acquaintance. What is important is that nearly all drug use is embedded in social networks. Some drug scenes (such as ecstasy and cannabis) seem to be more sociable than others. Participants have access to a large network behind the scenes, with plenty of people who can be seen as 'non-strangers', a status which can change really easily. Potter (2009) concludes that this seems to be part of the ideology of many drug scenes. Whereas the term 'non-stranger' seems too vague, the concept of 'friendship' seems to be widely used, though it is at least as subjective. Furthermore, what constitutes friendship is problematic, as literature shows users do not always get their drugs from friends but also from friends of friends.

A recent Australian social supply study suggests that the social bond between users and suppliers does not always come first (Lenton et al., 2015). Cannabis users (n = 120) between 18 and 30 years old residing in urban settings (Melbourne, Perth, Armidale) were interviewed. Respondents often described their cannabis suppliers as 'a friend'. However, while roughly three-fifths reported that this relationship was a friendship first, two-fifths reported it was actually primarily a supply relationship. About one-fifth of the sample (18 %) described their relationship with their main supplier as 'strictly business'. A 'friend who sells' implied in this study that the supplier was considered a 'friend' rather than a 'supplier', whereas 'directly from a seller or grower' meant the relationship's primary goal was the exchange of cannabis. When respondents were asked how they *most commonly* obtained their cannabis, this was 'directly from a seller or grower' (35 %), 'from a friend who sells' (31 %) and 'a 'friend gets it from a seller' (21 %).

2.3.2 "Non-commercial/not-for-profit" supply

Referring back to Hough et al. (2003), Potter (2009) notices that the distinction between 'non-commercial' and 'not-for-profit' is not made, as both are seen as part of the definition of social supply. He distinguishes research that deals explicitly with social supply from research that does not. The former seems to focus on the social relationship and does not really discuss the financial aspect. The latter mentions a variety of financial arrangements, such as buying together to get a discount, using intermediaries who get their drugs for free and make some money to cover for the risk, and paying regular market prices. Potter adds that there seems to be no consistency in the recognition that social supply needs to incorporate a 'not-for-profit' element, and even if so, what would 'profit' mean? He concludes that the difference can be found in the motivation, which is not purely oriented towards making profit. More specifically, social supply can be considered a transaction *"that would happen even if profit were not to be made, but that might include some profit if the option is there"* (Potter, 2009, p. 63).

Coomber and Moyle (2014) argue as well that the ideal notion of social supply, which according to them is one where no financial gain is involved, does not occur in reality, as the same form of payment is involved through taxing, mark-up or economies through bulk purchase. It is suggested that the initial motive should be key in defining social supply, rather than notions of profit, quantity or friendship. They propose that a broader concept of *minimally commercial supply* captures this type of supply better than *social supply.*

Social supply is linked to transactions defined as an *"act of friendship and trust"* (Parker, 2000). Sharing' and gift-giving are thereby seen as a part of friendship building. Still, Taylor & Potter (2013) argue that there are further possible advantages: for the customer it helps ensure that the product received is of good quality and quantity, and for the dealer selling to friends it is a form of risk management because it reduces the risk of being reported to the police or of goods getting stolen (Potter, 2009; Werse, 2008).

Ethnographic research in the particular organisation of cannabis markets suggests that these acts of friendship are part of a range of informal controls and do not only structure cannabis use but form supply patterns as well (Dunlap, Johnson, Benoit, & Sifaneck, 2006; Zimmerman & Wieder, 1977). Cannabis smoking is thereby seen as part of a social ritual, where regardless of the setting, group processes encourage equal sharing, moderation in consumption and rituals involving the way cannabis should be smoked. These studies

describe that the majority of cannabis supply involves a sharing of cannabis, without any monetary profit being made.

These informal social controls are situated within a broader culture of reciprocated sharing. Though some authors argue that sharing cannabis involves no or little expectation of some sort of reward, others state that there is no such thing as an 'unreciprocated gift' (Mjåland, 2014). Classical anthropological theories of exchange point to how exchange is always embedded in social relations (Mauss, 1990; Sahlins, 1972). Mjåland's ethnographic study of drug sharing among Norwegian prisoners uses this perspective of gift-giving to illustrate how sharing is shaped by motives of caring, compassion and solidarity, while it simultaneously emphasises the self-interest embedded in such drug exchanges (Mjåland, 2014). Drug sharing is then understood as continuous gift-giving.

The obligation to reciprocate is what binds individuals, families or associations together and, in doing so, social relations and solidarity might develop (Mjåland, 2014; Sahlins, 1972). The gift perspective allows us to see that it is essential to always include an economic self-interest and obligation. This reciprocity can vary along a continuum that stretches from generalised reciprocity and balanced reciprocity towards negative reciprocity. *Generalised reciprocity* refers to a vague obligation to reciprocate goods when the person who gave them needs them and the recipient can provide them. *Balanced reciprocity* is more economic and directed, and involves people giving back for specific things they received. Negative reciprocity refers to attempts to get something without giving something in return.

2.3.3 Drifting from one to another form of supply

Coomber & Turnbull (2007) suggest that social supply is a separate category of supply, something different than 'dealing'. Other studies suggest that users will often avoid contact with those they class as 'real dealers', choosing to buy only from 'friends' or 'friends of friends' (Parker, 2000; Stevenson, 2008). 'Real dealers' are assumed to be those who profit from drugs or sell drugs for a living rather than just helping 'friends' (Jacinto, Duterte, Sales, & Murphy, 2008; Parker, 2000; Stevenson, 2008). Suppliers themselves often refrain from using the term *dealer* as well, claiming they're just helping out or 'doing their friends a favour' (see §2.2.2). As is discussed below, some authors see a technique of neutralisation in this (Potter, 2009; Sykes & Matza, 1957) (see chapter 3).

However, some studies suggest that there is a group of cannabis suppliers who have *drifted* from a friendship-based 'social supply market' into 'dealing' (Murphy, Waldorf, & Reinarman, 1990; Taylor & Potter, 2013). This suggests that social supply and 'dealing' might be more intertwined than suggested by Coomber & Turnbull (2007). 'Drifting into dealing' refers to the idea of how young people 'drift' into delinquency through a series of gradual escalations of deviant behaviour (Jacinto et al., 2008; Matza, 1964). This process is gradual to such an extent that it is barely noticeable. Applied to drug dealing, 'drifting' refers to those sellers who do not make a clear choice to become a drug dealer but become involved in drug supply *"in such small steps they are hardly noticed by the individuals involved"* (Coomber, 2006, p. 12, as cited by Taylor & Potter, 2013).

Taylor & Potter (2013) argue, in line with Jacinto et al. (2008), that this process of drifting might happen within a relatively short period of time as individuals drift from being a 'user' towards being a 'social supplier' before drifting further up into drug distribution. Suppliers who drift into dealing seem to be least likely to perceive themselves as dealers. As Taylor & Potter (2013) assert, they are the ones most likely to increasingly start using techniques of neutralisation to resist the label of deviancy (see chapter 3). This group of dealers is also less likely to see the risks associated with being caught because they perceive their activities as being non-deviant (Jacinto et al., 2008; Murphy et al., 1990).

This group of suppliers has a very high turnover (e.g. £ 1,000 on average per week), making them dealers, but the market in which they operate is structured like a social-supply market rather than that of stereotypical violent drug traffickers (Brownstein, 1999; Taylor & Potter, 2013) (see §3.2.1). Taylor and Potter (2013) collected data through participant observation and informal conversations as well as in-depth interviews with 13 'real dealers' who, over a period of 18 months, had bought on average quantities of cannabis, cocaine, ketamine and MDMA with a retail value of over £ 1,000 (approx. €1,250) per week. Most of the dealers in the study started dealing to help out friends or as *user-dealers*, to cover the costs of their personal use. Although the majority of them still considered helping out friends and covering the costs of personal use as their motivation, financial gain seemed to have become an increasingly important motive. For most, the profit from selling had become their primary source of income, confirming them as 'real dealers'.

As mentioned in chapter 1, this kind of supply also seems to be part of a closed market. The most important motive for these dealers to keep being involved in supply is the social

aspect. Taylor and Potter (2013) describe the social aspect as seeing and spending time with friends, giving dealers a chance to maintain and extend their friendship groups. Most of these dealers for instance only sold to friends, friendly acquaintances or friends of friends. None of their customers were strangers, and they only sold to those introduced by already trusted friends.

2.4   Conclusion

Rather than describing all suppliers and 'dealers', empirical studies indicate suppliers tend to described as 'friends' (e.g. Coomber & Turnbull, 2007; Harrison et al., 2007; Parker, 2000; Werse, 2008). Already in the 1970s Goode suggested that users and sellers are part of the same social universe because they are quasi indiscernible from each other. Throughout the years a range of typologies is put forward. For instance, a range of retail level dealers are described as 'not *real* dealers' or 'user dealers' (Coomber, 2006; Potter, 2009). In other words the cannabis markets I described in chapter 1 are not only dynamic in a vertical sense, they also are characterised by a horizontal complexity.

Grower typologies reflect this horizontal complexity. They are developed based on motivations to grow, sometimes combined with other quantitative indicators like the number of plants. Most types of commercially motivated growers are situated in large-scale operations, and here I include pragmatists (Weisheit, 1992), large independent home growers, large industrial growers, organisers of industrial cultivation (Bovenkerk & Hogewind, 2003), corporate growers, franchises (Potter, 2006) and entrepreneurs (Bouchard et al., 2009) Others are described as cultivating cannabis on a smaller scale, in a less organised way. Here I situate for instance commercial growers (Hough et al., 2003) and generalists (Bouchard et al., 2009) who grow for personal use, both mainly to make money. One-off opportunists (Potter, 2006) and helpers (Bouchard et al., 2009) are involved in cultivation with a specific goal, for instance to pay off a debt (Potter, 2006) or to gain an income: in other words, not to cover their costs of using cannabis but rather to cover their living costs (Bouchard et al., 2009). This final group of helpers is where the most women are found.

Some types of growers are described as not completely financially motivated. These growers are described as communal growers (Weisheit, 1992), small home growers, (Bovenkerk & Hogewind, 2003), socio-commercial growers (Hough et al., 2003) and self-employed growers (Potter, 2006). What unites them is the finding that they all grow cannabis for personal use but sell their surplus to friends. A key difference with

commercial growers is the type of customer they intend to sell to. Cannabis is sold to friends only, people they trust and know and thus not to strangers. Social growers, referred to by Hough et al. (2003) as social suppliers and cooperatives (Potter, 2006) are not financially motivated either. This group of growers asks little or no financial reward for their cannabis and is mainly motivated by social rewards, namely providing a group of friends with good-quality cannabis.

Social supply was conceptualised in the early 2000s as a type of supply that has a *social* aspect and a *non-commercial* aspect. To date, there is still no unified definition of *social* supply. In terms of the social aspect, some definitions include everyone a person knows by name, for instance Hough et al. (2003) include "non-strangers". Other definitions refer explicitly to "friends" and "friendship networks" as the setting for this type of supply (Coomber & Turnbull, 2007; Harrison et al., 2007; Parker, 2000; Werse, 2008). The *non-commercial aspect* sometimes refers to no monetary profit or money merely to cover costs (Hough et al., 2003; Harrison et al., 2007), while others suggest that some monetary profit can be made (Werse, 2008). Most definitions refer to supply as the end-supply, where a supplier provides cannabis to a user, but one definition also includes brokers, which it refers to as facilitators of supply (Coomber & Turnbull, 2007).

In social supply, which is constructed based upon the reflections of suppliers and users themselves, there remains much room for discussion as to what the social and commercial aspects actually involve. In the past few years, social supply studies have tried to further nuance both aspects. Potter (2009) questions the importance of the social aspect of social supply directly when he argues that the finding that cannabis use is embedded in social networks confirms the existence of closed markets rather than defining social supply *per se*. He questions the definition of Hough et al. (2003), which describes the social aspect as 'non-strangers', which seems too vague but also puts question marks against the concept of 'friendship', a concept far too subjective to be used when defining supply. His questions are further supported by findings in the Australian social supply study (Lenton et al., 2015) where roughly 40 % of recreational cannabis users argued that their relation with their supplier was a supply relation first, meaning supply was key rather than friendship.

That said, the 'non-commercial' aspect leaves as much room for discussion as this social aspect. As described, some definitions refer to acts of friendship and sharing as social supply (Hough et al., 2003), while others suggest that 'some' monetary exchange can take place (Werse, 2008). Potter (2009) argues that the difference between 'dealing' and

'social supply' lies in the initial motivation of the supply, which is not financial in the case of social supply. That way social supply might include some monetary exchange, but it is not the initial goal of the transaction. Coomber and Moyle (2014) suggest that 'minimally commercial supply' would be a more appropriate term to describe many transactions that otherwise would be seen as 'social supply'.

Besides this, one definition seems to suggest that other forms of profit might also be included (Hough et al., 2003): some 'intangible reward' (Weisheit, 1992). These kind of profits can be situated within broader research into reciprocity, where it is suggested that there is no such thing as an 'unreciprocated gift', as reciprocity is what binds individuals, families and associations together (Mauss, 1990; Sahlins, 1972). In case of social supply, which seems to be inherently connected to friendship building and trust, these intangible rewards include for instance mutual advantages for supplier (e.g. lower risk of apprehension) and user (e.g. assured quality).

Social supply might be more dynamic and less part of a separate arena of transactions than suggested by Coomber & Turnbull (2007). Some social suppliers are found to have drifted into what I described as 'traditional forms of dealing'. This process is so gradual that these people do not seem to notice the evolution in their supply pattern, still describing it in terms of social supply while for instance their average weekly revenues are more than £1,000 (Taylor & Potter, 2013). This group of dealers still considers helping out friends and covering personal use to be their main motivation, but gaining financial profit has become an important second one.

In chapter 3 the concept of social supply is explored theoretically. Instead of describing what supply patterns look like, I focus on why users and suppliers tend to describe social supply as such. Notions of neutralisation, subcultural values and social learning are found within these studies of social supply. However, in order to explore the nature of social supply, I argue for viewing the acquisition of cannabis as embedded in a supply tie between user and supplier(s) within the context of their personal networks.

Chapter 3   Theoretical background of social supply

3.1   Introduction

The previous chapter presented social supply in its empirical context. This chapter further develops the concept of social supply theoretically. To understand and explore the grey area of retail-level supply, it is not only important to understand how supply takes place but also why supply is perceived in this particular way.

The first section presents social supply within the *normalisation hypothesis*, where its first notions were developed (§3.2). Parker et al. (1999) argue that recreational cannabis use among young people has become *normalised* (§3.2.1). The extent of this wider social and cultural accommodation is debated. Some authors suggest normalisation is too expansive as a concept and should be *differentiated* (Shildrick, 2002), while Hathaway, Comeau, and Erickson (2011) argue cannabis use is still stigmatised and *normified* rather than *normalised* (§3.2.2)*.*

The second section applies current theoretical views considering cannabis use on (social) supply (see §3.3). A clear theoretical view of supply is not yet formed. However, some authors do suggest different user theories might help to explain why people define supply as "social" (Potter, 2009). The normalisation perspective argues cannabis users are 'insiders'. This individualistic perspective is rooted in a view of use, and therefore also maybe of supply, as the result of a cost-benefit analysis (§3.2.1). As a social supplier seems to be described as a 'friend' or an 'acquaintance', one could also assume perceiving supply as social is the result of social learning or of a cultural process (§3.3.2). A third perspective nuances this idea of social learning and suggests defining supply might be a way to deal with risks or stigma (§3.3.3).

3.2   Social supply within a debated normalisation framework

3.2.1   Normalisation hypothesis: drug use, cultural and social accommodation

During the nineties, self-report studies in the UK showed a sharp increase in cannabis use, especially among young people. Furthermore, drug research, mainly from the UK, portrayed cannabis users as predominantly young, otherwise law abiding, both male and female and from all social classes (Aldridge, Parker, & Measham, 1999; De Donder, 2009;

Duffy et al., 2008; EMCDDA, 2011). Both observations stimulated Parker et al. (1999) to develop a longitudinal study into the drug career of a cohort of conventional young people in England from adolescence to adulthood. The key question was: 'to what extent has mainstream youth culture assimilated and legitimated recreational drug use?' (see chapter 2).

Aldridge et al. (1999) concluded that recreational cannabis use had become a normal part of youth activities. They focused on recreational cannabis use because a large majority of substance users settle primarily for cannabis use, and only a small minority transfer to poly drug use. The *normalisation thesis* has become one of the most influential yet contested developments in the sociology of drug use. In the next paragraphs I discuss six dimensions of normalisation: the *availability* and *accessibility* of cannabis (*drug availability, drug trying, drug use* and *future drug use*), a wider *cultural accommodation* of recreational cannabis use*,* and a *social accommodation* of recreational cannabis use, i.e. being 'drug-wise' regardless of any individual experience with the drug (Measham & Shiner, 2009; Parker et al., 1999).

The first four dimensions of normalisation refer to the *availability and accessibility of illicit drugs*, which is a prerequisite for something to become normal (Aldridge et al., 2011). As is common knowledge, cannabis use is the most widely available illicit drug, not only in the UK but also in many other European countries. The research team not only describes a rise in drug availability*,* but also in *drug trying* rates. Furthermore, the closure of gender and social class differences indicate a growing normativity. Traditionally, more men than women use illicit drugs. Parker et al. (1999) however found no significant differences in drug trying between both sexes. Since the nineties, increasingly more well-behaved middle-class young people are trying drugs, putting the traditional image of a delinquent drug user with low self-esteem in doubt. The authors therefore argue that recreational cannabis use is the result of a cost-benefit assessment (see §3.3.1). Finally, the open-mindedness about *future drug use* by young adults who go through adolescence without using illicit drugs is a further indication of the normalisation thesis. During interview sessions it became apparent that nearly two-thirds of abstainers held approving attitudes towards the drug, and half of the ex-drug takers was tolerant as well (Parker et al., 1999).

The extent to which recreational drug use is *accommodated into cultural understandings of normality* is very difficult to evaluate. Parker et al. (2002) argue multiple indicative signs of recreational drug use becoming accepted as a 'liveable reality' by wider society.

Young people have accommodated drug use not only in terms of what is acceptable to do, but also by absorbing the language and imagery of drugs via the fashion, media, music and drink industries, which focus on youth markets. For example, the blurring of illicit and licit drug use in 'going out' is now often referred to in television dramas and series, and drug-taking is a source of stand-up comedy.

Concerning cannabis use, public opinion studies show that in the UK more and more people are in favour of some decriminalisation. A study into British public opinion (aged between 16 to 59) towards drug use involved respondents being asked to assess the relative harmfulness of different drugs. Only one-third judged cannabis to be harmful, in contrast to the 90 per cent who considered heroin, cocaine, ecstasy and amphetamines to be harmful. School surveys show nevertheless a more nuanced picture: 11- to 16-year-olds estimate all illicit drugs (including cannabis) as more or less equally harmful. This attitude however changes considerably as children grow older, so that by the age of 15-16, they tend to see cannabis the same way adults do (Police Foundation, 2000).

A further illustration of this wider cultural acceptance is the finding that 'recreational' drug use seems to have become a 'normal youth activity'. The drug use Parker et al. (1999) described is largely recreational and relates to less physically addictive drugs. It is explicitly argued that hard drugs like heroin and cocaine are not the focus of the normalisation thesis. The results of the survey and interviews indicate recreational drug use has moved from being a marginal activity towards a normal youth activity. Consequently, Parker et al. (1999) argue subcultural theory has lost analytical value. The theoretical framework is discussed in detail below (see §3.2.2).

Abstainers seem to be *drug-wise* as well, even though they did not use cannabis, which suggests cannabis is also *socially accommodated* (Parker et al., 2002). Even abstainers knew quite a lot about the recreational drug scene simply because they could not avoid encounters with it. Parker et al. (2002) combine their assessment of social accommodation with an evaluation of attitudinal scales, self-nominated status, recentness and frequency of use as well as future intentions. They questioned, particularly among abstainers, how many of their friends used drugs. As expected, cannabis is again the most important drug, with 85% of the respondents having friends who take it. Cannabis received the most tolerant attitude of all drugs. Drugs are very real, and while growing older they developed a very pragmatic view. Abstainers distinguished between gross misuse of hard drugs on the one hand, and 'sensible' recreational use of cannabis and to

some extent amphetamines, LSD and ecstasy on the other. This moral accommodation is grounded in a notion of freedom of choice as long as it does not harm anyone. Drug use remains deviant but it is accommodated and rarely reported in official instances. Parker et al. (1999) point to a 'matter of factness'. This is indicated by the way drug 'dealing' is perceived by most young people as a sign of trust and friendship. 'Sorting out friends' is rarely seen as a serious criminal offence.

3.2.2   Differentiated normalisation and *normification*

One of the main criticisms is formulated by Shildrick (2002) who argues normalisation is not only too expansive as a concept, but also misrepresents personal experiences of young people with illicit drugs. She suggests a more differentiated understanding of normalisation theory. Shildrick (2002) develops this conclusion using data collected from 76 interviews with 16 to 26 year olds, coming from all kinds of backgrounds.

First Shildrick (2002) argues that normalisation as described by Parker (1999) does not succeed in capturing the complexity of drug use of young people. For example, in line with previous research, all respondents generally accepted the use of cannabis, and many abstainers were aware of drugs being used in their personal environment. However, many respondents remained ignorant or confused about the actual potential or consequences of cannabis use. Instead of being 'drug-wise', as Parker et al. (1999) suggested, 'drug-aware' is a more accurate description of their attitudes and experiences of illicit drug use.

Second, Shildrick (2002) argues normalisation theory fails to describe the concept of recreational cannabis use. What constitutes recreational cannabis use is not as self-evident as assumed by Parker (1999). Normalisation theory makes a sharp distinction between 'recreational' cannabis use and 'problematic' cannabis use. However, the interviews revealed a more nuanced picture, as what one person defines as recreational cannabis use is considered problematic use by another.

Third, Shildrick (2002) suggests traditional dimensions of inequality (e.g. class, gender) may no longer be useful when looking at the use of drugs. Parker et al. (1999) argue that socio-economic factors are no longer linked to drug use. However, for some interviewees there was a clear relationship between socio-economic factors and drug use. For example, the most disadvantaged young people were most likely not only to use a wider range of drugs but also to use illicit drugs on a more regular basis. Shildrick (2002) recognises the limits of her study but sees in this group of disadvantaged people an illustration that recreational drug use does not take place in a vacuum where people make informed

choices about whether or not to take drugs. She concludes that cost and availability may influence young people's drug use patterns more than assumed by normalisation theory.

Normalisation might be predominantly present among young cannabis users compared to older ones. Van Hout (2011) studied varying patterns of drug use and transitions relating to youth drug use in a rural area in Ireland. She conducted 78 semi-structured interviews with youth, community and addiction, educational and health service providers. In a second phase, following a pre-development phase of several months where the researcher was engaged in several recreational after-school activities, a sample of 220 15- to 17-year-olds attending schools and training centres in the rural area was interviewed using a semi-structured scheme. The results are in accordance with the normalisation theory, as Van Hout discusses increased drug activity in rural areas, the prevalence of rural youth drug use and the normative tolerance of rural youth drug use. Older cohorts report maturing out of drug use because of a new relationship, loss of interest or preference for alcohol, making the study of Van Hout (2011) an example of Shildrick's differentiated normalisation theory (2002).

Besides age, some studies suggest cultural accommodation might be limited to specific local contexts (Cheung & Cheung, 2006; Duff, 2005). For instance, Duff (2005) suggests drug use is less normalised in Australia because consumption is less frequent. He points to the need for more detailed empirical research into the culture and meaning of young people's drug use (Wilson, Bryant, Holt, & Traloar, 2010). Duff (2005) draws on the methods and approach as developed in the *Dance Drugs, Nightclubs* study, a research project conducted by Measham, Aldridge and Parker (2000) in a small number of nightclubs in the northern England. In line with this research, he utilizes both quantitative and qualitative methods. An intercept survey developed by research staff at the Centre for Youth Studies and was administered by 379 individuals ranging from 18 to 44 years of age (mean age of 22,9) at different party venues (a dance club and two mixed venues comprising bars and private lounges across multiple rooms).

Some argue social and cultural accommodation are not actually present and cannabis users still deal with stigma today, trying to *normify* their behaviour. Canadian research into the normalisation hypothesis suggests, notwithstanding indications of a normalising process that were found, this process could be more aptly described as *normification* rather than *normalisation* (Hathaway et al., 2011). Despite indications for instance of a high prevalence of cannabis use and political statements in favour of cannabis legalisation,

open use and openness about one's use is guarded to avoid threat of sanctions. In line with Shiner and Newburn (1997), Shildrick (2002), and Blackman (2004), the authors argue that the normalisation hypothesis might overestimate the prevalence of cannabis use and the extent to which non-users see cannabis use as non-problematic. It is argued that illicit substance users, thus cannabis users as well, still need to neutralize their behaviours or manage stigma, and are often seen as deviant by others (see § 3.3.1 and 3.3.3).

Hathaway et al. (2011) studied the meaning of cannabis use through in-depth interviews with 92 recreational cannabis users, who were defined as people who had used cannabis 25 times or more. The interviews focused on use patterns, circumstances and personal experiences. The study draws upon Goffman's notions of stigma (1963)(see §3.3.3) to explain the rationale for users to take up attitudes that 'normalise' what they do while differentiating themselves from the more obvious bearers of stigma by defining clear boundaries (e.g. differentiating between 'hard drug' users and 'recreational' cannabis users). The researchers noted that most mainstream cultural assumptions were tacitly accepted, including the negative mainstream view on drug use, which was reflected in their narratives.

Standard stigma-management techniques used by respondents stressed rational behaviour, such as the importance of moderation and discretion. For example, respondents used instrumental and symbolic explanations to explain why they did not use cannabis at work (because this would influence their 'performance'). This reflects a concern for social status, notwithstanding a level of acceptance of cannabis use. According to Hathaway et al. (2011), this internalisation of guilt and discomfort suggests cannabis-related stigma is still present. Despite normalising trends, the authors argue that the fear of social status and shame still requires users to demonstrate control of their cannabis use. Cannabis users thereby present themselves as normal, *normifying* by performing along the expected (normative) behaviours to keep social interactions going. However, Hathaway et al. (2011) consider this process not a matter of *normalisation*, which they consider to be the accepting of the stigmatised individual as there would be no stigma anymore. For a normalisation process to take place, broader societal transformation (e.g. removing penalties for cannabis use) is necessary.

3.3   Why perceive supply as 'social supply'?

3.3.1   Social supply as part of 'normal' behaviour

The process of normalisation has been seen as indicative of the emergence of a postmodern era (Parker et al., 1999; Shiner & Newburn, 1999; South, 1999). Normalisation is thereby argued to be a radical break from the 1960s and 1970s (Shiner & Newburn, 1999). Parker et al. (1999) found that a process of *normalisation* explains the change from illicit drug use as a deviant activity to illicit drug use as part of mainstream youth culture. Parker et al. (1999) describe supply in this setting as 'sorting out friends'. However one could argue that if use is 'normal', supply could be considered normal as well and thus situated within the same context of individualisation and cost-benefit assessment (Potter, 2009).

There is no such thing as *the* concept or *the* principle of normalisation. Normalisation as a concept was first used in Scandinavia during the fifties. The fundamental aim of the early definitions was about ensuring people with learning disabilities would enjoy the same legal and human rights as 'other people'. As such, the definition did not need any scientific justification. However, normalisation was not seen as equal to integration. The early Scandinavian researchers did not see integration as an essential component of normalisation. The term nevertheless became increasingly popular in service development for disadvantaged groups. Since the fifties it has been used within a wide variety of disciplines (Emerson, 1992). In 1938, Lindesmith developed the first modern sociological application of the term 'normality' applied to drug consumption (Blackman, 2004). Lindesmith's point is that scientists, policymakers and the media have created this 'monstrous person' called the drug user (1938).

Parker et al. (2002) however were influenced most by Wolfensberger, the leading North American proponent of normalisation theory, who explicitly attempts to universalize normalisation (Emerson, 1992). The fundamental aim of normalisation should be to change the status of social groupings. Unlike his Scandinavian 'colleagues', Wolfensberger stresses the right of individuals not to be segregated. He links normalisation to labelling and social reaction theory, and develops the social role valorisation theory, which is applicable to any social group who are devalued or at risk of being devalued in society (Emerson, 1992). Normalisation is then defined as *" the utilization of means which are as culturally normative as possible, in order to establish and/or maintain personal behaviours and characteristics which are as culturally normative as possible"* (Emerson, 1992, p. 4).

Parker et al. (2002) started from this basis to define and re-test the concept of normalisation in order to improve its utility in understanding the growth of recreational drug use. Their ultimate aim was to provide better understanding of a process of social and cultural change. In a society that claims to be committed to social inclusion and to adapt laws and social policy to enact social change, normalisation is a helpful concept to explain the perceived wide availability of recreational drug use.

This process of normalisation takes place within Beck's *risk society*, where young people deal with risks on a daily basis (Beck, 1992; Parker et al., 2002). In this risk society, the transition from childhood to adulthood has become a longer, more uncertain journey. Whether this period is called 'youth', 'adolescence' or 'post-adolescence' is not important. Aldridge et al. (2011) want to refer to a far longer period of semi-dependency as young people spend more time in education, live longer at home, delay parenting and marriage, etc. Although objectively the risks of failure are differentiated along socio-demographic characteristics, subjectively all youth experience this long period of uncertainty.

Beck (1992) argues the distribution and modernization of risks is but one aspect of a risk society. Global risk situations have disembodied and reshaped the inner social structure of society. Modernity has become a *reflexive* modernity, causing a social transformation of society. Class culture, gender and family roles are dissolved along with a surge for individualisation. At the same time inequality has not decreased. The collective fate of class biographies is now replaced by reflexive biographies that depend on the actor. Social inequality is then classless, as everyone has to choose which subculture or group they want to be identified with.

So *individualisation* means the variation and differentiation of lifestyles and forms of life, as opposed to thinking in traditional large-group societies. Subcultural identities and class distinctions no longer receive their traditional support (see §3.3.2). The individual becomes detached from their traditional support networks (e.g. family) and gets more dependent on the labour market. Processes of individualisation are therefore not only very dynamic, but are also a product of education, mobility and competition.

Individualisation is thus understood as a process of *societalisation*. The manifestation of a variety of lifestyles can result in new social movements which are expressions of new risks but at the same time also form the start of a search for a new social and cultural identity. As traditional neighbourhoods and forms of community outside family start to disappear, newly formed social relationships appear. Social ties are becoming reflexive,

as they have to be established, maintained and renewed by the participating actors. The ability to choose social relations is not a given, but is learned and depends on social and family background. The planning of one's life thus gives room for a new inequality—that of dealing with insecurity and risks or risk management. Inequalities are redefined in terms of individualisation of social risks. In an attempt to deal with social problems, people will form new alliances. However, these will be temporary coalitions, depending on the particular issue at stake as well as the particular situation. In other words, they will be pragmatic alliances in an individual's struggle for existence within the social battlefields of society.

In this context of continuous risk management, drug decisions seem less dramatic for young people (Aldridge et al., 2011). This does not make drug use either safe or right. Nevertheless, rational decisions about consumption are key to both the normalisation thesis as to living in modern society. Drug users extend the same decision-making processes to illicit drugs as others do in respect to smoking cigarette, drinking alcohol or horse riding. The illegality of drug use and supplying is rarely perceived as a risk factor, despite the rates of prosecution (Aldridge et al., 2011). This feeling of negotiating in a 'risk society' is the result of an individualisation process where young people accept success or failure as indicative of their own performance. The cost-benefit risk assessment is very elaborate. Abstainers regularly mention that drug users must make up their own mind. The fact poly-drug users indicate they can be tolerated because 'it's up to them to kill themselves', serves as an excellent example of individualisation. Similarly, drug triers and users, certainly once through adolescence, strongly refute peer pressure as a key factor in their decision to take drugs. It may not always be correct, but it is up to them. They accept individual responsibility as they are not denying risk nor view themselves as invulnerable. Despite poor judgement, they accept some bad experiences though sometimes ignoring their own mortality.

3.3.2 Social supply as part of social learning

Social learning theorists see the process where criminal behaviour is learned within intimate groups as key in becoming criminal or deviant (Cullen & Agnew, 2005; Sutherland, Cressey, & Luckenbill, 1992). One becomes delinquent because of learned associations with criminal patterns, and also because of an isolation of anti-criminal patterns. The ratio between delinquent and non-delinquent contacts is what Sutherland calls the principle of *differential association*. A person will only become delinquent if the

definitions that they are exposed to are favourable to violating the law (Sutherland et al., 1992). Sutherland however does not fully describe the exact process of *how* crime is learned. Akers and Burgess develop social learning theory by arguing that crime is learned through rewards and punishment (Akers, Krohn, Lanza-Kaduce, & Radosevich, 1979; Burgess & Akers, 1966; Cullen & Agnew, 2005; Goode, 2007). An individual's actions are determined through past and present rewards and punishments within a group setting. Akers et al. (1979) tested social learning theory with survey data on criminal behaviour. They conducted a self-report questionnaire completed by 3,065 adolescents attending grades 7 to 12. It was concluded that drug use can indeed be explained through differential exposure to groups in which drug use is rewarded. Whether someone uses illicit drugs depends on the combination of social reinforcement by peers and the absence of negative sanctions from peers, parents and the law.

Differential association and social learning theory are related to *subcultural theory* (Goode, 2007). All three theories suggest that involvement in an identifiable group with attitudes favourable to drug use is key to one's illicit drug use. Involvement in a group with negative attitudes to illicit drug use, on the other hand, will discourage such use. Sutherland argues the socialization process can take place with one friend or in small groups. In contrast, subcultural theory argues the socialization process occurs through the assimilation of individuals into specific groups, and leads to a transformation in identity, values and behaviour.

Pioneering work on subcultural drug use was done by Becker (1963), who focused on the process of becoming a marijuana user (Goode, 2007; Gourley, 2004). Becker (1963) did not focus on the characteristics that distinguish users from non-users. Instead, he examined how people became marijuana users in such a way that they continued to use marijuana with pleasure. For this to happen, three things must be in place: one must learn the techniques of how to use marijuana, one must learn to perceive the effects of marijuana use, and one must learn to enjoy those effects. The key to this process is the subcultural group that will provide logistic and normative support for the novice user. Consequently, individualistic theories cannot explain illicit drug use as one does not use illicit drugs by oneself. Becker's approach was also adopted by Zinberg (1983), who was one of the first to point towards the importance of both personal and social factors in the development of a regular pattern of use. In the explanation of drug use it soon became generally accepted that any theory or explanatory framework should entail three

categories: the drug (pharmacological characteristics of the drug used), the set (attitudes and personality of the user), and the setting (social and physical environment where the use takes place). The complex interaction between drug-set-setting will determine who uses a particular drug as well as how a user is affected by this drug.

Of particular interest is the way both Becker and Zinberg acknowledge the existence of a wide variety in drug-use patterns (Decorte, 2001). During the sixties, drug use was always equated with misuse, and drug research focused on the pharmacological aspects of the drug. Instead, both authors sketched another pattern: one of *recreational* drug use. Since the seventies, several studies have mentioned this type of user. Furthermore, studies also indicated motives and strategies of people who were able to quit drugs in a relatively autonomous way. Besides pharmacological characteristics of the drug, Zinberg (1983) found that the attitude and personality of the user as well as the social and physical environment mitigated the experience. Zinberg argued that this setting was where users learned to control their drug use, as it was there users learned the proper rituals and sanctions to bring its use under control (Decorte, 2001; Zinberg, 1983).

Today, it is argued that the social context in which an adolescent grows up has changed in such a way that life pathways are no longer predictable, but rather a result of individual choices (see §3.3.1) (Cotterell, 2007). Research on youth cultures attempts to grasp the fragmented nature of this culture by emphasizing individualisation. In doing so, research into youth cultures leans on a traditional definition of subcultures, and claims that nowadays there are no specific groups of people who have different characteristics than the rest of society.

Based on ethnographic research in a Norwegian context, Sandberg (2013) however suggests not defining subcultures as a group of people but from a socio-cultural perspective. He then aims to search for a definition without identifying clearly delineated groups nor claiming that all has been individualised. Subcultures are then defined as *"a collection of rituals, stories and symbols"* (Sandberg, 2013, p. 68).

3.3.3   Social supply as a strategy to avoid risk or stigma

Classic subcultural theories to date entail a certain "black box" factor. Becker (1963) for example does not focus on the content of a specific subculture. Why a certain person is more likely to be attracted to illicit drug use remains unexplained (Goode, 2007). Sykes and Matza (1957) built upon the work of Sutherland, and focus on the content of what is taught through social learning. Techniques that neutralise the effect of the existing system

of norms are an important aspect of what young people learn. Rather than learning norms that contradict conventional society, one becomes deviant through the adoption of neutralisation techniques.

Potter (2009) uses this core idea to explain why cannabis users define their supplier in terms of 'friends' or 'friends of friends'. This way they 'neutralise' the apparent immorality of their 'illegal' activities. The above-mentioned avoidance of the 'dealer' label can be analysed in terms of Sykes and Matza's neutralisation theory (Potter, 2009; Sykes & Matza, 1957). Shiner and Newburn (1997) also argue that the description of cannabis supply as *social* is actually a way to justify their behaviour. The expression of neutralisation statements by young drug users is considered as evidence of their underlying opposition to drug taking.

One might argue 'social supply' definitions are part of a wider strategy to avoid risks. Peretti-Watel (2003) describes risk avoidance theory as an update to Sykes and Matza's neutralisation theory. As such, he argues cannabis users neutralise their 'risky' label through techniques of risk denial. He used the data collected in the French part of the survey of the European Study for Alcohol and Other Drugs to test for these techniques[3]. He found that users deny their 'risk' label through by comparing themselves with 'hard drug users' (*scapegoating*), by emphasising their own ability to control their own use (*self-confidence*) and by comparing the risks of their own behaviour with the risks of other 'accepted' behaviour (e.g. drinking alcohol) (*comparison between risks*). For instance, by describing their own behaviour as 'social supply' they scapegoat 'real dealers'.

In addressing normalisation, Hathaway et al. (2011) draw upon Goffman's interpretation of stigma to argue users internalise wider negative perceptions of cannabis use and still feel stigmatised in the present day (see §3.2.2). Describing supply as social could be viewed as a way to manage this stigma. As *recreational* users differentiate themselves from the more obvious bearers of stigma (e.g. *problematic* users) by defining clear boundaries, differentiating between 'friends' and 'dealers' could also be a process of stigma management.

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[3] The data Peretti-Watel (2003) used was collected from March to May 1999, based on a standardised questionnaire focusing upon drug uses, behaviours and opinions (Hibell et al. 2001) ADD REF. In France, sampling was set up randomly according to several standards: level and type of high school, public or private sector and urban situation. The main part of the sample was aged 14–19 (91.8%, n = 10,810).

One way to deal with this stigma might be by constructing a micro-reality or *transparent bubble* (Mische & White, 1998). This concept is developed in conversational analysis, but reflects how supply might be defined in a sort of 'semi-private' place in which it is temporarily condoned, like Parker (2000) suggested in the Dance Drug , Nightclub Study (see chapter 2). This sort of transparent bubble or social space-state surrounds speakers and suspends for a moment the longer-term processes that are part of the network domains to which the speakers belong.

3.4 Conclusion

Social supply as a concept tries to grasp the empirical finding that cannabis users and suppliers seem to differentiate between "real dealing" and a more "social" form of supply without a "commercial" goal. Whereas the previous chapter discusses the definition of supply, the present chapter explores the theoretical underpinnings of this concept. Through literature review of use and supply theories, various theoretical viewpoint are discussed.

Social supply was first mentioned within a broader perspective on cannabis use as normal. Parker et al. (2002) elaborate on the different dimensions of their definition of normalisation. Besides widespread use and easy access, normalisation entails a wider social accommodation and cultural accommodation. Several authors argue normalisation is too broad to be applied to recreational cannabis use, and therefore should be differentiated. Others argue this apparent normal behaviour of drug users is actually a technique to deal with stigma (Hathaway, 2011).

Normalisation is defined within a society characterised by a broad social and cultural change towards perceiving recreational cannabis use as a normal youth activity (Parker et al., 2002). This change is placed within Beck's *risk society* (1992), which is characterised by a move towards individualisation leading to the disappearance of traditional forms of community. In this risk society, social relations are not a given but created and maintained actively. The planning of one's life becomes a matter of managing these new social inequalities, which Beck defines in terms of social risks. Deciding to take drugs, in the framework of risk management, is then the result of a cost-benefit analysis, much like deciding to take horse riding lessons. It is also the result of a negotiating process where people accept failure or success as a result of their own performance. One could argue a supplier is then a risk manager who takes responsibility for his own decision to supply

cannabis to another person. This suggests suppliers, like users, are 'normal' people within society.

A second viewpoint challenges this individual perspective and argues something *social* is happening (e.g. Becker, 1963; Goode, 2007; Zinberg, 1983). Building upon social learning theory, differential association and subcultural theory, a different picture of cannabis use, and supply, appears. Use is seen as part of some socialisation process where, besides personal factors, social factors play an important role in how cannabis use is perceived. If use is part of a social context of a group where one learns how to perceive use, perceptions of supply could be part of this context as well. Taking into account studies which point to the disappearance of subcultural groups of 'outsiders', perceiving supply as social supply might be the result of a continuous process of learning to understand and define different ways to supply cannabis.

A third perspective argues that defining supply as 'social' is a way to rationalise, or neutralise, behaviour that users and suppliers internalise as being 'not accepted by mainstream' society (e.g. Potter, 2008; Hathaway et al., 2011; Peretti-Watel, 2003). In this case, society's understanding of drug use has not changed or accommodated, but, in contrast to the above social understandings of supply, users are 'insiders' in society to the extent they have internalised this apparent negative perception of cannabis use. From this perspective, social supply is a matter of risk avoidance or a way to manage the stigma ("it is with 'friends', not 'real dealers'").

The next chapter studies social supply from a social network perspective (chapter 5). Through defining social supply in terms of relations and networks, supply can be placed within its social context. A relational perspective furthermore allows an exploration of the intertwining of social and commercial aspects of supply.

Chapter 4   Social networks: a method, theory and paradigm

4.1   Introduction

In the previous three chapters it became clear that social networks are important when studying supply in cannabis markets. Existing theoretical frameworks explain social supply by looking into *structural aspects* ("social influence") or *agency* ("individual decision to rationalise or to normalise). This chapter argues that a relational perspective, where the relation between individuals is put forward as a unit of analysis rather than only individual attributes, might overcome this thinking in terms of either structure or agency (Mische, 2011). This relational perspective is the basis upon which I develop a tentative definition of social supply in terms of ties and networks (see chapter 5). In chapter 6 this perspective will also guide the development of an instrument to explore social supply and its meaning.

In order to be able to understand social supply in network terms, I first explain what social network analysis is all about. As such I focus on the mixed roots of social network analysis (§4.2). Network analysis is rooted in social psychology, with a strong quantitative focus, as well as anthropology, with a more qualitative focus (§4.2.1). These dual roots provided the basis for development of a network perspective, methodology and theory (§4.2.2).

There is much disagreement concerning network theory (§4.3). Although all of these theoretical underpinnings rely on the same world view, the way network analysis contributed to the development of theoretical frameworks is debated. Most network studies are in line with formalist theory, which entails a view of network analysis as atheoretical (§4.3.1), while some others state network analysis can be used to study substantive topics in sociology (§4.3.2). A small group of authors suggest network analysis relational thinking is the way to overcome the problem of thinking either in structural or agency terms (§4.3.3).

Though network analysts are divided about the theoretical framework, they are more united in terms of methodology. Most network analysts make use of a specific set of methods to measure structure and composition in networks (§4.4). Several concepts are developed to describe the composition and structure of a network (Hanneman & Riddle, 2011). Graph theorists and social network analysts developed a wide range of formal

algorithms to index the different types of connections in the whole networks as well as the position of the individuals within them. The basic characteristics of these networks will have implications on the distribution of resources or information (Hanneman & Riddle, 2011; Scott, 1991).

The final section of this chapter uses the above-described theoretical viewpoints as well as key concepts to discuss the current state of social network analysis within criminological research (§4.5). Social network analysis is for instance used to study how networks of drug traffickers are composed and structured (§4.5.1). Furthermore, network analysis is also applied in search for a more nuanced interpretation of the concept of *peer influence* (§4.5.2).

4.2   The development of social network analysis

4.2.1   Roots: sociometry and anthropology

The dual roots of social network analysis date back to the early 1930s when a group of Gestalt psychologists left Germany and settled in the United States. It is imperative to realise that the idea *"relations are more important than individuals"* can be traced back to influential thinkers in sociology like Marx and Durkheim. Social network analysis is also rooted in the work of Parsons, who is generally associated with a norm-based approach, which is frequently contrasted with network analysis (Marin & Wellman, 2011).

The primacy of relations is most explicit in the work of Georg Simmel (1909). He clearly articulates that things should be understood as being at the intersection of relations and as deriving their defining characteristics from these intersections. He further argues that society is but a web of relations, instead of a mass of individuals who each react independently to circumstances based on their individual tastes, and who create new circumstances merely by the simple aggregation of their actions.

Scott (1991) summarizes the literature in three main lines of research: the sociometric analysts who were heavily influenced by Gestalt psychology, the Harvard researchers of the 1930s, and the Manchester anthropologists. Together, they lay the foundations for graph theory, a variety of mathematical formulae to describe the properties of the patterns formed by the lines.

Sociometry encompasses the study of relations between people and how these relations affect them (Freeman, 2004). It was developed by Jacob Moreno, a first proponent of this Gestalt-influenced social psychology. Moreno's principal aim was to investigate how the

psychological well-being of an individual is related to 'social configurations'. Moreno's biggest innovation was the way he visualised the set of studied relations in what he describes as a *sociogram*, a diagram of points and lines used to represent relations among people. Moreno used these *sociograms* to identify social leaders and isolates, to uncover asymmetry and reciprocity in friendship choices, and to map chains of indirect connections. One of the principal concepts is the *sociometric star*, which indicates that the individual has a central place in the network (Moreno, 1934) (see chapter 6).

The Lewin group further developed the idea of *centrality*. This concept is first mentioned in *field theory*, developed by Lewin, a second proponent of this Gestalt-influenced social psychology (Lewin, 1939) (see §4.4.2 . Field theory is used to explore interactional interdependencies. *Fields* are thereby divided into *regions*, formed by a pattern of paths between points and separated by an absence of paths between distinct regions. The opportunities of individuals are determined by the boundaries of a *region*, which serve as 'forces' that determine group behaviour (Scott, 1991). Lewin (1939) focused on interpersonal relations and group processes, which he said were a function of conflicting social forces. He thought of the group as existing in a *social space* or *field* consisting of the group and its perceived environment. The group and its environment interact and the meaning of these interactions is constructed by the group members on the basis of their perceptions and experiences. The so-called Lewin group was inspired by this field theory as developed by Lewin. Luce and Perry (1949), who argued that in any organisation the degree to which a single individual dominates its communication network – the degree to which it is centralised – affects its efficiency, morale and the perceived influence of each individual actor, were strongly influenced by this notion of centrality, as was Bavelas (1950). Accordingly, they developed the notion of a 'clique'. Together they developed a formal model for centrality in patterns of communication, based on the systematic collection of data.

The framework for concepts like transitivity and reciprocity was first described in the work of Heider (1946), a third and final proponent of this Gestalt-influenced psychology (see §4.4.3). Scott (1991) described Heider's concern as with interpersonal balance, and the congruence (or lack of congruence) among attitudes to 'other people' (Heider, 1946). For example, if person A likes person B, and person B likes person C, there is only balance if A also likes C. Although Heider did not study the social relations between A and B, he

sees balance as a psychological state. His work is a first indication of what Cartwright and Harary (1956) later described as balance theory.

Cartwright and Harary integrated the work of the three proponents—Moreno, Lewin and Heider—and developed models of group cohesion, social pressure, social cohesion, power and leadership (Cartwright & Harary, 1956; Freeman, 2004). In doing so, they were the first to apply *graph theory* to problems of social structures, for example in the study of group dynamics. Graph theory made it possible to move away from the concept of cognitive balance in an individual, like Heider, to that of interpersonal balance in groups. This allowed researchers to study the systematic interdependence of attitudes between several individuals in a group. In practice, a graph consists of a set of lines connecting points that have directions and a positive or negative value, and graph theory is a variety of mathematical formulae to describe the properties of the patterns formed by the lines.

The first main finding is the presence of *transitivity.* The direction of a triadic graph allows a distinction to be made between different orientations of person A to person B, and person B to person A. Cartwright and Harary (1956) described that if person A has a positive relationship with person B, but a negative relationship with person C, while person B likes person C, this will put a strain on the relation between person A and person B. Each participant in this unbalanced network will attempt to resolve this strain, making group relations dynamic and a result of compromises.

The second main finding was the existence of *sub-groups or cliques.* Any balanced graph, no matter how large, can be divided into smaller graphs as simple triadic structures are always the building blocks for larger social structures. Moreover, any balanced graph consists of at least two sub-groups. Within these sub-groups, relations will be positive and cohesive, while between both sub-groups a negative, antagonistic relation exists. The notion of balance influenced the sociometry of large-scale social studies, for example the exploration of the spread of disease from one person to the other in order to develop predictive epidemiological models of contagion (Cartwright & Harary, 1956; Freeman, 2004).

The search for ways to decompose networks into their sub-groups was not only central to sociometry, but was also key to an anthropological research tradition at Harvard during the 1930s and 1940s and at Manchester from the 1950s onwards. Whereas the Harvard group emphasized cohesion and integration among sub-groups, the Manchester group argued the configuration of social relations is the result of an exercise in conflict and

power. Although both sociometry as well as anthropological accounts developed simultaneously, there is no evidence of any impact on each other (Freeman, 2004; Scott, 1991).

Strongly influenced by Radcliffe-Brown and Durkheim, a group of anthropologists discovered that social systems entailed sub-groups and explored techniques to disclose this sub-group structure. The main projects the research group undertook were the Hawthorne studies[4] as well as an ethnographic study of stratification in industrial communities in the Yankee City study (Freeman, 2011). The Yankee City was one of the first studies to use network terminology to describe the social organisation of whole societies in sub-groups (Warner, 1937).

Warner focused on the social organisation of communities and further developed the concept of 'cliques'. In the study of Yankee City for example he applied the same anthropological perspective Radcliffe-Brown used to study Australian tribes to the study of modern urban communities (Freeman, 2004; Warner, 1937). Later on, Warner continued with the Deep South project which studied the impact of race differences on social stratification (Warner & Lunt, 1941). Warner drew not only on the ideas of Radcliffe-Brown but also Simmel's ideas of reciprocal relations. In line with Moreno, he also used the terminology 'social configurations', describing the social organisation of a community in terms of a web of relations through which people interact with each other. Warner argued that a community consists of several sub-groups. One of these sub-groups he described as a 'clique': an informal association of non-kin people, which may vary in numbers. This 'clique' was considered by Warner as the most important way to group people in a society, besides family.

At the beginning of the fifties, a group of social anthropologists at Manchester University—Barnes (1954), Bott (1957) and Mitchell (1969)—started to develop of what is known today as social network analysis. They were also influenced by Radcliffe-Browne, but developed his ideas in a different direction. Instead of emphasizing integration and cohesion, the Manchester anthropologists argued that the actual configuration of relations was the result of an exercise in conflict and power (Scott, 1991).

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[4] The Hawthorne studies, originally set up to study the effect of alternating physical conditions of work on productivity, revealed that the crucial motivation for increased productivity was linked to the mere participation of the employees in the study (Mayo, 1933; Scott, 1991). Employees were pleased with the interest their managers had taken in their work, and were more motivated to work.

Barnes (1954) took the lead in applying the metaphorical idea of a social network in a more analytical way. Together with Bott (1957), he studied the work of Moreno and Lewin's field theory. Barnes was particularly interested in the part kinship, friendship and neighbours play in the integration of communities. He discovered these relations were not tied to formal structures or territorial locales, but formed a separate set of informal and interpersonal relations. Barnes consequently argued that the whole of society could be seen as a 'set of points of which some are joined by lines' to form a 'total network' of relations. The informal relations are then a partial network of this 'total' network (Barnes, 1954).

Mitchell (1969) generalised Barnes's concept of informal relations into that of a 'personal order', a pattern of links individuals have with a set of people and the links these people have in turn among themselves. Furthermore, he described the 'total network' of a society as an "*ever-reticulating set of linkages that stretches within and beyond the confines of any community or organisation"* (Mitchell, 1969, p. 12)*. To describe the quality of the relations involved, he developed several measures e.g. reciprocity, intensity, durability, reachability, and density.

Mitchell (1969) however refrained from a study of a total network and argues that in actual research only partial networks can be studied. Instead he used a 'residual' definition of network analysis, leading to the specific study of interpersonal relations, extracted from their political and social context. This definition was very influential in the identification of network analysis as concerned with informal, interpersonal relationships in a community and as a method mainly concerned with egocentric networks.

4.2.2 Networks: method, paradigm, world view

Social network analysis has developed as a separate paradigm since the 1970s, with the Harvard group around Harrison White as main contributors. White and his associates were the first to integrate all ingredients to develop a new scientific paradigm as their findings were motivated by a structural intuition, grounded in systematic empirical data, visualised in graphs and based on the use of mathematical and computational models (Freeman, 2004). Until the 1970s, a variety of research focused on social networks although most of it happened independently from each other.

The final breakthrough of social network analysis, namely the development of algebraic models, came in the 1970s with the work of Harrison White and his associates at Harvard (Freeman, 2004; Scott, 1991). The development of algebraic models of groups not only

lead to a re-consideration of graph theory but can also be seen as a first attempt to use algebraic models to conceptualize the concept of 'role' in social structure. These algebraic models were used to further elaborate block models (Berkowitz, 1982; Wasserman & Faust, 1994). Block models reduce the complexity of a network as it is represented through a set of blocks of network members according to maximal similarities in their ties to each other. In this way, relations of positions in the network are highlighted, rather than information on individual actors (Burt, 1980).

The second innovation was the development of multi-dimensional scaling, a scaling technique for translating relationships in 'social distances' and for mapping them in a social space (like field theory). On the basis of these two innovations, White and his 'colleagues' became mathematically orientated structural analysts, concerned with modelling a wide variety of social relations. The Harvard group did not share one theoretical focus but were united in their choice of method.

Despite the popularity of social network analysis, there is still an on-going debate whether social network analysis is a methodology or a theory (Wellman, 1988). For many researchers, social network analysis is *atheoretical* (Emirbayer & Goodwin, 1994). For example, in 1991 Scott argued social network analysis should be considered as a specific set of methods and not a body of theory. Despite the debates, research increasingly indicates social network analysis not only creates theory but is also rooted in theoretical traditions. Borgatti and Halgin (2011) for example claim social network analysis as such can generate theory. The authors further argue social network theorising entails two components: network theory and theory of networks:

> *Network theory refers to the mechanisms and processes that interact with network structures to yield certain outcomes for individuals and groups. In contrast, theory of networks refers to the processes that determine why networks have the structures they do – the antecedents of network properties.* (Borgatti & Halgin, 2011, p. 1168)

Marin and Wellman (2011) adopt an even more different view and argue social network analysis is neither a methodology nor a theory, but rather a perspective or a paradigm which provides a way to look at a problem, but does not predict what you will see. When considering social network analysis as a paradigm, one can argue that network analysts have developed theory in two ways: either by focusing on the patterns of relations themselves, creating *formalist theories*, or by focusing on substantive issues, creating

structural theories (Marin & Wellman, 2011). The building blocks for both perspectives are found in graph theory, which describes the basic elements of a network (see §4.4).

Network analysts, though divided about the theoretical framework, are more united in terms of world view. Putting many differences and debates aside, three principles guide any kind of network research (Marin & Wellman, 2011). First, network analysis argues that behaviour is not only shaped by individual attributes but is always interdependent of social structures (e.g. the position one has in a particular network). Second, members of networks do not belong to mutually exclusive groups. Treating membership of a group as binary and dividing research subjects in mutually exclusive groups is an oversimplification of the way networks constrain or create opportunities for their members. This makes it impossible to study membership of multiple groups at the same time, and differing levels of connectedness to a group. To conclude, network analysis does not only study relations but also the relational context of these relations (e.g. relations between two individuals is also influenced by relations of one of these individuals with a third party).

4.3   Network theory: formalism, structuralism and relational sociology

4.3.1   Formalism

Most network theories build upon a formalist perspective, and focus mainly on the mathematical form of social networks. Formalism, according to Erikson (2011), is based on a structuralist interpretation of Georg Simmel's work. Simmel stimulates a perspective in which categories of relational types and patterns are present *a priori*, and operate independently of cultural content. In his essay, Simmel (1909) separated the 'content' of social life (e.g. wars, families) from its 'forms' (e.g. conflict). Whereas contents vary depending the context, forms will possess common features across different social situations. Formalism therefore focuses on the identification of generic patterns and processes through which 'content' is comprised of: stigma, for example, may be present in different substantive areas like family, education and media. Among the forms central to Simmel's thinking were identity, roles and group relationships.

Formalist theories study the effect of forms, the forms themselves as well as the causes of these forms. Formalists are therefore mainly concerned with the pure form, in a mathematical sense, of a network, making it possible to study them without empirical studies. Freeman (2011) refers to publications concerning the small-world hypothesis which started a revolution in social network publications. The small-world effect refers

to the finding that two randomly chosen actors can be connected to each other by only a short chain of intermediate acquaintances (Newman, 2000; Pool & Kochen, 1978). This view contrasts with another view of the world as being divided in big concentric circles that have no contact with each other. The "six degrees of separation" hypothesis is a famous example of the small-world view (Milgram, 1967).

Formalist theories took an important leap at the beginning of the nineties, with the involvement of physicists in the field. In 1998, physicists Watts and Strogatz (1998) developed a mathematical model to capture the universal tendency of clustering – the universal tendency of friends to be friends of friends. Together with the study of Barabási and Albert (1999), who presented a simple model to capture the distribution of networks as they grow, Watts and Strogatz (1998) put in motion a growing interest of physicists in formal social network analysis.

4.3.2   Structuralism

Structuralists, in contrast to formalists, are interested in how network analysis can help to study substantive topics in sociology by analysing structural constraints on activity. A structural analysis starts with five key assumptions:

> 1. Behavior is interpreted in terms of structural constraints on activity, rather than in terms of inner forces within units (e.g., "socialization to norms") that impel behavior in a voluntaristic, sometimes teleological, push toward a desired goal.
> 2. Analyses focus on the relations between units, instead of trying to sort units into categories defined by the inner attributes (or essences) of these units.
> 3. A central consideration is how the patterned relationships among multiple alters jointly affect network members' behavior. Hence, it is not assumed that network members engage only in multiple duets with separate alters.
> 4. Structure is treated as a network of networks that may or may not be partitioned into discrete groups. It is not assumed a priori that tightly bounded groups are, intrinsically, the building blocks of the structure.
> 5. Analytic methods deal directly with the patterned, relational nature of social structure in order to supplement -and sometimes supplant -mainstream statistical methods that demand independent units of analysis. (Wellman, 1988, p. 20)

Two of those substantive—though heavily debated—topics are social capital and social support. That said, studies on these topics can contribute to study the exchange process through which a user finds a supplier (see chapter 5). Network studies on social capital and social support for instance suggest that strong social relations stimulate the

development of group norms and systems of favours, while weak social relations can connect people to different groups making it easier for someone to obtain new information/goods (Coleman, 1988; Granovetter, 1973, 1983).

4.3.2.1   Social capital: a network view

The structuralist interpretation of social capital focuses on the benefits linked to the configuration of an individual's network. There is much debate surrounding social capital's operational definition as well as the mechanisms through which it has its impact.

There are two ways to operationalise social capital. One approach focuses on *who* is connected to *who*, while another approach also takes into account *how well* two actors know each other (e.g. Granovetter, 1992; Nahapiet & Ghoshal, 1998). In other words, one group of researchers argues that a network's *structure* is more important than its content, while some other researchers argue the outcome of network interactions is influenced both by the structure of a person's relations as well as the quality of those relations. Granovetter's (1992) conceptualisation of embeddedness captures both *structural embeddedness* and *relational embeddedness*. Nahapiet and Ghoshal (1998) refine Granovetter's idea and develop a definition for both dimensions. Structural embeddedness is defined as: *"the impersonal configuration of linkages between people or units"* (Nahapiet & Ghoshal, 1998, p. 244). Relational embeddedness is then defined as: *"personal relationships people may have developed with each other through a history of interactions"* (Nahapiet & Ghoshal, 1998, p. 244). Key aspects to this second form of embeddedness are interpersonal trust, overlapping identities and feelings of closeness or interpersonal solidarity.

In that regard, taking into account its roots in social networks, Lin (1999)argues that social capital includes a structural element of embeddedness, an opportunity to act and an element of purposeful action. Therefore, social capital should be defined as:

> *Resources embedded in a social structure which are accessed and/or mobilized in purposive actions. By this definition, the notion of social capital contains three ingredients: resources embedded in a social structure; accessibility to such social resources by individuals; and use or mobilization of such social resources by individuals in purposive actions. Thus conceived, social capital contains three elements intersecting structure and action: the structural (embeddedness), opportunity (accessibility) and action-oriented (use) aspects.* (Lin, 1999, p. 35)

Secondly, the mechanisms through which social capital influence a possible outcome (e.g. personal power, compensation) are discussed. Here, researchers disagree on the benefits of *closed* networks, where all contacts of an individual know each other, versus *open* networks characterised by structural holes (e.g. Burt, 1992; Coleman, 1988; Granovetter, 1973, 1983). The debate concerning how social capital influences networks is split between authors stressing the benefits of open networks (Burt, 1992; Granovetter, 1973, 1983). and those emphasizing the benefits of closed networks (Coleman, 1988). Granovetter (1973, 1983) suggested networks that consist of a lot of people that do not know each other are the most valuable when looking for a job. As a member of the Harvard group surrounding Harrison White, he was strongly influenced by them (Freeman, 2004; Scott, 1991). In line with the Manchester anthropologists, Granovetter (1973) focused on ego[5] networks rather than whole networks. He started from the assumption that triads consist of ties, which are strong, weak or absent, between the ego, the alter and any arbitrarily chosen friend. Focusing on the diffusion of information, he stressed the importance of weak ties. Granovetter (1973, 1983) argued that weak ties can form bridges between two densely knit groups of friends. It follows then that people with a few weak ties are limited in their resources for information and will be confined to the views of their close friends. Burt (1992) developed a similar argument in his structural holes theory. He argued that a person will have more access to information if his ties connect him to different groups. If a person's contacts are all connected with each other, the chance of that person getting new information is small. In Burt's words, the first person has more 'structural holes' than the second. Borgatti and Lopez-Kidwell (2011) argued that this theory is little different from Granovetter's ideas.

A different view was adopted by Coleman (1988), who argued that the power of social capital lies in closed networks of personal relations. Because all of one's contacts know each other, they are more likely to develop group norms and enforce social sanctions. Closed networks also favour the development of a system of favours, which can be accessed when necessary. The resulting social cohesion reduces exchange risks, and enhances the likelihood that actors receive resources from others, and get their cooperation. According to Moran (2005), the benefits of an open network lie in the possibility of accessing new information. The merits of a closed network are situated in

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[5] Ego refers to the *focal node*, the node the study centres on (see Hanneman & Riddle, 2011 and §4.1). In my study for instance *ego* is the respondent. All other netowrk members are *alters* (see also Introduction and chapter 6).

the presence of certain information, like group norms and rules, which limit the possibility for exploitation.

4.3.2.2 Social support and emotional closeness

Network studies into social support argue that such support might influence how people access resources, thereby blurring the line with social capital studies, or explain people's behaviours (e.g. when dealing with health problems) (McCarty, 2002; Walker, Wasserman, & Wellman, 1993). Despite the substantial popularity and voluminous development of the term social support, there is still debates on its conceptualization and operationalization. Social support is confounded with other network-based but distinct social factors without clear discrimination, such as social cohesion, social integration, social networks, and social capital (Song, Son, & Lin, 2011).

Social support can be categorized in different ways (Song et al., 2011; Wellman & Wortley, 1990). In terms of its content, social support can be divided into emotional support (liking, love, empathy), instrumental support (goods and services), informational support (information about the environment), and appraisal support (information relevant to self-evaluation). In terms of its degree of subjectivity, social support is dichotomized into perceived support and objective or actual support. Regarding the relationship between recipient and donor, social support could be kin-based (e.g., parents, spouses, children, siblings, other relatives) or non-kin-based (e.g., friends, neighbours, co-workers). In terms of its contexts, social support could be routine support within an ordinary situation or non-routine support within a crisis situation.

Besides social support, the most common method to measure tie strength has been to use indications of the *emotional closeness* of a relationship; thus, close friends are said to be 'strong' ties, while acquaintances or friends of friends have been called 'weak' ties (Marsden & Campbell, 1984). Numerous other measures of strength have also been used. These include the duration of the contact, the provision of emotional support and aid within the relationship (Wellman, 1981). Overall, the measure of emotional closeness, or the emotional intensity of a relationship, is the best indicator of the concept of tie strength among those available to us (Marsden & Campbell, 1984).

4.3.3 Towards relational sociology

Although still debated, there is an increasing recognition of a broader relational perspective within sociology (Mische, 2011). Key to this perspective is the assumption that what sociologists call 'structure' is in fact relational, and that relational thinking is

the way to overcome the problem of thinking either in structural or agency terms through a focus of social interactions in different kinds of social settings. Inspired by the work of Harrison White (1992), researchers developed this perspective within culture, history, economics, politics and social psychology.

Emirbayer and Goodwin (1994) used this argument in their research on cultural and historical change, and suggest structural theories are deterministic as they leave no room for cultural content and process. Consequently, network analysis should overcome this lack of attention for meaning and culture since any relation entails several meanings in particular contexts (Emirbayer & Goodwin, 1994). Networks are then not seen as mere analytical constructs, but as real social structures with three dimensions: the structure of social relationships, the individual actors and their connections, and the meaning associated with networks and their connections. *Meaning* can be theorized on different levels (Fuhse & Mützel, 2011). For example, at the subjective level *meaning* relates to the individual actors and their agency; and assumes people's actions are a consequence of their thoughts. The focus there lies in understanding people's motivation while constructing their networks. Meaning is also found at the inter-subjective level, where it is negotiated through communication. Fuhse (2009) combined both in what he described as the *meaning structure* of social networks. This meaning structure takes the form of a *"fuzzy social reality"* (Fuhse, 2009, p. 53) which exists of two interrelated levels: interpersonally established expectations and cultural forms one the one hand and individual perception and expectations on the other hand.

Mische and White (1998) therefore define networks as embedded in 'domains' (e.g. family domain, friendship domain) that are characterised by a specific set of stories which actors constantly switch between. Actors are always embedded in multiple network domains and thus they are orientated to multiple stories, and have multiple identities and multiple types of interactions. Krohn (1986) defined *multiplexity* as the number of different social contexts in which an individual interacts with the same people. Multiplexity of social relationships can constrain an individual's behaviour. Individuals involved in multiplex social relationships are less able to withdraw from the social network as withdrawal from the network influences the possibilities of participation in more than one social context. This idea of 'multiplexity' in networks includes a definition of networks that exist of different types of ties, which are sometimes combined.

Likewise, Crossley (2010) considers networks as part of an evolving social world:

> *A network comprises a set of vertices and set of links between those vertices. A social network, however, is much more than that. It is an evolving social world; a world of meanings, conventions, resources, resource distributions and sedimented histories. Relations are "switched on" then "switched off" as actors move between activities and interactions, and are themselves both constantly evolving and highly particular as a consequence of the on-going history of interaction between the parties to them.* (Crossley, 2010, p. 31)

In line with Becker (1984), Crossley (2010) adopts an interactionist definition of networks. The interaction between two actors not only creates ties but also various shared meanings, norms and identities. A social network is also a social world in an interactionist sense; that is a world of shared meanings, purposes, knowledge, understandings and identities that affect the way in which those within it act. When two actors are related, they have a shared history which they each draw upon in their interactions. Therefore, Crossley argues that networks are not 'things' that are either present or absent, nor they are uniform. Relationships are dynamic; they evolve because these shared meanings also evolve constantly. For example, "friendship" takes on different meanings for different actors and even for the same actor in different situations or for each different friend an actor has. Mische (2003) also refers to a network definition in an interactionist sense when she discusses the link between culture and networks in social movement literature. She argues that: *"relations in networks are about what people do in interaction"* (Mische, 2003, p. 258). Mische further argues that it is not just networks and memberships that matter, but also how these relationships are represented in social settings. Edwards and Crossley (2009) see Mische's work on 'network switching' and 'cross-talk' in movements as exemplary of the need to supplement sociometric graphs with qualitative components.

4.4 Key concepts

4.4.1 Whole versus egocentric networks

Network analysts see individual people as nested or embedded within networks of face-to-face relations with 'other people'. Generally, once a set of actors is defined there are two ways for approaching the population. The full network method (or *whole network analysis*) requires collecting information about each actor's ties with all other actors. Whole network analysis is focused on a single bounded population (for example students in a classroom) for which a census is conducted. All elements or 'nodes' of the population are included as units of observation. The boundaries of a network study are drawn *a priori*

(e.g. a particular organization) or by the researcher (e.g. a population that meets a specific criterion) (Hanneman & Riddle, 2011). Full network data is often difficult to collect, especially for large groups, but allows for powerful descriptions of social structures.

On the other end of the spectrum are egocentric networks. An *egocentric analysis* begins with a selection of egos, or focal nodes, before identifying the nodes which they are connected with. Egocentric networks aim to describe the local network in which an individual is embedded. Egos, for example people or groups, can be connected and form a network, but it is also possible that data consists of egos that are not at all connected to one another. Most ego-network analyses use binary data, regardless of whether actors are connected. Ego network data is either gathered through surveys (using snowball sampling techniques or name generators) or by extraction from a whole network. The size, density and distances in an ego network are parallel to the same ideas for whole networks. Besides these measures, ego-network analysts developed approaches to understand the role that an ego plays in connecting the neighbourhood and to understand the ego's positional advantage and disadvantage (Hanneman & Riddle, 2011).

McCarty (2002) uses the term *personal* network in contrast to *socio-centric* networks. Personal networks are a type of egocentric network that consist of the set of family, friends and acquaintances surrounding a focal person, whereas socio-centric networks focus on interactions within a defined focal group. Wellman (1988) defines these personal networks as *personal communities*, networks of sociability, support and identity. They typically consist of a great variety of ties, differing in their origin and duration. Different types of alters serve different purposes for the ego (*network owner*). Wilkinson (2010) indicates personal communities are also a form of ego-centric networks. Unlike forms of community where people are bound to each other by common values, goals, cross-cutting ties or shared experience, these personal communities have been shown to be self-selected and individuated as well as a source of support.

4.4.2   Density and centrality

One of the most widely used concepts in graph theory is density, which measures the cohesion or general linkage among points in a graph (Hanneman & Riddle, 2011). The more points in a graph that are connected to each other, the denser a graph is. Maximum density is reached when all individuals know each other.

To capture how individuals are embedded in networks, one measures their distance. If two members are directly connected the distance is one, whereas if an actor is not

reachable the distance is infinite. The most common way to measure binary data is geodesic distance, which is the shortest pathway between two actors in a network. One approach to measure how connected actors are is to ask how many different actors in the neighbourhood of a source lie on the pathway to a target. The strength of a tie is then measured by the weakest path between two actors.

In general, the distance between two nodes is short. Consequently, a lot of actors in very large networks tend to be close to each other or 'clustered' into local neighbourhoods. Formulated this way, people are both close to people they know but also to a lot of unknown actors. The *small world* phenomenon captures both observations: path lengths between actors are relatively short as there are maximum six steps separate any two alters, and in the whole network there are 'clique'-like structures. The small-world hypothesis is further discussed below.

The concept of *centrality* originates from the sociometric concept of a star. A central point is the one at the centre of a number of connections (Scott, 1991). A point can be locally centred or globally centred. If a point has a lot of connections with other points in its immediate environment or neighbourhood, a point is locally centred. A point is globally central if it has a position of strategic importance within the overall structure of the network. A specific case of global centrality is betweenness centrality. Betweenness measures the extent to which a specific point lies between various other points. This way, one can measure the extent to which an actor can play the part of a broker or gatekeeper. To conclude, centralisation refers to particular properties of a graph rather than the prominence of a particular point. Centralisation is complementary to density as it describes to what extent cohesion is organised around particular points.

4.4.3 Homophily, homogeneity and transitivity

The smallest social structure is a dyad, a relation between two actors (Hanneman & Riddle, 2011). Two actors can be not connected, connected in one direction or connected in both ways. The amount of *reciprocated* ties tells something about the stability of a network. Networks that have a lot of asymmetric connections may be less equal and stable, and rather hierarchical, than networks with a lot of reciprocated or null connections.

A triadic relation connects dyadic relations with an 'other', present alongside 'ego' and 'alter'. In this structure, measures such as balance and transitivity are present. Among three actors, different types of relations exist ranging from hierarchy, equality to the

formation of exclusive groups. *Transitivity* is a measure which is present within a triadic relation. Mathematically speaking, transitivity is a property of a tie. If there is a tie between actor A and B, and one between B and C, than in a transitive network A and C will also be connected (Hanneman & Riddle, 2011). Louch (2000) argues empirical studies have found up to 70-80% of small group situations are characterised by transitivity.

Homophily is a property of a tie and refers to the tendency to contact people that share similar characteristics (e.g. age, education, occupation, race, gender) (Lazarsfeld & Merton, 1954; McPherson, Smith-Lovin, & Cook, 2001). Families, organisations and geographical closeness create a context in which homophilous relations are formed. Moreover, ties between non-similar individuals tend to dissolve more quickly.

To conclude, *homogeneity* is a characteristic of a group or population. A group is homogeneous if not only ego and alter have a homophilous relation, but the same relation also exists between different sets of alter pairs. The principle of homophily is the basis for the development of the strength of weak ties idea of Granovetter, which is discussed below (see §4.3.2.1).

4.4.4 Connections among groups: cliques/substructures

Cliques can be defined in two ways (Hanneman & Riddle, 2011). The bottom-up approach starts from the most basic group and sees how far this kind of group goes. Formulated in this way, cliques are defined as the largest possible group of nodes (more than two) in which all nodes are directly connected to each other. Reasoned top-down, looking at the whole network, one can discern substructures, which are areas in the graph that seem to be locally dense but are separated from the rest of the graph.

Substructures are formed by categorical subpopulations within a whole network that share an attribute, for example people of the same gender, or a context, for example people who attend the same school. From the top down, substructures within a whole network look like dense areas that are locally dense but separated to some degree from the rest of the graph. The idea that some parts are less connected to other parts gives insight into lines of division. Weaker parts in the network also create opportunities for brokerage and are indicators of opportunities and constraints of groups and actors.

4.4.5   Position in a network

The fundamental basis for the notion of positions is that of similarity. Actors who are connected in the same way to the rest of the network are said to be equivalent and to occupy the same position.

The goal of positional analysis is to divide actors into mutually exclusive classes of equivalent actors with similar relation patterns. Structurally equivalent actors do not need to be in the same group or network to be in contact with each other. This is contrary to the relational approach, which attempts to find groups of actors who are closely related to each other (Borgatti & Everett, 1992). In order to analyse these multi-relational networks, block models have been developed. Block modelling is a tool to reduce the complexity of a network, as it is represented through a set of blocks of network members according to maximal similarities in their ties to each other. This way, relations of positions in the network are highlighted rather than information about individual actors (Burt, 1980).

Positional analysis is often conducted in egocentric network analysis as well. Ego might be the "go-between" for pairs of other actors (see also §4.4.2). For example, if actors in an ego network are only linked to ego and not to each other, ego can perform as a broker if it is situated on the path linking two others. The position an ego takes in a network can constrain an actor or provide opportunities. Actors that have fewer constraints are then considered to be in a favourable structural position. Having a favoured position might lead to an actor getting more power, influence or easier access to resources (Hanneman & Riddle, 2011).

4.5   Social network analysis in drug market and criminological research

4.5.1   Structure and composition of 'criminal' networks

4.5.1.1   Organised crime in general

The most popular and common way to use social network analysis within criminology is in the field of *organised crime*[6]. Most of these studies focus on whole networks, and aim to describe a particular network and to visualize it statistically. Instead of assuming a

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[6] There is no unified definition of the concept of organised crime. The UN Convention against Transnational Organised Crime (2004) defines an organised crime group as a "*structured group of three or more persons existing for a period of time and acting in concert with the aim of committing one or more serious crimes or offences in order to obtain, directly or indirectly, a financial or other material benefit*". Serious crime is defined as "*a criminal offence punishable by a maximum deprivation of liberty or at least four years or a more serious penalty*" (Finckenauer, 2005).

particular structure, formal network analysis allows to identify and compare the structure of different groups (for example criminal groups versus non-criminal groups) and to test theoretical concepts concerning groups empirically. Most of these studies focus on the organisation of criminal groupings, terrorist organisations or white-collar conspiracies.

Social network research of *terrorism* has increased since the attacks of 9/11 and is used as part of counter-terrorism measures (Ressler, 2006; Yang & Sageman, 2009). The attention for social networks in terrorist organisations was influenced by the empirical observation that a growing proportion of violent attacks by terrorist groupings were not performed by hierarchical paramilitary organisations but rather by small, informal and non-hierarchical social frameworks that are flexible and dynamic. The growing number of similar observations led scholars to shift attention from the individual levels or organisational levels of analysis towards a network approach (Sageman, 2004). Social network studies on terrorism focus on the detection of sub-groups, the identification of important actors and their roles and the description of patterns of interactions. Though most of this research is done in the fiend of political sciences, some criminological studies also pay attention to terrorist social-network analysis.

Few studies have used social network analysis as a paradigm or method to investigate *gangs*. The social organisation of gangs is analysed at an organisational level, but the network approach remains rare (Bouchard & Spindler, 2010; McGloin, 2005; Papachristos, 2006). One example is found in the work of McGloin, who investigated Newark street gangs using a network approach (McGloin, 2007). Data was collected during semi-structured interviews with law enforcement officials, who were asked to identify and describe characteristics of gang members and their interactions with each other. The conclusion indicated that street gangs generally lacked cohesion, and were described as a social system of criminal entrepreneurs rather than a hierarchical, stably organised crime syndicate.

White-collar crime researchers also acknowledge the added value of a network approach. Traditional research methods identify key relationships and the environment in which the actors operate. Network analysis, however, allows a visual representation of structural roles of market participants as well as to assess the density of networks or the centrality of certain actors to others (Simpson, 2011). One notable example is the study of illegal networks in the heavy electrical equipment industry by Baker and Faulkner (1993). Using archival data (sworn testimonies), the researchers reconstructed the

communication networks involved in conspiracies in switchgear, transformers and turbines through the integration of theories on organisational crime with work on network analysis and inter-organisational relations. Network analysis indicated that illegal networks did not follow the same efficiency logic as legal business activities because they focus on concealment rather than maximisation of efficiency.

4.5.1.2   Networks of drug traffickers

Drug trafficking and drug market researchers have also found their way to social network analysis (Bright, Hughes, & Chalmers, 2012; Morselli, 2009; Natarajan, 2000, 2006). Morselli (2009) for example argues that network analysis can help to study a wide range of criminal groups, ranging from simple co-offending to highly sophisticated groups. He starts from the assumption that criminal groups do not follow a strict hierarchy but are flexible, and organised in an informal way.

Social network analysis is used to describe the composition and structure of *dark* or *covert* networks (Morselli, 2009). Drug market research mainly adopts social network analysis to describe the social organisation of drug trafficking organisations. Based on mainly secondary data, network studies explore the composition and structure of these organisations. Network measures like density give information about the presence of connections between members that are actually present. On the other hand, measures of centrality can give insight into the positions of certain individuals in a network (see §4.5.3.2).

Network studies confirm the idea of flexible and dynamic organised groups rather than strict hierarchical groupings. Criminal groups do not follow a strict hierarchy, but are flexible and organised in an informal way. McGloin and Nguyen (2013) for example point to the finding in literature on criminal networks that networks consist of varied structures, and therefore treating all groups similarly is not realistic. Drug market studies have regularly pointed out their flexible and dynamic nature (Calderoni, 2012). The traditional *corporate* model, arguing that criminal organisations are centralized, with a strict division of labour and a strict hierarchy, is challenged by the research mentioned above (Giménez-Salinas Framis, 2013). In recent years, social network analysis has focused on the nodes and links of members of these networks to provide a more profound insight and understanding of connectedness and patterns of organisation. From this point of view, some authors argue illegal networks adopt a more horizontal structure, with interchangeable roles, and flexible rules (Giménez-Salinas Framis, 2013). These networks

are considered more resilient to external threats than networks with a more strictly organised structure.

Social network analysis aids in exploring two aspects of collaboration in covert settings: trust and secrecy (Morselli, Giguère, & Petit, 2007). Morselli et al. (2007) describe two particularly interesting studies: Erickson's (1981) study of six different covert networks[7], a network of marihuana users being one of them, and the study of Baker and Faulkner (1993) into conspiracies in a heavy electrical equipment company. Erickson (1981) stresses the importance of trust in a covert social network under risk. Organisation-wise, these networks will rely on long-existing relationships and will place security over efficiency when acting. In their study of conspiracies, Baker and Faulkner concluded that peripheral players are crucial to the network. These players stay at the periphery on purpose in order to protect themselves.

As these networks lack a clear-cut core, there is a negative effect on efficiency, as transmission of information takes longer. However, knowing that detection highly increases the risk of termination, this lower efficiency is a price they are willing to pay for security. Morselli et al. (2007) further argue this security-efficiency trade-off is also influenced by the network's objective and the frequency of actions. Especially in the case of drug trafficking, peripheral actors bring security to the network (e.g. by acting as brokers between otherwise disconnected traffickers). They also insulate participants at the core (Dorn et al., 1992; Pearson & Hobbs, 2001).

Furthermore, criminal networks are argued to be *embedded*, meaning that social networks, be they criminal or non-criminal, overlap and intersect so that individuals exist in multiple social circles at the same time. Papachristos and Smith (2012) analysed relational data between nearly 3,000 individuals connected to Al Capone's syndicate and explored the way this crime syndicate interacted with legitimate social institutions. Moreover, he also found ties to be *multiplex* in nature, meaning that they consist of several types of relationships simultaneously (e.g. social relations, exchange relations). Although theories accept this interdependent nature of ties, most research does not include these

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7 Erickson (1981) studied the following six cases: the Auschwitz underground during World War II; a rebellion group in 19th century China; a New York City Cosa Nostra family; a heroin market in San Antonio, TX; a sample of marijuana consumers from Cheltenham, England; and a Norwegian resistance group during World War II.

complexities due to data-related or methodological limitations (Papachristos & Smith, 2012).

4.5.2 Structuralist interpretation of *peer influence*

4.5.2.1 Multiplexity, presence and strength of social relations

The relationship between peers and delinquency is one of the key themes in criminology and it is generally assumed that peers will behave consistently with their friends. The assumption of peer influence is based on a one-dimensional concept of peer influence as *exposure to delinquent friends* (Haynie, 2001; Papachristos, 2011). Accordingly, peer influence is often measured by the number of delinquent friends an individual has. Empirical research confirms that peers are, among a complicated set of circumstances and risk factors, the most consistent and strongest influence on adolescents' substance use. Peers are furthermore believed to influence an individual both directly (for example in providing opportunities to use drugs) and indirectly (for example by shaping norms and attitudes) (Bauman & Ennett, 1996; Kobus, 2003). A primary motivation for the belief that peer influence is an important factor in an adolescent's drug behaviour is the strong correlation between drug use by adolescents and the drug use adolescents attribute to their friends. Research confirms that this relationship is maintained when other variables are controlled. Moreover friend behaviour is stronger than other predictors like parental behaviour, demographic characteristics, attitudes and personality characteristics (Bauman & Ennett, 1996).

Social network analysts however argue that peer influence is a multi-faceted concept. Not only is the *exposure to friends* important but also the structure and pattern of one's network plays an important role (Papachristos, 2011). The number of delinquent friends is an incomplete measure of peer influence as it fails to recognise structure and patterns within one's network. Papachristos (2011) further argues that centrality and density of a network is important as well. In a dense network, all members are linked to each other, which increases the likelihood of tendencies towards similar behaviours. This conclusion empirically confirms some of the social learning assumptions. To date, most research has used sociometric techniques in order to map and describe delinquent social networks (Valente, 2003). Peer influences are thus studied mostly from a top-down perspective. Sometimes whole network analysis is completed with analysis of ego networks that are extracted from the whole network. Personal network analysis, which focuses on the social environment of one person, is least popular.

Multiplexity and density are among the first concepts to be linked to developing a broader understanding of how users are motivated to start using cannabis. Krohn (1986) studied structural characteristics of networks in research into the relationship between social status and delinquency. He argued that network complexity and density were important to determine the degree to which an individual's network influences their behaviour. Furthermore, he assumed that the more an individual interacts with the same people in different contexts, the more likely it is that their behaviour in one context affects their behaviour in another context. Accordingly, Krohn (1986) defined *multiplexity* as the number of different social contexts in which an individual interacts with the same people. Multiplexity of social relationships can constrain an individual's behaviour. Individuals involved in multiplex social relationships are less able to withdraw from a social network as withdrawal from the network influences the possibilities of participation in more than one social context. On the other hand, it is assumed that the greater the density of a network, the more an individual's behaviour will be constrained as actions are subject to reactions of all group members.

Looking at a network as a *multiplex* network suggests a user's behaviour is influenced by those 'outside' the group they use cannabis with. A number of social network studies research how specific network structures influence an individual's criminal behaviour (Papachristos, 2011; Valente, 2003). Research into peer influences mostly focuses on delinquency as a general concept for a range of risk behaviours. Some go into substance use (regular tobacco, alcohol or marijuana), either separately or together. Substance use is then defined as a form of *criminal, delinquent* or *deviant* behaviour. My study does not define respondents' supply and use behaviour *a priori*. However, in order to create a basis for discussion, I adopt the choice of words of the individual studies. Social network research into adolescents' risk behaviour focuses on smoking (Kobus, 2003), on smoking, drug taking and alcohol consumption (Aloise-Young, Graham, & Hansen, 1994; Kobus & Henry, 2010; Valente, Gallaher, & Moutappa, 2004), cigarette smoking and alcohol use (Urberg, Degirmencioglu, & Pilgrim, 1997) or smoking and drug taking (Ennett & Bauman, 2006; Michell & Amos, 1997; Pearson & Michell, 2000).

A number of studies explore how aspects of *social embeddedness* aid our understanding of peer selection and socialisation processes. A key assumption here is that if patterns of friendship ties structure the flow of information, social support and social norms, they also influence delinquency (Ennett, Bailey, & Federman, 1999). In 1995 and 1996, Ennett

et al. (1999) interviewed and surveyed a purposive sample of 327 runaways and homeless youngsters in Washington DC aged 14 to 21. The study described the personal networks of these young people and examined network characteristics associated with risky behaviours, including alcohol and illicit drug use and unsafe sexual behaviour. Although the majority of the interviewees reported social relationships, a significant minority (26%) indicated that they had no social relationships. Young people with no social relationships were significantly more likely to report risk behaviours (for example current illicit drug use) than those who reported social relationships. Young people who claimed to be part of a wider social network, on the other hand, usually participated in networks that were small, strongly affective and supportive, comprised of friends and typically included an alcohol user or illicit drug user. Interestingly, these networks were generally not conceived to be a source of pressure to engage in risky behaviours.

The Context of Adolescent Substance Use studied the way social proximity, social status and social embeddedness are relevant to marijuana use (Ennett et al., 2008). This study included 5,104 eleven- to seventeen-year-olds who were surveyed every six months between 2002 and 2004. Slightly more than half (54%) of the respondents provided data at all five times. The research team examined the importance of peer attributes other than adolescent marijuana use in the life path of an individual. Three domains of peer networks were assumed to be related to adolescent substance use: social embeddedness, social status, and social proximity to substance users. Social network analysis was used to identify an adolescent's friends, to define structural properties of peer relations and to measure smoking. Four dimensions of adolescent peer relations were tested: having friends, friendship quality, status among peers and the identity or behaviours of friends . Data analysis revealed multiple dimensions were relevant to peer substance use.

Based on the analysis of the aforementioned Context of Adolescent Substance Use study, Ennett et al. (2006) argued that adolescents were more likely to use marijuana if the social distance to a substance user was low, even if the user was not among their set of friends. Adolescents with closer proximity to peers who reported substance use, those less embedded in a network, and those with a higher status in a network, were more likely to smoke marijuana themselves. Ennett et al. (2006) found that adolescents who were less embedded in a social network were more likely to smoke marijuana. Adolescents were less likely to use marijuana when they had more rather than less reciprocated friendships, and when more of their friends were friends with each other. The researchers concluded

that from a relational perspective, a highly dense network constrains substance use. Concerning social status, they concluded that those adolescents who are most visible and popular in a network are most likely to be substance users. This confirms the hypothesis that substance use is a means of maintaining social position among peers. To conclude, substance use was significantly higher when a best friend was also a user or when higher proportions of the whole network use.

Social embeddedness was also explored via measures of emotional closeness in Dutch research (Baerveldt, 1990; Houtzager & Baerveldt, 1999). Baerveldt (1990) developed a school survey which, amongst other questions, asked school pupils to choose a maximum of three friends out of a numbered list of students. The data was used to compare delinquent behaviour among friends. The research concluded that individual delinquent behaviour and delinquent behaviour of friends is correlated but to a lesser extent than was previously assumed.

The Dutch Social Behaviour study surveyed 1,528 Dutch pupils between the age of 13 and 18 to test the relationship between delinquency and closeness of friendship (Houtzager & Baerveldt, 1999). Delinquency was measured by a self-report questionnaire inquiring about different types of crime (e.g. shoplifting, vandalism) committed in the past twelve months. Drug use or supply was not included. The existence of different types of relationships, representing different levels of closeness, was measured using six social network items: unpopularity, functional relationships for misconduct, practical support, emotional support, best friendship, and intimate friendship.

The findings of this Dutch Social Behaviour study suggest that relationships among delinquents are not dependent on intimacy and support, but rather on the function for committing crimes (Houtzager & Baerveldt, 1999). Furthermore, delinquent young people sometimes have relationships with non-delinquents young people, leading to the conclusion that delinquent young people can maintain good relationships but the relationship between delinquents is poor in terms of intimacy. Houtzager and Baerveldt (1999) compared the social abilities of delinquents and non-delinquents. Marcus (1996) suggested that the friendships of delinquent adolescents are less intimate than those of non-delinquents. If there is a difference in intimacy of relationships between non-delinquents and delinquents, this could imply delinquents are not capable of forming the same bonds as non-delinquents. Houtzager and Baerveldt (1999) therefore suggested that criminal behaviour is a sign of lack of social abilities in general. However, the findings

of their social network study do not support the social ability hypothesis. A possible explanation is that the differences in closeness indicators, like support and intimacy, depend on the type of tie under consideration.

Besides *social embeddedness, social capital* and *social learning processes* were also found to shape networks of students. However, gender seems to mediate their influence on network composition more (Van de Rakt, Weerman, & Need, 2005). Social capital is here assumed to protect an individual from criminal behaviour but can also be *antisocial*, in a way that it stimulates an individual to commit crime. These studies are in line with the structuralist views portrayed above. The personal network data of the second wave of the Dutch Social Behaviour study was used to analyse the role social capital plays in the explanation of delinquent behaviour. The researchers focused on the influence of school, bonds with parents and the direction of the relation between delinquent friends and delinquent behaviour.

The researchers suggest bonds with school and parents as well as friendship relations do not influence boys and girls in the same way (Van de Rakt, Weerman & Need, 2005). Concerning boys, the number of friends had a significant effect on the delinquent behaviour of the individual. However, the delinquent behaviour of friends did not have a significant effect. Van de Rakt et al. (2005) argued that it is not the delinquent behaviour of friends but the group *itself* that has an influence on the behaviour of an individual. Group processes do include fear of exclusion, status protection and so on. This in itself could lead to delinquent behaviour. This certainly seems the case in a school environment. A significant effect of delinquent friends is however found among girls. Moreover, the number of friends was not significantly related to delinquent behaviour. This finding made the authors to suggest girls are less sensitive to group processes.

Gender seems to play an important role in the formation of networks as well. *Homophily* of gender might influence network composition far more than homophily of delinquency (Baerveldt, Van Rossem, Vermande, & Weerman, 2004; Weerman, Bijleveld, & Averdijk, 2005). A sample of 1,730 students of 13- and 15-year-olds filled out a questionnaire about their personal network (maximum ten alters could be named). Delinquency was measured through a wide range of crimes a respondent might have committed during the past year. The homogeneity hypothesis was confirmed, although homogeneity of *gender* was far larger than homogeneity of *delinquency*. Baerveldt et al. (2004) argued that much similarity regarding delinquency is explained by gender homophily (boys interact with

boys, girls with girls), and suggested that the influence and selection processes lose a lot of explaining power when they are controlled for gender.

A UK study further suggests that selection and socialisation processes might be embedded in a timeline, where selection processes based on *gender homophily* predate a socialisation process based on shared substance use (Kirke, 2006). Kirke (2006) addressed the issue of relative importance of peer influence and peer selection in creating similar substance use among teenagers. Instead of relying on schools as a setting, which is more common, she examined the substance use of 14- to 18-year-olds in one working-class community in Dublin, Ireland. A census of every house in the selected community was carried out. 298 teenagers were identified, of which 267 participated. The fieldwork was completed by six interviewers, and lasted for six weeks. Network analysis of dyadic data confirmed that young people were likely to be similar to their peers concerning smoking, drinking and the use of illicit substances. Kirke's (2006) study illustrates the relative impact of peer selection and peer influence on substance use. Similarity of substance use between teenagers and their peers occurred both through peer selection and peer influence. According to Kirke (2006), this finding contradicted previous studies, which concluded that either peer selection or peer influence explained similarity. To describe this phenomenon, she used the image of a chain. Peer ties are formed when teenagers select other teenagers as their peers. The social position of a selected peer is important to the extent that he or she might be located centrally in a chain of substance users, peripheral to such a chain or among all non-users.

To conclude, there is no agreement in literature on which type of network structure is linked to greater substance use. Some authors argue that peer influence is the greatest in close-knit groups (Oetting & Beauvais, 1987). Consequently, members of substance-using peer groups are most similar to friends in their substance use behaviours. Others, like Granovetter (1983) and Wasserman and Faust (1994), argue that in the case of substance use, loose-knit networks have more potential for influence. Weak ties give an individual more freedom to engage in substance use, and hence *liaisons*, who are loosely connected to more than one network, should show greater substance use (see also §4.5.2.2).

Based on the personal network analysis in a second wave of the Dutch Social Behaviour study, Baerveldt et al. (2004) concluded that strong relationships seem to be less important than previously assumed. Accordingly, they suggest future research should focus on the strength of weak ties or the role of social capital. The researchers questioned

1,317 15- to 17-year-olds and included up to twelve nodes in a network. This time, the researchers drew personal network data from the full network analysis in order to investigate whether delinquency is related to the quality of personal networks. Although the study is limited to petty crime, the results indicate that networks differ considerable in their similarity in delinquent behaviour. However, the similarity in delinquent behaviour was not greater for stronger relationships than it was for weaker ones.

4.5.2.2 Network position

Drug markets further confirm the hypothesis that criminal groups consist of loose partnerships rather than hierarchical relationships (McGloin & Nguyen, 2013; Morselli, 2009; Papachristos, 2011) (see chapter 1 & 2).

For instance, Morselli (2009) measured density, the number of contacts with whom a participant is directly connected, and betweenness centrality. Thus he studied not only how many connections a person has, but also focused on individuals who have fewer direct contacts but hold an important intermediary position (McGloin & Nguyen, 2013). Centrality is assumed to relate to influence and control. Morselli (2009) analysed 6 Canadian cases: a terrorist network, three drug trafficking organisations and two groups that export stolen luxury vehicles. In order to visualize the network and to measure centrality, Morselli (2009) analysed physical surveillance and electronic records as well as conversations obtained through phone taps.

Morselli's study (2009) also suggests *brokers* can obtain a powerful position within these loose partnerships. In such fluid structures, individuals with large brokerage capital might position themselves better than other individuals. Papachristos (2011) refers to the work of Morselli (2009), pointing out that the structure of a broker's network is likely to be more like a star. The broker is the middle point of a star-like network. If one person wants to contact a different person in this network, they have to pass through this broker because the latter is the only connection to the other person. This results in a powerful position for the broker.

A number of network studies identify and study the *positions of users*. Three network positions are identified: *members*, who belong to dense networks; *liaisons*, who are loosely connected to peers; and *isolates*, who are relatively unconnected with others (Kobus & Henry, 2010). A number of social network studies argue that isolates are more likely to use substances than members or liaisons (Fang, Li, Stanton, & Dong, 2003). Some research argues that the relationship between substance use and network position is moderated

by the prevalence of substance use in specific peer groups. Pearson and Michell (2000) for example concluded that those who were peripheral (either isolates or liaisons) to substance-using peers were more likely to smoke than those peripheral to non-substance-using groups. Others argue marijuana use of liaisons is more closely tied to peer use than isolates or members. The fact that the liaisons in the study all had more social ties than members or isolates might help to explain this. Having more social ties is important for accessing to marijuana as opposed to cigarettes, which are more readily available (Kobus & Henry, 2010). Based on the complete network data, Kirke (2006) concluded that social position *per se*, in terms of being in a peer group or being an isolate, was unrelated to substance use.

Furthermore, the importance of network positions might depend on the type of substance used. Kobus and Henry (2010). Via a survey, data on cigarette smoking, alcohol and marijuana use was collected from a sample of 163 twelve- to fourteen-year-olds. Both perceptions of use and social network analysis were compared as measures for peer substance use. The study compared the level of cigarette, alcohol and marijuana use among young people with different network positions. Network position, referent peer-group substance use and their interaction all predicted adolescent substance use, though the specific pattern of influence varied by substance. Concerning cigarette use, members and isolates seem to be less affected by network positions than by the actions of their peers. There were only significant effects found in the social network analysis, and not through other types of analysis. Kobus & Henry (2010) argue that the social networks rather than normative influences explain this result.

Besides homogeneity, Weerman et al. (2005) looked into how different levels of delinquency and the popularity and position in a network of an individual are linked. The second hypothesis, which is that more serious delinquents are popular and occupy a central position among non-delinquent friends but are unpopular as best friends, was only partially confirmed. Mildly delinquent young people proved to be most popular as friends, possibly due to the attraction of mild delinquency as opposed to 'soft' non-delinquent youth and 'weird' serious delinquents. However, as far as popularity as best friends is concerned, seriously delinquent youngsters do not score lower than non-delinquent or mildly delinquent youngsters. Weerman et al. (2005) compared their findings with previous research into network positions (Baerveldt et al., 2004; Haynie, 2001). The popularity of mild delinquents, in comparison to more serious offenders, was

not found in other research. However, Haynie (2001) did conclude that the difference between delinquents and non-delinquents, as far as network positions are concerned, is very small.

4.6   Conclusion

This chapter presents social network analysis as a way to overcome the gap between existing theoretical frameworks of supply, which tend to emphasize either structural factors or individual factors.

The roots of social network analysis show its intrinsic mixed nature (Freeman, 2004; Scott, 1991). Graph theory, built upon the basic principles as explained by balance theory, field theory and sociometry is enriched with ethnographical research into subcultures and communities. Nowadays, network analysts are united in viewing the world as a web of relations. Understanding this world view is guided by three principles: behaviour is not only shaped by individual attributes but is also always interdependent of social structures; membership of groups is not mutually exclusive and relations are shaped by the patterns of relations between other members in the group (Marin & Wellman, 2011).

Though guided by similar principles, the extent to which theories of networks or network theory exists is strongly debated (Borgatti & Halgin, 2011; Wellman, 1988). Marin & Wellman (2011) argue one should consider network analysis as a paradigm or a perspective. Most network studies adopt a formalist view, and treat network analysis as atheoretical, thereby focusing on the patterns or forms of the relations (Erikson, 2011) rather than how these patterns might influence or be influenced by individual behaviour, which is in line with a structuralist view on networks (Wellman, 1988). A third group of theorists argue that sociology as a whole should adopt a more relational perspective (Mische, 2011). This final point of view sees networks as created by social interaction.

Structuralists focus mainly on the way actors use their connections to find resources or information (e.g. Burt, 1992; Coleman, 1988; Granovetter, 1983) as well as the extent to which the quality or strength of these relations influences these opportunities to find information or resources (e.g. Granovetter, 1992; Nahapiet & Ghoshal, 1998). A networked view on social capital emphasizes the importance of putting social capital in network terms and includes resources that are embedded in a social structure, individuals with access to such resources, and use or mobilisation of these social resources by individuals in purposeful actions. The notion of quality of relations is often also referred

to in terms of social support or emotional closeness, which is then perceived as possibly influencing the way individuals behave (McCarty, 2002).

The building blocks for network analysis overcome different theoretical viewpoints as well. A discussion on the difference between whole network analysis and egocentric analysis, which focuses on the social world of an individual, inspired me to look at the personal networks of cannabis users (see chapter 5) (McCarty 2002; Wilkinson, 2010). To study this social world concepts like density, centrality and homophily are key, as is an understanding of the formation of cliques or subgroups and the position of individual actors.

In this chapter, I also discussed the current situation in criminological research, with a specific focus on studies exploring drug markets from both supply side and demand side. Formalist studies suggest drug trafficking markets confirm the description of drug markets already put forward in chapter 2. These network studies focus on the issue of trust and secrecy in collaborative settings that surround trafficking. Depending on the network's objective and frequency of actions, either security or efficiency will be most important. This influences the shape and structure of the network (Morselli, 2007).

Considering the motivations for defining supply, I mainly have to rely on studies into the demand side of drug markets exploring *peer influence*, as I did when I presented the theoretical framework in chapter 3. Network studies confirm use homophily, referring to exposure to substance-using friends, is an important factor in explaining individual substance use. However, a range of studies nuances this finding to the extent that gender homophily, referring to males mainly associating with other males and females with females, might play a more important role. Kirke (2006) for instance suggests gender plays an important role in the initial selection of friends, while substance use happens within an already formed group. A second finding refers to the strength of these relations: not only who is connected to who but also the quality of these friendships. Thus findings are mixed, suggesting that the strength of a social relation might not influence individual behaviour more than the mere presence of 'a' user (Houtzager & Baerveldt, 1999).

To conclude, both supply- and demand-side studies have looked into network positions. Supply-side studies emphasize the crucial role of intermediaries, whose network is structured in a star-like shape (e.g. Granovetter, 1983; Morselli, 2009), reflecting the powerful position of these actors. Demand-side studies reflect on three possible positions

of users: liaisons, isolates and members. However, it is unclear to what extent these positions relate to explaining substance use.

All of these above considerations have inspired me to develop a conceptual framework for social supply from a network perspective. Chapter 5 explores the concept of social supply as a multiplex tie in a multiplex reality, continuously shaped by social interactions.

Chapter 5   Conceptual framework

5.1   Introduction

In the previous chapters I presented sensitising concepts considering drug markets, supply patterns and networks. Chapter 1 presented different views on drug markets and cannabis markets while chapter 2 presented different ways to perceive supply in these markets. Chapter 3 detailed different theoretical perspectives that might help to explain why supply is referred to as 'social', and chapter 4 focused on various perspectives on social networks and key concepts that are applied to study substantive topics in criminology as well as drug markets more specifically. This chapter uses these building blocks to develop a conceptual framework for perceiving (social) supply from a network perspective (Seibold, 2002) (see also Introduction). This conceptual framework guides the further empirical study, which aims to contribute to the development of (social) supply conceptualisation and theory.

The rich body of literature into supply, social supply and networks provides the basis for the formulation of the central research questions in this study (§5.2, see also Introduction). These research questions guide the further development of the conceptual framework. Chapter 4 elaborates on the added value of a network perspective in the study of substantive concepts in supply research. In section 5.3 I specify how networks in my study are defined. This perspective further requires specification of what is meant by the individual level and the relational level (§5.4) as well as the network level (§5.5). These considerations and choices are then put together in section 5.6, where the conceptual framework is visualised.

5.2   Research questions

One of the main aims of my research is to explore the social world in which users and suppliers interact (see Introduction). I focus on the tie between young cannabis users and their suppliers and the way personal networks are structured around these actors. The social world of individuals encompasses different types of networks which overlap (Crossley, 2010). In line with research describing recreational cannabis use as a leisure-time activity, I situate cannabis use and supply within that particular part of the social world of an individual (Coomber & Turnbull, 2007; Parker, 2000). However, little is

known about the composition and structure of that part of the *leisure-time network* that is actually involved in cannabis use and supply, further referred to as the *cannabis network* and *supply network* respectively (see first research question below).

In line with Crossley (2010), I assume this supply relation is neither absent nor present, and nor is it uniform. Supply ties are not passive, but involve a unique history of interaction and take on different meanings for different actors (Crossley, 2010; Mische & White, 1998). This history of interaction created and continues to create a social world of shared meanings and knowledge that affects the way network members interact. In this way I explore the nature of the supply tie between users and suppliers. The second research question explores this process of interaction in order to examine the nature of the supply tie between users and suppliers. In my research I study the nature of the supply tie through two sub-questions that refer to the central elements of social supply: its social and non-commercial aspect, as outlined by Hough et al. (2003) (see second research question). Each of these two research goals are addressed in a set of subquestions:

1. **How are personal networks of young people in which cannabis use and supply is present composed and structured?**
   a. How are active *leisure-time networks* of young people in which cannabis use and supply is present composed and structured?
   b. How are active *cannabis networks* of young people composed and structured?
   c. How are active *supply networks* of young people composed and structured?
   d. How are suppliers and middlemen positioned in active *supply networks* of young people?
2. **What is the nature of the supply tie between young cannabis users and their suppliers?**
   a. To what extent is the supply tie between young cannabis users and their suppliers perceived as 'social'?
   b. To what extent is the supply tie between young cannabis users and their suppliers perceived as 'non-commercial'?

5.3 Personal networks

While Dorn, Levi and King (2005) point to different types of network structures, network analysts discuss drug markets in terms of the way information and resources are diffused within a particular network structure. Most network studies define networks as 'pipelines' for cultural formations, such as identities. Relationships are considered either observed (1) or not (0). These zeros and ones are an abstraction of social reality. Network analysis is seen as the measurement of structural roles, which exist apart from their enactment in conversation and interaction processes (see chapter 4). Some drug market researchers assume that if patterns of friendship ties structure the flow of information, social support and social norms, these ties also influence substance use. Survey research for example suggests that dense networks are more likely to constrain opportunities for substance use rather than to stimulate it (Ennett et al., 1999).

Some researchers however argue that networks are not merely 'conduits' for cultural formations, but they are themselves culturally constituted. Network analysis has reduced social networks, and as such has lost its grasp on culture, agency and process. Network ties are thereby not considered as a 'given' or 'having a simple fixed meaning', but as a result of interaction. Relations are always part of a history but are at the same time under construction, because actors build them through repeated action. Moreover, relationships vary in different contexts. This complex process cannot be captured by straightforward categorisation or statistical predictability (Edwards & Crossley, 2009) .

Like Mische and White (1998), I define networks as embedded in 'domains' (e.g. family domain, friendship domain) that are characterised by a specific set of stories between which actors constantly switch. Actors are always embedded in multiple network domains and therefore are orientated to multiple stories and have multiple identities and multiple types of interactions (see §5.3.1). Likewise, Crossley (2010) considers networks as part of an evolving social world (see also chapter 4).

> *A network comprises a set of vertices and set of links between those vertices. A social network, however, is much more than that. It is an evolving social world; a world of meanings, conventions, resources, resource distributions and sedimented histories. Relations are "switched on" then "switched off" as actors move between activities and interactions, and are themselves both constantly evolving and highly particular as a consequence of the on-going history of interaction between the parties to them.* (Crossley, 2010, p. 31)

In line with Becker (1984), these authors adopt an interactionist definition of networks. The interaction between two actors not only creates ties, but also creates various shared meanings, norms and identities. As such, a social network is also a social world in an interactionist sense, namely a world of shared meanings, purposes, knowledge, understandings and identities that affect the ways in which those within it act. When two actors are related, they draw upon a shared history in their interactions. Therefore, networks cannot be defined as 'things' that are either present or absent, nor are they uniform (Crossley, 2010; Mische, 2003). As such, I do not study *true* networks but how these networks are *perceived*.

Describing networks as embedded in 'domains' includes seeing these networks as multiplex in nature (Krohn, 1986; Papachristos & Smith, 2012). *Criminal* networks (as Papachristos and Smith call them) are embedded, meaning that social networks, be they criminal or non-criminal, overlap and intersect so that individuals exist in multiple social circles at the same time. Ties in these networks are *multiplex* in nature, meaning that they consist of several types of relationships simultaneously (see §5.3). Multiplexity of social relationships can constrain an individual's behaviour (Krohn, 1986). Individuals involved in multiplex social relationships are less able to withdraw from the social network, as this would limit the possibilities of participation in more than one social context. Although theories accept this interdependent nature of ties, most research does not include these complexities due to data-related or methodological limitations (Papachristos & Smith, 2012).

This interactionist definition of networks is in line with studies that describe drug markets as flexible and organised in an informal way (Calderoni, 2012; Giménez-Salinas Framis, 2013; McGloin & Nguyen, 2013; Morselli, 2009) (see chapter 1). From this point of view, authors argue illegal networks adopt a more horizontal structure, with interchangeable roles, and flexible rules. These networks are considered more resilient to external threats than more strictly organised structures (see Giménez-Salinas Framis, 2013).

In these dynamic networks, trust and secrecy are key (Baker & Faulkner, 1993; Erickson, 1981; Morselli et al., 2007). Organisation-wise, these networks will on the one hand rely on long-existing relationships. On the other hand, the organisation will place security over efficiency when acting. As described in chapter 1, this security-efficiency trade-off is also influenced by the network's objective and the frequency of actions. Especially in the case

of drug trafficking, peripheral actors bring security to the network (e.g. by acting as brokers between otherwise disconnected traffickers). They also insulate participants at the core (Dorn et al., 1992; Pearson & Hobbs, 2001).

5.4 Relationship between ego and alters

5.4.1 Social relation

Multiplexity in a supply tie first of all refers to the **interchangeability of roles** (Giménez-Salinas Framis, 2013). In case of social supply this interchangeability includes switching between multiple social roles (e.g. 'friend', 'family member') and exchange roles (e.g. user, supplier, broker).

Non-network drug research indicates suppliers are described by both supplier and user in terms of 'friend', 'acquaintance', 'kin' or even more generally 'non-strangers' (Coomber & Turnbull, 2007; Harrison et al., 2007; Hough et al., 2003; Parker, 2000; Potter, 2009; Werse, 2008). Existing research refers to suppliers in terms of 'friends', 'family' or 'acquaintances', but remains vague on what is actually meant by 'friends' or acquaintances or even family (Potter, 2009). Social network analysts suggest that concepts like 'friends' or 'acquaintances' are far too subjective to use. Like the networks they are part of, relations are dynamic. They evolve because these shared meanings also evolve constantly. For example, 'friendship' takes on different meanings for different actors and even for the same actor in different situations (Crossley, 2010; Mische, 2003).

In addition to *social* roles, actors in a network where cannabis is present will take up a *range of roles* associated with cannabis use and/or exchange. For instance, network studies on the position of go-betweens or brokers argue that drug markets characterised by loose partnerships (see chapter 1) are also characterised by a high interchangeability of these kinds of roles (Giménez-Salinas Framis, 2013). Accordingly, suppliers not only take the role of supplier at one moment, but take on one or more different other social roles (e.g. user, 'not being a user', 'friend', 'family member', 'colleague') at a different moment or even simultaneously (e.g. a 'friend' who is also a supplier takes on both these roles at the moment cannabis is exchanged).

Looking into 'who is connected to who' also includes looking at to what extent someone (e.g. a supplier) is associated with network members that share the same characteristic (in this case, also being a supplier) (see also chapter 4). One of the key findings in studies into cannabis use is that substance users mainly have substance-using 'friends' who

influence an individual's using behaviour and attitudes (Ennett & Bauman, 2006; Haynie, 2001; Houtzager & Baerveldt, 1999; Kirke, 2006). Network analysts explore this issue via measures of *homophily*, the extent to which actors in a network share a pre-defined attribute (e.g. gender, age, substance use). Their findings confirm the importance of substance use homophily, but some research indicates *cannabis networks* are formed based on prior homophily of age and gender, rather than on homophily related to substance use (Kirke 2006).

Some network studies focusing on peer influence argue this concept is multifaceted, and therefore the measurement of the mere presence of social relations does not capture this concept in all its aspects (Haynie, 2001; Papachristos, 2011). One of the suggestions concerns a study of the **quality** or **strength** **of social relations** between ego and alter (Crossley, 2010).

Social suppliers are described as 'friends', 'kin' or 'acquaintances' (Coomber & Turnbull, 2007; Harrison et al., 2007; Hough et al., 2003; Parker, 2000; Potter, 2009; Werse, 2008) (see chapter 3). To a network researcher these concepts refer to two types of relations (Crossley, 2010). Whereas 'friend' and 'kin' refer to core or very strong relations, the more general term 'acquaintances' or 'non-strangers' includes a wide range of peripheral relations that have little homogeneity. These peripheral relations tend to be more specialized but are also unstable over time and have a lower density (Crossley, 2010). Current network research into drug markets focuses solely on core ties, as in close friendship ties, for instance in the form of classmates (e.g. Baerveldt, 1990; Ennett et al., 2008). To allow for a more unified comprehension of social supply, I assume that besides social roles, exploring the quality of social relations might help to define the social aspect of supply further.

I thereby acknowledge the debate in drug market studies concerning the way tie strength influences substance-use behaviour (Ennett & Bauman, 2006; Haynie, 2001; Houtzager & Baerveldt, 1999; Kirke, 2006). In this regard, some authors argue the influence of tie strength is less than being exposed to others (Ennett et al., 2008). Baerveldt et al. (2004) therefore argue weak social relations should be explored further.

5.4.2 Supply relation

5.4.2.1 Mechanisms of exchange

Drug market literature as well as network studies indicate that the process of acquiring is shaped by aspects of individual rational actions as well as a complex peer-influencing process (Aloise-Young et al., 1994; Bauman & Ennett, 1996; Coggans & McKellar, 1994; Cullen, 2010; Kirke, 2006).

Network analysts define an **exchange process** in three steps: an initial motivation, the different actions undertaken to exchange a good, and the result of these actions. Possible results include exchanging goods and rewards as well as being referred to a different person (Giuffre, 2013). When cannabis is present, an actor can either obtain cannabis or not (e.g. by accepting an offer to share, by buying an amount of cannabis for personal use or to sell to other alters or to 'other people' outside of the network). Not obtaining cannabis can result in a new question to another person or a *further referral*. *Obtaining cannabis* can follow different patterns (e.g. 'dealing', swapping', 'gift-giving', 'sharing'). Social supply studies inform here on the distinction respondents make between 'suppliers' and 'real dealers' (Coomber, 2006; Coomber & Turnbull, 2007; Hough et al., 2003; Potter, 2009).

This framework guides my study in our understanding of how perceptions of supply and shared histories are created and diffused through this exchange relation (in this study also referred to as 'supply relation'). This exchange process, either initiated by themselves or through the acceptance of an offer from somebody else, can be guided by information provided by other sources. For example, basic factual information and gossip is information (e. g. about use techniques) provided by other sources (Lee, 1969). The second level refers to the shared stories about technical knowledge and sensible use (Aldridge, Measham, & Williams, 2011; Duff, 2005; Pearson & Michell, 2000). For instance, in dense networks where a lot of information is present on how to obtain cannabis, individuals are less likely to search for information outside of their network. If there is little or no information present, individuals will have to find a way to enter into another network in order to find information (Giuffre, 2013).

Drug market research suggests **middlemen** are key in this process (Morselli, 2009). I assume, as suggested in chapter 4, that people with a high brokerage capital might be more capable of finding resources. The possibility to broker, or *brokerage capital*, is associated with opportunities to influence and control others (McGloin & Nguyen, 2013;

Morselli, 2009). Network studies including positional analysis point to the importance of intermediaries in the search for information or goods (Burt, 1992; Granovetter, 1973).

Social supply research further suggests suppliers can take multiple roles, one of which being a *go-between* or *broker* (Werse 2008). Three positions have been most frequently identified: *members*, who belong to dense networks; *liaisons,* who are loosely connected to peers; and *isolates,* who are relatively unconnected with others (Kobus & Henry, 2010). In some studies the characteristic of "being a user" is mostly connected with being a *member* of a dense group. Other studies argue users are mainly *liaisons* who are loosely tied to the network (Kirke, 2006; Kobus & Henry, 2010). As Kobus and Henry (2010) suggest, a possible explanation might be that these *liaisons* have more social ties than *members* or *isolates*. Having more social ties might make it easier to obtain cannabis as well (Kobus and Henry 2010).

A key element in the discussion of supply patterns concerns the issue of a **reward**. An exchange relation is founded in complementary needs (in this case cannabis and a reward) that should be satisfied by the exchange. Literature on *social supply* indicates that this reward is sometimes absent or non-monetary (Coomber & Turnbull, 2007; Harrison et al., 2007; Hough et al., 2003; Parker, 2000; Potter, 2009; Werse, 2008). I assume rewards can be both tangible (money, trade for other kinds of cannabis) or intangible (ideology, power, status…) (see chapter 2).

Recently, Coomber & Moyle (2014) studied the first kind of reward, and more specifically the issue of exchanging money. I assume a supply tie can involve a transaction of money but only to the extent this money is intended to cover costs, for instance associated with the growing process. Profit is therefore defined by the intention to sell substances to cover all kinds of other costs of living (e.g. hedonistic lifestyle, rent, food…). Coomber & Moyle (2014) extend the concept of social supply *to minimally commercial supply* in the case of heroin use. This definition of social supply includes those suppliers who are user-dealers. They are addicted to heroin, sell only to other addicts, make little profit from the sale and consider supplying as a substitute for committing other crimes.

I assume that these intangible rewards are part of *communal relations* where benefits are given in response to a need and out of concern for the welfare of the other person. In such relationships, receiving benefits does not create a specific obligation to return a comparable benefit, as it does in exchange relationships (Clark & Mills, 1993). However, Batson (1993) suggested exchange principles might be present in both exchange and

communal relations. The difference between these two types of relations might be less clear-cut than anticipated (Batson, 1993).

5.4.2.2   Exchange patterns: possible outcomes

I assume that the result of a transaction can be defined in terms of being part of a *social relation* and in terms of being part of an *supply relation*. The conceptual framework defines the outcome based on two axes, which represent the basic assumptions of social supply (see §5.7). The horizontal axis represents the goal of the transaction (ranging from non-commercial to commercial). The vertical axis represents the social nature of the relationship between user and supplier. This social aspect is expressed in terms of strength of the social relation, ranging from very weak to very strong.

Combining aspects of both these relations, the exchange process might result in four possible outcomes. *Commercial-social supply* refers to a supply relation in which a supplier mainly sells cannabis for profit, but only to known customers (closed market). Users are very likely to refer to this supplier in terms of 'friends' or 'relatives'. A *commercial supplier* is what is more commonly referred to as a 'dealer', and in my definition refers to a supplier who sells for profit to anyone. A *socio-commercial supplier* is mainly motivated by the intangible rewards of sharing cannabis, but would share it with anyone. To conclude, a *social supplier* is mainly motivated by the intangible rewards of sharing cannabis, but only shares it with people that are close to them.

5.4.3   Setting: social, collaborative and use

I assume supply experiences are situated within a *social setting* (*setting* used as synonym for *domain* or *circle*), a *use setting* as well as a *collaborative setting* where the actual exchange takes place (Coomber & Turnbull, 2007; Morselli, 2009; Parker, 2000). Previous drug market research has put forward issues like identity, shared meaning, and symbolic value of cannabis (e.g. Coomber & Turnbull, 2007; Cullen, 2010). These findings are more in line with a definition of networks that are constructed in interaction, rather than being external elements which function as 'tools' (Crossley, 2010).

Drug market research argues that informal controls are part of the wider social setting that shapes the way cannabis use and supply are defined. This wider social setting refers to the (the history of) interactions outside recreational cannabis use and its supply might shape supply and use definitions as well. This is in line with social supply research which situates supply in a social setting and considers supply as a 'social' event (Coomber & Turnbull 2007; Harrison et al. 2007; Parker 2000).

The use setting then refers to the 'domain' in which cannabis use takes place. An individual in a network where cannabis use is present is also part of a social world of shared meanings about for example 'sensible' use, a 'responsible' user and a 'social supplier' (Amos, Wiltshire, Bostock, Haw, & McNeill, 2004; Bell, Pavis, Cunningham-Burley, & Amos, 1998; Cullen, 2010; Highet, 2003, 2004; Michell & Amos, 1997).

Obtaining or supplying cannabis takes place in a collaborative setting where secrecy and security are evaluated against each other. Network research of drug markets indicates that the trade-off between secrecy and security influences the focus of their social organisation (Morselli et al., 2007). Especially at the moment when there is activity, meaning when substances are acquired or supplied, the level of trust and secrecy will be balanced against efficiency in what Morselli describes as "*risky collaborative settings*" (Morselli et al., 2007, p. 144).

A study of setting is in my research situated in network research and framed in the debate about whether open or closed networks might shape supply (e.g. Granovetter, 1992; Nahapiet & Ghoshal, 1998; Marsden & Campbell, 1984). The debate concerning how social relations influence network is split between authors stressing the benefits of open networks (Burt, 1992; Granovetter, 1973, 1983) and those emphasizing the benefits of closed networks (Coleman, 1988). Granovetter (1973, 1983) stressed the importance of weak ties because they can form bridges between two densely knit groups of friends. Burt (1992) developed a similar argument in his structural holes theory and argued that a person will have more access to information if their ties connect them to different groups. A different view was adopted by Coleman (1988), who argued that the power of social relations lies in closed networks of personal relation. Because all of one's contacts know each other, they are more likely to develop group norms and enforce social sanctions.

5.5 Tentative definition of "social supply"

Social supply, as described above, is but one possible outcome of an exchange process. Based on the literature review in the previous chapters and the description of a supply tie above, I suggest that looking at supply from a network perspective entails paying attention to the multiplexity of the tie, as well as its context, and taking into account the multiple outcomes and interchangeability of roles. As such, I tentatively define supply in my study as follows:

> *Supply is a transaction moment which is the result of an exchanging process and can take multiple forms. Supply is part of multiplex ties between two individuals, embedded in multiple social circles, part of a collaborative setting and shaped by the wider relational context.*

In my study, supply is assumed to be a *transaction moment*. Supply is dynamic, and is defined at the moment cannabis is exchanged. Supply between two individuals can take one form at one moment, but another form at a different moment. This transaction moment is the *result of an exchange process*. Supply is the result of a process that can be instigated by person A asking person B for cannabis or person B offering cannabis to person A. In both cases the answer of the other person can be either yes or no. If the answer is no, one can be referred further, start a new search or decide not to use or supply. This exchange process can take *multiple forms*. Each of these forms is described in terms of motivation, location and people involved. As a result, a reward might be exchanged. This reward can be monetary or non-monetary.

Supply is assumed to be *part of multiplex ties*: The relation between those involved is characterised by a certain level of closeness and is to a certain level goal-oriented. The social relation can exist outside of the transaction. Sometimes this "relation outside of the transaction" barely exists. This tie exists *between two individuals, at that time user and supplier*: However, these are not the only roles these individuals occupy as they often are 'friends', 'colleagues' or family at the same time. Sometimes this relation takes place through a referral. These intermediary people are often users who happen to know somebody in a different network and arrange cannabis for other users.

This tie is *embedded*, so supplier and user are part of multiple network domains at the same time. One of these domains is the above-mentioned *collaborative setting*. This setting shapes the moment when cannabis is exchanged to the extent that at that moment the perceived level of trust and secrecy are balanced against efficiency and influence the process of exchanging cannabis. Being embedded also implies being part of *a wider relational context.* These ties are part of a wider context, which consists of existing stories about how to use, get or grow cannabis, what amount should be bought and what is an acceptable price. Actors in the network have relations among themselves. Sometimes these are also supplier-user relations.

5.6   Conclusion

The conceptual framework links the theoretical frameworks as developed in the previous chapter with the next chapter that details the research design, methods of data collection

and describes the sample. This study starts, like these studies, from the general assumption that the way individuals perceive the composition of their personal networks influences the way they define and explain how supply takes place in these networks. The illustration below depicts on the left side the continuous interaction between the relational, individual and network level. As described above, each of these intertwined levels are assumed to shape how supply takes place in personal networks where cannabis use and supply is present. On the right, the several outcomes of the exchange process are illustrated. In my study I assume the structure and composition of these networks shape the outcome:
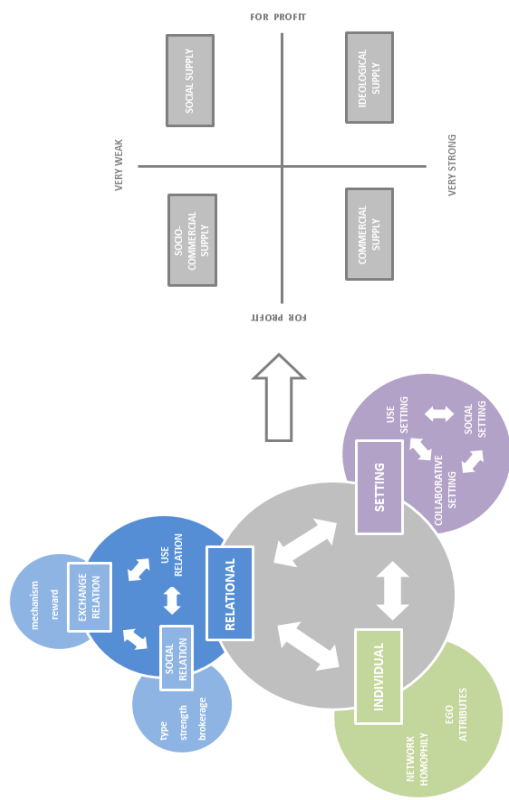
Figure 1 Conceptual framework: a networked definition of 'social supply'

Chapter 6   Research design, data collection and sample description

6.1   Introduction

The previous chapter detailed how, based on *sensitising* concepts of cannabis markets, supply and networks, I arrive at describing the central aim of the study: to contribute to the body of literature around the definition of supply patterns and more specifically to further explore the theoretical framework of social supply. The present chapter details the research design and data collection methods as well as the sample description.

In the first section, epistemological considerations and the research design are presented (§6.2). The dual nature of the research questions instigates epistemological considerations around pragmatism (§6.2.1). Within this pragmatist world view, a flexible cross-sectional design is developed where data is collected through qualitative interviewing (§6.2.2).

Data collection is further discussed in §6.3 till §6.6. There are very limited examples of in-depth interviews concerning social networks of young cannabis users. Supply and network literature give a lot of suggestions concerning dimensions of friendship networks, and focus both on the composition of a peer group as well as on the influence this group exerts on its individual members. Based on this body of literature I developed a computer-assisted personal interview. Though developed based upon valid existing instruments, the instrument as such is novel, which means thorough testing is required to strengthen reliability and validity. This data was not used in the final empirical study. Therefore, I describe in detail the setting (§6.3), sampling and recruitment strategies (§6.4) and the actual instrument (§6.5) that was initially developed and adjusted after the test phase. A discussion of the mode of administration, strategies to increase validity and reliability and ethical considerations conclude the description of the data collection method (§6.6).

The final two sections detail how data is analysed (§6.7) and the final sample (§6.8). In section 6.7 I detail the methods of analysis. Analysis of network data requires a careful preparation of data (§6.7.1). The mixed research design results in a mixed analysis of both

quantitative (§6.7.2) and qualitative data (§6.7.3). In section 6.8 I present the sample of 50 respondents. The following aspects are described: socio-demographics (gender, age, socio-economic status, living arrangements, origin and leisure-time activities). Respondents' experiences with substance use and supply are analysed as part of the detailed description as these experiences are formed and influenced by egos relations with alters as well as the relational context in which they take place.

6.2 Epistemology, research design and method of data collection

6.2.1 Epistemological considerations: pragmatism

While some social supply studies make use of qualitative designs (Coomber & Turnbull, 2007; Hough et al., 2003) most seem to adopt mixed method designs to study this grey area of supply (e.g. Harrison et al., 2007; Lenton et al., 2015; Parker et al., 2002; Werse, 2008). Despite employing different types, or styles, of data-collecting methods, these studies often do not describe a philosophical standpoint to account for their methodological options (Greene & Caracelli, 2003). Rather, the choice of mixed methods design seems dependent on practical concerns and context.

The 'compatibility thesis' refers to the view that combining methods is part of a methodological movement, which is rooted in a quantitative and qualitative research history (Bryman, 2008). During the first half of the 20th century, mixed research designs were used without methodological controversy. After WWII, positivism was discredited as a philosophy of science. This period was important for the rise of post-positivism, which emphasizes the value-ladenness of inquiry, theory-ladenness of facts, and the nature of reality as constructed by my understandings. Qualitative research and constructivism rapidly gained popularity and the paradigm wars were launched based largely on the incompatibility thesis. As several paradigms with distinct epistemology and ontology, paradigm wars were inevitable between paradigm purists that claimed mixed methods were impossible due to the incompatibility of the underlying paradigms. At the same time, scholars criticised this paradigm purity and discussed the issue in terms of triangulating methods in order to offset the weaknesses of one method by the strengths of another method, and suggested combining both qualitative and quantitative methods to do so (Kirke, 2010). Since the nineties, a third methodological movement has emerged which is described as 'postmodern or present moments' or in terms of the emergence of 'pragmatism and the compatibility thesis'. Howe (1988) argues in favour of a 'compatibility thesis' which supports the view that combining quantitative and qualitative

methods is a good thing, and that there are important ways in which quantitative and qualitative methods are inseparable.

A pragmatist design agrees with this 'compatibility thesis'. The distinction between quantitative and qualitative methods is also reflected at the level of design, data analysis and interpretation of results. Howe (1988) however argues there is no ground for incompatibility as there is always some non-mechanistic mechanism operating at all these levels. Therefore qualitative and quantitative methods are not only compatible, but they are inextricably intertwined. A pragmatist design corresponds with this compatibility thesis. Pragmatism emphasizes the importance of the research questions, the value of experiences, and practical consequences, action and understanding of real-world phenomena. The research questions are crucial to the design, and the choice of methods is guided by these questions (Creswell, 2011; Tashakkori & Teddlie, 2003).

Despite its popularity, there is still no agreement on a definition of mixed methods. Different viewpoints include elements of methods, research processes, philosophy and research design (Sudman, 2001). Recently, some authors have proposed a definition of mixed methods based on common features (Creswell, 2011; Johnson, Onwuegbuzie, & Turner, 2007; Morgan, 2007). The definition of Creswell and Plano Clark (2011) is the most comprehensive because it includes all of the core characteristics of a mixed-methods research. I therefore adopt this definition in the present research:

> *In mixed methods the researcher collects and analyses persuasively and rigorously both qualitative and quantitative data (based on research questions); mixes (or integrates or links) the two forms of data concurrently by combining them (or merging them), or sequentially by having one build on the other, gives priority to one or to both forms of data (in terms of what the research emphasizes); uses these procedures in a single study or in multiple phases of a program of study; frames these procedures within philosophical worldviews and theoretical lenses; and; combines the procedures into specific research designs that direct the plan for conducting the study.* (Creswell & Plano Clark, 2011, pp. 5-6)

Qualitative and quantitative methods are considered in network analysis as complementary because they explore different sides of the same coin (Edwards & Crossley, 2009). Both are equally important to gain adequate understanding of the significance of social networks in relation to recruitment and mobilisation in social movements. In social network research, mixed methods are defined in terms of

triangulation. Crossley (2010) further indicates both approaches have strengths and weaknesses, and therefore they are best used in combination with each other.

Quantitative methods are deemed important for several reasons. First, quantitative tools reduce and systematise the data. This way the processing of lengthy and complex relational data is facilitated. Secondly, graphs and matrices require a systematic survey of the population, and allow visualising ties that remain invisible in qualitative studies. Thirdly, quantitative tools allow connections to be seen simultaneously, and allow structures to be spotted that one cannot observe *a fortiori* from any qualitative impression. To conclude, statistical techniques lend precision and reliability to the explanation of ties and improve standardisation of observation (Crossley, 2010).

However, quantitative tools do not suffice as qualitative data gathering can be much more open-ended and unstructured. It can follow leads and deal with complexity. Qualitative data analysis can pull all these details together into a story of the network (Crossley, 2010). As Crossley describes: *"the abstraction and simplification involved in an adjacency matrix, invaluable though it is, can for certain important purposes amount to over-abstraction and oversimplification…the process of abstraction brackets out important data which are essential to both a proper sociological understanding of social networks and to a proper understanding of many key concepts, measures and mechanisms from the SNA literature"* (Crossley, 2010, p.5).

In the case of my research, a mixed method approach is a particularly suitable method because it allows the structure of networks, the formation or dissolution of connections to be studied, as well as the meaning attached to these connections. One of the key advantages is the possibility to construct and test a theory at the same time (Hunter & Brewer, 2003). As such, in adopting a mixed methods design I aim to further operationalise social supply while simultaneously fine-tuning its theoretical framework.

Taking into account all of the above considerations, a concurrent nested design fits my research goals best. This particular design allows both qualitative and quantitative data to be collected from each individual, without preferring one type. Qualitative methods and quantitative methods are used equally and in parallel (Creswell, Plano Clark, Gutman, & Hanson, 2003).

Methods are mixed at several phases in the research except for in the analysis phase. Data is analysed separately because it is not only my goal to find congruent findings, but also

to add more depth to the description of how networks are composed and structured. Data is therefore only mixed in the data interpretation phase (Johnson et al., 2007), so I will not transform qualitative measures into a quantitative form. More specifically, methods are mixed in the following phases of my research:

- problem specification /research question: both quantitative and qualitative research questions

- data collection: one data collection phase where both types of data are collected at the same time

- data interpretation and discussion: qualitative data is used to contextualise quantitative findings. I thereby assume that the analysis can reveal convergence, inconsistency and contradictions

6.2.2 Qualitative interviewing

Social supply studies are sometimes longitudinal (e.g. Werse, 2008; Parker, 2000) but mostly cross-sectional (e.g. Coomber & Turnbull, 2007; Harrison et al., 2007; Hough et al., 2003; Lenton et al., 2015). Longitudinal social supply studies focus on the transition into adulthood. The goal of my study is not to study change or transition, but rather to explore the present (hence the research questions wording of *'active'* networks). As mentioned in the general introduction, present ties in my study are seen as reflecting a past of shared interactions and/or an expectation of future interaction (Crossley, 2010). A study of how the tie is shaped in the present thus inherently sheds light on how things were in the past and/or are expected to become in the future.

Moreover, most social supply studies adopt mixed methodological designs (see above). In most cases, the administration of a questionnaire is combined with one-on-one interviews of either a subsection (e.g. Harrison, 2007; Parker, 2000) or the complete sample (Coomber & Turnbull, 2007; Lenton et al., 2015). Besides these methods, Parker (2000) relies on observational data.

Crossley (2010) argues quantitative tools reduce and systematise the data. Furthermore, graphs and matrices visualise ties that remain invisible in qualitative studies. Thirdly, quantitative tools allow seeing connections simultaneously, and spot structures one cannot observe *a fortiori* from any qualitative impression. To conclude, statistical techniques lend precision and reliability to the explanation of ties and improve standardisation of observation. However, there are some additional issues to take into

account. Literature indicates several reactive effects (e.g. ego and alter bias, social desirability bias) to which network studies are particularly sensitive. As these effects influence validity and reliability, they are discussed below. For instance, in a network survey, online methods are less feasible because of the high respondent burden (Crossley, 2010).

Interviews are ideal for exploration of concepts because they allow probing by the interviewer and therefore provide good in-depth information (Beyens & Tournel, 2010; Johnson & Turner, 2003). This type of data collection is particularly interesting for exploration and confirmation. Interview data has a good interpretive validity as well as moderately high measurement validity for well-constructed and well-tested interview protocols. But, in-person interviews are expensive and time-consuming, especially when only one researcher is conducting the interviews. Respondents cannot stay anonymous, so it is important to build trust. Furthermore, interviews are very sensitive to interviewer effects as well as reactive effects, for example in case of possibly intrusive questions concerning use and supply of cannabis.

From a network point of view, interviews are ideal to explore specific types of relations (in my case: supply tie) (Hollstein, 2011). Network research sometimes uses interviews to collect data on actor interpretations, individual systems of relevance, and orientations of action. Although these perceptions can also be measured by more formal methods, an open approach is more suitable when studying how networks matter or when exploring variation among respondents (Hollstein, 2011). Different types of open-ended interviews are the most popular method to collect qualitative data (e.g. narrative interviews, thematic interviews, open-ended questions in a survey). Network interviews share the same strengths and weaknesses of interviews with different goals, but the researcher must be aware responses tend to be socially biased. For example, the greater the proximity between actors, the more accurate statements one can make (Hollstein, 2011). These issues are further addressed below (see §6.7).

6.2.3   Computer-assisted face-to-face interview

In line with other personal network studies, I used a face-to-face interview. All interviews were conducted by the researcher. Personal network studies are typically administered face-to-face, over the telephone and by mail (Bryman, 2008). In comparison to face-to-face interviewing, telephone interviews are cheaper, quicker to administer, easier to supervise and might lessen the interviewer bias to a certain extent. However, the length

of a telephone interview is unlikely to be beyond 20-25 minutes and the interviewer is not able to respond to signs of unease with the respondent. Furthermore, the interviewer is not able to use visual aids (e.g. a network map). Thus, when questions are sensitive, there is some evidence suggesting a personal interview is superior (Bryman, 2008).

The interviews were computer-assisted in a sense that I utilised visualisation software: the programme VennMaker[8] (Hogan, Carrasco, & Wellman, 2007). Visual aids in personal network studies are used for respondents to draw their network maps. One can either use a large sheet of paper and pencils or visualisations software. The former creates a low threshold for the respondent but involves a burdensome analysis afterwards. It might also be complicated to trace the changes one makes to the network map during the interview. The latter relies on software which reduces the time for analysis. This type of interviewing allows respondents to answer one question for multiple alters at the same time, which reduces the respondent burden (see below). Furthermore, computer-assisted interviewing gave my respondents greater autonomy in designing and altering their personal network map, as all changes are recorded during the interview.

To counter possible technical failures, I tested the user-friendliness of the software in the pilot phase. A break-down or failure of the software might disrupt the flow of the interview. Additionally, I always took a spare laptop, a spare mouse and extra batteries when doing the interviews. As I was present during the whole interview, I could also help out when respondents did not understand for instance where to click or how to draw a line.

Respondent fatigue was addressed in this study by using participatory mapping. An in-depth study of personal networks often results in lengthy interviews that require extensive involvement from the respondent. Though this can help to establish trust, it also means respondents have to concentrate for a long time. Studies warn about respondent fatigue (Hanneman & Riddle, 2005). In order to lower this respondent burden, the interview should be dynamic and interactive. Participatory mapping involves the

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[8] VennMaker combines quantitative methods (such as the collection of standardised data via integrated questionnaires) and qualitative methods (for instance by the audiovisual recording of the collection process) of social network analysis. The programme is used in the context of ego network analysis through computer-assisted personal interviews. The first version of VennMaker was developed in 2006. Since then it has been further developed as part of a project in the research cluster "Social dependencies and social networks" at the University of Trier, Germany. The research team is led by Dr. Markus Gamper, Michael Kronenwett (MA) and Martin Stark (MA) and coordinated by Prof. Dr. Michael Schönhuth. For further information see: http://www.vennmaker.com

respondent into the interview, which enhances the interaction with the interviewer. Face-to-face administration of the interview while using participatory mapping gives a respondent the feeling of independence and responsibility (Hogan et al., 2007). Furthermore, through actual visualisation of the network, further questions can be elicited about clustering but also about specific social relations. The map then serves as a sort of anchor point during the interview.

In the research, most individuals did not perceive the respondent burden to be high. Though the interviews took up to two-and-a-half hours, respondents said multiple times that it did not feel that long. As a matter a fact, respondents often referred to the act of creating their own map as an interesting and even fun exercise. It also helped motivate them to answer more in-depth questions.

6.3   Setting of the study: young cannabis users in Flanders

6.3.1   Population: young cannabis users

6.3.1.1   Test phase

My study aims to explore a similar sample of cannabis users as other social supply studies, namely 'young' people (Aldridge et al., 2011; Coomber & Turnbull, 2007; Duffy et al., 2008; Harrison et al., 2008). Epidemiological studies furthermore indicate cannabis users are predominantly young, otherwise law-abiding citizens, both male and female and from all social classes (De Donder, 2009; EMCDDA, 2011; Melis, 2016; Gisle, 2014).

The initial sampling strategy focused on this wide group of users. This resulted in an opportunistic recruitment strategy that was guided by broad inclusion criteria (see also §6.4). Respondents could be included if they were between 18 and 25, if they had used cannabis less than three months ago and/or if they had supplied cannabis less than six months ago.

The original age category of 18 to 24 was delineated based on prevalence research and the different judicial treatment of minors and adults concerning cannabis. Prevalence research indicates the highest prevalence of cannabis use is between 15 and 34 (Gisle, 2014). The Belgian Health Interview Study indicates that cannabis use is most popular in the age category 15 to 34. In this age category, use is most popular among 15- to 24-year-olds. The difference in lifetime prevalence between this age category (26 % to 30 %) and age categories above 34 years old (3% to 15%) is significant (Gisle, 2014). As described below, Belgium has a lenient policy for cannabis. Adults (18 years or older) who possess

three grams of cannabis or one cultivated plant for personal use receive the lowest priority in prosecution. Moreover, I aim to study networks that have already developed. Furthermore, specific limits interviewing minors (parental consent is required for this kind of research) would require the development of a different instrument for minors. Therefore, only individuals aged 18 or older were included. The upper limit was originally set at 24 years old because prevalence research indicates prevalence of cannabis use decreases starting from 26 years old.

The study focuses on *active* networks, which means I only included people who had used at least once during the 3 months prior to the interview and/or had supplied at least once during the 6 months prior to the interview. This inclusion criterion was originally adopted from previous *social supply* research (Coomber & Turnbull, 2007; Duffy et al., 2008). Bell, Belli-McQueen & Haider (2007) further argue that network members can best recall events that happened up to a maximum of six months ago. I noticed during the test phase that one individual's last use was more than six months previously. It was very difficult for him to discuss the composition of the network because in his perception he no longer had a *cannabis network*. A full study of the history of the network is also difficult as in this case a biographical interview is needed. As described above, it is very difficult for respondents to recall the full history of their personal network (Bell, Belli-McQueen, & Haider, 2007).

My study is on *recreational* cannabis users (see Introduction), but does not define this concept *a priori.* As presented in chapter 3, social supply as a concept is rooted in a normalisation perspective. Parker et al. (1999) make a distinction between 'recreational' and 'problematic' cannabis use. The research team concluded that drug triers during the nineties are 'ordinary' young people, with a normative range of personal, familial, social and intellectual characteristics. They did recognise that at the margins, drug trying can lead to problematic use. However, most of the drug triers will never develop problematic use. The vast majority of cannabis users has no or only a mildly criminal past. Most recreational adolescent users are otherwise law-abiding (Parker, 2000). Parker et al. (1999) did not specify the amount of drug use but defined recreational drug use as: *"involving mostly weekend use of drugs in (recreational) social settings and at (recreational) leisure times"* (Parker et al., 1999, p. 6). That said, one of Shildrick's (2002) main critiques is that what constitutes recreational cannabis use is not as self-evident as assumed by Parker (1999). Moreover, some research points to more intensive users being the ones

who broker access or supply cannabis (Werse, 2008). As my study starts from an insiders' perspective of cannabis use and supply, I left the definition of what 'recreational use' is to the interviewee.

6.3.1.2   Adjusted inclusion criteria

The analysis of the test phase indicated that people aged 18-25 with active networks, as described above, were able to provide the information necessary to explore the social world of cannabis users and suppliers. Due to the specific age category and the initial opportunistic recruitment strategy, all respondents during the test phase were either students or had obtained a degree from an institution for higher education. All can be considered as active users (at least once during the past three months) and/or suppliers (at least once in the past six months).

In order to study personal networks in all their aspects, recruitment aimed to include a wide variety of these l networks. A first decision was to widen the age category. While the main focus remains the age category where prevalence research indicates cannabis use is most present (18-24 years old), respondents up to 30 years old could participate. The initial inclusion criteria were also further specified by a range of preferences. At the end of the interview, when further recruitment was discussed, I used the guidelines below to ensure variety in the sample. Respondents were not recruited based on the strength of the relationship, to avoid people only referring their closest friends (Taylor & Griffiths, 2005). These preferences were developed based on the analysis of the composition of the 14 test networks as well as guided by supply literature. Alters that had one or more of these characteristics were more likely to be suggested by the researcher for further referral. The first characteristic refers to *suppliers that supply to other alters and/or suppliers who supply to people outside of their personal network of egos.* These suppliers connect multiple alters with each other and are potentially interesting when searching for information concerning cannabis supply (Granovetter, 1973; Burt, 1992). A second characteristic concerns being a *female suppliers.* Similar to the suppliers that do not use cannabis themselves, female suppliers are a minority (Decorte & Tuteleers, 2007). As described above, network research also indicates network composition is influenced by gender (Kirke, 2006; Harrison et al., 2007). A third characteristic has to do with *people who did not complete a form of higher education.* For this research purposes, I measured socio-economic status through three variables: occupation; income; and educational achievements. The test phase revealed the applied recruitment strategy and inclusion

criteria lead to a sample of almost exclusively university students. By actively recruiting respondents without a degree of tertiary education, I aimed to create more diversity in the sample.

A final remark concerns abstainers. The test phase revealed cannabis networks sometimes include abstainers. These people are present during the moments cannabis is used, but do not use themselves. Although these people probably have very interesting perceptions of the cannabis network, they were not recruited. Network research indicates people are not good at reflecting on a relationship they are not part of (Hanneman & Riddle, 2005). Moreover, the instrument I developed to study cannabis networks is only partially applicable to abstainers. An exception is made for abstainers who do supply. As they are suppliers, they can reflect on the relationship between themselves and the people they supply to.

6.3.2 Wider setting for shaping cannabis supply: Belgian legal context

As described above, I focus this study on young *adult* (18+) cannabis users. I thereby assume that this legal context might shape the way cannabis supply is structured, composed and given meaning. This legal context is part of the wider social setting as referred to in chapter 5, which I assume interacts with use and supply settings.

Research suggests cannabis is perceived as easily accessible. ESPAD results of 2011 show that on average 30 % of the respondents thought cannabis was easily accessible. Belgium scores higher than average, with 40 % of the pupils indicating easy access. Cannabis is perceived to be the most accessible illicit drug. The VAD school survey indicates that in 2014-2015, 45.5 % of 17- and 18-year-olds think they can easily get cannabis. Across all age categories, about one-fifth claimed cannabis was easily accessible to them (24.9 %) (Melis, 2016).

That said, in Belgium cannabis remains a prohibited product. In 1997 the Parliamentary Working Group on Drugs decided in favour of an integrated and global drug policy taking into account the normalization of cannabis. Accordingly, the prosecution for possession of cannabis for personal use was given the lowest law enforcement priority. The recommendations and guidelines proposed by the working group have been adapted and translated by the government into a national drug strategy document, the Federal Drug Policy Note of 2001 (Federal Government, 2001). This was translated into laws of 4 April

and 3 May in 2003, which finally meant reform of the 1921 Law on Narcotic Drugs[9]. From that moment on a long period of legal uncertainty followed, along with a highly inconsistent law enforcement policy (Decorte et al., 2014).

The Ministerial Circular of May 2003, later confirmed by the Ministerial Guideline of January 2005[10], further detailed the exact amount which is considered for personal use. The Guideline states that adults who are found in possession of three grams of cannabis or less or one female cannabis plant for personal use will not be prosecuted, unless there are aggravating circumstances. Aggravating circumstances are defined as: possession of cannabis inside a prison or youth protection institution; possession of cannabis in a school or near a school (i.e. places where people under the age of 18 gather, such as bus stops or parks near a school); or blatant possession of cannabis in a public place.

The distribution of cannabis is not regulated in any way (Decorte et al., 2014). It remains unclear where people can buy cannabis, or where home growers should get seeds or seedlings. Moreover, one plant typically yields more than 3 grams of cannabis, but selling or giving it away for free is still a punishable offence. In theory, the cultivation of two or more plants can be prosecuted, but in practice this depends on the assessment of the public prosecutor. Hence, the new drug law of 2003 has not lead to a uniform law enforcement and prosecution policy.

6.4 Sampling & recruitment

6.4.1 Snowball sampling

Recreational cannabis users are argued to be hard-to-reach and show characteristics typical of a hidden population (Heckathorn, 1997, 2002). However, based on the normalisation hypothesis, this study starts from the assumption that cannabis users are no longer part of a hidden population. This implies my target population is difficult to distinguish from the general population. Self-report studies indicate that cannabis users are almost indiscernible from other adolescents not only because they are young, but also because they are mostly law-abiding. Most of them have never had contact with the police

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[9] The Law of 4 April and 3 May 2003 lead to the adaptation of the Law of 24 February 1921,the Royal Resolution of 31 December 1930 and the Royal Resolution of 22 January 1998

[10] In 2004, decision No. 158/2004 of Constitutional Court of Belgium quashed the Law of 3 May 2003 and added article no. 11 tot the Law of 24 February 1921. The concepts of 'problematic use' and 'nuisance', which were set as criteria for determination, prosecution and punishment of cannabis possession for personal use, were considered by the Court as too vague. Since then this particular article has not been adjusted in the Law itself. The Joint Directive of January 2005 provides for further criteria.

or treatment facilities. Therefore there is no sampling frame, and only an estimation of how many people would fit in my population (Gisle, Hesse, Drieskens, Demarest, Van der Heyden, & Tafforeau, 2010).

In line with the exploratory aims of the research, I aim to make theoretical inferences rather than empirical generalisation. It is not my aim to test certain hypotheses, but to draw theoretical conclusions based on insiders' views. As is described below, the instrument was developed to describe personal networks from the point of view of young cannabis users. As my aim was mainly descriptive and qualitative, my sample did not have to be representative (Arber, 1993).

Snowball sampling allows the researcher to take advantage of the ties between cannabis users to recruit new respondents. One subject gives the researcher the name of another subject, who in turn provides the name of a third, and so on. Snowball sampling can be placed within a wider set of link-tracing methodologies which seek to take advantage of the social networks of identified respondents to provide a researcher with an ever-expanding set of potential contacts (Atkinson & Flint, 2001; Spreen, 1992; Thomson, 1997). Although social networks are a straightforward way to recruit new respondents, I take into account that referrals will largely depend on subjective perceptions of initial respondents. Certain individuals will be referred to easier than others, which might result in a sample with largely homogenous social traits (Atkinson & Flint, 2001). Therefore it is important to recruit a diverse group of initial respondents.

6.4.2   Recruitment: online and word-of-mouth referrals

6.4.2.1   Test phase (n = 14)

Parker (1999) argues *social supply* tends to occur among recreational cannabis users. This refers to individuals who are otherwise law-abiding and whose substance use does not inhibit their day-to-day lives. Therefore, I aimed to recruit respondents through a non-institutionalised setting, meaning that I did not contact institutions as a means for recruitment. During the test phase, the non-institutionalised setting referred to the social network of the researcher. Four initial respondents were recruited through the wider social network of the researcher. To avoid disqualification of the research, all of these respondents were not in the close personal network of the researcher, but could be described as acquaintances. A further recruitment strategy involved an announcement of the research on the learning environment website (Minerva) of second year students on

the Bachelor's of Criminology programme at the University of Ghent as part of the "Qualitative criminological techniques and research methods" class.

The first recruitment strategy resulted in four possible referral chains: C1, C2, C3 and C4. These first four zero-stage respondents were recruited to test the practical implementation of the instrument (e.g. the extent the software is user-friendly) (see §6.2.3). After the initial interview, all four respondents were asked whether they wanted to recruit new respondents. All but one agreed (C4). This particular respondent's network was no longer an active network, as the last time cannabis was used in this network was more than 6 months prior to the interview. The other three initial respondents were then given a flyer explaining the basic information about the research topic, data collection method and analysis. This flyer also included the researcher's contact details: e-mail, landline and a mobile phone number that was only used for this particular research. It was explained that respondents could contact the researcher in two ways: either directly, using the contact details given to them by the recruiter, or they could ask the recruiter to pass on their details to the researcher. In the end all of the further respondents choose the second option.

The three remaining zero-stage respondents successfully recruited at least one other respondent. This happened within a couple of days after the previous interview or after a gentle reminder to the respondents already interviewed. However, C3 stopped because the zero-stage respondent could no longer reach the recruited respondent. After the second interview in C1 and C2, the recruitment process was repeated, but now with the second respondents being asked to recruit further. At this point, recruitment became more difficult. It took a long time and several reminders to the recruiters to get another referral. In the end, only C1 resulted in four more interviews while C2, after several reminders, dropped out. At that time I could not pursue these chains further because I was on maternity leave.

The second recruitment strategy, through an announcement on the "Qualitative methods" course website, was rather unsuccessful. Only one student was interested and took some brochures home, but no further contact was made. Probably this is not the best way of recruiting respondents for snowballs as a researcher has no control over who will contact them.

6.4.2.2   Final recruitment strategy

Due to the specific age category and the initial opportunistic recruitment strategy, all respondents during the test phase were students or had obtained a degree from an institution for higher education. This might be a possible limitation and bias of the research. In order to include a wider variety of initial respondents, I therefore developed a more diverse recruitment strategy that included both internet-based recruitment strategies as well as traditional word-of-mouth strategies.

Digital strategies included website recruitment. Barratt et al. (2015) evaluated he use of internet-based recruitment strategies to recruit cannabis cultivators to fill in a web survey concerning the characteristics of cannabis and cannabis growers. Although my aim is different, their experience with digital as well as traditional recruitment methods of this particular population is of importance for me as well. Overall, in the six countries where the survey was done, discussions and advertisements through cannabis websites and forums was the most successful recruitment method. In my case, website recruitment was not successful. Posts on discussion boards and drug forums were unsuccessful. I posted an announcement on several forums but did not find any respondents this way. I checked these announcements regularly and answered questions concerning for instance the inclusion criteria instantly. The main problem seemed to be that it was mainly Dutch users on these forums. Moreover, some of these forums were closed a short while after the announcement was posted.

A further digital strategy included Facebook. Barratt et al. (2015) describe active recruitment by researchers entering Facebook groups to discuss their project and/or creating Facebook pages to promote their projects via Facebook users' existing networks. An important advantage of this strategy is the fact this way a wider variety of initial respondents can be found (Barratt et al., 2015). I created a Facebook page detailing the goals and topics of the research to promote the research in other individuals' networks. The Facebook page mainly helped to promote the research, rather than be an actual form of recruitment. This Facebook page was mentioned in every communication with potential respondents, regardless of the way they contacted me (e.g. text message, e-mail). Some potential respondents also contacted me through Facebook, but most of these people did not fit the inclusion criteria. That said, one respondent was recruited this way.

Besides website recruitment and Facebook, the internet-based strategy in my study also included email recruitment. A first email recruitment strategy involved targeted emails

towards students in the master's year writing their thesis about cannabis–related subjects. This strategy was successful, as three of these students helped recruiting respondents. A second email recruitment strategy was a very successful email via people and organisations that had an established relationship with the population (e.g. peer support projects like Breakline, organisers of cannabis social clubs). This strategy was much more successful. This might have to do with an element of trust. Respondents trusted my contacts within these peer support projects or cannabis clubs. That way, it was easier for them to come forward and participate. All of these respondents contacted me via e-mail. Although unsuccessful in the test phase, all students in the third year Bachelor's of Criminology once again received an email explaining the goal of the study and a direct question for participation. This method, as in the test phase, proved unsuccessful. No respondents were recruited this way.

Nowadays internet penetration is very high and research almost 90% of the Belgian population has access to the internet (Internet Live Stats, 2016). Moreover about 6 million people in Belgium have a Facebook login (Peeters, 2016). However, there are still groups of people (e.g. people with lower levels of education) that do not have access to the internet (Couper, 2000). Therefore, I also continued to use non-digital, traditional methods to recruit initial respondents.

Non-digital strategies included contacting youth clubs. I was inspired by the study of Van Hout (2011) who successfully recruited young cannabis users through youth clubs. Youth centres offer leisure-time activities for people between 14 and 25. *Formaat* is an NGO that supports local youth club initiatives. They also organise regular meetings with representatives of local youth club initiatives in their local secretariats of Ghent, Antwerp and Hasselt. The goal of this recruitment strategy was for youth club representatives to act as gatekeepers, as they have privileged access. These organisations were not seen as places where cannabis is used or supplied. Youth clubs were seen as a possible strategy, as part of a wider range of strategies, to contact young people in their leisure time. To test this strategy, I contacted all youth clubs in Ghent. None of these clubs showed interest in receiving further information. One of the key reasons for them not to participate was their fear of being presented as a place where cannabis is used and supplied. Because of this reluctance, I opted to not further pursue this recruitment strategy.

Besides youth clubs, I continued to recruit respondents through word-of-mouth referral. As described in the sampling strategy, alters in the personal network of one respondent

were perceived as potential new respondents. Further recruitment followed one of three possible strategies: the interviewer suggested new possible respondents based on the guidelines described above; interviewees themselves suggested possible further referrals; or a more general question for further referral was instigated by the interviewer. Referral through the respondents of the test phase was not successful. Of the four initial respondents, only one referred other potential respondents.

6.4.2.3   Final recruitment: referral chains

In total 11 out of 32 zero-stage respondents were recruited through word-of-mouth recruitment. These respondents included a range of referrers contacted directly by myself e.g. (former) 'colleagues', (former) trainees, master's thesis students. Almost none of these eleven zero-stage respondents fitted the inclusion criteria themselves. Nine of the eleven zero stage respondents acted as a referrer only. In two cases (C8 and C10) the initial participant was interviewed and acted as a referrer as well.

Most of these 11 zero-stage respondents referred to more than one person afterwards. Chains tend to include one (n =6) or two steps (n = 5). Among these eleven zero-stage respondents there are some students from the University of Ghent (see also §6.9). The table on the next page sketches these referral chains. The colour of the shapes indicates the way people participated (grey = respondent, shades = referrer, shaded and grey = both respondent and referrer). The shape indicates the gender of these participants: round is female and square is male.
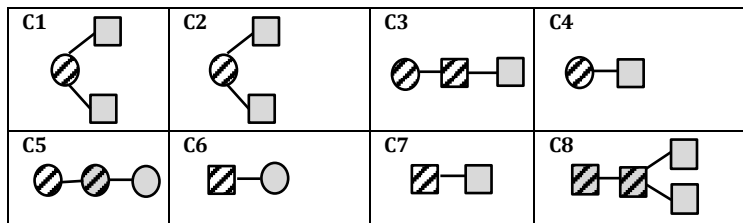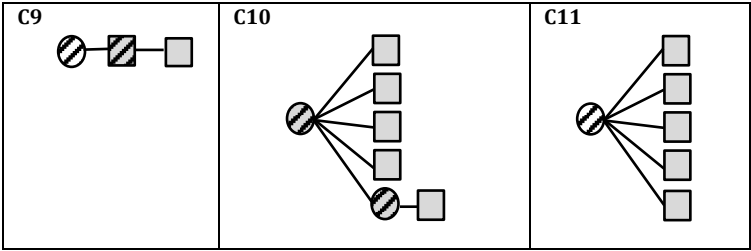
Table 1 Referral through word-of-mouth advertisement

Twenty-one of the 32 zero-stage respondents were recruited through internet-based strategies: public Facebook page of the research, announcement at Breakline (peer support projects), announcement on website of cannabis social clubs. These twenty-one people contacted the researcher through email or a Facebook post. In 19 cases (C12 to C30), these respondents participated in the research but did not refer to further potential respondents. In one case both the zero-stage respondent and one immediate referral participated (C31). In this case both the contacting respondent and her 'partner' participated in the study. In the remaining case the initial participant did not fit the inclusion criteria, but contacted me to suggest a potential respondent (C32). This group of respondents did not include students from the University of Ghent.

6.5   Instrument: computer-assisted personal interview

6.5.1   Test phase

There are limited examples of in-depth qualitative interviews concerning social networks of young cannabis users. Social network studies into substance use among young people often rely on quantitative school surveys to measure several dimensions of friendship networks. As I describe in chapter 4, most of them focus both on the composition of a peer group as well as on the influence this group exerts on its individual members. All of them measure individual attributes and indicators of different types of relationships (Ennett et al., 2008; Houtzager & Baerveldt, 1999; Urberg et al., 1997).

Based upon the limited literature I developed an initial version of the instrument. This instrument was tested and adjusted during an extensive testing phase. The instrument elicits information about the composition as well as the structure of an ego's network. Therefore data was collected about attributes of the respondent (*ego*) and other network members (*alters*), and the relationships between egos and alters, and among alters. As such, the survey questioned both individual attributes and relational data. Questions

about attributes of the ego and individual alters allow comparison between ego and alter. Relational data on the other hand inform about the composition and structure of an ego's network. The interview section helps to understand some of the individual data gathered in the survey, but also allows the social environment of ego to be studied more in-depth (see attachment Instrument).

Due to the novel nature of this instrument, the questions were tested in fourteen test interviews. Data collected in these interviews was not used for further analysis. Four of these interviewees tested the practical handling of the software programme used to elicit these personal networks. The other ten interviewees were recruited using the inclusion criteria. These respondents were asked throughout the interview how they interpreted the key concepts used (e.g. 'leisure time'). More importantly, their input was vital in the development of the topic list to elicit information on the nature of supply relations. On the basis of their input and a primary analysis of the test data the final instrument was created.

Two questions were changed because answering them proved to be too time-consuming. I changed the way the question considering leisure time was constructed. Originally the frequency of each activity was asked via an open question, which took too long, so I introduced answer categories that made it easier for respondents to answer the question. Originally, respondents were asked to draw separate subgroups within their personal network. This question was asked at the end of the interview, when all alters were indicated on the network map. However, many respondents were a bit tired by that stage and felt that they had already answered the question during the interview. Qualitative analysis confirmed their reflections and this final question was withdrawn.

I added a question concerning the income of the respondents to be able to sketch the variety in socio-demographics in more detail. Considering supply, I added an extra answer category ("only through sharing other people's cannabis") because some respondents wondered why this was not seen as a separate way to obtain cannabis in the questionnaire.

The name generator was adjusted as well because some respondents refused to use abbreviations to refer to respondents, out of fear these alters would become recognisable. Instead of requiring respondents to use abbreviations when describing alters, I opted to leave it up to the respondents how they wanted to refer to these alters (e.g. using numbers, nicknames,...).

The qualitative topic list was extended with one topic: the influence of the presence of non-users in the cannabis network. Originally this question was only asked in the questionnaire, with no further details. However, qualitative analysis of the test data indicated these non-users were not only frequently mentioned, but they also seemed to play a role in the structure and composition of an ego's personal network.

Finally, one topic was questioned in a different way. Respondents were originally asked about personal experiences about being a 'dealer'. Mentioning the concept 'dealer' resulted in quite strong and mainly negative reactions. In later test interviews I instead asked: *"Did you ever have the opportunity, or were you ever asked, to be more involved in supply than you are doing now?"* If respondents answered that they had had this opportunity, I asked a subsequent question about the way they reacted to this opportunity. Qualitative analysis indicated this phrasing elicited a much more nuanced story about personal supply experiences.

6.5.2 A computer-assisted personal interview

6.5.2.1 Individual attributes and network elicitation

The following sub-sections discuss the structure and main network questions of the instrument. An English translation of the full instrument, including the topic list of the interview and all specific questions, can be found in the attachment (see attachment Instrument).

Existing surveys dealing with substance use describe several individual attributes as influential for cannabis use (Houtzager & Baerveldt, 1999; Ennett et al., 2008). Based on this research, the survey started with questions concerning attributes of ego, more specifically gender, age, substance use, living situation, working situation and origin. As cannabis use is considered a leisure-time activity, these activities were questioned as well. Based on preliminary analysis of the test data, the original question proved too burdensome. Instead of asking about the frequency of each activity, I formulated the question more broadly. Individuals were asked to indicate from a range of predefined activities whether they did this the past three months 'very often', 'often', 'sometimes', 'rarely' or 'never'.

The second part of the social network survey focused on the identification of those individuals that compose the relevant network. Name generators set operational boundaries on the interpersonal environment and generally follow one or a combination

of four approaches (exchange, role, affective and interactive approach). One can opt to use a single name generator or multiple name generators (Hanneman & Riddle, 2005). Multiple name generators give additional dyadic ego-alter characteristics. Furthermore a second name generator can be used to reduce the number of alters who you ask questions about. For example, for the purpose of my research it is interesting to know something about the size of the ego's total personal network. However, the actual network under observation (the part in which the exchange processes take place) is assumed to be a smaller part of the wider network.

The first question should be non-intrusive and easy to answer. In order to compare the network sizes between different respondents, the number of possible alters was not fixed. The question asked about spending time outside of school because drug use in my study is defined in terms of a recreational activity. As I did not know whether these are only a respondent's closest friends, this question had to be kept quite elaborate and easy to answer. As no research gives a good indication of the strength of ties between drug users, there should be room to generate weak ties. This question was formulated as follows:

> *"First I would like you to think about all the people you spend time with outside of school or work (e.g. playing sports, going for a drink, youth movement, art school …) during the last three months. Start with the people whom you spend most of your time with"*

This question identifies who an ego has been in contact with in a specific period of time, within a specific context. In this way, social activity, rather than strong ties, is measured. An important issue to take into account is the fact respondents tend to report about typical network ties when asked about interactions. The most reliable answers are given when reporting on actions shortly after they occur. Therefore the timeframe was set to three months. The limitation 'outside of school' helped to delineate the context further, and concrete examples were given (e.g. sports, leisure time, youth movement,…). By adding 'start with the people you feel closest to', the question included an element of the exchange approach. This way, a role approach is avoided. The role approach questions specific roles (e.g. 'friends'), but as the interpretation of 'friends' varies a lot according to age, race, and socio-economic status, it enhances the expansiveness bias (see below).

A second name generator focused on a list of people the user usually does drugs with (Latkin et al., 1995). Cannabis use is a social event, and most users will only smoke in the company of others. As drug markets vary depending on the type of drug, the research focuses on cannabis use only. Some researchers also include alcohol use, but this question

would have resulted in a repetition of almost all names of the first name generator, and not a smaller group on which I could focus the remainder of the research. The second name generator is assumed to generate a subgroup of the earlier mentioned population. However, because people tend to focus on strong ties, it was important to allow the respondent to add new people to the group, as it is possible that some members of this particular network were weak rather than strong ties.

> *"Now, I am going to ask you about another group of people, those who you use cannabis with. To use cannabis with, means being in the same place when using cannabis. These individuals may be close friends or casual acquaintances. These might be people who use cannabis themselves at that moment or not. These might be people you have listed before or they could be new names."*

As this was a more difficult question to answer, probing questions were important in order to get a full account of the *cannabis network* (Latkin et al., 1995) (see attachment Instrument for an overview of these questions).

To conclude, there are some questions concerning characteristics of alters. In order to calculate network measures the following attributes were questioned for the whole group: age, gender and substance use.

6.5.2.2   Relational attributes

Next, a name interpreter was used to elicit information about the type of relation between ego and the different alters in his or her network (Hanneman & Riddle, 2005). The strength of relationship was questioned in three ways: *"Do you go to [NAME] when you have a practical problem?"; "Do you go to [NAME] when you have a emotional problem?" ;"How close is [NAME] to you?"*

If applicable, the type of supply was questioned, as follows:

> *"How many times, during the past six months, have you shared cannabis that belonged to [NAME]?"*
> *"How many times, during the past six months, did you receive cannabis from [NAME] as a gift?"*
> *"How many times, during the past six months, did you swap [NAME]'s cannabis for something else (e.g. tickets for concerts, other kinds of cannabis, in return or a favour)*
> *"How many times, during the past six months, did you give/sell/share/swap cannabis to/with [NAME]?"*

> *"How many times, during the past six months, did you obtain cannabis from [NAME], and you paid for it?"*

The supply experiences of an ego were questioned as follows:

> *"How many times, during the past six months, have you shared your cannabis with [NAME]?"*
> *"How many times, during the past six months, did you give cannabis to [NAME] as a gift?"*
> *"How many times, during the past six months, did you swap your cannabis for something else (e.g. tickets for concerts, other kinds of cannabis, in return or a favour) with [NAME]"*
> *"How many times, during the past six months, did you give/sell/share/swap cannabis to/with [NAME]?"*
> *"How many times, during the past six months, did you provide cannabis to [NAME], and [NAME] paid for it?"*

Questioning alter-alter relations gives further detailed information on the network structure of an ego's personal network. Respondents cannot give much reliable information about the relation between alters (Hanneman & Riddle, 2005). However they were able to answer the following: *"If [NAME1] and [NAME2] met each other, would they talk without you present?".* As for the alters that were named during the second name generator respondents also answered the following question: *"If [NAME1] and [NAME2] met each other, would they use cannabis together without you present?"*

6.5.2.3   In-depth interview

The qualitative interview guides the completion of the survey as well as serves to further explore the nature of the supply tie between ego and alter. Due to the rather novel nature of the instrument, these topics were extensively tested and adjusted after analysis of the fourteen test networks (see above). The structure of the questions was adjusted to the natural flow of the interview. For instance, respondents were keener to first talk about their network, then about their own position in this network and finally about other actors in the network. The topic list followed this flow of thinking.

As is indicated in the instrument (see attachment Instrument), I developed a range of questions for further clarification on topics. Upon completion of the final network map, the interview took a more open approach. At this point the tie between user and supplier was further studied. Based on the literature, I developed a range of topics through which I gained insight into not only the shape of a relation but also the nature of supply. The topics were developed based on qualitative studies into social supply (Coomber & Turnbull, 2007; Harrison et al., 2007; Hough et al., 2003; Parker, 2000; Potter, 2009;

Werse, 2008). To my knowledge, supply has not yet been studied from a qualitative network perspective. The topics aimed to explore past and current definitions of use and supply.

The history of a respondent's *cannabis network* was addressed to capture the extent that present ties are shaped by past interactions (Crossley, 2010). In discussing these past interactions I could explore how social relations might be formed around supply and use. This helps to understand the extent respondents prioritise social relations over use or supply relations (Lenton et al., 2015). A careful exploration of this complex interaction between these settings informs how shared definitions of supply and use might have evolved and adjusted, for instance as a result of events that changed the composition and structure of the network. So this topic involved questions about how and why people joined the *cannabis network*, as well as how and why the current composition of the network might have changed throughout the years.

The supply relation between an ego and alter(s) is studied through actual exchange experiences (Giuffre, 2013). First, I discussed the ego's experiences as a supplier. At that moment I discussed every single supply relation that is visualized on the network map, going from the ego to a specific alter. This topic was only discussed as far as the respondent perceived him- or herself as a supplier. For each alter that is supplied by the ego I therefore first asked about the different ways this exchange takes place. This allowed the respondent to reflect on actual examples and to give me insight into a range of possible exchanges that can exist not only within a network, but also between two people. Second, I explored supply relations that go from alter to ego. How the ego perceives this exchange process was discussed here. This is in line with the aim to study personal networks. The exchanges were discussed in the same way as personal experiences.

The key in exploring these exchange processes is a discussion of types of rewards and reciprocity (Mauss, 1990; Mjåland, 2014). An exploration of the extent to which rewards are intangible or tangible informs about thresholds respondents might use to distinguish *social supply* from *dealing*. These processes also allow further detailed discussion not only about the types of rewards but also the extent to which rewards are expected. As explained in chapter 5, many of these supply relations might be described as a *communal relation* where reciprocity is expected implicitly (Parker, 2000).

Once the actual exchanges and the types of rewards were discussed, I asked about the extent to which the respondents considered one or more of these exchanges as *dealing*

and if so, why. I asked for definitions of exchanges that were not considered dealing, if the respondent had not done this spontaneously. Moreover at that point I also asked to what extent they consider themselves or other alters as dealers and why. By doing so, I gained further insight into the way *commercial supply* is defined, lived and given meaning (Crossley, 2010).

Supply-side drug market studies inform about how middlemen play a role in structuring supply relations. Therefore, aside from the actual exchange processes I explored the extent to which respondents consider themselves and/or alters as middlemen. The goal of this topic was to gain further insight into the reasons why respondents prefer (not) to contact a middleman as well as to explore the position of this person in the wider *supply network*. Drug market literature suggests these people might play a major role in retail markets as they connect the low-level suppliers with the 'real' drug market. As social supply is often framed in a motivation to shield oneself from this drug market, I aim to explore the extent to which this drug market is 'near'.

To gain further insight into the structure of the *supply network* I questioned whether suppliers are also supplying to other alters in the *supply network*. I acknowledge this might have been difficult for respondents to answer as it assumes knowledge some of them might not have (Hanneman & Riddle, 2011).

6.6   Reliability and validity

Reliability first of all refers to the question whether upon replication this instrument would lead to the same conclusions (Bryman, 2008). To strengthen this external reliability I opted to use a name generator and name interpreters that have been tested multiple times in previous research (Hanneman & Riddle, 2005; Latkin et al. 1995). Furthermore, the topic list was developed based on literature as well as a thorough piloting of the instrument. This study also includes a detailed overview of the theoretical and methodological choices that were made (see chapter 5 and §6.2 to §6.8).

Data analysis combined an inductive with a deductive approach (see §6.8). This increases the overall depth of the analysis and strengthens its internal reliability[11] (Bryman, 2008). Part of the pilot phase consisted of an outside researcher analysing the same five

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[11] Internal reliability refers to strategies to strengthen the likelihood that when data is analysed again, the same conclusions can be drawn.

interviews independently from me. Upon completion, the results were discussed and used as a means to further develop the instrument.

Validity on the other hand refers to external validity and internal validity. External validity in my study refers to analytical generalisation (Firestone, 1993). The study aims to provide a rich understanding and insider's insight into the way supply can be defined. Driven by theory it aims to provide a contribution to this body of literature based upon an empirical study. Internal validity refers to the extent observations capture the theoretical ideas that were developed in the study (Bryman, 2008). For instance, the open interview section focuses on some measures that were questioned in the survey, which will further ensure the convergent validity of the results (Bryman, 2008). In this study I use several strategies to strengthen the validity of the findings. These strategies include *thick description* as well as reflections concerning potential biases.

Thick descriptions in my study include developing a 'thick' methodology which gives respondents the opportunity to report their own interpretations (Creswell & Miller, 2000). Throughout analysis one might pick those quotes that essentially support the researchers' position. This kind of "cherry-picking" produces 'thin' instead of 'thick' descriptions (Morse, 2010; Ponterotto, 2006). I try to avoid this 'cherry-picking' by contextualising respondents' statements within their web of social interactions (Ponterotto, 2006). This description is completed by providing respondents' quotes, which stimulates transferability of my findings to other supply studies. I thereby try to counter-balance possible cherry picking by providing quotes that present a wide variety of opinions as well as by using quotes from various respondents.

Due to the nature of the sampling strategy (snowball sampling), the study might be characterised by a self-selection bias as well as a volunteer bias (Atkinson & Flint, 2001). A snowball sample runs the risk of being biased towards the inclusion of individuals with close social relations. Furthermore, it is possible that only a specific kind of cannabis users volunteered for this study. I tried to avoid this bias by specifically formulating guidelines concerning further referrals as well as by using a broad range of recruitment strategies.

During the complete interview both respondent and interviewer characteristics have possible effects on the question-answer process (Billiet & Carton, 2003). The main influencing factors on the side of the respondent are perception problems, respondent motivation, memory effects, and a social desirability bias.

Disruption of perception depends on the respondents' understanding of the goal of the research (Billiet & Carton, 2003). Clear instructions and clear question wording are therefore important. To prevent the misinterpretation of questions, the instrument was piloted thoroughly. The goal of the research was made clear in each contact with a possible respondent. I described the goal of the research and the research methods on the Facebook page (see §6.4), in e-mail conversations and text messages, as well as on the general website of the Institute of Social Drug Research. At the beginning of the interview, the goal of the research was once more made clear orally and in written form by the researcher. This way, the interviewee could give informed consent. In order to ensure anonymity, consent was given orally.

A further issue concerns the motivation of the respondent. Network research is known for carrying a high respondent burden (Hanneman & Riddle, 2005). This can cause fatigue or a tendency to satisfy the researcher among respondents. One way to improve a respondent's cooperation is by making the instrument attractive and keeping the interview dynamic (see below).

Memory effects are a further issue. A self-reported personal network is a cognitive representation of the network, which may differ from the true network. In some cases, like in my study, these cognitive schemes are more interesting than the true networks because I study the perception of networks rather than true networks. Furthermore, network members are categorised in social groups/roles rather than based on individual attributes (Brashears, 2013; Fiske, 1995) (see also Introduction). Network members are therefore not easy to recall. Forgetting network members is however not random, as taken-for-granted members (e.g. spouses) are often forgotten. The closest, most frequently and recently contacted members on the other hand, are better recalled. There is some evidence that the number of forgotten alters is proportional to the number of recalled others, but the evidence is mixed (Brashears, 2013).

In a personal network study, two further biases need to be taken into consideration: an ego bias, and an alter bias. The ego or expansiveness bias refers to the tendency for egos to over- or underreport their interactions with others, for example due to variation in understanding the minimum requirements for reporting a relationship as existent (Feld & Carter, 2002). The alter or attractiveness bias is the tendency to over-report relationship strength and interactions with attractive, desirable people and/or to overlook their relationships with undesirable people (Brewer, 1995). For example, in my

research respondents might over-report the strength of the relationship with people who are popular or are perceived important (e.g. fellow cannabis users, suppliers).

There is a risk for a social desirability bias. Whether it is considered a personal trait or a temporary social strategy, researchers agree questions about behaviour or attitudes which are considered deviant from the social norm are likely to be answered in a socially desirable way (Tourangeau & Yan, 2007). The main influencing factors include question wording, the mode of administration (see below), the data collection setting, and the presence or absence of others during the interview (see below). Considering question wording, for instance, one way to establish trust between the interviewer and the respondent is to discuss supply using neutral terms. Only at the very end are the different meanings of supply (e.g. when money is exchanged or when you expect someone to bring a treat along if they come over) discussed in more depth.

The interviewer also influenced the outcome of the interview. There are some issues related to the role of the interviewer that can be controlled, but there are also some role-independent influences (Billiet & Carton, 2003). For instance, an interviewer can (un)knowingly influence the interviewee in answering particular questions. An interviewer also might let his or her own actions colour the interpretation of the answers of the respondent. Some characteristics are not bound to the interviewers' role but can also influence the question-answer process. In this study, the researcher is a woman who was pregnant at the time of some of the interviews, who is older than the interviewees and who dresses differently to the way they do. Furthermore, the researcher does not use cannabis.

6.7   Ethical considerations

The research design and the instrument were approved by the ethics board of the Faculty of Law (Ghent University) on 19th December 2013.

The research contains an important empirical orientation, and therefore the issue of *informed consent* is at stake. According to the protocol[12], each respondent should confirm

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[12] Upon approval of the Ethics Board I prepared a file based on the Ethical protocol for ethical research at the Faculty of Law (University of Ghent). This protocol refers to three sources for guidelines: Ethical code of Scientific Research in Belgium (http://www.fmre-gske.be/pdf/ethcode_nl.pdf), the European Manifest for Researchers (http://ec.europa.eu/euraxess/pdf/brochure_rights/eur_21620_en-nl.pdf), and the Framework for Research Ethics (FRE) from the European and Social Research Council from the European Commission (http://www.esrc.ac.uk/_images/framework-forresearch-ethics-09-12_tcm8-4586.pdf).

the fact he or she is giving informed consent in writing. The protocol also states that where the research works with fully anonymised data files or field observations without manipulations, informed consent is not obliged. Nevertheless, the research goals were made clear to the respondent during recruitment in order to avoid misinterpretation about the content of the interview (see above).

A further issue concerns the *anonymisation* of the data. All files were anonymised during the interview. I did not aim to perform complete network analysis. Therefore there was no need for a respondent to give full names of network members because I did not need their contact details. In order for the respondent to remember which alter the questions refer to, it is common to replace the actual names of the network members by an abbreviation of the first and last name (for example *WillSha* stands for William Shakespeare). At the end of the interview, these nicknames are transformed into numbers. This way data files are anonymised at the point of data collection. Files with personal data of egos are kept separately from the remainder of the data.

All information that was revealed during interviews was treated confidentially, so no information can be passed onto third parties, for example the police. The interviewer stressed the fact the interview is confidential. The starting assumption of the interviewer was that the respondents' situations were not problematic. If a respondent had appeared to be in a problematic situation, contact details of social care agencies would have been passed on..

A final issue concerns *rewards*. The protocol[11] prescribes 'no inappropriate financial or other rewards' can be issued in order to recruit respondents. Respondents were rewarded with two cinema tickets. This stopped a black economy emerging but provided a reward for an intensive interview.

6.8   Analysis

6.8.1   Data preparation
Quantitative data was collected through a software programme called VennMaker (see §6.2.3). In total 50 personal networks were analysed, including data on 1418 alters. Five types of data were collected: ego characteristics; alter characteristics; ego-alter relational attributes; alter-alter relational attributes; and pictures of network maps.

Data cleaning was done in SPSS. Atypical cases were cross-checked with the original VennMaker project, and double cases were removed. Numeric alter and ego IDs were

added to make dataset merging and switching between ego- and alter-levels more feasible. Egos were numbered 1 to 50 and alter IDs were linked to these IDs. This made it possible to see which network a particular alter belongs to at any moment. Alter IDs were formatted as follows: ego ID + random number received during the pseudonimisation procedure (e.g. alter 57 of the first ego was numbered "157").

In order to be able to analyse ego and alter attributes I created two folders which each contained 50 CSV files, one for each ego. The folder with ego attributes listed, for each ego, socio-demographic characteristics as well as data on substance use. Each CSV file within the alter attribute folder contained data on alter characteristics as well as data on the different types of relationships between ego and alter. Personal network analysis treats ego-alter relations as alter attributes. As such, the original alter attribute file was merged with the adjacency matrices containing data on ego-alter relations. As a result, one large file was created with data on alter characteristics (e.g. gender, role, age) as well as on ego-alter relations (e.g. role, social relation, supply relation). To be able to analyse each network separately, this file was split, based on ego IDs.

Alter-alter relation matrices were formatted as edge lists to make the data ready for analysis. As respondents were allowed to add new respondents throughout the interview, some alters were added after the question about "who-knows-who" was already asked. These alters were not in the edge lists. This question was not asked again as it would have involved egos going over the list of alters again and indicating whether the newly added alter knows the other alters. These alters were followed up orally because going over the network again would have been time-consuming, and interviews were already lengthy.

Ego attributes and alter attributes were analysed in SPSS as well as via R functions. SPSS is used for general descriptive analysis of ego and alter attributes. R is used for descriptive analysis at a network level as well as to calculate network measures. E-Net is used to calculate further structural and compositional network measures (e.g. density, homophily).

6.8.2   Quantitative analysis

Quantitative analysis focuses on the composition and structure of personal networks where cannabis is present. Personal networks in my study include *complete network*, *cannabis network* and *supply network*. The *complete network* includes all alters mentioned by the ego throughout the interview. This includes all alters mentioned in the first name generator, which generates the names of 25 people the ego spends leisure time with.

Additionally, this *complete network* includes any alter that is mentioned later on the interview (at the time of the second name generator as well as while discussing supply patterns). The *cannabis network* reflects all those alters mentioned during the second name generator, which focuses on those alters present while a respondent uses cannabis. This name generator is a free-recall name generator. As such this group of alters includes some or all of the alters mentioned in the first name generator, and any alter who the ego only meets when using cannabis. The *supply network* involves all those alters an ego has a supply relation with. This supply relation is either one-way (from ego to alter or from alter to ego) or reciprocated. The supply network was not defined by the respondents beforehand, but during the interview, when discussing supply relations in the *cannabis* and *complete networks*.

The composition of each of these three networks was analysed in three steps. First, I analysed the attributes of ego and alter and the size of *cannabis*, *complete* and *supply networks*. Second, I analysed homophily. Third, I analysed the type and strength of social relations. The table on the next page overviews all attributes analysed to describe composition of the *complete, cannabis* and *supply network*.

Level	Type	Details
Ego	Socio-demographics	Age, gender, living situation, work/school situation, ethnicity, leisure time activities
	Substance use	Alcohol (prevalence), tobacco (prevalence), cannabis (prevalence, supply, age of first use, location, timing, growing experience), other substances (type, frequency)
	Cannabis supply	Prevalence of different types of supply (receiving)
Alter	Socio-demographics	Age, gender
	Substance use	Cannabis (prevalence, location of use (if member of the *cannabis network*)

Table 2 Quantitative analysis: attributes

Homophily was measured using the External – Internal index (further referred to as the E-I index) as developed by Krackhardt and Stern (1988) and further adopted by

McPherson et al. (2001) in their study into peer influence. The E-I index measures the number of external links (EL) with members of a group and subtracts it from the number of external links (IL) with outsiders. This total is then divided by the total number of links this individual or organisation has:

$$E - I\ index = \frac{EL - IL}{EL + IL}$$

The value of the E-I index ranges from +1 to -1 (Hanneman & Riddle, 2011). I used homophily measures to study the extent to which egos tend to include alters who possess similar traits in their *complete, cannabis* and/or *supply networks*. If the egos only associate with people who possess equal traits (e.g. same age, same gender) the E-I index will be -1. This points towards trait homophily. In the opposite case, if egos tend to associate with people with different traits, the E-I index will be +1, which points to heterogeneity. Homophily was measured here for the following traits: age, gender, use and supply.

The type of social relations was measured via seven social roles defined by the researcher in advance: 'friend', 'best friend', 'partner', 'family member', 'household member', 'colleague', 'other people'. Respondents could choose one or multiple social roles. Analysis at the network level is descriptive in nature. As such I measured the frequency (%) of each social role in each *complete*, *cannabis* and *supply network*. These frequencies are compared among the fifty networks.

The notion of quality of relations, or strength, is often referred to in terms of social support or emotional closeness, which is then perceived as possibly influencing the way individuals behave (McCarty, 2002). The strength of social relations is measured through enacted social support (Lin, 1999; Marsden & Campbell, 1984). Social support encompasses multiple types of support e.g. financial, emotional or practical. Personal network studies reveal that particularly emotional and practical support measures, even though they can subjectively be defined differently by each individual, measure social support uniformly (Hanneman & Riddle, 2005). As such I measured received practical support ("Do you go to [NAME] when you have a practical problem?") and received emotional support ("Do you go to [NAME] when you have a practical problem?"). Examples given for further clarification were borrowed from the Dutch Social Behaviour Study (Houtzager & Baerveldt, 1999).

The frequency (%) of enacted practical and received emotional support is analysed within the *complete, cannabis* and *supply networks*. Strength of social relations was further

measured via a measure of emotional closeness, a key aspect of relational embeddedness (Nahapiet & Ghoshal, 1998). Respondents were asked to indicate the extent to which they feel close to a person, on a scale from 0 to 5,. This measure has been used is a large number of studies and is found to be the most adequate measure to analyse emotional closeness (e.g. Ackerman, Kenrick, & Schaller, 2007; Cummings & Higgins, 2006; Hill & Dunbar, 2003).

To further analyse embeddedness and the meaning of the concept 'friend', both measures of strength were linked to compositional variables. I used a two-tailed t-test, Fisher's Exact tests, Pearson's r correlation and ANOVA tests. The difference between average levels of closeness and being a member of the *cannabis network* or *supply network* is tested using a two-tailed T-test. T-tests further inform about whether average scores on closeness differ between male alters and female alters and whether alters who use cannabis score differently from alters who do not use cannabis. The difference between perceived received emotional or practical support and being a member of the *cannabis network* or *supply network* is tested using a Fisher Exact Test. This Fisher Exact Test further informs about whether perceived received emotional and practical support differs according to the alters' gender or them being a cannabis user. The extent to which the size of the *complete, cannabis* and *supply network* confounds the average levels of closeness found in these networks was analysed using a Pearson's r correlation. The extent to which average levels of closeness are associated with the amount of received emotional and/or practical support was tested through t-testing (received emotional support, received practical support) as well as ANOVA testing (both received practical and emotional support).

Besides the composition, quantitative analysis also included structural analysis. Structural analysis in my study existed of three elements: size, network density and measures of structural holes.

First, I measured the size of (i.e. the number of *alters* mentioned) of the *complete, cannabis* and *supply network.* This analysis was completed by a look into the overlap between the *complete, cannabis* and *supply networks* (i.e. the number of *alters* mentioned in for instance the *cannabis* and *supply network).*

Second, structural analysis included a study of network density (Wasserman & Faust, 1994). Density measures the proportion of the *potential* ties in a network that are also *actual* ties. *Potential* ties are ties that could possible exist between two alters (e.g. an alter

could know another alter, regardless of whether they actually do. *Actual* connections are those that exist (for instance an alter *does* know another alter). Density is calculated as follows (n = the total number of alters):

$$potential\ connections = n * \frac{n-1}{2}$$

$$network\ density = \frac{actual\ connections}{potential\ connections}$$

Few studies inform about the thresholds that help to distinguish 'open' structures from 'closed structures'. I used two measures as indications of thresholds. The first threshold is based on a social network study into marihuana use among college students by Wister and Avison (1982). There it is argued that on little more than a third of all alters in a network knows each other (38%). I remark here that the size of these personal networks was artificially set at 14, though other studies with different sizes confirm this finding. The second threshold is suggested by Wellman (1988), but is generally adopted in network studies as well: densely-knit networks refer to those where at least two-thirds of alters know each other.

Third, structural analysis involved measures of structural holes. Structural holes theory was discussed in chapter 4. Here I detail the four measures taken in the study. Structural holes calculate redundancy (Burt, 1992). A respondent's personal network has redundant alters to the extent that these alters are connected to each other as well (Borgatti, 1997). I measure structural holes by looking at effective size, efficiency, hierarchy and constraint.

Effective size is the number of alters that an ego has, minus the average number of ties that each alter has to other alters. Hanneman and Riddle (2005) give an example. The network size of alter A and alter B is three. Alter A has ties to three other actors and none of these actors have ties to any of the others. In this case the effective size is 3. To reach the other actors, the ego has to contact every one of them. Alter B also has ties to three actors but all of these actors know each other. In this case the effective size is 1, because the ego can reach all of these actors by contacting any one of them. Mathematically, effective size is formulated as follows:

M_{jq} = i's interaction with q divided by j's strongest relationship with anyone

P_{iq} = proportion of i's energy invested in relationship with q

$$EffSize_i = \sum_j \left[1 - \sum_q p_{iq} m_{jq} \right], q \neq i, j$$

$$EffSize_i = \sum_j 1 - \sum_j \sum_q p_{iq} m_{jq}, \ q \ \neq i, j$$

Efficiency expresses how the effective size of an ego's network relates to its actual size (Hanneman & Riddle, 2005; Burt, 1992). This principle argues that an ego should invest more in alters that broker access to other networks, and therefore the alters are non-redundant. If efficiency reaches 100%, this suggests all alters broker access to networks beyond the ego's network. An efficiency of 0% then indicates that all alters are connected to each other, and there is no brokerage potential. Effective size indicates how many alters in total are reached through all non-redundant alters, or the yield of the network. If the effective size equals one, alters are redundant because they provide access to alters who are also connected to each other. If the effective size equals the actual size, alters are non-redundant because they broker access to alters who are not otherwise connected.

Constraint is a summary measure that measures the extent to which an ego's connections are connected to others who are connected to one another (Hanneman & Riddle, 2005; Burt 1992). If an ego's potential trading 'partners' all have one another as potential trading 'partners', the ego is highly constrained. If an ego's 'partners' do not have other alternatives in the neighborhood, they cannot constrain an ego's behavior.

Hierarchy describes the nature of the constraint on the ego. If the total constraint on ego is concentrated in a single other actor, the hierarchy measure will have a higher value. If the constraint results more equally from multiple actors in an ego's neighborhood, the hierarchy will be less. The hierarchy measure, in itself, does not assess the degree of constraint. But, among whatever constraint there is on an ego, it measures an important property of dependency—inequality in the distribution of constraints on an ego across the alters in its neighborhood.

6.8.3   Qualitative thematic analysis

This quantitative analysis is framed within a thematic analysis of the qualitative questions concerning the *cannabis network*, as described above. The list of questions is integrated in the instrument (see attachment Instrument). Two things are added in particular. First of all, the origin of the current network and more general information about the social relationship between egos and alters as well as alter-alter relations was added. In this phase, qualitative data completes or nuances quantitative data. This particular analysis follows a more *inductive approach* as well as a *deductive approach* in order to further explore the nature of the supply tie between egos and alters.

The test phase data as well as the actual collected data was transcribed literally. The quotes that are used to enrich the result section were translated into English. This allows an in-depth interpretation of the data from the beginning. The transcriptions were analysed by the researcher using NVIVO software. Data was coded as soon as the transcriptions were finalised. Initial basic codes were reviewed to search for connections with other codes and existing concepts in literature. These mutual connections were used as a basis for further generation of theoretical ideas. As such, a depth and accumulation of codes was created (Bryman, 2008).

Qualitative data is analysed in three ways: inductively; using coding done beforehand; and through contrasting with the perspective of an outside researcher (Bryman 2008). First I use *a priori* coding. I integrated all of the topics from the questionnaire (see above) in NVIVO. In that regard, data was organised thematically according to the central concepts of the study. This first round of analysis mainly provides insight into different interpretations of the concepts put forward in the questionnaire (e.g. definition of what a user is). Second, to make a more in-depth exploration of the nature of supply, I adopted a bottom-up approach. I started from a print-out of one interview, instead of a pre-defined topic list, and with a blank code tree. This way I was able to look further than the existing topics and explore the underlying themes (e.g. processes of *normification*). Third, to further create inter-rater reliability, an outside researcher coded 5 interviews from the bottom-up. Once both this researcher, who had no further knowledge of the study, and I had completed the coding of these interviews, we compared the findings. Through a discussion on (dis)similarities in choices of coding, my analysis was further refined.

The findings of these interviews are supported by quotes. I cannot give any details that could possibly lead to the identification of these people. Therefore, each interviewee is assigned a number (R1 to R50) and a general typology (M = male, F = female, S = supplier, NS = not a supplier, SS = sole supplier, G = grower, NG = not a grower). This is in line with the ethical obligations in conducting social research (see above).

6.9   Sample description (*n* = 50)

6.9.1   Socio-demographics

The majority of respondents are male (78%), about a quarter of the respondents are female (22%). Age ranges from 20 to 31 at the time of the interview (*M* =24, *SD* = 3). The youngest respondent was 21 at the time of the interview, and the eldest is 31. Half of the

respondents were 22 to 27 years old. There is no significant difference in average age between male ($\bar{x}$= 25; s=3) and female respondents ($\bar{x} = 24, s = 2$) (t (48) =.161, p > .5).

The sample reflects the number of female cannabis users in the wider Flemish population. The Health Interview survey, a population study on health topics in Belgium, indicates about 11% of all women while 19% of men are cannabis users (Gisle, 2014). As one of the inclusion criteria was age, it is not surprising to find age is in line with the findings of the Health Interview Survey. Limiting the findings of the survey to my study's specific age category (18-31 years old), I note that 37% of all males that are in this age category have experimented with cannabis. A quarter of all females in this age category experimented with cannabis (Drieskens, Charafeddine, Demarest, Gisle, Tafforeau, & J., 2016).

Origin is asked in three ways: country of birth of ego, ego's father and ego's mother. Four respondents are born in another country themselves (Ukraine, the USA, Belarus and the Netherlands respectively). Eight respondents have at least one parent who was not born in Belgium. This parent was born in the same country as the respondent in four cases. The other four respondents are born in Belgium, but one or both their parents are born in another country (Spain, Chile, or the Netherlands).

Most of the respondents indicate they either lived together with their 'partner' (and kids) (26%) or lived with their parents (34%). About one-quarter lived in rooms (16%) or together with friends (12%). Five respondents live alone (10%). One respondent described a different living situation: he lives half the time with his parents, and half the time with a 'friend'.

The differences in educational levels and lifetime prevalence are not line with what I would expect based on the data from the National Health Survey (Gisle, 2014). Their findings indicate that of all Flemish 18- to 31-year-olds: about 4% had no higher education and used cannabis at least once, while a quarter of those who obtained a degree of lower secondary education had used cannabis at least once. A third of those with a higher secondary education (32%), as well as a third of those with a higher education tried cannabis (33%), while in total about 77% of all those who used cannabis did not have a degree of higher education (Drieskens et al., 2016).

The table beneath details the results from the survey question. A small group of respondents only obtained a degree of higher secondary school (8 %). About two fifths completed some form of higher education, and 48% has obtained a degree from some

form of tertiary education. Exactly 50% has not obtained a degree of higher education at the time of the interview.

Education (n = 50)		
	N	%
Vocational - lower years	1	2
Vocational - higher years	4	8
Technical - higher years	9	18
General - lower years	3	6
General - higher years	8	16
Higher non-university education	10	20
University - bachelor	4	8
University - master	10	20
Other	1	2
Total	50	100

Table 3 Highest degree obtained at the time of the interview (n = 50)

Because part of the sample is students who had not yet obtained a master's degree, the data is biased. During the interview, more specific details were asked. The qualitative accounts about education further nuanced the above findings. During the interviews, the respondents differentiated between ongoing studies and finished studies. Seven of the people who had not obtained a further degree were at the time of the interview in the final year of professional or academic bachelor studies. Of the people who indicate they had obtained an academic bachelor ("University – Bachelor"), eleven were in the process of obtaining their master's degree. Furthermore, five respondents have already finished one bachelor's or master's degree and are in the final year of obtaining a second degree; one respondent has successfully finished two master's programmes.

A little less than half my sample has a job (either full time or part time) at the time of the interview (44%). About the same amount, 38%, is a student (either full time or part time). The remaining 12% is in search of employment. Three respondents indicate "other": all three of them are unemployed at the moment of the interview. Two of them are studying but receiving benefits, and the other was setting up his own business and was not receiving a wage at the time of the interview.

Half of the respondents (52%) has a monthly income of at least €1,001 (net). The majority of this group earn more than €1,501 (30%), with 12% of this 30% earning more than €2,000 EUR. The remaining 22% earned between €1,001 and €1,500. The group of respondents earning less than €1,001 included students and unemployed people (48%).

One respondent does not wish to answer this question. Income out of supply was not questioned nor discussed further. In this account my sample does not corroborate with the population study. The results nationally is that of all Belgians aged 18- 31, about 22% of those that earn less than €750 a month have ever used cannabis. About 33% of earn between €750 and €1,001 monthly. Looked at the other way around, 40% of the population that is between 18- and 31-years-old and earns more than €2,500 per month has experience with cannabis use.

The majority of the respondents visit friends or have friends coming over at least once a week (53.9%). Most of the respondents visit a pub at least once a week (59.2%), but two-thirds have not been to a youth club ("jeugdhuis") during the three months prior to the interview (61%). To conclude, 65.3% goes to a party or dancing one to three times a month.

6.9.2   Substance use

6.9.2.1   Prevalence

About two-thirds of the respondents have used alcohol once or a few times a week (57.1%), about 18% have used alcohol once or a few times a month, and 12% have drunk alcohol less than once a month. A small percentage has never drunk any alcohol at all (6%). More than one third of the sample either quit smoking regular tobacco or never did it to begin with (36.7%). Of the remaining two-thirds, 20% indicate they sometimes smoke tobacco without cannabis, and 44% mention they use tobacco every day. A large part of this final group smokes more than five cigarettes a day (34%).

Respondents were also asked about the use of other substances, besides alcohol, tobacco or cannabis. Fifteen respondents recall the use of one or more substances. Most popular are MDMA (n = 6), cocaine (n = 6) and XTC (n = 6); other substances include designer drugs (n =2), mushrooms (n =2), LSD (n =1), speed (n =1), truffles (n =1), sleeping pills (n =1) and helium (n =1). Another eight respondents have some experience with other substances, but either do not like the effect and quit using these substances, or did so very sporadically (a few times a year). This is higher than is estimated at the population level: about 8% of the Flemish population between 18 and 31 years old have experimented with other drugs than cannabis (Gisle et al., 2016).

Cannabis use of respondents was questioned in three ways: age of first use, last month's prevalence, and last week's prevalence. The average age of first use was 15 years old (*SD*

= 2). Three-quarters of the sample was 16 years or younger when they first used cannabis (76%).

Cannabis use: age of first use (n = 50)

Age (years old)	N	Valid %
8	1	2
12	1	2
13	6	12
14	12	24
15	11	22
16	7	14
17	10	20
18	1	2
21	1	2
Total	50	100

Table 4 Cannabis use: age of first use (n = 50)

This is in line with the findings of school surveys (Melis, 2016). However, it is not in line with these of population studies, as on average, Belgian users start using at the age of 18, with a median of 17 years (Gisle, 2014). This age is higher than the age I found. The recent prevalence of cannabis use is questioned in two ways: last month's prevalence and last week's prevalence. Half of the respondents indicate they had used daily during the month prior to the interview. Another quarter uses cannabis more than once a week, but not every day (26%). The remaining quarter uses cannabis either once a week (16%) or less than once a week (8%).

On average, respondents have used cannabis on 8 separate occasions during the past week, though standard deviation is high (M = 8.46, SD = 11.2), pointing to the presence of some high outliers. Seven respondents have not used cannabis during the seven days prior to the interview. Little more than one-third has used between 1 and 6 times (36%). Slightly more than 30% of the respondents have used cannabis between 7 and 14 times during the past week (36%), and the remaining 18% have used cannabis on 15 to 63 separate occasions during the past week.

6.9.2.2 Location and timing of cannabis use

Respondents' use patterns were further explored by questioning the location and the timing of their use.

Cannabis use: location (n = 50)		Never	Sometimes	Regularly	Total
At home	N	2	7	41	50
	%	4	14	82	100
At a friend's home	N	2	5	43	50
	%	4	10	86	100
At a party/club	N	9	22	19	50
	%	18	44	38	100
In a pub (indoors and/or outdoors)	N	21	17	12	50
	%	42	34	24	100
On the street/ in a park	N	17	20	13	50
	%	34	40	26	100
Other	N	33	10	7	50
	%	66	20	14	100

Table 5 Cannabis use: location (n = 50)

Respondents could score five locations, ranging from "I never use when I'm there" to "I use cannabis almost always when I'm there". Most respondents use regularly at home (82%) or at a friend's home (86%). Other, more public, locations proved far less popular: 38% regularly smokes at a party, 26% on the street or in a park, and 24% in a pub.

Almost half of the respondents indicate they smoke in other places (44%). Their qualitative accounts suggest other places are mainly festivals but also at a coffee-shop in the Netherlands, a particular pub, while walking in the woods or just while waiting for 'other people'. Fourteen respondents do not give a specific example, but indicate cannabis is used on special occasions. Nine respondents mention festivals as a specific timing rather than a specific location.

Besides location, respondents were also asked to indicate when they usually used cannabis. Except for two respondents, everyone uses cannabis at the weekend. About three-quarters smoke cannabis on a regular basis during the week, after school or work (76%), but few people use it regularly before going to school or work (10%). About half of my sample has periods of daily use on a regular basis (54%).

Cannabis use: timing (n = 50)

		Never	Sometimes	Regularly	Total
Week, after school/work	N	2	10	38	50
	%	4	20	76	100
Weekend (Friday evening -Sunday evening)	N	0	7	43	50
	%	0	14	86	100
Every day	N	14	9	27	50
	%	28	18	54	100
Week, before school/work	N	41	4	5	50
	%	82	8	10	100
Other	N	14	11	25	50
	%	28	22	50	100

Table 6 Cannabis use: timing (n = 50)

Half of the sample regularly smokes cannabis at 'other moments' (50%). The majority of these respondents explain orally they use every day, so they would use at any other type of *"special occasion"* as well (20%). Two respondents repeat the same answer as they gave when filling in types of "other locations" in the previous question. The other eight respondents use cannabis while playing online videogames, before going to bed, during "*smoke downs"* (themed parties where cannabis use plays a central role), while travelling, during a weekend out with friends, going to a pub during the week (instead of during the weekend) or on their day off during the week.

6.9.3 Supply/growing experiences

6.9.3.1 Buying, swapping and gift receiving

Respondents were asked how they, in general, obtain cannabis. Almost all respondents (90%) indicate they swap cannabis, buy it alone or in group, share their cannabis or share someone else's cannabis. Swapping is least popular. Most respondents needed some extra clarification in the form of an example (e.g. you can swap cannabis for cannabis) before they felt comfortable answering the question. In the end, about three-quarters of the sample indicate they never or rarely swap cannabis (76%). Similarly, the answer category *receiving a gift* often invoked questions for examples. Again, about three-quarters of the sample has never or rarely receive cannabis as a gift (74%).

Buying cannabis is a more popular option as three-fifths indicate they buy cannabis by themselves on a regular basis (58%) and half of the sample regularly buys cannabis together with friends (50%). 'Sharing cannabis with other people' was slightly more

popular than 'buying cannabis'. Two-thirds of the sample indicates it is common to share cannabis while spending time with each other (62%).

A small part of the sample indicates that in their view they obtain cannabis in a different way (10%). During the interview these respondents stated that their source is not a person but rather a coffee-shop or a cannabis social club. One respondent is supplied by a *dealer* she does not know in person but who supplies other members of the *supply network* on a weekly basis.

Cannabis supply: types (n = 50)		Never	Sometimes	Regularly	Total
Swapping	N	28	15	7	50
	%	56	30	14	100
Gift receiving	N	17	27	6	50
	%	34	54	12	100
Buying (alone)	N	13	8	29	50
	%	26	16	58	100
Buying (with others)	N	15	10	25	50
	%	30	20	50	100
Sharing (cannabis of someone else)	N	5	14	31	50
	%	10	28	62	100
Growing	N	30	5	15	50
	%	60	10	30	100
Other	N	45	1	4	50
	%	90	2	8	100

Table 7 Cannabis supply: types (n = 50)

6.9.3.2   Growing cannabis themselves

A considerable part of the sample has grown cannabis themselves (40%). Most of these 20 respondents are growing at the moment of the interview (30%) or grew cannabis less than one year before the interview (55%). Three respondents have grown cannabis one to five years prior to the interview. For the largest part, respondents have attempted to grow cannabis more than five times (40%) or three to five times (30%). The remaining 30% have attempted it once or twice. In one attempt, most respondents grow two plants (45%) or three to five plants (40%). A small group grows more than five plants per attempt (15%) and two respondents grow one plant (10%).

Respondents do not intend to keep their entire harvest for personal use. When asked what they do with their harvests, almost all respondents mention they keep the largest part for themselves (95%). About half of the respondents share cannabis on a regular basis (55%).

About the same amount of people sometimes swap cannabis with someone else (50%). 'gift-giving' is not popular, as 95% does not or only sometimes give cannabis away.

Cannabis supply: aims of harvest (n = 20)

		Never	Sometimes	Regularly	Total
Personal use	N	0	1	19	20
	%	0	5	95	100
Swapping	N	9	10	1	20
	%	45	50	5	100
Give it away	N	5	14	1	20
	%	25	70	5	100
Sharing	N	4	5	11	20
	%	20	25	55	100
Selling for profit	N	16	3	1	20
	%	80	15	5	100
Selling to cover costs	N	17	1	2	20
	%	85	5	10	100

Table 8 Cannabis supply: aim harvest (n = 20)

6.10 Conclusion

This chapter presented the methodological choices that were made in this study. Based on the theoretical choices as presented in chapter 5, I argue a pragmatist design frames the dual nature of the research goals best. Furthermore, a qualitative interview allows examination of the setting, relation and attributes that guide respondents' perception of the nature of supply as well as an in-depth study of the meaning of supply. Furthermore, I opted for a computer-assisted personal interview, so the personal network of the interviewee is created in continuous interaction with the interviewer.

Inclusion criteria, sampling and recruitment strategies were tested and adjusted based on initial analysis of 14 interviews. As the test data was part of instrument development, it was not used in further analysis. In line with the normalisation theory, which frames the initial definitions of social supply, I included young Flemish people that used cannabis at least once during the three months prior to the interview and/or supplied cannabis during the six months prior to the interview. Based on the initial sample I developed preferences that further guided the snowball sampling strategy as well as multiple internet-based and traditional recruitment strategies. This way I tried to capture a diverse sample of youngsters, for instance those who did not obtain a degree, female suppliers, people from rural areas and people who supply to people outside their ego's personal network.

The instrument was tested in two ways: four respondents tested the user-friendliness of the software programme, and an additional ten respondents tested the content of the instrument. The actual instrument included three main parts: a general part where sociodemographic data of the ego was collected; a second part that zoomed in on the attributes of alters as well as the relation between those alters; and a third part that explored supply experiences and the formation and dissolution of relations in the personal network of ego.

The sample description illustrates the variety in socio-demographic characteristics. For instance, a quarter of the respondents are female. Respondents' income levels vary from less than €500 per month to more than €2,000 (net). Educational levels vary as well, ranging from a degree of lower secondary school to a degree of tertiary education at university (master's level). Living arrangements are diverse, though the majority seems to live either alone or with friends. Employment statuses varied from full-time student to full time employee. The sample did not include users without a secondary school diploma, or people earning more than €2,500 a month.

Recreational substance use and supply is also present in different ways. Respondents started using cannabis quite young. On average they were 15 years old, which is lower than the national average (18 years old). Looking at the data on use in the last month and use in the last week, there is a wide variation in what is considered 'recreational'. For some users 'recreational' means less than once a week, while others consider smoking multiple joints a day 'recreational'. A third has tried other substances. Sharing cannabis or buying seems to be the most popular way to obtain cannabis. Swapping is least popular, and few receive it as a gift. Twenty respondents grow their own cannabis. In most cases this is for personal use, though over half of the respondents tend to share the harvested cannabis with other people.

The next four chapters discuss the composition and structure of the personal networks of these 50 respondents. Chapter 7 studies network homophily and social roles, which are further nuanced through exploration of the quality of social relations in chapter 8. Chapter 9 looks at the structure of these personal networks. Chapters 10 and 11 situate the findings in the social, use and collaborative settings. This way I explore how individual attributes, relations between egos and alters as well as the relational context shapes personal networks in which cannabis use and supply is present and given meaning.

Chapter 7   Network homophily and social roles: who are the suppliers?

7.1   Introduction

The conceptual framework suggests that a definition and explanation of supply is situated by studying three aspects: individual attributes, relational aspects, and setting. This first results chapter presents how individual attributes might play a role in defining supply. In doing so, two key assumptions in broader drug market research are examined: (1) cannabis users and suppliers tend to refer to suppliers as 'friends'; and (2) users' behaviours and attitudes are mainly influenced because their peers use cannabis as well.

The first assumption is further examined a by exploring *who is who* in a personal network where cannabis is used. The overlap of social roles and cannabis-related roles, in this case 'user' or 'supplier' sheds a light on the social aspect of supply. Social supply research presents users and suppliers surrounding ego in terms of friendships ('friends', 'acquaintances') or kin relations (Coomber & Turnbull, 2007; Harrison et al., 2007; Hough et al., 2003; Parker, 2000; Potter, 2009; Werse, 2008). Network literature suggests these definitions are far too subjective to use because social relations involve a unique history of interactions and thereby of complex, nuanced meanings. As such, 'friendship' might not only take on different meanings for different actors, but might even mean something different for the same actor in different situations (Crossley, 2010) (see chapter 5).

Below I discuss the social roles that respondents attribute to alters and pay specific attention to the overlap between these roles (see §7.2.) Each respondent was asked to describe each alter using one or more of seven following pre-defined roles: 'household member' (e.g. father, mother, brother, sister); 'family member' (e.g. grandparent, cousin, aunt); 'friend'; 'best friend'; 'partner'; 'colleague'; or 'other'. The presence of these roles is discussed for every single alter an ego mentioned in the *complete network* (see §7.2.1), the *cannabis network* (each alter who is present when an ego uses cannabis) (§7.2.2) and the *supply network*, which includes any alter an ego has a (un)reciprocated supply relation with (see §7.2.3).

The second assumption is studied through homophily[13] measures. Network analysts study homophily to nuance the traditional idea people start to use cannabis because their 'friends' also 'use cannabis'. For instance, Kirke (2006) argues this particular characteristic, namely 'also using cannabis', was important but not important enough to explain why people use cannabis. Homophily of gender and age seemed to be more important in the formation and dissolution of networks than homophily of cannabis.

In section 7.3, the extent to which an ego associates with alters who have the same gender, age, user and supply experience is explored. Similar to the discussion of social roles, I analyse to what extent an ego tends to associate with alters who share this characteristic (e.g. same gender) in the *complete network* (see §7.3.1), the *cannabis network* (§7.3.2) and the *supply network* (see §7.3.3). Ego characteristics were described in chapter 6 (see §6.9). Each respondent identified the gender and age of each alter. Besides that, all egos indicated whether to their knowledge a specific alter can be described as a 'cannabis user'. As I also collected data on mutual supply experiences between ego and alter, I am able to study supply homophily as well. Supply homophily then reflects on the extent the egos that supply tend to associate with alters that supply as well. For a further understanding of the nature of these supply relations, see chapter 11.

7.2   Social roles

7.2.1   Social roles in complete networks

On average, two-thirds of all alters in *complete networks* are identified as '**friends**' (*M* = 63%, *MD* = 65%, *SD* = 20%). However, in one of these networks only two 'friends' are included. This network is composed of one-third 'family members', one-third 'other people' and one-third 'best friends' (15%) or 'household members' (8%) (R25, M/S/G). In his qualitative account, this male grower explains that for him there is a strict distinction between 'friends' and 'people you are friendly to if you meet them'. This last group of people are not really 'friends', so he chooses to describe them as 'other'. As will be discussed later in this part (see also chapter 11), this grower also has a very small *cannabis network* (*n* = 5). On the opposite side, twelve complete networks identified 80% or more of all alters as 'friends'.

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[13] In my study homophily is measured through the E-I index. The value ranges from +1 to -1. If respondents only associate with people who possess a trait equal to them (e.g. same age, same gender), the E-I index will be -1. In the opposite case, if respondents tend to associate with people with traits different to them,, the E-I index will be 1 (see also chapter 6).

Likewise, almost all *complete networks* include at least one **'best friend'** (M = 17%, MD = 16%, SD = 20%, n = 48). In two complete networks, no 'best friends' are included. Most complete networks even include more than one 'best friend'. The proportion of 'best friends' ranges from none to half of the complete network. Furthermore, in fourteen complete networks, between one and ten respondents are considered to be 'friends' as well as 'best friends' (M = 4, MD = 3, SD = 3). These personal choices in who to define as 'best friend', 'friend' or 'other people' illustrate the subjectivity of these concepts.

Over 30 *complete networks* include a **'partner'** (n = 32) who sometimes is attributed more than one social role as well. They are sometimes considered either 'best friend', 'friend' or 'family member' as well (n = 11). A male supplier explained that it is normal for a 'partner' to be a 'best friend' as well: *"if your 'partner' is not your 'best friend', that's a bad thing"* (R47, M/S/NG). Other respondents indicated a 'partner' is something different than a 'best friend'. This distinction was made instinctively; respondents did not explain their reasoning further.

Besides 'friends' and 'best friends', 41 complete networks include at least one **'household member'**, like a mother or a brother (M = 10%, MD = 9%, SD = 8%, n = 23). About half of the complete networks entail more than 10% 'household members' with one network mentioning almost half of the network as 'household members'. This final network belongs to a female supplier and grower. In this particular network the respondent included her own two children, the child of her new 'partner' as well as her 'partner'. She is also part of a large household herself. She has three brothers who she still spends a lot of her leisure time with. She started using cannabis with this group of 'household members'. 'household members' are something else to her than 'friends'. This is suggested by the finding there is no overlap between identifying someone as a 'household member' and 'friend'.

As with the aforementioned social roles, some *complete networks* did contain 'household members' with more than one social role. For example, nine complete networks include one or two 'household members' that are a 'friend' as well. Three complete networks identify a 'household member' as a 'best friend'. Two complete networks identify the 'partner' as 'household member'; another one considers one 'household member' as 'other'.

Just above half of the *complete networks* include a small proportion of **'other people'** (M = 8%, MD = 3%, SD = 13%, n = 28). These 'other people' are seen as people who are more

distant from an ego, both in terms of emotional closeness and frequency of contact. These 'other people' tend to be people that are either less important to an ego and/or who an ego spends less leisure time with. These alters are referred to in different ways such as 'acquaintances', ''partner' of a friend', 'suppliers that are not encountered otherwise', 'exes of friends' or ''friends' of friends'. The definition of these particular alters is dealt with more in-depth in chapter 10 when the meaning of the social relation between ego and alter is described in more detail.

About half of the *complete networks* (*n* = 26) mention a small number of **'family members'** (e.g. aunt, uncle, grandparents, cousins) as part of their *complete network* (*M* = 5%, *MD* = 3%, *SD* = 8%). In nine complete networks these particular alters make up more than ten per cent. One male grower even includes 31% of 'family members' (R25, M/S/G, see above). Eleven respondents consider at least one 'family member' as a 'friend'. In one network, one alter is identified as a 'family member' as well as a 'best friend'. This male supplier describes this 'family member' as a cousin who he grew up and became 'best friends' with. They also started using cannabis together (R4, M/S/NG).

Less than half of the *complete networks* (*n* = 22) include **'colleagues'** although in seven complete networks they represent more than 10% (*M* = 5%, *MD* = 0%, *SD* = 8%). Some 'colleagues' also take up more than one social role. For instance, in eleven complete networks, an ego considers some of these 'colleagues' to be 'friends'. In five complete networks, one 'colleague' is mentioned as a 'best friend'. These five suppliers either meet up with this person a lot outside of work, consider a fellow student as a 'colleague', or work together on a project outside of their regular jobs.

7.2.2   Social roles in cannabis networks

'Friends' are present in all *cannabis networks* in a similar proportion to the complete networks (*M* = 64%, *MD* = 66%, *SD* = 22%). However, more cannabis networks than complete networks are more than 80% 'friends' (*n* = 15). In two *cannabis networks* all alters are identified as 'friends'. These *cannabis networks* do not include a 'partner' so there is no overlap between these particular social roles. One of these *cannabis networks* only includes 'friends' (R24, M/S/G); in the second one 40% of the 'friends' are also considered to be 'best friends' (R31, M/S/NG).

Almost all *cannabis networks* include at least one **'best friend'** (*n* = 46). Social role analysis suggests in many cases respondents do not include all of the 'best friends' mentioned in the *complete network* in their *cannabis network*. In four *cannabis networks* none of the

members are perceived as 'best friends'. Two of those do not include any 'best friend' in the *complete network* as well. The other two belong to growers who mention 'best friends' in the *complete network* but did not include them in the *cannabis network*.

When present, 'best friends' seem to take up a larger proportion of the *cannabis network* than the *complete network.* On average, around 24% of the *cannabis network* is considered a 'best friend'. This is slightly higher than in the complete network (*MD* = 19%, *SD* = 17%). 'best friends' make up to 60% of the *cannabis network*. This does not indicate there are more 'best friends' in the *cannabis network* in absolute terms than in the complete network. Fourteen *cannabis networks* identify on average three alters both as 'friend' as well as 'best friend'.

Most **'partners'** that are part of the *complete networks* are also part of the *cannabis networks* (*n* = 27). In five *cannabis networks* the 'partner' is not included in the *cannabis network.* Either these 'partners' do not use cannabis and are not present while an ego uses cannabis, or both 'partners' use cannabis in separate groups (R12, *M*/S/G). Seven of these 'partners' are also considered an ego's 'best friend', and one was considered an ego's 'best friend' as well as 'friend'.

Less than half of the *cannabis networks* include at least one or a small group of **'household member(s)'** (*M* = 14%, *MD* = 12%, *SD* = 8%, *n* = 21). This suggests a large number of respondents do not include any of the 'household members' from the *complete network* in their *cannabis network*. Social roles do tend to overlap here as well. In seven *cannabis networks,* one or two of these alters are considered to be a 'friend' as well.

Seventeen *cannabis networks* include **'other people'** in their *cannabis network* (*M* = 22%, *MD* = 18%, *SD* = 17%). These are people the ego mainly has a connection with through cannabis use and not via other leisure-time activities (e.g. playing sport). In two of these seventeen *cannabis networks,* over half of the *cannabis network* consists of 'other people'. In one of these two *cannabis networks* these 'other people' are all suppliers to an ego who she otherwise does not know (R26, F/S/NG); the other network includes a large number of 'other people' who are considered to be 'friends' as well (R47, M/S/NG).

Similarly, most *cannabis networks* do not include broader **'family members'**. Seventeen *cannabis networks* do have at least one 'family member' and one *cannabis network* consists of one-third 'family members' (*M* = 10%, *MD* = 7%, *SD* = 7%). Eight of these *cannabis networks* considered one or two alters to be a 'family member' as well as a

'friend'. The one complete network including a 'family member' that was also a 'best friend' includes this alter in the *cannabis network* as well (R4, M/NS/NG).

Most *cannabis networks* do not include **'colleagues'**. However, ten *cannabis networks* include at least one 'colleague' (*M* = 17%, *MD* = 10%, *SD* = 15%). For two *cannabis networks*, over 40% are an ego's 'colleagues'. In one network these 'colleagues' are described by the ego as fellow growers for a cannabis social club (R18, *M*/S/G). In the other networks, all 'colleagues' involved are considered to be 'friends' as well. For one respondent, his 'colleagues' were not at work but rather his fellow bandmates with whom he uses cannabis and 'works' together when playing and recording music (R49, *M*/S/G). Furthermore, two *cannabis networks* considered one or two alters to be 'friends' as well as 'colleagues'.

7.2.3   Social roles in *supply networks*

Like *cannabis networks* and *complete networks*, almost all *supply networks* mainly exist of **'friends'** (*n* = 49). Again this group of alters takes up about two-thirds of the network on average (*M* = 66%, *MD* = 67%, *SD* = 27%). However, fewer *supply networks* are composed of mainly 'friends'. Unlike *cannabis networks* and *complete networks,* eighteen *supply networks* consist of 80% or more 'friends'. In eleven *supply networks* all suppliers are described by the ego as 'friends'.

That said, two *supply networks* only identify one or even no supplier as a 'friend'. One *supply network* belongs to the same person who mentions a lot of 'other people' in the complete network. In this *supply network*, 'other people' refers to suppliers who the ego only interacts with when exchanging cannabis (R26, F/S/NG). The other *supply network* is exclusively comprised of 'best friends', suggesting that there is no overlap between 'friends' and 'best friends'. This particular network also includes very few 'friends' in the complete and *cannabis networks* (R25, M/S/G).

The vast majority of the *supply networks* identify on average one-third of the *supply network* as **'best friends'** (*M* = 30%, *MD* = 30%, *SD* = 22%, *n* = 41). Thirteen *supply networks* include at least as many 'best friends' as 'friends'. Five *supply networks* have at least one alter that is described by the ego as a 'friend' as well as a 'best friend'.

In contrast, nine *supply networks* do not include any 'best friends'. This group includes those who did not mention 'best friends' in the *cannabis network*. Additionally, five more *supply networks* do not include the 'best friends' that are present in the *cannabis* and

complete network. For instance, in the case of one female grower, one 'best friend' uses cannabis while she is present but is not in a supply relation with her (R43, F/S/NG/G). In the case of one male supplier, one 'best friend' uses cannabis but in a completely different network where the ego is not part of it. Therefore this 'best friend' is neither in the *cannabis network* nor the *supply network* (R1, M/S/NG). Other 'best friends' do not use cannabis but are present while the ego uses cannabis. As they do not use cannabis themselves, they are not in a supply relation with the ego.

About a third of the *supply networks* include a **'partner'** (*n* = 16). In two *supply networks* this **'partner'** is also described as 'best friend', and in one of these the 'partner' is also considered to be a member of the household. One of these 'partners' is the girlfriend of R12 (M/S/G). Though, as I described above, she is not part of the *cannabis network* of R12, he does sometimes supply her with cannabis, which he grows himself.

Likewise, about a third of the *supply networks* include a **'household member'** (*M* = 16%, *MD* = 11%, *SD* = 11%, *n* = 15). In most of these fifteen *supply networks* between 6% and 29% of the network consists of 'household members'. One female grower describes a *supply network* consisting of 50% 'household members'. In this *supply network* the ego also indicates that 100% of the *supply network* are 'friends'. This suggests 'household members' are considered to be 'friends' as well. I note that this *supply network* is very small, as it has only two members (see chapter 11).

Most respondents do not include **'family members'** in the *supply network* (*M* = 6%, *MD* = 0%, *SD* = 9%). Eleven *supply networks* on average identify a little less than 20% of the *supply network* as 'family members'. All these 'family members' are part of the *cannabis network* as well. In one *supply network* up to half of the network consisted of 'family members'. In this *supply network,* the ego indicates 50% are 'best friends' and 50% are 'friends' (R4, M/S/NG). This suggests that 'family members' double up as 'friends' or 'best friends'. In six more *supply networks* indeed at least one 'family member' is identified as a 'friend' as well; in one *supply network* a 'family member' was also a 'best friend'.

Similarly, eleven *supply networks* include **'other people'** (*M* = 30%, *MD* = 22%, *SD* = 28%). Two *supply networks* are comprised of more than 40% 'other people'. In the first network a large number of the cannabis and complete networks consist of suppliers the ego does not interact with otherwise. In the second network, 'other people' are identified as 'friends' and 'best friends' as well.

To conclude, ten *supply networks* identify between 5% and 50% of all members as **'colleagues'** (*M* = 17%, *MD* = 15%, *SD* = 12%). As in the cannabis and complete networks, one *supply network* consists of 50% 'colleagues' - growers for a cannabis social club (R18, *M*/S/G). In five of the ten *supply networks,* the egos consider the 'colleagues' as 'friends' as well. In three other *supply networks* 'colleagues' are identified as 'best friends' as well.

7.3 Homophily: (dis) similarities between ego and alter

7.3.1 Gender & age homophily

7.3.1.1 Complete network

All male alters have a complete network characterised by **gender** homophily (*n* = 39). Twenty-three of these thirty-nine complete networks include slightly more male than female alters as homophily measures are equal or below -.5 (-.5 ≤ E-I index ≤ -.2). The remaining sixteen complete networks encompass mostly or solely male alters, making these predominantly or completely equal in gender (-1 ≤ E-I index ≤ -.6).

Almost all female alters (*n* = 11) have a complete network that is heterogeneous rather than homophilous in gender. Eight complete networks have as many men as women or slightly more men than women (-.4 ≤ E-I index ≤ 0). Three additional complete networks of female suppliers are characterised by the opposite and demonstrate a tendency towards gender homophily (-.4 ≤ E-I index ≤ -.3). These are the only complete networks where more female than male alters are mentioned.

Complete networks have, on average, a slight tendency to be slightly homophilous in **age** (*M* = -.1, *MD* = -.1, *SD* = .40). The majority of the complete networks (*n* = 26) tend to include more alters belonging to the same age category of ego than alters who have an different age than the egos (-.9 ≤ E-I index ≤ -.1). Among this group of complete networks there are four female respondents. Six of these twenty-six complete networks even predominantly include alters of the same age category (-.9 ≤ E-I index ≤ -.6).

Sixteen respondents, of which four are female, mainly associate with people of a different age than themselves (.1 ≤ E-I index ≤ .6). Finally, eight complete networks include as many alters of an age similar to the ego as alters of a different age (E-I index = 0).

7.3.1.2 Cannabis network

All male alters have a *cannabis network* that mainly or exclusively consists of alters that have the same **gender** as the ego. Twenty-eight of these networks, which is ten more than the complete networks, are even predominantly of the same gender (-1 ≤ E-I index ≤ -.6).

Female *cannabis networks* tend to be more diverse. Seven *cannabis networks* of female respondents include slightly more male than female alters (.1 ≤ E-I index ≤ .5), and two of them even predominantly include male alters (.6 ≤ E-I index ≤ .7). Beside these nine female respondents, two female suppliers have a homophilous *cannabis network* as well. These two female also have a homophilous complete network (-1 ≤ E-I index ≤ -.4).

Cannabis networks have a similar tendency towards **age** homophily as complete networks (*M* = -.2, *MD* = -.3, *SD* = .55). Thirty-nine *cannabis networks* mainly include alters from the same age category as the egos. Twelve of these *cannabis networks* are predominantly composed of alters with a similar age to the ego (-1 ≤ E-I index ≤ -.6) and three of these *cannabis networks* include only alters with a similar age to the ego. Twelve male suppliers have *cannabis networks* that show a slight to moderate tendency towards age homophily (-.5 ≤ E-I index ≤ -.1).

Besides this group of thirty-nine *cannabis networks*, eleven *cannabis networks* lean towards heterogeneity in age (0 ≤ E-I index ≤ 1). One male supplier has a *cannabis network* which includes only alters of a different age category.

7.3.1.3 Supply network

In comparison to cannabis and complete networks, there are a higher number of *supply networks* that are completely male. All male respondents lean towards or are completely homophilous in **gender** (*n* = 39). Thirty of these are even predominantly of the same gender (-1 ≤ E-I index ≤ -.6). Also, twenty networks are characterised by complete gender homophily, so have an E-I index of -1.

Female respondents again show a more diverse picture (*n* =11). Nine female respondents have a tendency towards gender heterogeneity. Five of these are completely male (E-I index = 1). The remaining three either have a slight tendency towards heterogeneity (E-I index = .2 or .3) or include as many women as men (E-I index = 0). One of the two female suppliers that had a homophilous *cannabis* and *complete network* also tends to associate with female suppliers.

Supply networks, on average, tend to be similar to *cannabis* and *complete* networks concerning **age** homophily (*M* = -.2, *MD* = -.2, *SD* = .55). About half of these *supply networks* are at least partially composed of alters in the same age category as the ego (*n* = 27). Seventeen of these twenty-seven networks have a strong tendency towards age

homophily (-1 ≤ E-I index ≤ -.6). Eight of this final group of networks are entirely composed of alters that are in the same age category as the ego (E-I index = -1).

Age heterogeneity is present in eleven networks. Eight of these are characterised by a moderate heterogeneity (.1 ≤ E-I index ≤ .5). Three *supply networks* include predominantly differently aged alters (.6 ≤ E-I index ≤ 1). One of these is the male supplier who, in line with his cannabis and complete network, includes only alters of a different age. This is not surprising as the only member of this *supply network* is the ego's older brother. This alter belongs to a different age category than the ego.

Six *supply networks* are neither homophilous nor heterogeneous. In these networks, alters of a different as well as the same age category are equally present (E-I index = 0).

7.3.2 Use homophily

Little more than half of all alters are described by the egos as cannabis users (56%). Most of the time, respondents knew whether an alter was also a cannabis user. Respondents did define what 'using' entails in various ways. For instance, while some said anyone who smokes cannabis once is a user, others differentiated and only identified those alters who use 'frequently' as a user. In 3% of cases, a respondent did not know for sure whether an alter was a user or not. In chapter 10, the definition of 'use' is further discussed.

None of the *complete networks* only include alters who use cannabis. That said, on average respondents have a slight preference to include alters who use cannabis than alters who do not (M = -.13, MD = -.15, SD = .31). Thirty-one networks include mainly cannabis-using alters (-.7 ≤ E-I index ≤ -.1). Twelve networks are heterogeneous with regard to cannabis use and thus include more non-using alters than alters who do use cannabis. Five of these twelve networks belong to female respondents.

Seven *complete networks* are composed of equal numbers of using and non-using alters (E-I index = 0). Two of these heterogeneous networks belong to male growers and are mainly composed of alters who do not use cannabis (E-I index = .5 or .6). As will become clear below, these networks belong in one case to an infrequent cannabis user and in another case to an ego who is almost the only one in his *cannabis network* who still uses cannabis.

Members of the *cannabis network* are likely to be cannabis users, although less than 25% of these networks only include alters who use. Use homophily is on average stronger in *cannabis networks* than in *complete networks* (M = -.63, MD = -.7, SD = .34). Almost all

cannabis networks include more alters who are described as users than alters who are not (*n* = 47). Thirty-three of these forty-seven networks show a strong tendency towards use homophily (-1 ≤ E-I index ≤ -.6). However, only twelve of these networks solely exist of cannabis-using alters (E-I index = -1). None of these belong to female respondents. Fourteen of these 47 *cannabis networks*, among which three belong to female respondents, include only slightly more alters who use cannabis than alters who do not (-.5 ≤ E-I index ≤ -.1). Besides these 47 networks, three *cannabis networks* either consist of alters who use cannabis and those who do not equally (E-I index = 0) or include more non-users than users (E-I index = .2 and .4).

The three *cannabis networks* that are heterogeneous in use belong to three growers. One male grower has a *cannabis network* made up of more than 80% alters who do not use cannabis themselves. In this particular *cannabis network*, the respondent gets his cannabis from a cannabis social club and is the only one who uses cannabis often. The other alters grew out of using cannabis and only smoke cannabis rarely. This group of alters does smoke regular tobacco, and while going out or visiting 'friends', the ego often goes outside with these alters. While they smoke regular tobacco, he smokes cannabis.

The second heterogeneous *cannabis network* is more diverse, with 60% of the alters not using cannabis. In the case of this particular male grower, the absence of users is a consequence of meeting users less frequently. Besides this, a part of the group no longer uses cannabis at all. Moreover, his 'partner' does not smoke cannabis, and he does not use cannabis when she is present.

The third heterogeneous *cannabis network* is of a female grower who mainly smokes cannabis by herself. She smokes small joints all day long. Her *cannabis network* includes as many users as non-users. Like the first male grower, she is one of the only ones in her personal network who still smokes cannabis. She thus has a lot of 'friends' not using cannabis. One group of 'friends' does not want her smoking cannabis in their presence, in which case she uses before she meets them. Another group of alters and her 'partner' do not mind, so she smokes when they are present.

The majority of the *supply networks* only include alters that use cannabis themselves (*n* = 42, E-I index = -1). Additionally, in seven networks, the ego is in a supply relation with both cannabis-using alters and non-using alters (-.8 ≤ E-I index ≤ -.5). In a final network, the ego is in a supply relation with alters that do not use cannabis themselves (E-I index = 1). One of the male growers mentioned above mainly buys in a group or by himself. In

the six months prior to the interview he had mainly bought cannabis from a supplier who grows cannabis because he likes the challenge, but does not use it himself.

7.3.3   Supply homophily

Supply homophily in my study exists if there is a supply relation between ego and a specific alter. This supply relation can go one-way ego to alter, one-way alter to ego, or reciprocated (see chapter 6). Homophily measures explore whether an ego and alter share the characteristic of 'being in a supply relation'. About one-fifth of all alters were supplied cannabis by an ego during the six months prior to the interview (19%). A slightly smaller group had supplied cannabis to an ego during this same period of time (16%) (see chapters 9 and 11).

The *complete networks* of 40 suppliers are mainly composed of alters that are not part of a supply relation. Twenty suppliers almost exclusively include alters who do not supply cannabis themselves in their complete network (.6 ≤ E-I index ≤ 1). Two of these respondents are the sole supplier as they only associate with alters who do not share the characteristic of 'being in a supply relation' with an ego (E-I index = 1). Twenty other suppliers associate with alters who are not in a supply relation with them but also include some alters who are (.2 ≤ E-I index ≤ .5).

The remaining ten *complete networks* belong to six suppliers and four respondents who do not perceive themselves as suppliers. The six suppliers are in *supply networks* that are characterised by supply homophily (*n* = 3) or have equal numbers of alters in a supply relation and alters who are not (*n* = 3). One of these homophilous networks belongs to a grower who has only slightly more suppliers than non-suppliers in his complete network (E-I index = -.1). Another one is from a grower whose complete network includes only alters he has a supply relation with (E-I index = -1) (see chapter 13). Finally, three complete networks belong to suppliers who tend to associate with suppliers and non-supplying alters equally (E-I index = 0). Three of the four respondents that do not supply cannabis themselves mainly associate with alters that are not in a supply relation with them as well (-1 ≤ E-I index ≤ -.1). Additionally, one female respondent who does not supply cannabis herself mainly associates with alters who do supply cannabis (E-I index = .6).

The *cannabis networks* are more diverse. In about half of the *cannabis networks* a large proportion of alters did not supply the ego with cannabis during the six months prior to the interview. About half of the 46 suppliers has a *cannabis network* which mainly includes

alters that are not in a supply relation with the ego (*n* = 22). Six of these *cannabis networks* even have a strong tendency towards heterogeneity (.6 ≤ E-I index ≤ 1). A slightly smaller group of suppliers have a *cannabis network* characterised by supply homophily (*n* = 16) or by alters in a supply relation with ego and alters who are not equal (*n* =8). Eighteen *cannabis networks* are more inclined towards supply homophily. Fifteen of these networks belong to respondents that supply cannabis (-1 ≤ E-I index ≤ -.1). Of this group, eleven show a low to moderate tendency towards supply homophily (E-I index ≤ .5), and 4 have a strong tendency to associate with supplying alters. Three out of four respondents who do not supply cannabis themselves mainly include alters that do not supply cannabis to them in their *cannabis network* (-.8 ≤ E-I index ≤ -.4). The fourth non-supplier does include more suppliers than non-suppliers in his network (E-I index = .3).

The *supply network* of the respondents only includes alters that the ego has a supply relation with. As such, forty-six networks have a perfect negative score because the egos only associate with alters sharing the characteristic of 'being in a supply relation', and the four networks of egos that do not supply themselves have a perfect positive E-I index as these networks only include alters who are in a supply relation with the ego. In this case, alters are suppliers and egos are not.

7.3.4   Focus: growers

Studies into grower profiles suggest that this group forms a particular group of cannabis user-suppliers (e.g. Bouchard et al., 2009; 2010; Potter, 2006). Respondents describe during the interview the extent to which they themselves are growers. As mentioned in chapter 6, twenty respondents had grown cannabis less than one year before the interview. Most of these respondents are male; five are female.

Growers tend to associate with male alters. *Complete networks* of male growers mainly show a moderate or strong tendency towards gender homophily (0 ≤ E-I index ≤ .9, *n* =11). Four female growers' complete networks have a moderate tendency towards gender heterogeneity (0 ≤ E-I index ≤ .5). The remaining complete network of a female grower shows a different picture and includes slightly more female alters than male alters (E-I index = .3). The *cannabis network* of growers consists of mainly male alters as well (*M* = -42, *MD* = -.55, *SD* = .53). Eleven male *cannabis networks* have a strong tendency towards gender homophily, with nine of them consisting solely of male alters (E-I index = -1). Female growers' *cannabis networks* consist largely of male alters as well (.6 ≤ E-I index ≤ 1). *Supply networks* are, in line with *cannabis networks*, composed of male alters rather

than female alters (M = -.44, MD = -.80, SD = .74). Nine male growers have a completely male *supply network* (E-I index = -1). Three out of five female growers have a completely male *supply network* as well (E-I index = 1). The other two female growers only include a few more male than female alters (E-I index = .2 and .3).

Growers seem to associate with alters of different age category. Seventeen *complete networks* indeed have a very slight tendency towards age heterogeneity (M = .1, MD = .1, SD = .42), though the difference in averages is very small as complete networks on average have an E-I index of -.1 while those of growers average .1. In ten complete networks this is only a moderate tendency (.1 ≤ E-I index ≤ .6) while seven complete networks have a moderate to strong tendency towards age homophily (-.9 ≤ E-I index ≤ -.1). The remaining three growers' complete networks have equal numbers of same-aged and differently aged alters (E-I index = 0). *Cannabis networks* show a similar tendency towards age heterogeneity (M = .12, MD = .25, SD = .55). Thirteen networks are heterogeneous in age (.6 ≤ E-I index ≤ 1). One of these networks is the one grower I above described. He includes only alters belonging to a different age category to himself. The remaining seven growers' *cannabis networks* have a tendency towards age homophily (-1 ≤ E-I index ≤ -.1). *Supply networks* have a slight tendency towards age homophily (M = -.01, MD = 0, SD = .52). Eight *supply networks* have a strong tendency towards age heterogeneity (.6 ≤ E-I index ≤ 1). Another eight *supply networks* include more alters that have an age similar to egos than alters who do not (-1 ≤ E-I index ≤ -.6). Four networks include an equal amount of alters who belong to the same age category as the ego and those who do not (E-I index =0). One male grower includes only alters from a different age category. This specific respondent is 25 years old while the sole member of the *supply network* is 23 years old. As age categories run from 20 to 24 years old and 25 to 29 years old, this alter is indeed in a different age category. This finding suggests the division of age categories might considerably influence the result in some cases.

Growers' *complete networks* indicate only a slight tendency towards use homophily (M = -.1, MD = -.1, SD = .35). Twelve complete networks include more alters who use cannabis than alters who do not, but only in two networks is the tendency towards use homophily strong (-.7 ≤ E-I index ≤ -.6). The remaining eight networks either consist of equally as many users and non-users or include more alters who do not use cannabis than those who do (0 ≤ E-I index ≤ .6). *Cannabis networks* of growers have a strong tendency towards use homophily (M = -.52, MD = -.5, SD = .37). Ten networks are either only made up of users

(n = 5), or have a strong tendency towards use homophily (-1 ≤ E-I index ≤ -.6). Eight *cannabis networks* include only slightly more alters who use cannabis than alters who do not (-.5 ≤ E-I index ≤ -.1). The two remaining networks are comprised of as many users as non-users or have a slight majority of alters who do not use cannabis themselves (0 ≤ E-I index ≤ .2). These two networks also have more users than non-users in their complete network. Fifteen *supply networks* of growers consist solely of cannabis-using suppliers (E-I index = -1). In four networks there are a few suppliers who do not use cannabis at the present moment (E-I index = -.7 and -.8) and in one network, that of R50 (see above), the ego was supplied by non-using alters (E-I index = .3).

Most of these growers have a *complete network* characterised by supply heterogeneity. Fifteen *complete networks* mainly include alters who are not in a supply relation with an ego (n = 17). Ten of these fifteen growers' complete networks even have a strong tendency towards supply heterogeneity (.9 ≤ E-I index ≤ .6). Additionally, two complete networks have equal numbers of alters who are in a supply relation and those who are not (E-I index = 0). Besides these seventeen *complete networks,* three *complete networks* are characterised by supply homophily (-1 ≤ E-I index ≤ -.1). One of these networks belongs to the respondent who is in a supply relation with all alters in his complete network. The second one includes only slightly more alters in a supply relation than those who are not. The third complete network belongs to an alter who does not supply himself. This final complete network is thus mainly composed of alters that do not supply cannabis themselves (E-I index = -.6). Supply in *cannabis networks* of growers is more diverse than in their *complete networks*. Thirteen suppliers have a *cannabis network* characterised by supply heterogeneity (0 ≤ E-I index ≤ .9). The remaining six *cannabis networks* have a tendency towards supply homophily (-.5 ≤ E-I index ≤ -.1), including one network in which the ego only has a supply relation with alters (E-I index = -1). The *cannabis network* of the grower who does not supply cannabis mainly includes alters who provide cannabis to her (E-I index = -.2).

7.4   Conclusion

7.4.1   Subjectivity of social roles

Social supply as a concept is rooted in an empirical definition of suppliers as 'best friends', 'friends', 'acquaintances' or 'kin' (Coomber & Turnbull, 2007; Harrison et al., 2007; Hough et al., 2003; Parker, 2000; Potter, 2009; Werse, 2008). My study includes seven social roles that reflect these different definitions of 'social suppliers' and simultaneously broaden

them[14]. All these social roles are found among *complete*, *cannabis* and *supply networks*. The social role 'friend' is the most popular social role. It is used to identify on average two-thirds of the alters, whether one looks at all alters leisure time is spent with (*complete network*), or zooms in on those present when the ego uses cannabis (*cannabis network*), or those alters the ego supplies to or is supplied by (*supply network*). The second most popular social role, in all *complete, cannabis* as well as *supply networks* is the role of 'best friends'. I do note 'best friends' as a social role is used to describe members of the *supply network* to a larger extent than members of the *cannabis* or *complete network.* The majority of the *complete networks* include a 'partner'. Though most of these 'partners' are also members of the *cannabis network,* a lot fewer of them are members of the *supply network.* 'Household members' are part of most *complete networks* but are found to a lesser extent in *cannabis* and *supply networks.* Few alters are identified as 'family members', 'colleagues' or 'other people'. These social roles are for instance found in about half the *complete networks* and in a third or less of the *cannabis networks* and *supply networks*.

That said, these social roles are not evenly present across networks. This finding illustrates the wide diversity in composition of personal networks in which cannabis is used. For instance, a few *cannabis networks* and a fifth of all *supply networks* only include friends. On the opposite side, some *complete networks* include a very low percentage of 'friends' and in some *supply networks* one or even none of the members are identified as 'friend'. Besides 'friends', 'kin relations' (in this case 'household members' and 'family members') are unevenly present. For instance, 'kin' are part of *complete* and *cannabis networks* but to a far lesser extent in *supply networks*.

The social role of 'colleague' and 'partner' aids our understanding that current definitions of 'social suppliers' as being 'kin', '(best) friends' or 'acquaintances' is too limited. This is in line with what Potter (2009) argued. 'Colleagues' are part of almost half of the *complete networks* and to a lesser extent in *cannabis* and *supply networks*. As described above, 'partners' are present in a lot of *complete networks* and *cannabis networks*. However, only about half of these 'partners' are also a member of the *supply network*. One of these respondents is the male grower who supplies cannabis to his 'partner' but does not use

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[14] Respondents could identify alters as 'friend', 'best friend', 'partner', 'household member', 'family member', 'colleague' or 'other people'. Respondents could choose one or more social roles to identify one alter (see §6.5).

cannabis together with her. Other female 'partners' are described as abstainers who agree the ego can use but not when the 'partner' is present. As will also be discussed below when focusing on gender homophily, this finding suggests composition of *supply networks* might differ between male and female respondents.

As the literature indicates, respondents seem to apply these social roles in a subjective way (Crossley, 2010; Papachristos & Smith, 2012). This reflects how social relations are not standard but take on different meanings (Crossley, 2010). The way 'friends', 'other people' and 'colleagues' are defined by the interviewees illustrates this finding. Some respondents use the social role 'friend' following a 'strict' definition while others interpreted this social role more loosely and identified almost all alters as 'friends'. The social role 'other people' is often used in contrast to 'friends'. For instance, 'other people' are those who one is in a supply relation with. Another respondent referred to his personal definition of friendship; 'other people' in this network are 'all alters one would have a conversation with but does not know *well*'. This group of alters is also described as 'acquaintances', 'partners of friends' or 'suppliers'. The social role of 'colleagues' is also described in a variety of ways. For instance, some are described as 'co-workers' but others are called 'band mates', 'fellow students' or 'co-growers'. This finding is further elaborated upon in chapter 10 where I examine how the social, use and supply setting play an important role in giving meaning to social relations. In chapter 11 I explore how the nature of this social relation shapes exchange processes and influences how supply is defined.

The subjectivity of social roles is further illustrated by the overlap between these roles. Although most alters are identified using one social role, some alters are identified using more than one. This illustrates the *multiplexity* of the social relation (Krohn, 1986). Most of the time, the social role 'friend' or 'best friend' is applied to describe other social roles as well (e. g. 'household members' or 'colleagues'). The most common overlap is found between 'best friends' and 'friends'. 'Partners' are for instance sometimes considered 'best friends', 'friends', or 'household members'. Sometimes there can be an overlap of more than two roles. For instance, one 'partner' is identified as 'best friend' as well as 'friend'. 'Colleagues' are sometimes also identified as 'best friends' or as 'friends'.

Consistent with Potter's (2009) argument, it seems that describing social suppliers merely based on their social role would result in a definition of the social aspect of supply that is too narrow and too broad at the same time. Most supply studies indicate suppliers

are 'friends', 'best friend' or 'acquaintances'. However, I found more social roles are involved (i.e. 'partners', 'colleagues', and 'other people') making this conceptualisation too narrow. The overlap of social roles as well as the subjective interpretation of for instance the social role 'friend' furthermore suggests these social roles are too broad to add to our understanding of the 'social aspect' of supply. This aspect is further explored in chapter 8, where the quality of social relations is put forward as an additional way to interpret the extent to which supply is *social*.

7.4.2 Composition: gender, age, use and supply

Network studies show that people sharing similar traits, thus whose networks are homophilous, are more likely to connect with each other (Lazarsfeld & Merton, 1954; McPherson et al., 2001). People that do not share similar traits might connect as well, but these relations tend to dissolve more quickly (McPherson et al., 2001). This principle of homophily is also used in network studies of cannabis use, where it is stated that the presence of alters that use cannabis, or 'use homophily', is a very strong predictor of an ego's own cannabis use (Haynie, 2001; Papachristos, 2011). An important element of homophily is that in networks that include mainly alters sharing the same characteristics, their social worlds might be limited in the extent to which they receive information, form attitudes, and experience interactions. For instance, a high use homophily in one's network might lead to the formation of specific shared meanings and histories created based upon the specific experiences within these networks rather than perceptions that live in the 'wider society'. Homophily in race and ethnicity are seen as attributes that are most likely to create homophilous networks, with age, religion, education, occupation, and gender following in roughly that order (McPherson et al., 2001).

My findings indicate that cannabis users do not predominantly associate with other cannabis users. This lack of use homophily is not what I would expect. As described above, network literature sees use homophily as one of the most important characteristics of personal networks where cannabis use is present (e.g. Bauman & Ennett, 1996; Kandel & Davies, 1991; Kobus, 2003). However, none of the *complete networks* consists solely of users. The majority of the *complete networks* is characterised by a weak tendency towards use homophily. Additionally, a large group of *complete networks* is composed of equal numbers of users and abstainers. Use homophily is stronger in *cannabis networks*, as almost all include more users than non-users. Yet, only a fifth of the *cannabis networks* solely consist of users. This is different for the *supply networks.* Almost all *supply networks*

include only alters that use cannabis. Alters that are in a supply relation are thus mainly users as well. Still, some *supply networks* include alters that use cannabis as well as abstainers, and in one network none of those alters involved in supply uses cannabis.

It seems all respondents, regardless of gender, tend to associate 'being a supplier' with 'being male'. I found that female respondents are more likely to include male alters rather than female alters in their supply networks. Only a few female respondents associate with female alters in their cannabis networks and even fewer female respondents include more female than male alters in their supply network. Gender homophily, or the tendency to associate with alters of the same gender, seems to be primarily present in personal networks of male respondents. Network literature suggests networks of cannabis users are characterised by this gender homophily (Kirke, 2006; McPherson et al., 2001;). However, one study into growers' networks argues these networks might be heterophilous rather than homophilous in gender (Malm, Nash, & Vickovic, 2011). The distinct difference between male and female alters suggests female respondents act upon masculinity. This 'masculine' behaviour is then illustrated by this finding that they, much like men do, mainly associate with male alters (Dahl & Sandberg, 2015; Grundetjern & Sandberg, 2012). This apparent masculinity is further explored in chapter 8, where I find that female respondents tend to have personal networks that look similar to those of male respondents but that supply mechanisms might be structured differently.

Additionally, suppliers seem to belong to the same age category as users (i.e. alters are maximum 4 years older or younger than ego). Malm, Nash and Vickovic (2011)studied race, gender, and age homophily within co-offending networks of small-scale cannabis growers. Based on a large sample of small-scale growers, they concluded that co-offenders have a slight tendency towards age heterophily. Contrary to their findings, I find the majority of *complete networks* is characterised by a weak tendency towards age homophily. This tendency towards age homophily is similar in the *cannabis networks* and *supply networks*. When interpreting this finding, it is important to take into account that this age homophily is on average very weak. The results indicate age homophily is less present than gender, supply and use homophily. This finding points to a diverse composition of the studied networks in terms of age. Thus in some networks there is quite a strong age homophily, whereas in others almost all alters are part of a different age category than the ego.

Personal networks of cannabis users seem to be characterised by supply heterophily. Regardless of whether an ego supplies cannabis or not, *complete networks* include more alters that are not in a supply relation with an ego than alters who are. My findings also indicate that supply is also not predominantly present in *cannabis networks*. However, overall, cannabis networks seem to show somewhat more diversity than complete networks. For instance, some egos that do not supply themselves tend to include mainly supplying alters in their *cannabis network*. This finding is further explored in chapter 9 where the analysis of the size of *complete*, *cannabis* and *supply networks* illustrates how *supply* and *cannabis networks* can only overlap to a small extent. To my knowledge, network research or drug market research does not focus on the extent personal networks where cannabis is used are characterised by supply homophily.

My findings suggest cannabis growers might take part in similar networks to suppliers that do not grow cannabis. Their *complete networks* seem to follow the general tendencies of the complete group of respondents: gender homophily/heterophily, a mild tendency towards use homophily, and supply heterophily. Growers also do not seem to belong to personal networks that consist solely of users, although many of their *cannabis networks* have a strong tendency towards use homophily and almost all *supply networks* include users only. This group of alters has a slight tendency towards age heterophily rather than age homophily. However, both the total sample as well as the group of growers had about the same amount of personal networks characterised by age homophily as with age heterophily. Supply heterophily is present in most *complete networks* of growers, while some *cannabis networks* do include more alters that are in a supply relation with an ego than alters who are not.

The above findings on social roles and homophily further suggest cannabis is not key to social relations with alters. This finding is illustrated by the absence of 'best friends' or 'partners' in *supply* and/or *cannabis networks* although they are present in *complete networks*. It seems that my respondents, who often consider themselves as 'suppliers', do have substantial connections with society outside cannabis use and supply. Furthermore, a weak tendency towards use homophily further suggests a lot of an ego's connections might be with abstainers rather than fellow users. It seems if they can maintain these relations with wider society, as the qualitative analysis indicates, a wider social accommodation of recreational cannabis use among young people exists (Parker et al., 1999; Parker et al., 2002). Furthermore, the social world of an ego might not completely

be shaped by meanings or definitions about use and supply as formulated by fellow users and suppliers alone but also by abstainers. As I further explore in chapter 10 and chapter 11, it seems networks are indeed created in a relational context within a social and use setting that goes wider than the collaborative or supply setting. This confirms an understanding of supply as embedded in multiple settings.

Chapter 8   Quality of social relations and supply

8.1   Introduction

Personal network studies suggest that not only the *presence* of social relations but also the *quality* of these social relations shape how shared meaning and definitions are formed (e.g. Granovetter, 1992; Nahapiet & Ghoshal, 1998; Marsden & Campbell, 1984, Crossley, 2010). The findings from the previous chapter suggest, like the supply and network literature, that social roles are too subjective to adequately capture what is meant with 'social' supply (Papachristos, 2011; Valente, 2003). For instance, the concept of 'friends' can include people one barely knows as well as people who are really close to you.

This chapter therefore zooms in not on the presence but on the *quality* of these social relations. Quality in my study is measured through two measures of *strength*: emotional closeness, and enacted social support (Lin, 1999; Marsden & Campbell, 1984) (see chapter 6). A study of strength in different network domains further informs us how strength and use or supply might be associated. Drug market studies illustrate a debate on strength: while in some studies strength seems to be associated with use behaviour, others argue mere proximity of alters is more important than the quality of social relations (Ennett & Bauman, 2006; Haynie, 2001; Houtzager & Baerveldt, 1999; Kirke, 2006). My findings aim to contribute to this debate.

The following sections first look into how strength varies across networks and across alters (§8.2). As such I explore the ways in which the complete, cannabis and *supply networks* vary in emotional closeness and enacted social support (§8.2.1), as well as to what extent the strength varies across social relation of alters with particular characteristics (e.g. being male, being a supplier) (§8.2.2).

Second, the connection between strength and social roles is explored. Across four sections (§8.3 to §8.6) the whole range of *emotional closeness* is explored, going from very weak social relations (§8.3) to very strong ones (§8.6). Each section first discusses the link between social roles and emotional closeness (§8.3.1 to §8.6.1) as well as how social roles, emotional closeness and supply mechanisms are intertwined (§8.3.2 to §8.6.2). In a fifth section I explore the association between *enacted emotional and social support* and social

roles (§8.7). Similar to the discussion of emotional closeness, the link with social roles (§8.7.1) as well as with supply mechanisms (§8.7.2) are discussed.

8.2   Strength and social roles in *complete and cannabis networks*

8.2.1   Very weak to weak social relations

Respondents consider a small group of the 1,416 alters as not important at all to them (n = 35, **emotional closeness = 0**). Most alters who are part of this group are 'other people' (51%). About one-fifth is 'friends' (20%) and another one-fifth is 'colleagues' (17%). The remaining seven people are 'colleagues' (n = 6), a 'family member' (n = 1) and a 'household member' (n = 1). None of these alters are 'best friends' or 'partners'.

There are twelve unique personal networks, out of a total of 50, that situate alters at this lowest level of closeness (n = 12). About half of the female respondents include alters at the lowest level of closeness (n = 4). Eight belong to male respondents. Considering supply, this group of respondents include two male non-suppliers and six growers. Despite what might be expected based on the amount of 'other people' present in the personal network of one female supplier, she does not put any alter at this level of closeness (R26 (F/S/NG, see chapter 7).

The *complete networks* of these 12 respondents include almost all social roles. 'Other people' (n = 6) and 'friends' (n = 5) are the most popular ways to describe alters in a very weak relation to an ego. Additionally, three complete networks include 'colleagues', who are also identified as a 'household member' or 'other people'. Few *complete networks* put kin relations, namely 'household members' (n = 2, R5, *M*/S/G and R43, F/S/G) and 'family members' (n = 1, R15, *M*/NS/NG), at this level of closeness. 'partners' and 'best friends' are not perceived to be in very weak social relations with the egos.

All the above-mentioned social roles, except for the 'family member', are present in the *cannabis networks* as well. But while 'other people' are most widespread in the *complete networks, cannabis networks* tend to include mainly 'friends'. Five *cannabis networks* include the majority of the 'friends' that are part of the complete network. For instance, one female grower includes nine of the eleven 'friends' that are part of the complete network in her *cannabis network* as well. 'colleagues' and 'other people' are included each time in three *cannabis networks*. Likewise, in three complete networks that include 'other people', all these 'other people' are part of the *cannabis network*. Furthermore, one female grower also includes one 'household member' in her *cannabis network*.

A larger group of alters received a **emotional closeness score of 1** (*n* = 131). About two-thirds of this group is identified as a 'friend' (62%). A quarter is described as 'other people' (26%), and about 10% are 'colleagues'. The remaining 5% include family (3%) and 'household members' (2%). This level of closeness is not attributed to any 'partner' or 'best friend'. About three-quarters of all networks include at least one alter at this level of closeness (*n* = 38). This group includes all non-supplying respondents, one sole supplier, fifteen out of twenty growers and about half of the female respondents (*n* = 6). The figure below shows the different social roles that are present in the cannabis, complete and *supply networks* at this level of closeness.

This group of alters is mentioned by 38 respondents. Most of the female respondents (*n* = 9) and most of the growers (*n* = 16) include at least one alter who they have a very weak social relation with. The majority of respondents are male (*n* = 29) and supply cannabis themselves (*n* = 32). All respondents that do not supply cannabis themselves, as well as one sole supplier, are in this group of 38 respondents.

This group of alters is spread over 38 *complete networks*. In two-thirds of these complete networks, between one and eight 'friends' are situated at this level of closeness (*n* = 26). The group of 'other people' is spread along sixteen of these complete networks. A quarter includes 'colleagues' (*n* = 10) while a small group of complete networks identify one alter as a 'family member' (*n* = 4), and one complete network describes two alters as a member of the household.

About half of these 131 alters are included in the *cannabis networks* (*n* = 68). Most of these alters are considered 'friends' (62%) or 'other people' (30%). A small group of *cannabis networks* includes 'colleagues' (7%), 'household members' (3%) or 'family members' (2%). These alters are spread over twenty *cannabis networks*. All of them include at least one 'friend'. For instance, half of these *cannabis networks* cover all 'friends' that are mentioned at this level in the complete network. Ten *cannabis networks* include 'other people' as a member of the *cannabis network*. In seven networks all of the 'other people' mentioned are members. 'colleagues' (*n* = 3) and 'family members' (*n* = 2) are present in few *cannabis networks*.

Respondents have a weak social relation with 14% of all alters (*n* = 217) (**closeness = 2**). Again, the largest group, this time about three-quarters, are 'friends' (78%). Five other social roles are present as well, though to a lesser extent: 'other people' (12%), 'colleagues' (8%), 'household members' (3%), and 'family members' (3%). This is also the

lowest level of closeness one 'best friend' received. No 'partner' received this level of closeness. The total percentage of social roles is above 100% because at this level some of the social roles overlap within one alter (e.g. in one network a 'colleague' is also considered a 'friend') (see chapter 7).

This group of alters is spread over 47 unique personal networks. Almost all female respondents include alters at this level of closeness (n = 10), as well as four out of five non-supplying respondents, the majority of growers (n = 17) and one sole supplier. Three growers—one female non-supplier, one male supplier, and one male sole supplier—do not include any alter at this level of closeness. The figure below shows to what extent these different social roles, at this particular level, are present in the *complete, cannabis* and *supply networks.*

Alters in a weak social relation are found in 47 *complete networks*. The majority of these networks identify these alters as 'friends' (n = 43). About one-third of the complete networks include 'other people' (n = 15) while in twelve networks these alters are described as 'colleagues'. In total, six complete networks each mention one 'household member'. Three complete networks are made of 'family members' while two complete networks include a 'best friend'.

In 34 *cannabis networks* some members are at this level of closeness (n = 94). They are identified as 'friends' (82%) or 'other people' (14%). Three alters in this group are considered either family (2%) or 'household members' (1%). At this level of closeness, neither 'colleagues' nor 'best friends' are members of the *cannabis network*. All *cannabis networks* have a least one 'friend' as a member. Nine *cannabis networks* include all 'friends' and in ten more *cannabis networks* there are as many 'friends' who are a member of the *cannabis networks* as there are 'friends' who are not. A further ten *cannabis networks* include 'other people' at this level. Two *cannabis networks* also include one 'family member' while each time one *cannabis network* includes a member of the household or a 'best friend'.

8.2.2   Neither weak nor strong social relations

A quarter of all alters are in a "neither weak nor strong" social relation with the ego (n = 363) (**emotional closeness = 3**). An even larger proportion compared to the previous groups is considered a 'friend' (85%). Six other social roles are also present: 'other people' (6%), 'family members' (5%), 'colleagues' (4%), 'household members' (3%), and 'best friends' (3%). Again, no 'partners' are included. All but one personal network includes

alters at this level of closeness (*n* = 49). One male supplier and grower does not include any alters. The figure below illustrates the extent to which these social roles are present at the third level of closeness in the *complete, cannabis* and *supply networks*.

All but one *complete network* includes at least one alter in the third closeness level (*n* = 49). All complete networks, except for that of one male supplier, include 'friends' (*n* = 48). The number of 'friends' included is larger than the two previous levels, with eleven complete networks for instance including ten or more 'friends'. The other social roles are spread out over a large number of networks. This way, most complete networks only include one or two alters with a specific social role. For instance, 'family members' are present in twelve complete networks and 'colleagues' are present in eleven complete networks, which all include 'friends' as well. Furthermore, eight complete networks put a few 'other people' at this level. One male supplier even mentions eight 'other people'. In about one out of ten complete networks, 'family members' (*n* = 6), 'household members' (*n* = 5) and 'best friends' (*n* = 5) are considered to be in neither a weak nor strong social relation with the ego.

About half of all alters mentioned above are also a member of the *cannabis network* (n = 179), with by far the largest group being identified as 'friends' (88%). 'friends' are found in the majority of *cannabis networks* (*n* = 43). About two-thirds of 'friends' mentioned at this level of closeness are included in both the complete and *cannabis networks* (*M* = 67%, *MD* = 67%, *SD* = 27%). Four *cannabis networks* even include all 'friends' at this level in the complete as well as the *cannabis networks*. The other thirty-nine *cannabis networks* include on average 52% of 'friends' in both the complete and *cannabis networks* (*M* = 52%, *MD* = 60%, *SD* = 24%).

The other social roles are far less present in the *cannabis network*: 'best friends' and 'other people' each represent 4%, while 'family' and 'household members' each represent 3%. 'Colleagues' represent 1% of this group of alters. An equally large group of *cannabis networks* include at least one 'family member' (*n* = 4), 'best friend' (*n* = 4) or 'other people' (*n* = 4). In two *cannabis networks* all 'household members' are part of both the *complete* and the *cannabis network* and another two *cannabis networks* include all 'colleagues'. Six of the 49 *complete networks* do not include any alter at this level of closeness in their *cannabis network*. These belong to three male suppliers, one female supplier and two female non-suppliers, four of which are growers.

8.2.3   Strong social relations

Another a quarter of all alters are in a strong social relation with the ego (*n* =326, **emotional closeness = 4**). This is the first level of closeness including all social roles. As was the case in the previous levels, most alters, about two-thirds, are described as 'friends' (67%). However, their proportion is lower than at the third level. This might have something to do with the larger proportion of 'best friends' (20%) that are present. The remaining group of alters include about as many 'household members' in this level (9%) as 'family members' (8%) and a small group of 'other people' (4%) and 'colleagues' (3%). To conclude, two 'partners' are mentioned. The total amount of alters is higher than 100% because there is an overlap between different social roles. All respondents include at least one alter they have a strong social relation with. The figure below once again illustrates the way these different social roles are present in the *complete, cannabis* and *supply network*.

This group of alters is spread out over all fifty *complete networks*. Forty-eight of them include at least one 'friend'. Three of these forty-eight networks even include ten or more 'friends' at this level of closeness. The group of 'best friends' is spread over 29 *complete networks*. Additionally, fourteen *complete networks* include 'household members' and ten *complete networks* encompass 'family members'. This is a far higher number of *complete networks* than in the lower levels of closeness, suggesting egos tend to have a strong social relation with the family and 'household members' that are part of their personal network. A small amount of egos put 'colleagues' (*n* = 5) or 'other people' (*n* = 5) at this level in *complete networks*. Egos in two *complete networks* add their 'partner' at this level of closeness.

A bit more than half of these alters are also members of the *cannabis network* (*n* = 186). Most of these alters are either 'friends' (72%) or 'best friends' (24%). A small group is identified as a family or 'household member' (5%), 'colleague' (4%), other (2%), or 'partner' (1%). In forty-one *cannabis networks* on average 68% of all 'friends' are also part of the *cannabis network* (*MD* = 67%, *SD* = 26%). In twelve *cannabis networks* all 'friends' are part of the *cannabis network*. The remaining 29 *cannabis networks* include about half of the complete network in the *cannabis network* (*M* = 55%, *MD* = 50%, *SD* = 20%). All *cannabis networks* include between one and four 'best friends' in the *cannabis network*. Seven *cannabis networks* include one or two 'household members' and an equal number

include a 'family member' (*n* = 6). Four *cannabis networks* include one other in the *cannabis network*. To conclude, both 'partners' are part of the *cannabis network*.

8.2.4   Very strong social relations

The group of people closest to the egos encompass 23% of all alters (*n* = 326, **emotional closeness = 5**). In this category 'best friends' form the largest group (48%), followed by 'friends' (29%) and 'household members' (26%). The remaining group of people includes almost all 'partners' (representing 9%), a small amount of 'family members' (6%) and an equal amount of 'colleagues' and 'other people' (each represent 2%). All respondents included at least one alter in their inner circle. The figure below illustrates how these social roles are spread along *complete, cannabis* and *supply networks*.

These alters are spread over all fifty *complete networks* as well. Forty-four complete networks include 'best friends' in their most inner circle; eight of these complete networks mention more than five 'best friends'. 'household members' are spread over thirty-four complete networks. Most of these complete networks (*n* = 30) also include 'best friends', or 'friends' (*n* = 22). Thirty-one of these complete networks include 'friends', with six complete networks including more than five 'friends'. It is also at this level where most 'partners' are situated (*n* = 30). Thirteen complete networks include 'family members' while a small amount of complete networks include 'colleagues' (*n* = 6) or 'other people' (*n* = 4).

Two-thirds of these alters are also members of the *cannabis network* (*n* = 222). Most of these alters are considered 'best friends' (60%) or 'friends' (37%). 'household members' represent 14% and 'partners' 11% of the total number of alters. The other social roles make up less than 10%: 'other people' (3%), 'family members' (3%) or 'colleagues' (2%). Forty *cannabis networks* include 'best friends'. A little over half of these networks include all 'best friends' at this level in their *cannabis network* (*n* = 23). Twenty-eight *cannabis networks* feature 'friends'. Most of these *cannabis networks* include all 'friends' of the inner circle in their *cannabis network* (*n* = 22). Almost all 'partners' are part of the *cannabis network* (*n* = 25). Thirteen *cannabis networks* include 'family members'. In seven *cannabis networks* all 'family members' included in the inner circle are members of the *cannabis network*. Six other *cannabis networks* encompass 'household members' in the inner circle. Four *cannabis networks* include 'colleagues'. To conclude, all four *cannabis networks* that include 'other people' in their inner circle also include all of these 'other people' in the *cannabis network*.

8.2.5   Enacted social support

The social role 'friends' tends to be associated with both types of enacted social support. In 39 *complete networks,* the ego receives emotional support from at least one '**friend'**. The majority of these networks include between one and seven 'friends' in the *cannabis network* (*n* = 33). Fifteen of these *cannabis networks* include all 'friends' the ego receives emotional support from. A few more *complete networks* have an ego that identifies at least one 'friend' as giving practical support (*n* = 43). Thirty-eight *cannabis networks* include between one and ten 'friends'. Fifteen of these *cannabis networks* all include 'friends' that are perceived as giving practical support.

A few **'best friends'** are not perceived as giving emotional or practical support. All but three *complete networks* include at least one 'best friend' giving practical support (*n* = 47). Again, almost all complete networks include between one and five of these 'best friends' in the *cannabis network* (*n* = 43) and in twenty-eight complete networks all alters giving practical support are part of the *cannabis network*. Almost all *complete networks* include at least one 'best friend' as the person giving emotional support (*n* =47). Almost all of these complete networks include at least one of these 'best friends' in the *cannabis network* as well (*n* = 45). All 'best friends' that an ego receives emotional support from are part of twenty-three *cannabis networks*.

The majority of the *complete networks* include at least one **'household member'** that is perceived as giving emotional or practical support. In thirty-four *complete networks*, the ego includes at least one 'household member' that gives emotional support. Sixteen networks include most of these 'household members' in their *cannabis networks*. In eleven of these networks all 'household members' are also part of the *cannabis network*. Thirty-eight *complete networks* include at least one 'household member' as giving practical support. About half of these networks include between one and five 'household members' in their *cannabis network* while in seven *cannabis networks* an ego receives practical support from all 'household members'.

'Family members' give emotional or practical support in about half of the *complete networks* (*n* = 27). In nine *complete networks,* one or two 'family members' give emotional support. Six networks include one or two members in their *cannabis networks* as well while four of them include 'family members' in the *supply network*. Sixteen *complete networks* include at least one alter giving practical support, and nine of these mention one alter in the *cannabis network*.

Almost all **'partners'** are perceived as giving emotional as well as practical support to respondents (*n* = 30). Likewise, most 'partners' that are a member of the *cannabis network* (n = 24) are perceived as giving both types of support. Additionally, two 'partners' that only give one type of support are also part of the *cannabis network*.

A small group of **'other people'** is identified by the ego as giving them support. Two *complete networks* include one or two others as giving emotional support, all these 'other people' are included in the *cannabis network*. In each of these networks one alter is supplied by ego. Three *complete networks* include between one and six 'other people' an ego receives practical support from. Three *cannabis networks* include between one and six of these 'other people' as well.

Seventeen *complete networks* include at least one **'colleague'** who gives emotional or practical support. Emotional support is given by at least one 'colleague' in seven *complete networks*. Four of these networks include at least one 'colleague' in the *cannabis network* and in two *supply networks* the ego has a supply relation with one 'colleague'. Ten *complete networks* refer to one to three 'colleagues' as giving practical support. Five of these networks include one to three 'colleagues' in the *cannabis networks*.

8.3   Strength and social roles in supply networks

8.3.1   Very weak to weak social relations

The 51 alters in supply networks that are in a weak social relation with the ego are mainly identified as 'other people' and 'friends'. About a third of all people in a supply relation with an ego are identified as 'other people' (*n* = 25) are also in a very weak or weak social relation with the ego (*n* = 9). Like in other networks, most alters however are described as 'friends' (*n* = 37). This represents about 16% of all people in a supply relation that are considered 'friends'. Five alters are considered, besides 'friends', 'other people', 'household members', 'colleagues' or 'family member'. Finally, one alter is identified as a 'family member'.

These 51 alters represent about 15% of all people in a supply relation with an ego (*n* = 13%). They are spread over a multitude of networks and tend to belong to male suppliers that do not grow cannabis themselves. For instance, the six alters at level zero are spread over 5 unique *supply networks*. The 13 alters in the first level of closeness is spread over 8 unique *supply networks* while the 32 alters at the second level of closeness are spread along 20 unique *supply networks*. Most of these networks belong to respondents that do

not grow cannabis themselves, are suppliers and are male. However, half of the female respondents include at least one alter at this level and two respondents do not supply cannabis themselves.

The supply mechanisms also seem to be linked to these specific social roles. The table below describes how supply takes place in a particular *supply network* for each social role. For instance, 'other people' are only in 'one-way' supply relations, as are 'family members' and 'colleagues'. 'Friends' on the other hand are in a multitude of supply relations. Four *supply networks* only include 'friends' that are in reciprocated relations, in three networks there are 'friends' in both reciprocated and one-way supply relations, but in 17 networks they are only in one-way supply relations.

At these lowest levels of closeness supply relations are reciprocated as well, although most networks seem to include one-way supply relations that mainly go from ego to alter. The table below also informs about the different mechanisms of supply. The final row (in **bold**) illustrates the different ways alters are in a supply relation with an ego. The majority of these relations seem to be one-way as just four networks only mention reciprocated relations while all other networks mention at least one one-way supply relation. In three supply networks, reciprocated supply relations are combined with one-way supply relations. Most one-way supply relations go from ego to alter (*n* = 19), while fewer networks include alter-to-ego supply relations (*n* = 9).

Supply relations x very weak to weak social relation

Type	Reciprocated				One-way			Total
Combination	only	ego-alter	alter-ego	both	ego-alter	alter-ego	both	
Friend	4[15]	0	3	0	13[16]	3	1	24
Family	0	0	0	0	1	1	0	2
Colleague	0	0	0	0	1	0	0	1
Other people	0	0	0	0	3	5	0	8
Total	**4**	**0**	**3**	**0**	**18**	**9**	**1**	

Table 9 Supply and weak social relation (*n* = 35)

8.3.2   Neither weak nor strong social relations

A quarter of all alters at the third level of closeness are a member of the *supply network* (*n* = 94). Again, most are 'friends' (84%), while a small group of 'other people' (7%), 'best friends' (6%), 'colleagues' (3%) and 'family members' (2%) are also present. At this level

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[15] Some respondents identify one 'friend' also as 'household member'
[16] Some respondents identify one 'friend' also as 'colleague' or 'family member'

of closeness, no 'household members' are involved in a supply relation with the ego. These 94 alters represent 24% of all people in a supply relation with the ego and are spread over 35 *supply networks*. The majority of the female respondents include alters in a supply relation at this level of emotional closeness (*n* = 7), as do about half of the growers (*n* = 12).

The supply mechanisms also seem to be linked to these specific social roles. The table below describes how supply takes place in a particular *supply network* for each social role. Members of the *supply network* at this level are involved in multiple variations of one-way and reciprocated supply relations. All social roles seem to be mainly associated with one-way supply relations. However, unlike the previous level of emotional closeness all of the social roles mentioned are to some extent also associated with reciprocated supply. For instance, in one network 'family members' are in a reciprocated supply relation only.

In comparison to the previous level, more *supply networks* include (only) reciprocated supply relations. However, for the most part, supply relations tend to go one way from ego to alter or one way between ego and one alter while other alters supply to the ego (see table below).

Supply relations x neither weak nor strong social relation

Type	Reciprocated				One-way			Total
Combination	only	ego-alter	alter-ego	both	ego-alter	alter-ego	both	
Friend	2[17]	2	1	3	13[18]	6	7[19]	34
Best friend	0	1	0	0	2	0	0	3
Family	1	0	0	0	0	1	0	2
Colleague	1	0	0	0	1	1	0	3
Other	0	0	0	1	1	0	1	3
Total	**4**	**3**	**1**	**4**	**17**	**8**	**8**	

Table 10 Supply and neither weak nor strong social relations

8.3.3 Strong to very strong social relations

About a hundred alters (*n* = 106), spread over 37 *supply networks*, have a strong social relation with their respective egos (**emotional closeness = 4**). About 30% of all alters who have a strong social relation with an ego are a member of a *supply network*. These *supply networks* include 7 female respondents, three non-suppliers and one sole supplier. Almost all growers (n = 17) have strong social relations with at least one alter they have

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[17] Some respondents identify one 'friend' also as 'family member'
[18] Some respondents identify one 'friend' also as 'other people'
[19] Some respondents identify two 'friends' also as 'other people'

a supply relation with. Almost all of these *supply networks* include at least one 'friend' at this level of closeness who is in a supply relation with the ego (*n* = 37). Sixteen *supply networks* include 'best friends'. A few networks also include other social roles at this level of closeness: 'family members' (*n* = 3), 'household members' (*n* = 3), 'other people' (*n* = 2), 'partners' (*n* = 2) and a 'colleague' (*n* = 1).

The inner circle includes about 30% (*n* = 131, **emotional closeness = 5**) of all alters in a very strong relation in the *supply network*. The largest group of alters is identified as 'best friends' (59%) or 'friends' (37%). About 20% are 'household members' (12%) or 'partners' (11%). 'family members' (3%), 'colleagues' (3%) and 'other people' (2%) are far less present. The alters are spread over 34 *supply networks*. All of these include at least one 'best friend' in a supply relation with the ego. Seventeen *supply networks* include at least one supply relation between the ego and a 'friend' in the inner circle. Thirteen out of 29 'partners' are in a supply relation with an ego, and eleven *supply networks* include at least one 'household member' in their inner circle. To conclude, only two *supply networks* include one or two 'other people' in their inner circle.

Unlike the other levels of emotional closeness, it seems reciprocated supply relations among 'best friends' and 'friends' are more common than one-way supply relations. That said, similar to the other levels of closeness, *supply networks* tend to include all varieties of supply relations. Supply relations, especially those with 'friends', have multiple varieties ranging from only one-way to one-way and reciprocated supply relations (see table on next page).

However, the social role 'partner' seems to be mainly associated with one-way supply relations. Sixteen out of 32 'partners' are in a supply relation with an ego. Fourteen 'partners' are supplied by an ego whereas in four cases an ego is supplied by the 'partner'. Nine male respondents provide cannabis to their female 'partner'. Additionally, three female respondents are provide by their partner with cannabis Conversely, one male respondent is provided by his female 'partner' while one female respondent provides her male partner. and involve female egos being supplied by their male 'partner'. That said, one female ego also supplies cannabis to her male 'partner'.

Supply relations x strong to very strong social relation			
Type	Reciprocated	One-way	Total

Combination	only	ego-alter	alter-ego	both	ego-alter	alter-ego	both	
Friend	9[20]	7[21]	4[22]	4[23]	7[24]	4[25]	6	41
Best friend	12	9	2	3	8	6	1	41
Family	2	0	0	0	3	1	0	6
Colleague	5	0	0	0	1	0	0	6
Other	1	1	0	0	1	0	0	3
Partner	2[26]	0	0	0	10	4[27]	0	16
Household	8	0	0	0	4	3	0	15
Total	**39**	**17**	**6**	**7**	**34**	**18**	**7**	

Table 11 Supply and strong to very strong social relation

8.3.4 Enacted social support

There are more *supply networks* that include 'best friends' who give practical support (*n* = 38) than 'best friends' who give emotional support (*n* = 26). However, those *supply networks* where 'best friends' are perceived as giving emotional support seem to include more reciprocated supply relations. Eleven *supply networks* indeed only have reciprocated supply relations with 'best friends' that the ego receives emotional support from. Twelve of these twenty-six *supply networks* combine both types of supply relations and the remaining three *supply networks* only include one-way supply relations. That said, a third of the thirty-eight *supply networks* with 'best friends' that give practical support only include one-way supply relations (*n* = 15). Seven of these *supply networks* has the ego as sole supplier to this group of 'best friends' (*n* = 7). Equally, seven *supply network* have 'best friends' as sole suppliers to the ego (*n* = 7). The one remaining *supply network* includes 'best friends' that provide cannabis to the ego but the ego also supplies cannabis to other 'best friends'. Besides these fifteen *supply networks*, thirteen additional *supply networks* have only reciprocated supply relations. Finally, ten *supply networks* combine both one-way and reciprocated supply relations among the egos and the 'best friends' who give practical support.

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[20] Some respondents identify one 'friend' also as a 'best friend', 'household member' or 'colleague'
[21] Some respondents identify one or more 'friends' also as 'best friend', 'household member', family member', 'colleague' or 'other people'
[22] Some respondents identify one or more 'friends' also as 'best friend', 'household member', 'family member' or 'other people'
[23] Some respondents identify one 'friend' also as 'best friend'
[24] Some respondents identify one 'friend' also as 'family member'
[25] Some respondents identify one 'friend' also as 'best friend'
[26] Some respondents identify the 'partner' also as 'best friend'
[27] Some respondents identify the 'partner' also as 'best friend' or 'household member'

Reciprocated supply relations are present in *supply networks* with 'friends' giving emotional support (*n* = 28) as much as those that have at least one 'friend' giving practical support (*n* = 33). Twenty-eight networks include 'friends' who are seen as giving emotional support in the *supply network*. Twelve of these networks mention only one-way supply relations. Eight of these twelve *supply networks* have an alter who provides cannabis to the ego (*n* = 8). Nine of these twenty-eight *supply networks* only mention reciprocated supply relations, while seven *supply networks* mention both types of supply relations. About half of the thirty-three *supply networks* including 'friends' that give practical support only include one-way supply relations (*n* =17). Nine of these seventeen *supply networks* include only 'friends' who are supplied by the ego, and eight networks each have four alters supplying the ego with cannabis. Nine of these *supply networks* combine these one-way supply relations with reciprocated supply relations. Seven only have reciprocated supply relations.

Supply relations with 'household members' seem to be mostly reciprocated, and 'household members' in a supply relation seem to give both emotional as well as practical support. In ten *supply networks,* the ego and 'household members' that give emotional support are in a supply relation. This supply relation is reciprocated in most of these networks (*n* = 7). In fifteen *supply networks*, the ego is in a supply relation with one of the 'household members' that gives practical support (*n* = 15). Again, in seven networks this relation is reciprocated. In more than half of these fifteen *supply networks* these 'household members' give both types of support (*n* = 8). In five networks, 'household members' that are in a supply relation give emotional support only. In the two remaining networks, the egos receive only practical support from these alters.

'Partners' that egos receive emotional and/or practical support from, and who are part of the *supply network*, tend to be in a one-way supply relation rather than a reciprocated one. I note that the two 'partners' who are in a reciprocated relation are perceived as giving both emotional as well as practical support.

Few of the 'family members', 'colleagues' and 'other people' that give emotional or practical support are also involved in a supply relation with the ego. For instance, four *supply networks* include 'family members' giving emotional support. In one network this supply relation is reciprocated. Five *supply networks* include one 'family member' giving practical support. In three of these networks, supply is reciprocated. In three *supply networks* 'colleagues' give either emotional support only (in one case) or both emotional

and practical support (in the other two cases). Supply relations are in the first case one-way, while in the two other cases they are reciprocated. 'other people'**,** to conclude, are perceived as giving emotional or practical support in three *supply networks* as well. All three networks include at least one other person that gives practical support in their *supply network*. In one network this supply relation is reciprocated. All of these *supply networks* include seven 'other people' in total who give practical support and supply egos with cannabis. Three of these 'other people' give both practical and emotional support. These three are labelled 'best friends' in two networks and 'friend' in one network. None of these 'other people' give emotional support only.

8.4 Variation in strength

8.4.1 Variation in strength across 50 *networks*

At the network level, alters of the *complete network* on average receive a 3.3 (*MD* = 3.3, *SD* = .5). A Pearson's r correlation was computed to assess the relation of the size of one's personal network and the average level of closeness. The size of the *complete network* did not seem to influence this average (*r* = -.076, *n* = 50, *p*= .6). The lowest score, on average was 1.2 (*n* = 30), and the strongest relations on average are found in one network in which alters scored on average 4.5 (*n* = 27).

The average closeness between ego and alter seems higher in *cannabis networks* than in *complete networks* (*M* = 3.5, *MD* = 3.6, *SD* = .7). This corresponds with the overall finding that an ego tends to have stronger relations with alters who are present when the ego uses cannabis. However, the difference has a fairly high probability of being caused by coincidence. Network size seems to be associated with the average strength of the relations in a particular network. Larger *cannabis networks* have a lower closeness score on average than smaller *cannabis networks* (*r* = -.47, *n* = 50, *p* = .01).

The *supply networks* seem to be characterised by the strongest relations between ego and alter (*M* = 3.8, *MD* = 3.8, *SD* = .6). *Supply networks* are smaller in size than *cannabis networks* but only those who include 9 or more alters (*n* = 19) seem to have a lower level of closeness (*M* = 3.6, *MD* = 3.5, *SD* = .4). A Pearson's r correlation was computed to analyse the relation between the size of the *supply network* and the average scores on closeness. Once again larger *supply networks* seem to have a lower average score than smaller *supply networks* (*r* = -.3, *n* = 50, *p* = .03).

On average, about one-third of the *complete network* was perceived as giving practical support to the ego (M = 33%, MD = 33%, SD = 17%). A Pearson's r correlation was computed to assess the relation of the size of one's personal network and the average level of emotional support (r = -.13, n = 50, p = .23) or practical support (r = -.13, n = 50, p = .34). The size of the *complete network* did not seem to influence this average (r = -.076, n = 50, p= .6). The smallest proportion of alters giving practical support to an ego is 7%; the largest practical support network encompasses 96% of the *complete network*. Five networks include half of all alters or more. About a fifth of the *complete network* gives emotional support to the ego (M = 23%, MD = 22%, SD = 16%). One *complete network* does not include any alter giving emotional support to the ego. In two networks, at least half of the members gave emotional support to the ego.

On average, about one-third of the members of the *cannabis network* give practical support to the ego (M = 29%, MD = 24%, SD = 16%). Since at this level network size does tend to influence the level of practical (r = -.33, n = 50, p = .02) or emotional support (r = -.775, n = 50, p = 0) one receives, my findings remain tentative. One network does not have any alters giving practical support, and in four networks at least half of all alters give social support (max = 80%). On average, the proportion of alters giving emotional support is higher than those giving practical support. On average respondents indicated about 34% of the *cannabis network* give them emotional support (M = 28%, MD = 24%, SD = 26%). This is higher than in the complete network. The smallest proportion of alters giving emotional support is 5%; the largest encompasses the complete *cannabis network*. Four of the *cannabis networks* include 50% or more of all alters.

The *supply network* includes on average the highest proportion of alters giving practical support (M = 52%, MD = 50%, SD = 26%). I can compare different levels of practical support to *supply networks* because network size does not seem to influence the outcome (r = -.23, n = 50, p = .07). Two networks do not include any alter giving practical support, while 56% of the *supply networks* include 50% or more alters with five networks including all alters. *Supply networks* on average encompass the largest proportion of alters giving an ego emotional support (M = 40%, MD = 33%, SD = 27%). Seven networks do not include any alter giving emotional support whereas 36% include at least half of their *supply network,* with three networks including every member of the *supply network*. However, my findings are tentative because the difference in proportions of emotional support might be influenced by the size of the *supply network* (r = -.29, n = 50, p = .04).

8.4.2   Variation in strength across *relations*

Looking at the dyadic level[28], differences in closeness seem to be associated with being a member of the *cannabis network*. Members of a *cannabis network* seem closer to an ego than those alters who are not members. An independent t-test was conducted to analyse the difference in closeness between members of the *cannabis network*. There was a significant difference in closeness between alters who are not part of the *cannabis network* (M = 3.13, SD = .5) and members of the *cannabis network* (M = 3.37, SD = .05) (t (1414) = 3.2, p = .001). This indicates that on average, egos consider members of the *cannabis network* to be closer to them than people who are not members.

Moreover, members of the *supply network* seem to be closer to an ego than alters who are not members. An independent t-test was conducted to analyse the difference in means of scores on closeness between alters that had a supply relation with an ego and alters who did not. There was a significant difference between non-supplying alters (M = 3.09, SD = .04) and supplying (M = 3.74, SD = .06) alters (t (805) = 8.6, p = .0). This means alters outside a supply relation are on average less close to an ego than those who have a supply relation with an ego.

Not being a member of the *cannabis network* or the *supply network* and being male seems to be positively related to giving practical support. However, this relation is very weak. A 2x2 Fisher's exact test was conducted to analyse whether the perception of practical support was related to being a member of the *cannabis network*, being a member of the *supply network* and gender. Egos perceive alters who are not in the *cannabis network* (p = .002, φ = .084), who are not a member of the *supply network* (p = 0, φ = .2) or who are male (p =.003, φ = -.08) as giving more practical support than those who are a member of the cannabis or *supply network* or those who are female.

Giving emotional support seems to be positively related to being a member of the *cannabis network*, being a supplier and being male. Again these relations are very weak. A 2x2 Fisher's exact test was conducted to analyse whether the perception of emotional support was related to being a member of the *cannabis network*, being a member of the *supply network* and gender. An ego perceives members of the *cannabis network* (p = 0, φ = .09), members of the *supply network* (p = 0, φ = .16) or male alters (p = 0, φ = .143) as giving

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[28] The dyadic level means I do not look at networks but only at the relations between ego and alter. In my study more than 35,000 relations were measured. This entails all relations between ego and alter as well as among alters. In total 5,664 relations were analysed to describe the link between different types of strength with alter characteristics.

more emotional support than those alters who are not a member of the cannabis or the *supply network* or those who are female.

Alters who give emotional support seem to be closer to an ego than those who do not give this type of support. Additionally, those who give practical support are also closer to an ego than those who do not. To analyse the difference between the average score for closeness of alters who give emotional support and those who do not an independent t-test was conducted. There was a significant difference between those who also gave emotional support (M = 2.9, SD = .04) and those who did not (M = 4.45, SD = .048). This means alters who give emotional support are closer to an ego than those who do not (t (841) = 24.93, p = 0). There was also a significant difference between those who gave practical support (M = 2.86, SD = .04) and those who did not (M = 4.1, SD = .05). This means alters who give practical support are closer to an ego than those who do not (t (1063) = 18.48, p = 0).

A one-way ANOVA was conducted to analyse whether the average closeness is different among people who give no support versus those who give either emotional or practical support or both. There was a significant effect on the average closeness at the p < .05 level between the three groups (F (2, 1413) = 289.52, p = 0). Post-hoc comparisons using the Bonferroni test indicate that those who do not offer support have on average the lowest level of closeness (M = 2.67, SD = .04). The group offering either practical or emotional support (M = 3.85, SD = .61) scores higher than the first group but lower than the group offering both forms of support (M = 4.55, SD = .06).

User experience and gender of alters is not associated with different averages of closeness. There is no significant difference between non-using (M = 3.35, SD = .06) and using alters (M = 3.2, SD = .05) (t (1363) = 1.9, p = .052). Moreover, there is no significant difference between male (M = 3.2, SD = .04) alters and female (M = 3.3, SD = .07) alters (t (1412) = 1.1, p = .26). This indicates that egos do not consider male alters to be closer to them than female alters. Being a user does not relate to giving practical support (p = .28) or giving emotional support (p = .8).

8.4.3   Strength and supply mechanisms at network level

About half the *supply networks* do not have any very weak to weak social relations (emotional closeness = 0, 1 or 2) (*n* = 24). Half of these supply networks have medium as well as strong social relations (*n* = 12). However, most of the people in a supply relation with an ego are in a strong to very strong social relation. Moreover, in eight of these

twenty-four networks the ego only has strong to very strong social relations with alters in the *supply network*. In four more *supply networks* the ego has a tendency to describe these suppliers in a neither weak nor strong social relation rather than strong to very strong social relation.

The other half of the *supply networks* include all possible variations of strength in social relations with alters that are in a supply relation with an ego (n = 26). Most of these networks include all ranges of social relations. In all but two networks, supply relations are strong to very strong (n = 24). In two networks relations with people in supply relation are predominantly in the middle group or even weak, rather than strong.

Though these groups are seemingly different in terms of strength, they do not seem to vary along grower or gender lines, but only along type of supplier. About half of the female respondents (n = 6) and little less than half of the growers have supply networks that include all sorts of social relations (n = 10). Reversely, half of the female respondents (n = 5) and little more than half of the growers (n = 12) have supply networks that do not include weak social relations. That said, only one of the four non-suppliers has a supply network that mainly includes strong social relations. The other three are in more varied supply networks.

All supply mechanisms are equally present in both groups. About 40% of the 383 alters that are in a supply relation with an ego is part of these twenty-four supply networks that do not include any weak social relations (n = 147). The majority of these alters are in a one-way supply relation with an ego, with an ego being the main supplier (43%). A slightly smaller proportion of these supply relations are reciprocated (36%) while about a fifth go one-way from alter to ego (19%). Two-thirds of all people in a supply relation are in networks that have social relations ranging from very weak to very strong (n = 237). A bit more than a third is supplied by an ego (38%), a third supplies to an ego (31%) and another third is in a reciprocated supply relation with an ego (29%).

8.5 Conclusion

8.5.1 Measures of strength as expressions of social relations

As network literature suggests, the findings in this chapter seem to indicate that a study of the *quality* in addition to the *presence* of social relations captures the way social supply is embedded in its wider setting more fully (e.g. Granovetter, 1992; Nahapiet & Ghoshal, 1998; Marsden & Campbell, 1984; Crossley, 2010). Social suppliers are often described as

'friends', 'best friends', 'kin' and 'acquaintances'(Coomber & Turnbull, 2007; Harrison et al., 2007; Hough et al., 2003; Parker, 2000; Potter, 2009; Werse, 2008). To a network researcher these concepts refer to two types of relations. Whereas 'friends' and 'kin' refer to core or very strong relations, the more general term 'acquaintances' or 'non-strangers' includes a wide range of peripheral relations with alters that show little similarity in attributes with the ego (Granovetter, 1973). However, as is further described below, the findings illustrate how the perception of the strength of a social relation is not always in line with the social role used to identify these alters.

The wide range of different levels of emotional closeness attributed to 'friends' is a first illustration of how social roles might not be able to capture the specific nature of *social* supply. Social supply studies often refer to suppliers in terms of 'friends'. Though Crossley (2010) suggests this social role mainly refers to strong or very strong social relations, my findings indicate 'friends' are found at all levels of emotional closeness and in almost all *complete networks*. It thus seems that this social role is used to identify alters in all strengths of social relation. *Cannabis networks* and *supply networks* include 'friends' at all levels of closeness as well but most of these alters are in a neither weak nor strong or strong social relations with the ego. In other words, in *cannabis* and *supply networks* there seems to be a tendency not to include 'friends' in the 'innermost' circle. The variation in levels of emotional closeness attributed to the social role 'friend' furthers confirms the subjective definitions of 'friends' that were found in chapter 7. There I found that some respondents consider all alters as 'friends', while others make a sharp distinction between 'friends' and 'other people'.

The social role 'best friend' illustrates how social roles might be linked to the setting one is talking about, as well as the temporality of social roles. Social suppliers are also identified as 'best friends', a social role that according to network literature is used to describe core social relations (Crossley, 2010). Respondents indeed associate this social role with strong and very strong social relations. However, I also found 'best friends' that are in a neither weak nor strong or even a weak social relation with an ego. This suggests that some alters are considered to be 'best friends' in general but are at the time of the interview there is a 'neither strong nor weak' social relation or even a weak relation with them. Most *complete, cannabis* and *supply networks* indeed mainly include 'best friends' the ego has a strong to very strong social relation with. The definition of this social role as

such reflects the temporal character of being defined as a 'dealer'. For instance in chapter 11 I find shared definitions of 'dealing' are applied in a flexible way.

The analysis of social roles that reflect kin relations (i.e. 'household members' and 'family members') further illustrates the importance of including setting when looking at strength. Though 'kin' are found in all echelons of emotional closeness, in most *supply networks* they are in the inner circle. Likewise, most *complete networks* also describe them as part of strong to very strong social relations. However, a fifth of the *complete networks* also mention 'household members' in less strong relations with ego. *Cannabis networks* mainly include 'household members' the ego has a very strong social relation with, although more than a fifth of the *cannabis networks* also encompass 'household members' in strong, 'strong nor weak' or weak social relations with the ego.

The variety of strength attributed to alters in a kin relation with an ego might be explained by different understandings of a 'family bond' versus a 'friendship bond'. In chapter 7 I describe examples of multiple role definition and subjective interpretation of friendship-related social roles. My study focuses on the social relation that exists together with the 'family bond'. In other words, I do not question the family relation but only the relation that is built while doing leisure time activities together. This social relation might take the form of a 'best friend' but in some cases can also be more 'acquaintance'-like. This does not necessarily mean the 'family bond' is weak as well. For instance, a respondent's mother might not be important when talking about general leisure time, but might be if I were to study for instance relations between 'family members'. This finding reflects the complex considerations respondents make when asked to describe alters through social roles. It shows how the subjective interpretation of friendship might influence how 'family members' and 'household members' are perceived as well.

Social supply literature also identifies social suppliers as 'acquaintances'. The social role of 'other people' is assumed to capture mainly weak social relations, or 'acquaintances' (Crossley, 2010; Granovetter, 1973). Indeed, 'other people' are predominantly situated at the lowest levels of closeness in *complete* and *cannabis networks.* However, when these alters are part of the *supply network*; they tend to be in a strong social relation, and thus not in an 'acquaintanceship' with the ego. Network analysts suggest weak social relations are what characterise these 'acquaintances'. If I look at the social roles used to identify alters in a weak social relation, I find these 'acquaintances' in my study include 'friends', 'other people', 'colleagues' but also 'family members' or 'household members'. My study,

aside from the category 'other people', did not include any category 'acquaintances'. During the test phase respondents did not remark on a lack in possibilities for choosing social roles. The above findings describe how this 'acquaintances', much like the pre-defined social roles, are also defined in a subjective way.

The analysis of strength shows how different social roles might be used to identify alters of equal emotional closeness. For instance, the two additional social roles, 'partners' and 'colleagues', reflect in the case of 'partners' a social relation similar to 'best friends', and in the case of 'colleagues' that of 'other people'. 'Partners', like 'best friends', are perceived as very close to the ego in most networks, as they are part of strong or very strong social relations with the ego. Almost all 'partners' are placed in the innermost circle in the *complete*, *cannabis* and *supply network*. Conversely, 'colleagues', much like 'other people', are situated in the lowest levels of closeness in most *complete networks*. An ego's relation with these alters in that network ranges from very weak to 'neither strong nor weak'. However, some networks include them in the two innermost circles, making some 'colleagues' part of strong or even very strong social relations with the ego. For instance, as I found for 'other people', members of the cannabis and supply networks identified as 'colleagues' also tend be part of strong to very strong social relations.

8.5.2   Interaction between supply and social relations

The findings in this chapter illustrate the complex interaction between overlapping yet different network domains (Mische & White, 1998). Parker et al. (2002) situated the conceptualisation of social supply within a broader reflection on cannabis use as *normalised* within wider society. The decision to use is the result of a cost-benefit analysis, much like one would do when deciding to take up a new sport (Measham & Shiner, 2009; Parker et al., 1999). (see chapter 3). As Potter (2009) argues, one could see social supply as an expression of this 'normality'. Following Potter's line of reasoning, 'social supply' could then argued to be decided upon like other 'normal' leisure time activities, namely through an individual cost-benefit analysis.

The findings in this chapter for instance further indicate recreational cannabis use seems to be socially accommodated to a certain extent. Membership of *cannabis networks* seems to be more important in the study of strength of social relations than the fact people use cannabis or not. As described in chapter 7, *cannabis networks* often include at least some alters who do not use cannabis but are present when an ego uses cannabis. In this chapter I found alters' use of cannabis does not seem to relate to the strength of the social relation.

It seems a particular level of emotional closeness is not associated with the individual attribute 'use'. Instead, emotional closeness seems to be linked to alters being part of the network domain where cannabis plays a role, regardless of alters' use. This finding suggests these non-users have a similarly strong social relation with egos than those who do use cannabis.

My findings suggest that supply as well as use, although situated within general leisure time, is part of a network domain consisting of particularly emotionally close social relations. This seems more in line with subcultural or social learning theories (Cullen & Agnew, 2005; Goode, 2007; Gourley, 2004) than what I would expect based on the above-described normalisation process. Egos have stronger social relations with members of *cannabis networks* than with alters outside of these networks. Furthermore, social relations with alters who are part of a supply relation with an ego also seem stronger than with those who are not. The results also indicate that members of *cannabis networks* and suppliers are more likely to give emotional or practical support. That said, the findings considering enacted social support need to be interpreted with caution as the testing was very weak.

The results indicate supply mechanisms are in close interaction with social relations. Normalisation studies describe social supply in terms of sorting 'friends' out (Aldridge et al., 2011; Parker, 2000). This sorting out includes a form of 'sharing' through which friendship is built and sustained. This supply is part of informal rules that create a wider culture of reciprocated supply (Mjåland, 2014). Across networks, very strong to strong social relations tend to go along with reciprocated supply that goes from an ego and an alter as well as from that same alter to an ego. A weaker social relation tends to be linked to *one-way* supply relations, which go from an ego to alter(s) or alter(s) to an ego. This does not mean *supply networks* with no weak social relations only include reciprocated supply relations; most of them also include one-way supply. The mere presence of a strong social relation in other words is not sufficient in explain the way supply is structured. This finding raises questions about how the broader network plays a role in these supply mechanisms. For instance, Morselli et al. (2007) put supply in a collaborative setting where people 'choose' to invest in social relations in order to protect themselves from getting apprehended or having to do 'risky' things like contacting a dealer. Chapter 9 further explores how *supply networks* are structured in order to gain further insight into this collaborative setting.

8.5.3   Gender and strength

In chapter 7, I found the presence of gender heterophily among female respondents might confirm male domination concerning supply (Dahl & Sandberg, 2015; Grundetjern & Sandberg, 2012). In this chapter I indeed find that almost all female respondents are on the receiving side of the supply relation. The role of the 'partner' becomes apparent here as about half of the female respondents are in a supply relation with this partner. Most of them are supplied by their male 'partner', while a few provide for their 'partner' themselves. Half of the female respondents are not in a supply relation with their 'partner', and get their cannabis mainly from other sources that are similar to those men use. As such, these female respondents indicate they obtain cannabis through 'friends' and 'best friends'. In some cases they include 'household members' or 'family members' as well.

In acting upon their masculinity, I note that female respondents seem to take on a similar position to male respondents. Gender literature suggests female suppliers tend to have social networks that are more kin-oriented, while male suppliers are more likely to include more non-kin and co-workers (Fischer, 1982; Marsden, 1987). However, descriptive analysis indicates that female respondents' supply networks are composed like those of their male counterparts. Unlike gender literature suggests, female respondents seem to include a similar amount of 'kin' in their supply networks as male respondents. Female respondents do not tend to maintain stronger social relations with alters in their social network, unlike the literature suggests (Fisher, 1982; Marsden, 1987). They also do not seem to be in closer or more reciprocated supply relations than men. For instance, half of the female respondents include weak social relations in their supply network. This might suggest that their position in cannabis markets has become more equal throughout the years (see also chapter 12).

Chapter 9   Network structure and supply

9.1   Introduction

Network studies into drug markets and cannabis use that include structural measures suggest *open* structures create more opportunities for control or to find new resources while *closed* structures are key in developing shared meanings of for instance cannabis use (see chapter 4). A network study in drug trafficking further suggests networks of 'dealers' tend to prioritise efficiency over security (Morselli et al., 2007). *Closed* networks are more associated with friendship networks. Such networks might put security first in order to prevent the loss of friendship and prevent being detected. Reversely, *open* networks, like for instance the one between a traditional 'dealer' and their 'client', prioritise efficiency. Though this creates opportunities to address multiple sources quickly, the risk of getting caught heightens because these loose partnerships are not built on strong friendship bonds that might offer more protection from detection.

In this chapter I explore to what extent personal networks in which cannabis use is present are *closed*, meaning at least two- thirds of the network knows each other, or otherwise *open*, meaning less than one-third of the network knows each other (see chapter 6, Wellman, 1988; Wister & Avison, 1982). My study builds the perception of the network rather than trying to reveal the *true* network.[29] As such I aim to look whether the suggestions of Morselli et al. (2007) about drug trafficking networks are reflected at the individual level. The first section explores *complete networks* (see §9.2). More specifically, I look into variation in size (see §9.2.1) and types of structures found (see §9.2.2). The second section focuses on the structure of *cannabis networks* (see §9.2). The extent to which this network is integrally a part of the wider network (see §9.2.1) as well as the types of structures are explored (see §9.2.2). In a third section the different ways *supply networks* are structured are presented (see §9.4). Besides the general measures (see §9.4.1), three main structures are discussed (see §9.4.2). Section 9.4.3 analyses how reciprocity is embedded in the structure of these *supply networks.*

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[29] In order to study structure further one should get information from all alters that are part of the networks as well. This is necessary to measure the extent alters know each other from their specific point of view, rather than building upon the ego's perception only. This would require whole network analysis of a predefined group, which is not our aim (see chapter 4 & chapter 5).

9.2 Complete networks

9.2.1 Structural holes: size, density and constraint

Respondents were asked to name exactly 25 people they spend their leisure time with. The second name generator prompted respondents to name all the people that were present when they had used cannabis during the past six months. This free-call name generator gives insight into the size of the *cannabis network* as well as how this *cannabis network* relates to the leisure time network. In total 1,418 unique alters were named. The actual size of *complete networks* varies between 25 and 38 alters (*M* = 28, *MD* = 28, *SD* = 4). This means respondents added new alters in the second name generator, or even later on, in the network map. This suggests some alters are perceived as members of the *cannabis network* and/or *supply network* rather than members of the leisure time network.

Density[30] in my study is associated with actual size and efficiency[31]: while density is lower in larger networks, efficiency is lower in dense networks. The size of *complete networks* varies between 25 and 33 alters. As expected, overall density within all *complete networks* is low: between 8% and 36% of the *complete network* is fully connected to each other (*M* = 20%, *MD* = 21%, *SD* = 8%). As expected, I found that the larger a network, the lower the overall density (*r* = -.351, *p* = .00). Furthermore, the larger a network is, the more efficient it is (*r* = .395, *p* = .01). However, initial correlation suggests lower density is associated with a higher efficiency score (*r* = -.972, *p* = .00).

The level of constraint (*M* = .125, *MD* = .125, *SD* = .024) as well as hierarchy (*M* = .059, *MD* = .055, *SD* = .030) is higher when density is higher[32]. Constraint and hierarchy indicate the extent to which an ego is confined in their behaviour by the other members of the *complete network* (see chapter 6). Constraint as a measure reflects density, size and hierarchy. It is no surprise then to find that density is correlated to constraint and

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[30] Density measures the percentage of alters a specific alter is connected with (see also §6.8). For instance, if all alters know all alters in the complete network, the density of that network would be 1. This measure is sensitive to size. This measure counts the extent to which alters are connected to each other, apart from the ego. Larger networks are more difficult to maintain, so these networks tend to have a lower density than smaller networks (Borgatti, Everett, & Johnson, 2013; Wellman, 2001).

[31] Efficiency measures the yield per alter, or the average proportion of the network reached through one alter (see also §6.8).

[32] Constraint and hierarchy measure the extent to which alters confine an ego's behaviour. Constraint is higher in small networks, and if contacts are highly connected (either directly like in a dense network, or indirectly through a mutual contact, such as in a hierarchical network) (see also §6.8).

hierarchy. Constraint is higher when density is higher (r = .555, p = .00). A higher density is in *complete networks* also related to a lower hierarchy (r = -.544, p = .00). This suggests, as I described in chapter 6, that in dense networks constraint is exerted by the whole group. In that case, hierarchy levels will be low. In the opposite case, if a network scores higher in hierarchy, constraint is provided by a single actor rather than divided among all group members. As constraint as a measure is influenced by the size of the networks, one can argue the correlation found might be explained by a difference in actual size.

9.2.2   Type of structure: open

All of the *complete networks* are open, meaning in none of these complete networks do more than one-thirds of the alters know each other. On average one-fifth of the complete network knows each other (M = 21%, MD = 20%, SD = 8%), with density ranging from 8% to 36%. This indicates all are less dense than I would expect based on friendship network research, which suggest that in friendship networks about one-third of all alters knows each other (see chapter 6, Wister & Avison, 1982). This might have to do with the large size of the *complete network* (see section above). That said, I note some networks include more parts that are connected densely than others. This distinction is illustrated by a discussion of structures present in those networks with a density lower than average (density ≤ 20%) and those with a density higher than average (density > 20%).

Complete networks with the lowest levels of density (8% to 20%) are associated with the highest levels of efficiency (between 72% and 86%) and tend to be shaped more like a star. These networks belong to five females, nineteen males, nine growers, 24 suppliers, two non-suppliers and one sole supplier. The size of these complete networks varies between 25 and 38 (see section above). This suggests also 'smaller' complete networks have an open structure.

For instance in R22, a male sole supplier has a network of size 25, characterised by an open structure. Alters in his network on average know about one-tenth of the other alters (density = 9%). Efficiency is very high (85%), meaning that few alters connect overlapping groups of alters. The effective size is 21, which is close to the actual size. Constraint in this complete network (.108) is lower than average and so is the score for hierarchy (.03). This suggests this network is not hierarchically structured. The picture below resembles a star, with the ego having the potential to broker access. The lower half of the network is only connected with the upper half of the network through the ego. All male nodes are coloured red, and all female alters are coloured blue. A square-shaped node represents a cannabis

user, and a downward triangle is someone who does not use cannabis. Upward triangles represent alters who the ego was not sure whether they use cannabis.
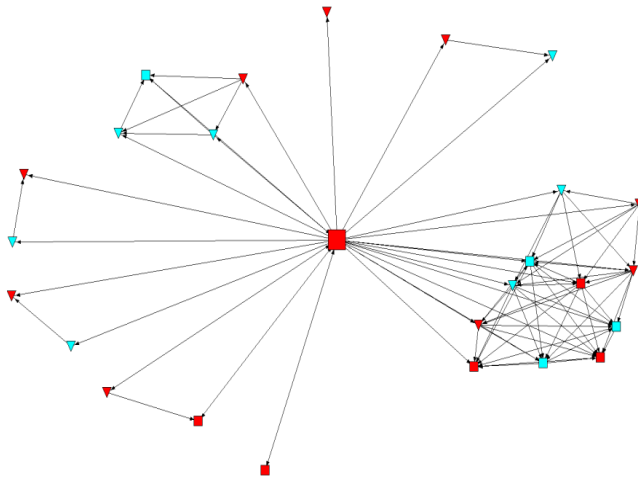
Figure 2 Complete network with an open structure (R22, M/SoleS/NG, *n* = 25)

9.3   Cannabis networks

9.3.1   Overlap and structural holes

Respondents include between a third and 90% of the *complete network* in their *cannabis network*. *Cannabis networks* are the result of a free recall name generator, so size is more subject to variation in comparison to the obliged 25 names that were given in the first name generator. The number of alters that are present when the ego uses cannabis varies between 5 and 30 people (*M* = 16, *MD* = 15, *SD* = 6). A quarter of the *cannabis networks* comprises 11 alters or less, and a quarter is larger than 20 alters. This suggests these networks form in some cases a separate subgroup within an ego's complete network. Ego is in that case part of multiple network domains at the same time. In other cases *cannabis networks* even almost completely overlap with complete networks. This suggests an ego's social world only includes relations which are characterised by cannabis use and/or supply.

On average the *cannabis network* includes about half of the members of the *complete network* (53%). The part of the complete network that overlaps with the *cannabis networks* varies between 19% and 93%. A quarter of the respondents add less than 44% of the alters that were initially mentioned as members of the *cannabis network*. Another

quarter of the respondents include 66% or more alters twice. This suggests that respondents perceive the alters they interact with in their leisure time to be a wider network than those alters who are present when they use cannabis. At the two ends of the continuum there is the network of a male grower where few alters are mentioned twice (19%) and the network of a male sole supplier, in which case almost all alters are part of the *cannabis network*.

Using cannabis together is seen by an ego as something different than knowing each other. Members of the *cannabis network* however do not tend to know all other members and even less of them are likely to use together. Members of these *cannabis networks* on average know more than two-thirds of the other members of the *cannabis networks* (*M* = 68%, *MD* = 73%, *SD* = 21%). However, on average members of the *cannabis network* use cannabis together with about half of the members they know (*M* = 34%, *MD* = 37%, *SD* = 11%)[33].

Cannabis use and leisure time in the personal networks under study seem to a certain extent separated from each other. About a quarter of all members of the *cannabis networks* are not associated with leisure time activities (see also above) (27%) [34]. These alters are spread over 33 *cannabis networks*, including between 7% and 69% alters that are only associated with cannabis use rather than leisure time (*M* = 26%, *MD* = 21%, *SD* = 15%). Although density and efficiency are not influenced by size, this finding suggests that cannabis use by the respondents is considered different from leisure time to a certain extent. However, as size does not seem to influence density and efficiency measures, the extent to which these alters influence structure might be quite limited.

As in *complete networks,* efficiency and density are negatively correlated; however unlike *complete networks* the actual size does not seem to influence measures of density nor efficiency. *Cannabis networks* are on average smaller than complete networks (see above), which would explain why density on average is higher (*M* = 50%, *MD* = 51%, *SD* = 23%). However, in-between *cannabis networks*, actual size does not seem to influence the

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[33] Across all networks, without taking size into account, I found a similar difference. Members of cannabis networks seem to know about half of the other members. However, they use together with only a quarter of all members. This results in a similar difference: alters of cannabis networks seem to use together with only half of the other members.

[34] The first name generator explicitly asks the ego to only mention alters who they associate with *leisure time activities.* These members of the *cannabis network* are thus part of the *complete network,* including all alters mentioned at any time during the interview but not of the group of alters mentioned in the first name generator.

measurement of density (*r* =-.057, *p* = .611) or efficiency (*r* = .038, *p* = .864). This indicates that differences in density found in *cannabis networks* are likely not caused by differences in size. As with *complete networks*, efficiency and density scores of the first question are negatively correlated (*r* = -.941, *p* = .00). A lower density goes together with a higher efficiency and vice versa.

Cannabis networks tend to have higher levels of constraint, which is organised in a single actor than divided among the whole group of members. That said, overall levels of hierarchy (*M* = .04, *MD* = .04, *SD* = .003) and constraint (*M* = .25, *MD* = .24, *SD* = .13) are really low, which is most likely due to the large size of the networks (*M* = 16, *MD* = 15, *SD* = 6). Constraint in general is correlated positively to density (*r* =.542, *p* = .00) while hierarchy shows a negative correlation (*r* =-.669, *p* = .00). These findings are in line with networks that tend to be densely-knit rather than openly structured and where the group rather than a single actor expresses constraint. However, a large number of *cannabis networks* have a density score between 30% and 36%, meaning about a third of the *cannabis network* know each other. This kind of density is found in sparsely-knit networks. It is in these *cannabis networks* that hierarchy scores are the highest, suggesting constraint tends to through a single actor(s) rather than a group.

9.3.2   Open, in-between and closed structures

Unlike *complete networks, cannabis networks* are characterised by three types of structures: open, in-between, and closed. I take the same points of reference as I did with *complete networks* to distinguish closed from open networks. This suggests *cannabis networks* are not necessarily structured as friendship networks as well. Fifteen *cannabis networks* are densely-knit (density = 67% or higher). The other thirty cannabis networks either are sparsely-knit (*n* = 20) or are somewhere in-between (*n* = 15, between one- and two-thirds of the alters know each other).

Similar to the *complete networks*, the largest group of *cannabis networks* has an open structure (*n* = 20). These networks are characterised by the lowest density (between 8% and 36%) and the highest efficiency scores (between 68% and 93%). This group of *cannabis networks* includes four female respondents, seven growers and two non-suppliers. These networks are loosely structured and have a lot of structural holes, which provide ample opportunities for the ego to find access to different groups of users on the one hand, but also provides some security for his or her 'friends' in the face of apprehension. In about half of these *cannabis networks,* the ego added extra alters in the

second name generator (see chapter 6). This suggests these alters are mainly associated with substance use, and less with leisure-time activities.

For instance, the one female supplier who includes a lot of 'other people' in her personal network has a *cannabis network* with an open structure (see chapters 7 and 12). The *cannabis network* (*n* = 14) of this female supplier takes up half of her personal network (*n* = 28). Efficiency in her *cannabis network* is high (efficiency = 84%), and so is effective size (*n* = 12). This suggests the ego needs to talk to almost every single individual if she wants to reach the whole *cannabis network*. Furthermore, few alters use together with other members of the *cannabis network* (density = 8%). Constraint (.22) is about average while hierarchy (.10) is double that of average. This suggests her *cannabis network* has an open structure, where the little constraint that is present is rather concentrated in single alters than divided among all alters. Moreover, as the figure below shows, this open-structured network takes the shape of a star. In the bottom-right corner of the figure, a small group of five alters seems to be more connected to each other. This group of alters are connected by one of the few alters that is not labelled 'other people'. This male cannabis user (coloured in green) connects two female and two male cannabis users:
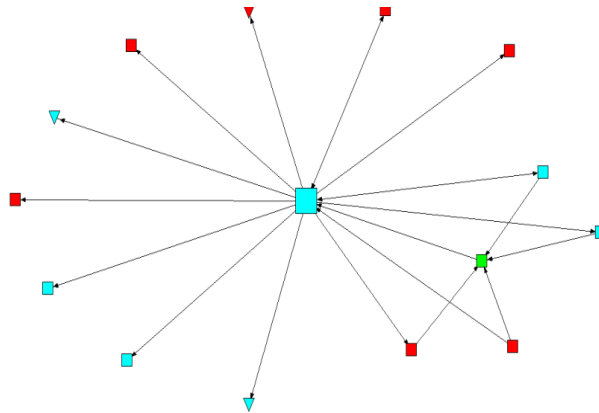
Figure 3 Cannabis network with an open structure (R26, F/S/NG, *n* = 14)

The second group of *cannabis networks* has a closed structure (*n* = 15). These *cannabis networks* are characterised by the highest density (between 67% and 93% of the network knows each other) and the lowest efficiency scores (between 16% and 41%). This group of nineteen *cannabis networks* combines five female respondents, nine growers and one non-supplier. A combination of these scores suggests these particular groups are more

tightly-knit and closed. Though this prohibits the ego from accessing new ways to procure cannabis, these networks might create longstanding friendships characterised by systems of favours for instance. That said, none of these networks are 'fully' connected, which suggests respondents do tend to include some loosely connected alters as well.

For instance, one of these closed networks belongs to a male non-supplier. He has a *cannabis network* that includes about half of the 25 alters that are a member of the complete network (*n* =11). No alters were added during the second name generator. Almost all of these alters know each other (density = 93%). That said, these eleven alters on average use together with about half of the other members of the *cannabis network* (density = 46%). Effective size approaches 1 (effective size = 2). This suggests almost any alter can reach any other alter in the *cannabis network*. This network is not efficiently organised as only 16% of these alters can be considered non-redundant. Constraint and hierarchy measures further inform that constraint in this network is higher than average (constraint =.35) but divided among all alters rather than concentrated in single alters (hierarchy = 0).The picture below sketches this tightly-knit network. This network is meshed, with a lot of alters connecting other alters:
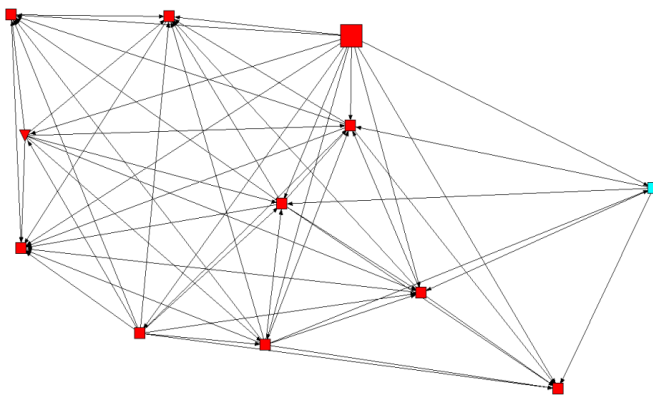
Figure 4 Cannabis network with a closed structure (R6, M/NS/NG, *n* = 11)

A final group of *cannabis networks* is 'somewhere in-between' (*n* = 15): density ranges from 36% to 66% while efficiency is between 44% to 66%). Between one-third and two-thirds of the *cannabis networks* know each other, creating some parts of the network that are well-connected or tightly-knit. But, on the other hand, between half and close to three-quarters of the *cannabis networks* is redundant, leaving a part of the network usable for

finding other opportunities. This mixture of goals is found among a group of seventeen *cannabis networks.* Two belong to female respondents, one to a non-supplier (on the edge with the low density), and only four belong to growers. This group seems to include many who have a *cannabis network* consisting of small groups of people that are well connected among themselves but not between each other.

For example, one female supplier has a *cannabis network* (n = 14) that includes over half the members of her complete network (n = 26) (see next page). One alter was added in the second name generator. Two-thirds of the *cannabis network* knows each other (density = 60%). Alters in this *cannabis networks* use cannabis together with about a third of the other members (density = 30%). Efficiency is higher than in the group I just described, as on average 44% of the alters can be reached through one alter. Effective size confirms this finding as about six alters are reached through primary contacts. Constraint (.22) and hierarchy (.05) are around average.
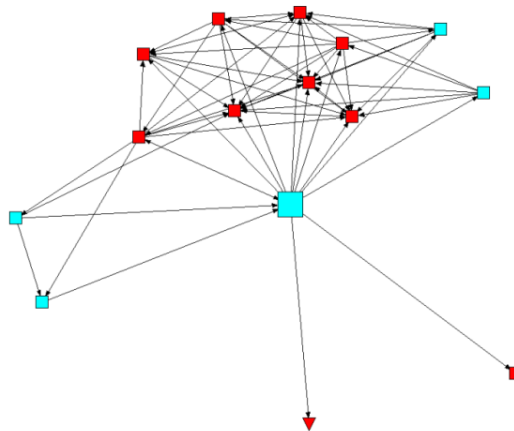
Figure 5 Cannabis network with an "in-between" structure (R10, F/S/NG, *n* = 14)

The woman's *cannabis network* just described then seems to be characterised by a constraint coming from a group of alters rather than single actors. The network picture below combines isolated alters with a larger well-connected group and a separate pair of alters. The two isolated alters, a user and a non-user, are on the right-hand side. On the upper part are a slightly larger group of well-connected mainly male users while on the left side of the picture there are two additional female users. The measures and pictures

suggest this *cannabis network* combines a group of users that are well-connected with another four alters that are far more isolated.

9.4   Supply networks: structure

9.4.1   Overlap and structural holes

The size of *supply network* entails three kinds of supply relations: unreciprocated supply relation from ego to alter, unreciprocated supply relation from alter to ego, and a reciprocated supply relation. Respondents were asked to indicate which alters they had supplied cannabis to and, vice versa, which alters had supplied them during the six months prior to the interview. *Supply networks* have an average actual size of 8 alters (M = 10, MD = 9, SD = 6). The smallest network entails one alter. Because structural measures examine relations amongst alters, this particular *supply network* is not further included in the analysis. The largest *supply network* has 23 alters. This largest *supply network* is not part of the largest *cannabis network*. A quarter of the *supply networks* include up to five alters, and a quarter encompass 10 alters or more.

On average the *supply network* encompasses 27% of the complete network (M = 23%, MD = 23%, SD = 15%) and about half of the *cannabis network* (M = 53%, MD = 50%, SD = 27%). The part that overlaps with the complete network varies between 4% and 92%. In a quarter of the *supply networks* the overlap is less than 20%, a quarter of the *supply networks* encompasses 35% or more of the complete network. The overlap between the supply and *cannabis network* ranges between 7% and 120%. A quarter entails 30% or less of the *cannabis network*, and another quarter encompasses 70% or more of the alters of the *cannabis network*. One respondent included more alters to the *supply network* than to the *cannabis network*, which resulted in an overlap score of 120%.

Supply networks seem to be more tightly-knit than *cannabis* or *complete networks.* Density seems to be the highest in *supply networks*. On average two-thirds of the *supply network* knows each other (M = 57%, MD = 53%, SD = 32%). However, similar to *cannabis networks*, respondents often include suppliers that are only in the *cannabis network* or even later on, in the final network map. Sixteen respondents include no additional alters in their *supply network*. On average, alters in the *supply network* know about three-quarters of the other members (M = 76%, MD = 91%, SD = 28%). This is higher than in the cannabis as well as complete networks and suggests most *supply networks* are closed rather than open in nature.

People in a supply relation with an ego seem to be more likely to know each other than to use cannabis together. Density of joint use for the sixteen networks with an equally sized complete network is indeed lower than those measuring how many other suppliers a single supplier knows. Just below 40% of these alters had already used cannabis with another alter in the *supply network* without the ego being present (*M* = 39%, *MD* = 45%, *SD* = 14%). This seems to be in line with the findings for the *cannabis networks,* again suggesting that alters in the *supply network* tend to use cannabis together with about half of the other members.

Similarly to the cannabis network, some members of the *supply network* are not associated with leisure-time activities or cannabis use. About fifty suppliers were only mentioned in the *cannabis network* (*n* =40) [35]. Twenty *supply networks* include at least one supplier who was not mentioned in the first name generator. Most of these suppliers were described as 'friends' (*n* = 31). The remaining nine are either described as 'other people', 'best friends' or 'colleagues'. All of these alters are cannabis users. Eleven members of the *supply network* are not associated with cannabis use[36]. So besides not knowing how connected they are to the remainder of the network, I do not have information about who they use cannabis with. These alters, spread among five *supply networks,* are not members of the *cannabis networks* or the first name generating networks. All of them are either considered a 'friend' or 'other people'. All but one of these alters are supplied with cannabis by the ego. The remaining alter is in a reciprocated supply relation with the ego.

Density and efficiency are, like in *cannabis* and *complete networks*, negatively correlated (*r* = -.952, *p* = .00). In other words, *supply networks* where alters know a lot of other alters are also not efficiently organised. Conversely, *supply networks* with a low density show a more efficient organisation because alters are more likely to broker access between an ego's network and other networks. Though the size of *supply networks* ranges from 1 to 33 this does not influence density (*r* = -.243, *p* = .09) or efficiency (*r* = .051, *p* = .73).

Supply networks seem to have higher levels of constraint than *cannabis* or *complete networks* (*M* = .50, *MD* = .42, *SD* = .30) while hierarchy scores are in line with *cannabis* and *complete networks* (*M* = .05, *MD* = .04, *SD* = .05). This higher constraint might be explained

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[35] The first name generator asks explicitly to mention only alters who ego associates with during *leisure time activities.* Suppliers are thus part of the *complete network,* including all alters mentioned at any time during the interview but not of the group of alters mentioned in the first name generator.
[36] These suppliers are not present when ego uses cannabis. Therefore they were not mentioned in the second name generator and thus not part of the *cannabis network*.

by the smaller size of *supply networks* (*M* = 9). Constraint in general is positively correlated with density (*r* =.633, *p* = .00). This indicates that the more alters know each other, the more they constrain the ego. Hierarchy is negatively correlated with density (*r* = -.614, *p* = .00), which confirms that constraint is not likely to happen through a single actor. These findings suggest *supply networks* tend to be densely knit rather than openly structured.

9.4.2 Open, closed and in-between structures

9.4.2.1 Open supply networks

The first group includes about 15 *supply networks* that are characterised by a low density (between 0% and 35%) and high efficiency (between 67% and 100%). These *supply networks* seem to have a lot of structural holes and thus opportunities to access different sources of cannabis. All these respondents are suppliers, two are female and six are growers. On the other hand, egos in these kind of networks run a higher risk of getting caught because these loose partnerships are not build on strong friendship bonds that might offer protection from detection. Thirteen of these fifteen networks have at least one supplier that is not included in the first name generator. In five networks, there is also a supplier who is only mentioned at the end of the interview.

For example, the female supplier described above has a *supply network* with a loose structure (density = 16%, efficiency = 86%, effective size = 9). Her *cannabis* and *complete network* are loosely structured as well. Constraint is below average (.30) while hierarchy is above average (.224). This suggests constraint in this particular *supply network* tends to be concentrated in a single actor rather than divided among all members of the *supply network*. She includes two suppliers that are only mentioned in the *cannabis network*. The green lines indicate two alters know each other, and the blue lines indicate that these two alters have used cannabis together without the ego being present. The figure below shows that one female and one male supplier appear not to be connected to each other or other alters. The nodes representing them are positioned in the upper-left corner. Because both suppliers are mentioned after the first name generator was questioned, it is unclear whether those who do not seem to be connected in the network do not actually know each other. The third isolated male supplier is inlcuded in the first name generator. The fact he is isolated means in this case that the ego thinks the alter does not know or use cannabis with other members of the network.
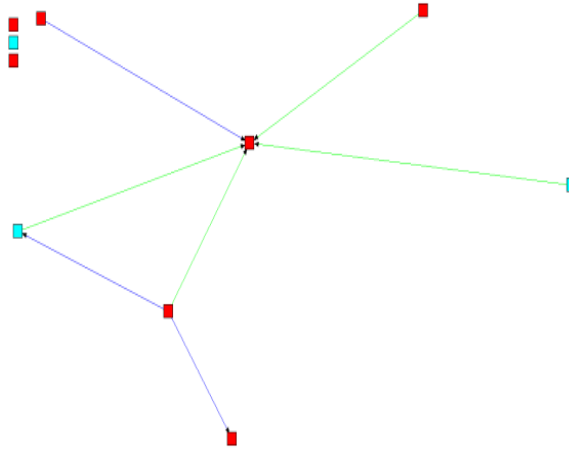
Figure 6 Supply network with an open structure (R26, F/S/NG, *n* = 11)

Another example is a *supply network* of a male supplier who includes four alters who are also part of the original group of people mentioned during the first name generator. This *supply network* encompasses about a fourth of his *complete network*. Both the *cannabis* and *complete networks* of this supplier are quite openly structured, and so is his *supply network*. With a density of 17%, and an efficiency score of 88%, this supply network is structured very efficiently to reach other networks with potential sources. Constraint is higher than average (.47) while hierarchy scores are below average (.083). This suggest this small *supply network* has an open structure where all four alters tend to constrain the ego's behaviour. However, because it belongs to a supplier the explanation might be different. The ego is the sole supplier in this *supply network*. This suggests efficiency might not be high because the ego wants to reach as many potential sources as possible, but might in this case be a strategy by the supplier to keep the people he supplies separate from each other.

The figure on the left depicts the *complete network* of this male sole supplier. This illustrates the ego is supplying four people belonging to different clusters of alters who know each other. The four alters that are supplied by the ego are coloured green. The figure on the right visualises whether members of the *supply network* know each other (blue lines) or use cannabis together (green lines). As none of them uses cannabis together, there are no green lines. This suggests both alters do not use cannabis together without the ego being present:
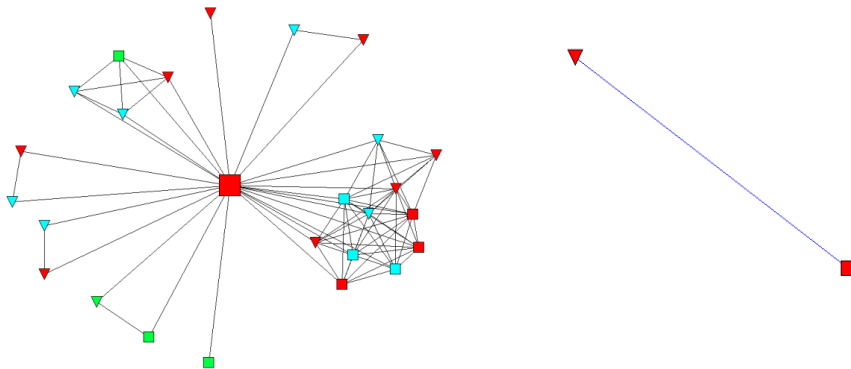
Figure 7 Supply network with an open structure (R 22, M/SoleS, NG, *n* = 4)

9.4.2.2 Tightly-knit supply networks

A group of nineteen *supply networks* is tightly-knit, with density score above 67% and efficiency scores between 10% and 50%. This group of *supply networks* includes 6 females, two non-suppliers and 8 growers. Nine of these nineteen *supply networks* are fully connected. The other ten networks are not fully connected, though very tightly-knit. Among these ten *supply networks* two have one supplier who is only mentioned in the *cannabis network*.

The first group of ten *supply networks* is characterised by very high density (between 67% and 99%). Alters are connected with more than two-thirds, and even up to almost all, of the other members of the *supply network*. The size of these *supply networks* varies between 7 and 22, which encompasses between 23% and 88% of the complete network. These high levels of density go along with the lowest levels of efficiency found in *supply networks* (between 10% and 44%).

The two figures below depict the *supply network* of a female grower. Density in this network is high (83%), while efficiency (26%) and effective size (2.33) are low. Furthermore, constraint is high (.42) while hierarchy is lower than average (.01). These measures suggest this female growers' supply network is densely knit, with constraint coming from a group of alters rather than single alters. The picture below first illustrates the supply network. As a supply relation is only measured between the ego and an alter, there are no relations between alters. This explains why despite being dense, the supply relations are shaped like a star. The second figure shows the extent to which alters in the

supply network just know each other (blue lines), or also use cannabis together (green). I note that the two female alters (coloured blue) in the middle of the network connect all alters of the supply network, which suggests these two females have the potential to broker between alters.
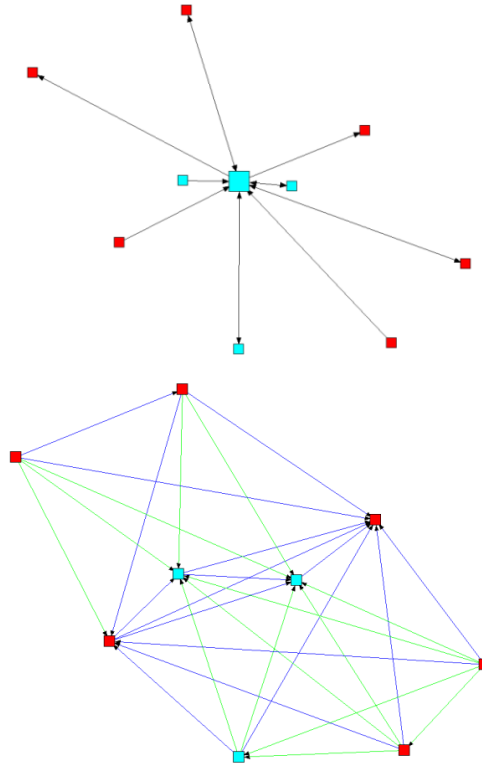
Figure 8 Supply network with a closed structure (R44, F/S/G, *n* = 13)

The second group of nine respondents is fully connected, but also quite efficient at the same time. Efficiency scores range from 17% to 50%. This supports the idea that in these networks friendship relations are prioritised most of the time, though at certain moments this group can take collective action. The *supply networks* of these respondents are quite small. In absolute numbers they are made up of between 3 and 10 alters. This represents between 12% and 32% of the complete network.

In three of these nine *supply networks,* half of the network seems to be redundant, despite a density of 100%. An effective size of 1 supports the idea of all alters knowing all other alters. However, the size of these networks equals 2. In each *supply network* both alters at

the other end of the supply relation know each other, which explains the density score of one as well as the effective size of one. Efficiency is mathematically calculated by dividing the effective size through the actual size. Size is expressed by the number of alters present in a network. In this case the actual size is 2, while the effective size is 1. As ½ is 50%, a connected triad will have an efficiency score of 50%. In other words, each alter can reach half of the network at most, because the total size of the network is 2. This finding does not corroborate with the suggestion in the literature that these networks might be more flexible.

The figures on the next page illustrate the brokerage potential of the two alters in one of these three *supply networks* (see also above). The two people in a supply relation in these three *supply networks* have similar brokerage opportunities in the *cannabis network*. If they were removed from the *cannabis network*, this network would not be connected anymore and would fall apart. The three figures below sketch the network of a male supplier and grower. The first figure depicts where the suppliers (coloured in green) are situated in the *complete network*. The second figure indicates their position in the *cannabis network*. The third picture shows what this *cannabis network* looks like without ego being present. This third figure shows that if both alters of the *supply network* were removed, the network would fall apart.
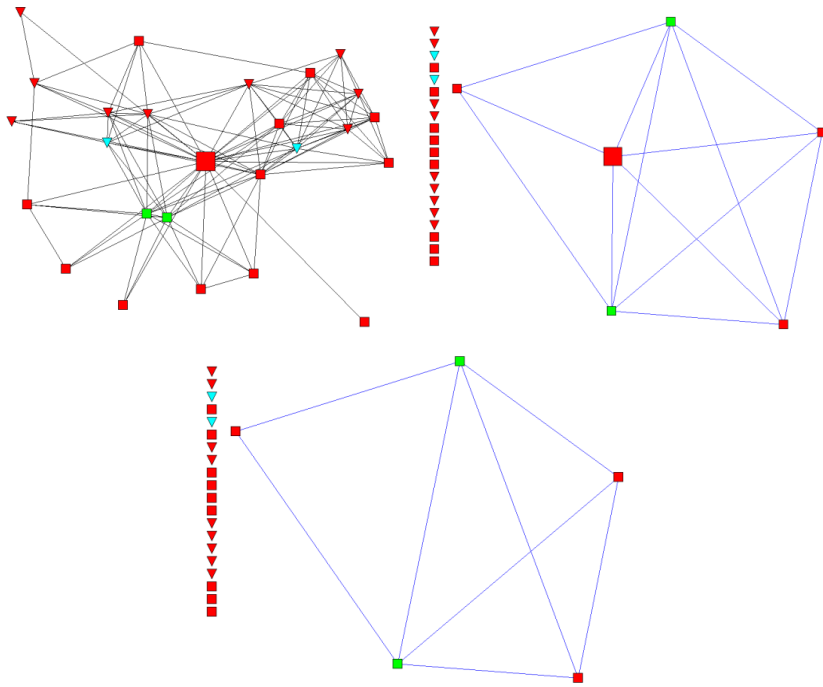
Figure 9 Position of suppliers in a triadic *supply network* (R24, *M/S/G*)

9.4.2.3 "In-between": tightly-knit supply networks with opportunities

Fifteen *supply networks* are characterised by a cluster of tightly-knit alters as well as some more isolated alters. Density is this group is higher than 37% but lower than 68%, so between one- and two-thirds of all alters know each other. Efficiency ranges from 42% to 68%. While the tightly-knit alters are key to closed networks, the isolated ones are a characteristic of open networks. The combination of both in one ego network suggests the ego has ties to both a closely connected group as well as some alters that broker access to other networks when needed. That said, half of these networks has at least one supplier who is only part of the *cannabis network*. This might increase the number of 'unconnected' alters, while in reality these alters are connected to the remainder of the network. The actual size of *supply networks* in this group varies from 7 to 16, which represents between 21% and 50% of the complete network. Thirteen respondents are male suppliers and all but one of them are growers as well. One male respondent does not supply or grow cannabis. The final respondent is a female supplier who includes predominantly female alters in her *supply network*.

The *supply network* of the one female supplier illustrates this "in-between" structure (see the three figures below). She includes nine alters in her *supply network*, which is one-third of her complete network. An alter knows on average about two thirds of the *supply network* (61%), but still about half of the *supply network* is redundant (efficiency = 46%). Constraint appears to be about average (.47), and so is hierarchy (.05). This suggests the network includes parts that are densely knit, but also loose and more efficient connections. Constraint seems to come mainly from the group, rather than from individual alters. The figure on the left shows the complete network (black lines) and cannabis network (blue lines) of this female supplier. All members of the *supply network* are also member of the *cannabis network*. The lines starting from the ego are supply relations. The blue lines connecting alters represent a use relation, and the black lines indicate the extent to which members of these networks know each other. The right figure zooms in on the supply network (green lines) and the cannabis network (blue lines). The pivotal position of the ego in connecting two parts of the network is thereby illustrated. Though both parts seem to know each other, they do not use together. The third figure (next page) shows the position of the ego in a different way. If I remove the ego from the network, the *cannabis network* falls apart in two unconnected parts and two isolated female cannabis users. On the left part of the figure five cannabis users are pictured who are loosely connected. Three of these are females. On the right part, two female users are connected with each other.
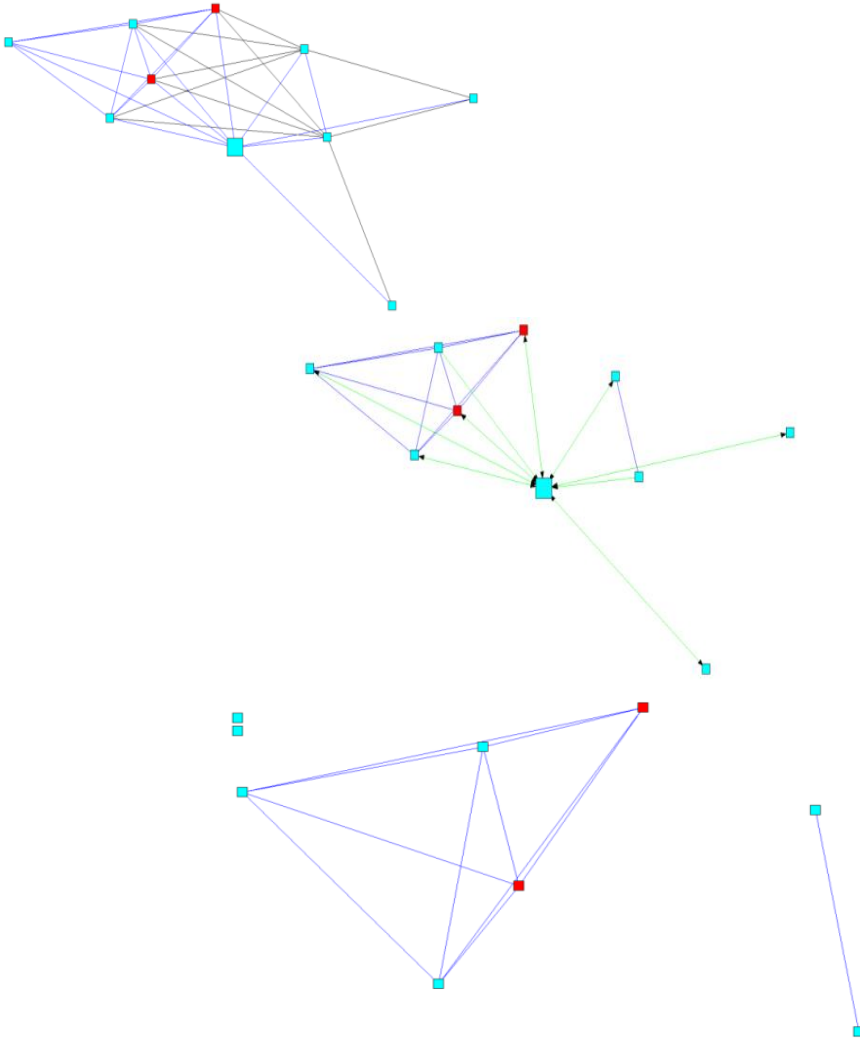
Figure 10 Supply network with "in-between" structure (R 46, F/S/NG, *n* = 16)

9.4.3   Network structure and supply mechanisms

Thirteen *supply networks* include only one-way supply relations. This group of thirteen networks is mainly characterised by two types of structures. Those networks where alters take on the role of supplier seem to be dense rather than efficiently structured (*n* = 7). On the other hand, when an ego supplies alters or when there is a balance between the two, *supply networks* seem to have a lower density and a higher efficiency (*n* = 6).

In this group of *supply networks,* all non-suppliers and sole suppliers are situated. The seven networks where alters are the main suppliers include four that belong to non-suppliers and three to male suppliers. In another five networks, the ego is the main supplier. Two of these five networks belong to the sole suppliers and a further three *supply networks* of male suppliers include predominantly supply relations going from the ego to alters. The thirteenth network belongs to a male supplier who includes exactly as many supply relations going from ego to alter as from alter to ego.

Three networks include only reciprocated supply relations. This small group of *supply networks* belongs to three suppliers who are also growers. Two of them are male respondents, and one is a female respondent. The size of these networks is very small. Two of these three networks only include two alters in their *supply networks.* These are the two networks I described in the section above. One male supplier only includes one alter in his network. For this network, no structural measures were calculated because this alter had no other alters whom he might know or use cannabis with. All of these *supply networks* are characterised by a density of 100%, and an efficiency score of 50%. In other words all of these mini *supply networks* were completely closed.

Besides these 16 *supply networks* where one supply mechanism is used, 34 *supply networks* combine reciprocated with one-way supply relations. The majority of these *supply networks* even combine all possible forms of supply relations: reciprocated supply relations, one-way supply relations between the ego and some alters, and one-way supply relations between other alters and the ego ($n = 20$). Twelve more reciprocated supply relations and one-way relations go from the ego to one or more alters exclusively. The two remaining *supply networks* combine reciprocated supply relations with one-way relations going from the alters to the ego.

All of these 34 *supply networks* belong to respondents that supply cannabis themselves. Nine respondents are female. Four of these female respondents have a supply network that mainly includes one-way supply relations, while the five other supply networks mainly include reciprocated supply relations. About half of the respondents grow cannabis themselves ($n = 14$). Eight of these growers are in supply networks that mainly include reciprocated supply relations, while five growers have a supply network that mainly includes one-way supply relations.

Twenty of these 34 *supply networks* do not mention alters beyond the first name generator and have a closed or "in-between" structure, though a few are more openly structured.

Eight *supply networks* combine reciprocated supply relations with both alter to ego and ego to alter supply relations. All of these eight supply networks have a closed structure. In eleven supply networks, besides reciprocated supply relations, the egos supply exclusively to alters. Five of these eleven supply networks have a closed structure, 5 more have an in-between structure and one has an open structure. In one *supply* network, besides reciprocated supply relations, alters provide exclusively to the ego. This final network is also characterised by an "in-between" structure.

Fourteen of these 34 supply networks did include alters after the first name generator and seem to have an open rather than a closed structure. In twelve of these 14 supply networks all mechanisms of supply are present. All but one of this group of twelve networks is characterised by a low density and a high efficiency score. Aside from whether ego or alters are the main suppliers, these eleven networks either have an open structure ($n = 6$) or belong to the category "in-between" ($n = 5$). The twelfth *supply network* is characterised by a high density and low efficiency score. Alters are the main suppliers in this network. This *supply network* of a female supplier includes one additional alter after the first name generator. That said, all other members of this particular network are fully connected. Besides these twelve, one *supply network* includes more supply relations that go from the ego to alter than reverse. Density is low, while efficiency is high. This seems to suggest this network has an open structure. The fourteenth of these networks includes supply relations that are one-way, this time going from alter to ego, rather than reciprocated. This suppliers' network seems to have an open structure.

Descriptive analysis suggests *a priori* defined patterns are found across the different types of structures (see chapter 6). Respondents were asked how they 'usually' obtain cannabis. More specifically, they were asked to rank the following supply patterns in order of frequency: gift-giving, sharing, buying (by oneself as well as in group) and swapping. Most respondents indicated they obtained cannabis through more than one way (see chapter 6). Most respondents usually obtain cannabis through buying and/or sharing or swapping ($n = 22$). Half of these 22 respondents describes a closed supply network. That said, some of these 22 respondents are part of an open ($n = 5$) *supply network* or in-between one ($n = 6$). Eleven other respondents obtain cannabis mainly through sharing, gift-giving or swapping. Three of these eleven respondents has a closed *supply network*, four are part of an open *supply network* and three respondents describe an in-between structure. An equally large group usually combines all a priori defined supply patterns (*n*

= 10). Here as well I find respondents to describe these *supply networks* as open (n = 4), in-between (n = 4) or closed (n = 2). A final six respondents usually only buy their cannabis. Among these six respondents all three types of structures are also found: open (n = 2), closed (n = 2) and in-between (n = 2).

9.5   Conclusion

9.5.1   Inside out: suppliers and users as integral but separated from society

The normalisation perspective considers users as 'insiders' rather than 'outsiders' of a wider society (Measham & Shiner, 2009; Parker et al., 1999). Older research describes a society that sees recreational cannabis users as 'outsiders' adhering to different social norms than 'insiders' (Becker, 1963). Likewise, suppliers might be seen by wider society as 'outsiders' as well when they are referred to as 'pushers' (Coomber, 2006). However, other studies state suppliers and users might be part of the same 'social universe' (Goode, 1970). Network analysis combines these elements of 'inside' and 'outside'. Networks are argued to be part of a multiplex reality (Krohn, 1986). Crossley (2010) defines this reality in terms of *network domains* in which individual actors constantly interact and so create meaning. In my study this means seeing egos and alters as part of a social, use and collaborative setting.

My findings reflect this debate to the extent that egos consider themselves as part of wider society, but simultaneously see cannabis use and supply as something that happens 'outside' of society. My findings illustrate how network domains to a certain degree overlap (Crossley, 2010; Mische & White, 1998), but seem to be kept 'separated' as well. For instance, on average the *cannabis network* covers half the *complete network* and again half of this *cannabis network* is part of the *supply network*. In some cases *cannabis networks* completely overlap with *complete networks* while in other cases *supply networks* include only a small portion of the *cannabis network*. The many alters that are added after the first name generator further indicates that to a certain extent supply is separated not only from a wider drug market but also from wider society.

It also seems that though alters in the *cannabis* and *supply network* know each other, alters that are 'using cannabis together' form a separate group. My findings indicate that cannabis users that are a member of the personal network of an ego often know each other but do not tend to use cannabis together. In this study I did not assume alters that know each other use cannabis together without the ego being present. Density measures indeed suggest that although many members in the cannabis network know each other,

only about half of them also smoke cannabis together without the ego being present. Likewise, about three-quarters of the supply network know each other but only half of this group also uses cannabis together.

Furthermore, structural analysis indicates cannabis might not be as socially accommodated among young people as I would expect based on normalisation studies and the findings in the previous chapters. For instance, though abstainers are present, the size and structure of these personal networks seems to suggest that suppliers and users do consider them to some extent not 'completely' part of this wider society. In exploring the collaborative and social setting these issues are examined further. In chapters 10 and 11 I find further confirmation of this duality. There I find that across use, social and collaborative settings a range of shared definitions of 'responsible use' and 'acceptable supply' are defined. These definitions take the form of informal rules and give meaning to the social, use and supply relations.

9.5.2   Formal structure of supply: open, closed, and 'in-between'

Structural holes analysis (Burt, 1992) in *complete, cannabis* as well as *supply networks* indicates the presence of three types of network structures: closed, open, and somewhere 'in-between'. While all *complete networks* are openly structured, *cannabis* and *supply networks* show all three these structures. I distinguish types of structures based on the balance between density and efficiency. In my study, very dense networks, where all alters know each other, are not efficient because the ego will reach the same alters no matter who he or she contacts. This is in line with what closed, tightly-knit networks would look like. Constraint and hierarchy measures further confirm the findings considering density. These measures reflect the extent to which an ego is influenced in their behaviour by alters present in this network (high constraint) and whether this constraint is concentrated in one alter (high hierarchy). Through comparison among the networks I studied, I found that a higher density seems to be associated with a high constraint and low hierarchy. This finding further confirms the presence of tightly-knit closed networks (see above) rather than hierarchal networks where one person exerts all constraint.

About a third of the *cannabis networks* and slightly more *supply networks* have a shape consistent with the first type of networks: *closed* networks. None of the complete networks has a closed structure. As described above, closed networks are characterised by a high level of density and a low level of efficiency. If visualised, these networks look

meshed or almost fully connected. This suggests these networks tend to rely on friendship relations. Though this limits an ego in accessing new ways to procure cannabis, these networks tend to be characterised by a high level of trust, which might limit the risk of getting apprehended (Morselli, 2009).

The second type of structure, an *open* structure, is found in all *complete networks,* as well as in a third of the *cannabis* and *supply networks*. Few alters know each other, which increases the potential to reach other people that are not part of the already known alters within the network. When visualised, these networks look like a star, with alters only connected through the ego and not amongst each other. Open *supply networks* seem to reflect Morselli's (2009) argument on the trade-off between security and privacy. This would mean that this trade-off is not only present at the organisational level but that it also applies to smaller individual decisions on actions concerning supply. This suggests these networks are loosely structured and have a lot of structural holes, meaning a lot of alters do not know each other. This provides ample opportunities for an ego to find access to different groups of users on the one hand, but also to provide some security for his or her 'friends' in the face of apprehension. In prioritising the potentiality for reaching new contacts, an ego him/herself might run a higher risk of getting caught because these contacts are less known.

Moreover, the presence of these open structures seems to be consistent with the image of highly flexible, loosely structured cannabis markets (May et al., 2000; Ruggiero & South, 1994). These open networks often include alters that are not associated with leisure-time activities but rather with cannabis use and/or supply. Relations with these specific alters seem not to be built upon longstanding friendships but rather situated solely in the use and/or collaborative setting. Density appears not to be correlated to size in *cannabis* and *supply networks*. Open networks found do not seem to be explained by their large size. It appears that alters who are not mentioned in either the first or second name generator might influence the structure of that specific network. These alters that are mentioned later in the interview are associated with cannabis use or supply and not with leisure time as such. This further confirms the image of overlapping yet separate *network domains* as found in chapter 8. Analysis of the size of the respective networks in chapter 8 illustrates how the use (i.e. *cannabis network*), supply (i.e. *supply network*) are to some extent seen as separated from the social setting (i.e. *complete network*).

Each time, a third of the *cannabis* and *supply networks* also take the form of a third type of structure: 'in-between' structures. These structures seem to indicate that some parts of the network are tightly-knit because for instance alters have been friends for a long time, while other parts are more flexible. Visually, one can distinguish a section of the network that is meshed or even fully connected while a different part of the network is not connected to each other except through the ego. These structures then formally resemble what Morselli et al. (2007) describe as 'organisations' that build upon long-term relations but are flexible when needed. This finding further suggests these forms of organisation are also found at the level of personal networks. *In-between structured supply networks* are flexible when action is needed, and outside this action build upon long-term-friendship relations. In chapter 11 I find further examples of these 'in-between' structures. There I find for instance that some respondents have part of their network they only address when their usual suppliers do not have cannabis available.

9.5.3   Shaping the structure: position, supply patterns, strength and gender

Besides the formal structure, I explore how pre-defined supply patterns are reflected in the structures found. As part of the profile sketch, respondents were asked to rank five supply patterns according to frequency they make use of them: the extent to which they swap, share, buy or receive as a gift. Based on the traditional definition of 'dealers' one might expect to find 'buying' in open or in-between structured networks, while 'sharing' or 'gift-giving' would be part of closed networks. But these supply patterns did not align with particular structural characteristics as I found all types of structures across different patterns of supply. In chapter 11 I describe how this might have to do with respondents defining supply not in these terms but rather in terms of exchange processes: 'give-and-take', 'selling to friends' and 'dealing'.

The findings in chapter 8 suggest alters in a supply relation are closer to an ego than those who are not in such a relation. Based on literature surrounding social supply I would expect to find a lot of reciprocated supply relations in tightly-knit or *closed* networks (Parker et al., 2002). This mutual beneficial exchange of 'favours' is said to take place between friends. Friendship networks are characterised by a closed rather than open structure, so I would mainly expect to find reciprocated supply relations in closed supply networks. However, in-depth analysis of these supply relations revealed only three growers fit this profile. In chapter 8 I found very strong to strong social relations tend to go along with *reciprocated* supply that goes from the ego to an alter as well as from that

same alter to the ego. This does not mean *supply networks* with no weak social relations only include reciprocated supply relations; most of them also include one-way supply.

The position of an ego seems to influence the structure in *supply* networks. In some networks, an ego is the main supplier. Egos that are the main supplier are more likely to be part of open *supply networks* than tightly-knit ones. Though some level of reciprocity is present, egos in this network has access to other networks with potential resources through this supplier. I would expect this type of network in cannabis markets that include more traditional 'dealer' networks where efficiency is prioritised over the risk of apprehension and/or the risk of losing friendship relations (Morselli, 2007). In other networks, alter(s) are more likely to supply the ego than the other way around. When the ego is *not* the main supplier, *supply networks* tend to be more closed. This finding is in line with what I would expect a social supplier would be part of: tightly-knit *supply networks* where everyone knows everyone (Parker, 2000).

Although many *closed supply networks* include alters that are also emotionally close to the ego, some do not.. This finding is central in the understanding of *supply networks* as composed of strong social relations that are not necessarily connected to each other. Analysis of emotional closeness indicates members of the *supply network* are considered by the ego as closer than those that are not a member of this *supply network*. However, structural analysis reveals that *supply networks* are often characterised by an open or in-between structure. Egos then might have strong connections with those they are in supply relation with, but these alters do not necessarily know one another. This suggests that structure mainly reflects what the network does 'in action', while social relations or *emotional closeness* reflect the dyadic relations that are present underneath.

In chapter 8 I found females in this cannabis market seem to enact 'masculinity' (Dahl & Sandberg, 2015; Grundetjern & Sandberg, 2012). When it comes to the composition of their network, they mainly include male alters as well. Furthermore, their supply relations also tend to be male-dominated. Network literature on gender argues female networks are more focused on risk minimisation. Structure-wise, this would include being part of tightly-knit closed networks (Morselli, 2007). However, the findings of the above chapter suggest that in case of recreational cannabis use, female users who are supplied by their partner seem not to be part of specifically tightly-knit *supply networks.* Female respondents are part of similarly structured *complete, cannabis* and *supply networks* as male suppliers. As among male respondents, their *complete networks* have an open

structure, while most *cannabis* and *supply networks* seem to be more closed in nature. However, again much like their male counterparts, some female respondents have *cannabis* and *supply networks* that lean towards an 'in-between' or open structure. This suggests these *supply networks* are not focused on risk minimisation but on the creation of opportunities for further supply (Griffin & Rodriguez, 2011; Maher & Hudson, 2007) (see below).

9.5.4 Structural analysis: a first step towards explaining 'social' supply?

The findings of the structural analysis seem to reflect the complex interaction between group and individual processes. The presence of *closed supply networks*, characterised by a tightly-knit structure where a lot of alters know each other, seems to be in line with what I would expect to find based on studies emphasizing the social aspect of social supply (Aldridge et al., 2011; Coomber & Turnbull, 2007; Parker et al., 2000), as well as studies stressing the social learning of cannabis use (Cullen & Agnew, 2005; Goode, 2007) that situate this use and supply in rather close friendship networks. In these *supply networks* one could situate social supply as part of 'friendship building' (Parker et al., 2002). Likewise, one could argue *open* networks reflect an individual cost-benefit analysis, much like Parker et al. (2002) describe when talking about recreational cannabis use. These networks are efficiently structured, which is beneficial if one wants to gain access to alters with a network which is not connected to an ego's *supply network*. An ego's position in this kind of open network might be strong. For instance in an open supply network, the ego is important as a potential source of cannabis because ego him/herself has a wide range of otherwise not connected alters. But this efficiency might come at a great cost (e.g. higher risk of getting arrested).

In-between structures seem to combine the flexibility of *open networks* with the protection found in *closed networks.* This apparent fluidity is illustrated by a female supplier saying some parts of the *supply network* can be *"switched on and off"* (R2, F/NG/NS). They seem to be part of 'normal society', and 'normally' they remain within these *tightly-knit* supply networks of 'friends doing each other a favour'. These parts that can be switched on and off can be accessed when 'in need'. When doing so, they access a much looser connected part of their network, one they might even intend to keep away from the remainder of the cannabis network.

The above considerations could be interpreted in the light of the position of the ego (see also above). One could argue that the *closed* networks found where the ego is the main

supplier are an expression of their attempts to avoid risks as well (Peretti-Watel, 2003). This finding is in line with what I found in chapter 8 where it became apparent that supply relations going from an ego to alter are less likely to involve an exchange of money than those supply relations that go the other way. By describing themselves as 'just another friend' who is part of a 'tightly-knit' *supply network*, one could assume they position themselves against 'real dealers', who serve as scapegoats to justify their own behaviour. These 'other alters' are then perceived as not conforming to a set of informal rules. This finding might then be explained by the research design. As detailed in chapter 6, this study explores personal networks from an insiders' perspective. As such, the perception of the ego is central, while the 'other' party in ego-alter relations is not studied.

That said, the extent of influence of the ego's position might be limited. For instance, the findings in chapter 11 show how respondents seem to apply 'informal rules' around 'dealing' to alters as well as to themselves. Furthermore, in chapter 8 I found that reciprocated supply relations also include exchanges of money. This suggests these supply relations are not necessarily indications of a 'pure' friendship relation where 'friends' do each other a 'favour'. These informal rules and the extent to which supply is a 'personal' thing is further explored in chapter 11 where I find further illustrations of risk avoidance theory as an explanation of why supply is 'social'.

Chapter 10 Supply in a social and use setting

10.1 Introduction

In chapters 7, 8 and 9 I discussed how individual attributes, relations and network structure shape personal networks where cannabis is present. This chapter as well as chapter 10 puts all these three aspects together in a wider history of shared meanings considering use and supply of cannabis. Drug market as well as network literature suggests informal rules structure use as well as supply (Dunlap, Johnson, Benoit, & Sifaneck, 2006; Potter, 2009; Zimmerman & Wieder, 1977). Network analysis and some growers' studies indicate an ego is part of multiple network domains simultaneously (Mische & White, 1998). Therefore, one can assume that an ego might also be influenced by alters 'outside' the group they use cannabis with (Papachristos, 2011; Valente, 2003).

The first two sections discuss how cannabis use influences the social relation between alter and ego (§10.2 and §10.3). Respondents' qualitative accounts confirm the specific position of users (see chapter 8) (§10.2). Cannabis use sometimes makes a social relation stronger (§10.2.1) but sometimes weaker (§10.2.2). However, most of the time it seems that whether someone uses cannabis or not does not matter (§10.2.3). In section 10.3 those alters that do not use cannabis but are present in the cannabis network are further examined (see also chapter 7). Besides defining what is meant by 'not-using' (§10.3.1), the ways these specific alters might shape supply and use are discussed (§10.3.2).

Two more sections describe the wider history of use (§10.4) and the dynamic character of *cannabis networks* (§10.5) respectively. While discussing how their use and social relations took their current form (§10.4), respondents often mention that the social relation is prioritised over the user relation (§10.4.1). That said, there seem to be important turning point in their use pattern (§10.4.2). As part of this evolving using pattern respondents refer to a change in the meaning attributed to this 'use' (§10.4.3). In section 10.5 this idea of volatility is presented (§10.5.1) and addressed through a discussion of how popular beliefs (§10.5.1) and policy shape the way use is perceived (§10.5.1).

10.2 Influence of cannabis use on the strength of social relations

10.2.1 Cannabis makes social relation stronger

In twelve *supply networks* the social relation with fellow cannabis users is strengthened because of their mutual use. Eight networks belong to male suppliers and an additional one is of a male non-supplier. Three networks belong to female suppliers. In total, nine respondents of this group do not grow cannabis themselves.

Most of these complete networks (*n* = 8) as well as all cannabis and *supply networks* include only alters who use cannabis (-1 ≤ E-I index ≤ -.3). That said, four complete networks include more alters that do not use cannabis than alters who do, or include them equally (0 ≤ E-I index ≤ .3). Whereas the complete networks are diverse, all *cannabis networks* include more users than non-users (E-I index < 0). But only four solely include users.

Though use homophily in these networks indeed tends to be strong, this group of networks does not seem to have a stronger relation with these alters than average[37]. Emotional closeness among members in *complete networks* (*M* = 3.12, *MD* = 3.04, *SD* = .35), *cannabis networks* (*M* = 3.28, *MD* = 3.24, *SD* = .48) and *supply networks* (*M*= 3.74, *MD* = 3.72, *SD* = .52) are around average.

Use in these twelve networks is seen as 'sharing' something you like to do or talk about. One male supplier adds that a social relation is mainly strengthened by the mere act of 'sharing' something *illegal*. Likewise, a female supplier describes cannabis use as a ritual that is something you don't do with 'other people'. A different male supplier even suggests that without cannabis his personal network would look completely different:

> *"Smokers attract each other, I mean, that's how I encounter things…. I don't know for sure. I can't really answer the question about what would have happened if I had met them outside the context of smoking. I don't know because I only know them through smoking cannabis together, and just like, I have everything, like, a long past I would say. I never did any criminal activities, but I do meet up on a weekly or even daily basis…"* (R48, M/S/G)

As this male supplier describes, shared cannabis use plays an important role in strengthening the social relation between an ego and alters as well as among alters.

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[37] In chapter 8 I found that emotional closeness in complete network is on average 3.3 (MD = 3.3, SD = .5), among members of the cannabis network 3.37 (SD = .05) and among members of the supply networks 3.74 (SD = .06).

However, the origin of the relation has nothing to do with cannabis use. A number of respondents indeed nuance the importance of cannabis for their social relations. For example, a female supplier agrees cannabis strengthens the relation between two people but it is not the only reason the people of the network come together. A further male supplier suggests cannabis use is not the main reason why relations can get stronger, but *"personal issues"* (R3, M/S/G) are.

I note that use of cannabis at the moment of the interview does not seem to fully explain the strength of social relations. Besides strength of the actual relation, twenty-three respondents linked cannabis use to the expansion of their personal network. Three-quarters of this group belongs to male suppliers, and six of them are also growers. Five *supply networks* belong to female respondents. Four female respondents are suppliers, while three are growers.

Fourteen of these twenty-three personal networks have a complete, cannabis and *supply network* characterised by use homophily (-.1 ≤ E-I index ≤ -1). However, seven respondents have a complete network that includes slightly more alters who do not use cannabis. Moreover, the majority of the complete networks also include some alters that do not use cannabis (0 ≤ E-I index ≤ -.7). Five male suppliers mention non-users in their *supply network* (-.5 ≤ E-I index ≤ -.6).

This larger group of networks does not have a stronger relation with the members of the *cannabis network* (*M* = 3.43, *MD* = 3.42, *SD* = .36). The strength of social relations within this group of networks does not seem different from the overall average. This suggests cannabis use is indeed a measure of growth rather than a measure of current strength.

Respondents in this group of *supply networks* explain the ways their *cannabis network* grows in different ways. A small group of male and female suppliers suggest people who use cannabis are more open-minded and it's because of the open-mindedness people are drawn to each other, not because of mutual cannabis use (*n* = 5). A further six male suppliers talked about coincidental meetings with other users which initiate a relation that grew stronger than a mere user relation, because after their initial meeting they kept meeting on other occasions. For example, some met while going out (e.g. to parties or to festivals) or at a skate park.

Four respondents, male and female, suggest the social relation between an ego and an alter already exist but cannabis use is what made the network further expand. Conversely,

one male and one female supplier mention their wider personal network grew out of an already existing supply relation. In the case of the male supplier, his own supplier became his girlfriend. The female supplier, on the other hand, got in contact with a new network of suppliers through her boyfriend.

10.2.2 Too much, or quitting cannabis, weakens a social relation

Although many explicitly speak about cannabis strengthening their social relation, nine respondents also talked about the opposite. Social relations might become weaker or even dissolve completely when an alter uses too much, when an alter or an ego stops using or when an ego or alter starts to use other substances.

This group of nine respondents are all suppliers themselves. Seven of them are male, and two belong to female suppliers that do not grow cannabis themselves. Two male suppliers also grew cannabis. The complete network of these respondents tend to include many alters that do not use cannabis themselves (-.4 ≤ E-I index ≤ .4). The *cannabis networks* and *supply networks* mainly include alters that use cannabis (-1 ≤ E-I index ≤ -.4). However, only three *cannabis networks* consist solely out of users (E-I index = -1).

Four male suppliers talked about instances where people who used too much in comparison to an ego or other users in the network got isolated from the network. One of them describes these alters as *"addicted who isolate themselves from the rest of the network. These are users who are always looking for cannabis and only come to social activities because they hope cannabis will be used"* (R34, *M*/S/NG).

All of these respondents would avoid contact with cannabis users if they considered quitting or decreasing their use. It seemed for them too difficult to resist the temptation of cannabis use when in the company of other users. However, each of them commented that not all relations would weaken or dissolve. For example, a male supplier says the social relation with his 'partner' wouldn't be affected and a female non-supplier adds she would meet up more with people in her network that don't use cannabis.

Four suppliers add that if alters stop using cannabis they would remain close to the ego but they would become less close to each other. Two of these suppliers nuance this. A female and male supplier explain that when alters quit using cannabis, social relations weaken only temporarily. In the long run things normalise because the strong social relation runs deeper than the user or supply relations. Similarly, another male supplier

suggests that only alters with whom the user relation is more important than the social relation would disappear from the network map:

> *"In the long run, that* [the social relation] *might be a bit less, hmm how should I put it, strong, that connection.. but it's not like you're no longer 'friends', that will remain. But still, you will share less, of course; the more interests you share with 'other people', the better a friendship can be, uh, but it's, yes, it would become in the end a less, uh, intense bond."* (R47, M/S/NG)

Similar to avoiding contact with users that use too much according to the ego, two male suppliers also avoid alters that start using other substances. Both respondents argue they do not want to get into trouble.

10.2.3   Using is not key

Over half of the respondents argue cannabis is not key to the formation of their current *cannabis network* (*n* = 28). As described above, some male and female suppliers suggest the initial social relation with other users wasn't built around cannabis use, but around what respondents described as *"a shared open mind-set"* (R3, M/S/NG).

This group of respondents includes four respondents that also perceive social relations can be strengthened by using cannabis together. The large majority of these networks belong to male suppliers (*n* = 22). Less than half of this group of male suppliers are growers (*n* = 7). Additionally, five female suppliers and one female non-supplier are included. Two female suppliers also grow cannabis themselves.

The personal networks of this group of respondents are composed in a similar way to the group of networks I discussed above. Eleven of the 28 complete networks in this group include more non-users than users (E-I index ≥ 0). Additionally, only three *cannabis networks* include only users (E-I index = -1). The remaining 25 *cannabis networks* thus all include some or even more alters that do not use cannabis (-.9 ≤ E-I index ≤.2). Similarly, six *supply networks* include non-users as well as users (-.7 ≤ E-I index ≤ -.3). Emotional closeness between ego and members of the *cannabis network* is similar to the group of networks I discussed above (*M* = 3.43 *MD* = 3.54, *SD* = .44).

Although cannabis is an integral part of their present social relation, some male and female suppliers argue this does not mean cannabis is central to it. To them, *"cannabis is part of the package but does not influence my relation"* (R26, F/S/NG). In that case, the social relation dates back to before cannabis was introduced in the network. A further

group of growers, male and female suppliers describe that they knew the alters for some time before realising that they both use cannabis.

Further elaborating on the lack of importance of cannabis for the social relation is the remark that quitting cannabis would not influence the social relation or only to a small extent. As an example, some male and female suppliers refer to the position of alters who don't use cannabis (any more). Although these respondents think alters would not quit using cannabis because someone else does, they all agree people who don't use cannabis are not perceived as different from fellow users, because "*he remains my 'best friend', whether he uses or not*" (R23, M/S/NG). Some male suppliers do describe some strategies for meeting with non-using alters. For example, when non-users are present the group smokes regular cigarettes instead of joints, or the ego uses beforehand or goes outside to smoke.

10.3 Non-users

10.3.1 Defining use and 'non-use'

As described above and in chapter 7, a number of respondents mention alters who are part of their *cannabis network*, but do not use themselves ($n = 564$). These "non-users" are present while an ego smokes cannabis but do not smoke weed at the same time. Respondents mention three kinds of non-users: temporary non-users, ex-users, and people who have never used cannabis and do not plan to do so in the future.

Not all alters use cannabis each time they meet with the ego and/or other members of the ego's *cannabis network*. These *temporary non-users* are people (alters or egos) who are part of the group of people where cannabis is smoked, but do not always participate. A large group of respondents even finds the distinction between a user and "not-a-user" difficult. For instance, about half of all suppliers, as well as one non-supplier, include a small number of alters in their *cannabis networks* who, according to the ego, use cannabis rarely. These alters are often present when an ego uses cannabis, but do not participate on a regular basis. A few male suppliers note a more general changing use pattern among alters, with some alters gradually using less or more frequently over the years. Furthermore, in the case of a male supplier, one alter, a professional sportsman, only uses cannabis when he does not participate in sport competitions. A small group of male and female suppliers suggest the presence of specific other alters (e.g. parents, non-using 'partner', problematic users) might influence not using at a certain moment. One male supplier for instance mentions that the group of girls in the network never uses cannabis

together with the boys (including the ego). This group of girls smokes cannabis at a separate location and time.

Some male suppliers identified themselves as *temporary non-users*, and say they not always participate when other alters are using cannabis. The reasons for their limited cannabis use are similar to the reasons described above. Some respondents described a changing use pattern throughout the years or depending on the sports season. Some respondents refer to previous negative experiences as a main reason to limit their cannabis use (e.g. one supplier became anti-social when under the influence of cannabis, while another one had a medical condition which enhances the effects of cannabis).

Most of these male suppliers explain that they do not use often because to them cannabis use is not important. However, one male supplier adds that though cannabis use did help to expand his *cannabis network*, it can also weaken social relations. However, at the time of the interview, this was the only supplier who is in a *cannabis network* that only include other users (E-I index = -1). The other three suppliers include some non-users or even more alters who do not use cannabis in their *cannabis network* (-.6 ≤ E-I index ≤ .6).

Little over half of the respondents include *ex-users*: people who no longer use cannabis themselves but who are still present when the ego and other alters use cannabis in their *cannabis network*. For the large part, these respondents also mention one or both of the other types of non-users. Respondents do not always seem to know exactly why an alter quits using cannabis; however six suppliers suggest these alters quit using cannabis because of negative psychological or physical effects. Other respondents mention more general reasons like *"he didn't like it anymore"* (R15, M/NS/NG; R47, M/S/NG) or *"he had enough of it"* (R23, M/S/NG).

Finally, a number of respondents also mention alters who are sometimes present when they use cannabis but have never smoked cannabis in their life. Most are suppliers themselves, while a few also grow cannabis. Four of these respondents include all three types of non-users in their *cannabis network*. These alters that have never used cannabis are often described in terms of *"principally against any substance use except for alcohol and regular tobacco"*. Still, these alters do not seem to try to get the egos to quit cannabis. Most of these alters seem to be not frequently present, as only three male suppliers add them to their active *cannabis network*.

10.3.2   Non-users shape cannabis and *supply networks*

Non-users might influence the way use is structured. For instance, three suppliers and one non-supplier indicate that when non-users are present the *cannabis network* is temporarily separated in two groups. One group includes those who go somewhere else for a while and use cannabis together. The other group entails those who remain at the original gathering place. In one case it did force the other cannabis users to look for another gathering place, when the alter who lived where they used to smoke cannabis quit. Six other suppliers suggest the presence of non-using alters changes the substance use pattern within the group. The group is in that case not divided physically, but in terms of substance use. For instance, some alters smoke regular tobacco while other alters are using cannabis. In other cases, non-using alters come along but drink alcohol instead of smoking weed with the other members of the network.

Temporary non-users might influence the way supply is structured as well. For instance, some male suppliers mention that alters who rarely use cannabis rely completely on the ego or other alters to get cannabis. Their cannabis use is linked to the presence of suppliers. Similarly, a male supplier who describes himself as a *temporary non-user* never buys weed because he thinks he supplied enough weed to others when he is younger, so now it's time they return the favour. His supply relation in other words does not involve the exchange of monetary rewards (see chapter 11).

A number of respondents however do not feel like the presence of non-users have an impact on how the *cannabis network* is structured. Non-users are then described as no different to other members of the *cannabis network*. However, this apparent acceptance sometimes seems to be the result of a process rather than a given fact. For instance, a male supplier describes himself as a *temporary non-user*. When he was younger, his presence as a non-user was not really appreciated in his group. Nowadays, the group accept the fact he does not use as frequently as the remainder of the group:

> *"Tonight it will probably happen again that I just meet at my place and while I have some drinks someone will say "I'm going to smoke a joint outside". He then will ask "Is everyone going to chip in?" At that moment, I just sit down and don't answer. And then the guys know, OK, he's not coming along… They do not look angrily at me because of that. While before, someone who would not tag along would get some nasty looks, like "wuwuwuwuwu"… I'm the one that just drinks a beer. It's my choice, my life in the end. They have to know for themselves whether they want to keep on smoking cannabis or not.*

> *[I: Do you have the impression that your connection with them has changed since you stopped smoking cannabis as much as them?]*
>
> *No, not at all. I always treated each of them the same way. And we always stay friendly to each other. It's not like "you quit smoking, so get away"... those guys tell me: "it's nice of you that you can do that, but I can't do this, I need this in my life". I then answer them "Yeah, you have to make that decision yourself."* (R30, M/S/G)

10.4   Growth of social- use and supply relation

10.4.1   User or social relation: setting priorities

A number of male respondents and a few female respondents describe that the social relation predates the user relation. These respondents mention they knew the people in their *cannabis network* from before they started using cannabis. In their accounts about their original *cannabis network*, many respondents refer to the way cannabis use is introduced in the network which they were part of at that particular moment in time.

The first *real* experience seems to take place outside of the personal network. Some female as well as male suppliers remember cannabis being introduced to the group by one person who had already some experience using cannabis. Another female grower describes a completely different picture. In her case the members of her personal network decided as a group to try out cannabis during a sleepover.

Male as well as female suppliers, growers, and non-suppliers indicate they did not continue using immediately after their *real* first time. The time in between ranged from a couple of months to three or even four years. The main explanation for this interval seems to be a lack of opportunity. Most respondents, suppliers as well as non-suppliers, remember they used a second time because they got to know people who could access cannabis easier. In response to the question at what age respondents started using cannabis, they refer to this age, which I call the *second* first time, rather than the age they were when they used cannabis for the *real* first time.

As this *second* first time is actually the moment a use pattern is formed, this time might play a more important role in the composition of the present *cannabis network* than the *real* first time. Putting aside this *real* first time, this group of respondents suggests the *second* first time took place within a network of 'friends' they already knew for some time. Gradually, cannabis use became one of the social activities in the group. Some male suppliers and one non-supplier mention they were already 'friends' with alters for a while before realising both of them were cannabis users. Other male respondents remember

some alters were already using a while before they themselves joined them. While describing this process, these respondents stress they remember not feeling any pressure of the group to start using cannabis. Illustrative of the lack of pressure are the comments concerning non-users being treated the same way as other members of the network are (see section above).

10.4.2 Dynamic user and social relation: turning points

Many respondents do not have a stable use pattern. This makes it difficult for them to assess their overall prevalence of cannabis use. Even respondents who are daily users sometimes do not use cannabis for a certain period of time. All respondents do describe their use as recreational. However, two female suppliers and one male grower add they need to use cannabis in order to function in a normal way.

The use pattern seems to depend on an ego's financial situation, living arrangements and the time of the year. Female as well as male suppliers and non-suppliers use more cannabis when they have enough money to buy cannabis, when they live together with other cannabis users and when their work schedule allows it. Besides these eight respondents, the cannabis use of male and female suppliers seems to be linked to the time of the year. For instance, a male and female supplier use cannabis every day but not while on holiday. In contrast, another male supplier's cannabis use increased while on vacation. A third male supplier, who is also a grower, stops using any kind of substance during Lent.

Some male suppliers describe their use pattern as a circle. First they use sporadically, then it gradually increases to a daily habit and then, because they perceive this as too much, they decrease their level of substance use. When they use sporadically for a while, the pace slowly picks up again until they reach a moment they do not feel comfortable with the prevalence of their use. At that moment, they try to decrease it once again.

A number of respondents—male as well as female supplier and growers—associate trying to lower the level of use with a decreased frequency of contact with cannabis-using alters. As a female non-supplier describes below, she tries to avoid meeting up with alters who use cannabis because she wouldn't be able to refuse a joint if one is offered:

> *"It's the principle of "putting the cat with the milk". When I wanted to quit, that's what I was afraid of, because my friendship network includes mainly people who use cannabis. It is changing nowadays, but yes, I avoided some people at that moment. Not because I did not want to be 'friends' with them anymore, but because I thought that I was no capable of having a nice chat with that person while he or she is smoking a joint. It could lead to situations where that person would pass*

> *the joint to me and I would smoke one out of habit. Or also, if I told them "I quit", they would say*
> *"what? Why? Are you serious?" But in the long run, it did not have such a massive influence [on my*
> *social relations]."* (R2, F/NS/NG)

Like this female non-supplier, some respondents feel that in order to be able to decrease one's own prevalence of use one needs to cut the ties a little. As described above, this does not necessarily disrupt the complete network. That said, in the case of one other female supplier, her desire to use less leads her to move to another city and cut the ties with her previous network completely. In the end this strategy is not successful as at the moment of the interview she is using cannabis more frequently now than she was before.

The dynamic character of use patterns is further illustrated by respondents talking about turning points in their lives. These turning points seem to influence both the social as well as the use relation. Social relations are perceived as evolving through time. Some male respondents do not relate the change of a relation to a particular event but see the evolution of a strong social relation to a weaker one as the result of time passing by. Others refer to specific turning points that changed the composition of their complete and *cannabis networks*. These include going to university, starting to work and the start or ending of romantic relationships. This further highlights the dynamic character of personal networks.

Female and male respondents describe relations getting stronger or weaker when going to university or starting to work. Structural analysis (see chapter 9) indicates people who work tend to include more alters that are not associated with leisure time or cannabis use than students. Moreover, respondents that are employed seem to have *supply networks* that have an open or in-between structure, whereas students all have *supply networks* that have a more closed nature. This suggests use and supply is considered more of a separate domain. When starting to work, one comes in contact with a range of new people and influences. Alters might not join an ego at the same university, or might go abroad, which makes it harder to keep in touch. One single male supplier compares the evolution of social relations in his personal network with economic fluctuations:

> *"I only joined a youth movement as a leader, for a period of three or four years. I have strong*
> *connections with them* [fellow leaders of the youth movement] *but my actual 'friends' are from*
> *before. It's very like, uh, like sensitivity to economic cycles. It* [the network] *goes apart and*
> *comes together again. For instance, if one of us becomes single again, they join the ranks again.*

> *That happened exactly like that already two times. But, uh, it's a bit like growing up, going to different cities to study and starting to work at different moments in life."* (R3, M/S/NG)

This male supplier illustrates both that the study–work evolution and the end/ beginning of a romantic relation have an effect on not only social relations but also the wider composition of the complete network. Some other female and male suppliers also mention that alters getting into romantic relations with people outside the network might weaken the relation between the ego and that specific alter. However, if the new 'partner' of that alter is accepted in the group, the social relation is not weakened as much. A more extreme example is given by a female supplier who currently does not supply cannabis, but has a lot of experience supplying. She describes how ending her relationship with her 'partner' meant losing contact with his 'friends' and the dissolution of her *cannabis network*.

Going to school or transitioning from school to work influences the extent to which cannabis is used as well. A large group of respondents, male as well as female, suppliers as well as non-suppliers, never use cannabis before going to school or work, because they then can't do their work properly or because they do not find it an appropriate thing to do. Some of these respondents did try it in secondary school or at university but they did not like feeling stoned in class and did not like the fact they had to read through the materials afterwards because they could not pay attention while stoned. A number of male growers used to smoke cannabis before going to school, but do not use cannabis before going to work. A number of male and female respondents use cannabis every morning before going to school or work because they feel that it helps them handle the day easier.

Whereas turning points in life might influence the use pattern of an ego, negative experiences because of cannabis use do not seem to lead to a decrease in use in the long run. That said, these negative experiences might influence the shape of an ego's *cannabis network*. Respondents claim to be fully aware of possible negative effects. Some of them refer to the negative experiences of alters. For instance, two male suppliers describe a specific alter suffering from a psychotic episode. In both networks this alter became isolated from the *cannabis network* when, despite this psychotic episode, he continued to use cannabis.

Most respondents however mainly refer to their own negative experiences. Many respondents recall a moment when they felt something was wrong. These moments include for instance a panic attack, becoming really lazy or falling asleep, feeling paranoid,

becoming delusional, getting 'the munchies' really heavily or feeling uncomfortable among 'other people'. Some respondents suffer negative effects of the combination of cannabis with other substances. For instance, a few male growers indicate becoming paranoid when combining cannabis with MDMA. Other male suppliers indicate feeling dizzy or really anti-social when combining alcohol with cannabis.

Others refer to more prolonged negative effects like psychosis, depressed feelings and the decline in short-term memory. For instance, two female respondents became clinically depressed after quitting cannabis. In the case of one female grower she was forced to quit using cannabis use because she suffered a psychotic episode. However, she started to use cannabis again after a while because she felt depressed when not using cannabis. Some male as well as female suppliers experience problems with their short-term memory. In the case of one male supplier, he decreased his level of use as soon as he noticed these cognitive effects. However, he does not plan on stopping completely.

Respondents consider these moments as a learning moment, rather than a turning point. The negative effects are attributed to their lack of experience or bad quality of the product. Accordingly, they develop strategies or rules to avoid further negative experiences. For example, some never use at parties because they become anti-social under the influence of cannabis. After a bad experience, a male supplier wanted to be more in control of the quality of the cannabis he uses. Therefore he began growing his own cannabis. Some respondents avoid smoking when they are feeling stressed because cannabis strengthens that feeling.

10.4.3   Public to private

10.4.3.1   Public setting to private business

As part of their evolving use pattern, respondents also refer to a change in the meaning they attribute to cannabis use. It appears cannabis use evolves from something close to a public statement to something that is part of a private setting.

Several respondents state they used to use cannabis for the group feeling or because they thought it was cool to be part of an anarchist or *rastafari* community or to provoke reactions from society. As is illustrated by the three growers below, some respondents became more aware of the society surrounding them. Nowadays, more than before, they want to be part of this society without quitting cannabis completely:

> *"Yeah, now I hide it, uh, no I don't really hide it but I'm not going to show it as well. Absolutely not. I'm not going to show off to everyone, I think, that I smoke cannabis."* (R13, *M/S/G*)

> *"I feel more uncomfortable now. That's because nowadays, in comparison with when I was much younger, I am much more concerned with what happens around me and with what people think of me. Before it was more a matter of wait-and-see: the idea of just doing what I want and I'll get there. Before this resulted in being anarchistic, but now it's more like just enough participating in society to get from it what I want. Although, that's maybe a tough statement."* (R38, *M/S/G*)

> *"I also used to be much more irritable and aggressive, and I notice that cannabis helps me to judge things much more relaxed. So, the tough edge is gone, but I still very much enjoy using it."* (R42, *M/S/G*)

Together with their wish to participate in society, a number of respondents strongly view cannabis use as a personal choice, and that it should be smoked in a private setting. Even respondents who had a habit of smoking cannabis in public when they were younger, now prefer using cannabis in a more private environment (e.g. at home or at a friend's house). Some respondents attribute this change to practical reasons (e.g. they can't meet with people as often as while they were studying, or now they have a place of their own). However, a number of respondents state they do not want to bother people with it, and therefore choose to only use cannabis in a private setting.

10.4.3.2 Using alone versus in a group

A final aspect of the user relation involves whether respondents use alone or in a group. It appear respondents gradually evolve to a use pattern including solo use because they don't meet up with the other alters of their *cannabis network* as frequently as they did in secondary school. This explains why more non-users are present in their current personal network than in the past.

That said, a lot of respondents indicate they never use alone, mainly because they consider using cannabis as a social activity or because they are afraid that using alone would lead to a sharp increase in cannabis use. Others do smoke alone, but do it more frequently together with at least one other user because it is more fun to do it in company. In general, these respondents consider using alone as something abnormal to do. That said, they do sometimes make an exception. For instance, some male suppliers indicate they sometimes smoke alone when they come home from work and really feel like smoking but there is nobody around to join them. One of these male suppliers describes how starting to use

alone feels like transgressing a border. The crossing is however not one-way. As this male supplier describes, one can have moments in their use history of using more alone before transgressing back towards using in a group:

> *"Uh, I don't know, I think it has to do with a slow progression in use or something. You know, at a given moment you cross the border of buying cannabis, and then also the border from using together with 'other people' to using alone, uh smoking alone, because that's of course… I kind of was conscious that I was crossing a border, but I did not linger on it… and, yeah, then I started to use weed more and more by myself. Now I'm at a point that I do not need that anymore."* (R45, F/S/NG)

Other male as well as female respondents mainly use alone. For instance, they regularly smoke alone when they come back from work or school. Respondents gave two main reasons as to why they mainly use alone. First, they don't meet up with 'friends' that often anymore, for instance because they moved away. Second, some respondents refer to their perception of cannabis use as a personal choice. Because it is a personal choice, they argue you should only do it by yourself.

10.5 Wider influences on perception of use and supply

10.5.1 Volatility of cannabis networks

About a third of the respondents said there is one specific person who introduced them to cannabis. Most of them are still in contact with this initiator. Some female as well as male suppliers do not use cannabis together with this person any more, mainly because throughout the years their network has evolved and contact has been lost. In the case of one male supplier this initiator quit using cannabis himself.

Sometimes the initiator was an outsider to the network to begin with. For instance a male supplier describes that his first experience with cannabis use took place outside of his then friendship network. A number of male and female suppliers tell a similar story. These are the group of respondents who distinguish between their first time and their *real* first time. The first time is then described as something that just happened with an outsider. The second time, which they refer to as the *real* first time, is with members of their *cannabis network*. It is in this network people learned to use cannabis. This process is described above; here the focus is on the origin of the current *cannabis network*.

About a third of other female as well as male respondents started using together with a (small) group of people. Most of them are no longer in contact with these people. Some respondents even lost touch with every member of their original *cannabis network* when

changing schools or when finishing secondary school. One male sole supplier moved from the United States to Germany and lost touch with his original *cannabis network* completely. Some male growers lost contact with the original members of their *cannabis network* after one of them was caught by the police. In some cases alters have been to jail and the respondent does not want to see them anymore. In case of one male grower, alters stopped talking to him because he was caught by the police a couple of years ago. His current *cannabis network* only includes one person from before he was caught.

For just over half of the respondents, their original *cannabis network* still exists today. Some male suppliers started to work and continue to meet with the same people, but less frequently. Other male suppliers indicate their use pattern or that of the original group changed but this did not disrupt the network. For example, one male supplier is the only one in his *cannabis network* who still uses cannabis but he continues to be 'friends' with the original group he started using cannabis with. These 'friends' are present while he uses cannabis, but smoke regular tobacco at those times.

A number of male suppliers however only continued to meet with part of their network. Over the years their *cannabis network* has grown larger or its composition has changed almost completely.

As one male supplier explains, the core of the network continues to exist, while a wide group of occasional contacts changed a lot:

> *"My 'little group', so to speak, went to squats every Wednesday afternoon. Actually we were really loitering youngsters; I only started to go to bars at an older age. Then you really get to know a large circle of weed smokers, in a manner of speaking, but that disappears quickly. I meet up with this group of 'friends', quite often but the people at the fringes disappear."* (R3, M/S/NG)

Apart from three respondents who depict a stable network that has been steady for a long time, most respondents indicate their *cannabis network* has changed considerably over the past years. A number of respondents further comment on why their network is dynamic and prone to change quickly. This change can be temporary or fixed. Some male growers give the examples of a fight between an ego and a specific alter or a drop in the frequency of meeting each other that can cause a temporary change to the composition of the network. The volatility of social networks is further illustrated by a female non-supplier who suggests she has different parts in her personal network she can switch on and off:

> *"So, then I see him, for example if 271 is with us, then I see him twice or three times a month. But at other times that is not the case. These are the networks that can be switched on for a moment only to disappear the next."* (R2, F/NS/NG)

Sometimes the instability of networks is attributed to specific moments in a respondent's life. For example, some male suppliers distanced themselves from the 'bad crowd' they were with a secondary school. As described above, one male sole supplier lost touch with his network because he moved to Germany and some suppliers' networks dissolved when alters or ego were arrested by the police. Referring to the turning points, some male growers saw their complete network becoming substantially larger when they started a new job.

10.5.2   Popular beliefs: cannabis is taboo outside of the network

A large group of respondents spontaneously compare smoking cannabis with drinking alcohol. Cannabis is seen as better than alcohol, because it is perceived healthier and it does not make you aggressive. Smoking cannabis in a group is often compared with having a drink at a pub. Smoking weed is then considered a social activity as well but without the side effects of drinking too much alcohol. Some respondents do not use alcohol when they smoke cannabis because they previously had negative experiences combining both substances. While talking about their user experiences, respondents often compare cannabis to tobacco. A number of respondents see tobacco as a necessary evil. According to these respondents, they are not addicted to cannabis but rather to the tobacco that they use to make the joints with. Some have tried to smoke pure joints or use a vaporizer but they did not like the obtained effect.

The general beliefs about cannabis that are present in wider society appear to influence the way use and supply is defined within the egos' personal networks. One female supplier for instance describes how she and the other members of her *cannabis network* regularly discussed how they perceive cannabis use and supply as a group.

Many respondents, male as well as female, perceive cannabis as a taboo outside their own network. These respondents have the impression that cannabis nowadays is a little bit socially accepted, as long as it takes place in a private setting. Other respondents further elaborate and feel that every substance user, besides alcohol users and cigarette smokers, is labelled as a "*drug abuser"* by society. One male supplier claims the taboo surrounding cannabis is actually growing. He perceives cannabis as far more a taboo now than a couple of years ago. In this particular case, the composition of his personal network changed once

he started working and got in touch with more people who had never used cannabis. These people give him the impression the taboo surrounding cannabis is still quite strong.

Respondents seem to have a clear view about the way society perceives substance use and more specifically cannabis use. Several respondents, suppliers as well as non-suppliers, attribute the existence of a taboo to ignorance of society. Therefore, one cannot be angry with society because society does not know any better or misunderstand what cannabis use entails. Some respondents saw a solution in promoting cannabis use. For instance, a female non-supplier suggests more people should try cannabis, so they would know what it is all about. However, another male supplier saw it differently. According to this respondent, there is no way to solve the taboo as long as substance use is considered by others as an ethical issue rather than part of a scientific discussion.

The perception of a taboo within wider society seems to influence the way cannabis is supplied. Suppliers frequently refer back to this taboo to explain the strategies they have developed in order to keep supply and use of cannabis outside of the public eye (see chapter 11). For instance some respondents developed a code language or avoid talking in public about cannabis. Other suppliers argue the taboo makes it difficult for them to access the right information on the possible negative effects of cannabis use. As people in general tend to be reluctant to talk about, it is difficult to find reliable information. This increases the risk of users getting harmed.

10.5.3   Policy context

A number of suppliers suggest the prohibition policy increases the risk of users getting harmed. According to some respondents, the prohibition of cannabis supply increases the risk of people getting in touch with dodgy dealers because there is no legal way to procure cannabis. This suggests respondents would be inclined to plead for a regulation of cannabis supply.

About a third of the respondents, all of them suppliers, indeed explicitly indicate they are in favour of a certain form of regulation of cannabis. They point to several possible motivations: better protection of users, decreased criminality and violence associated with cannabis supply, and the possibility of taking away the taboo because if it's legal you can talk openly about it. As to what the regulation of cannabis supply should look like, opinions are diverse. Some respondents are in favour of a full regularisation of all substances because substance use is a health issue, or even a full commercialisation,

similar to alcohol. Others are in favour of regulation but controlled by the state and accompanied with better information campaigns.

A number of respondents refer to policy regulations in the Netherlands as a possible option for Belgium. However, there is no uniform opinion on whether the Netherlands sets a good example or not. Some respondents think the weed pass[38] for instance has failed because the black market in Belgium has grown again. One of these respondents argued cannabis social clubs are a better option because it's a closed network of members rather than public shops. Others point to possible positive effects of coffee-shops. For instance, a male supplier thinks they would make cannabis readily available and might avoid people coming across other substances through dealers who just want to sell anything.

Some suppliers, and one non-supplier, doubt whether regulation of cannabis would lead to a more positive view on substance use or a decline of the black market. For example, a male grower suggests if cannabis use were legal, insurance companies could take cannabis use into account when developing your risk profile. This particular respondent is worried this might lead to cannabis users having to pay a higher premium.

Other respondents think a regulation would not matter for different reasons. Most of these respondents, all of them suppliers, stress that cannabis use is a personal choice and therefore regulation would not influence their prevalence of use in any way. For example, a male supplier claims the current quality control provided by the customer reviews on the dark net is better than could be provided by any other legal instance. A female non-supplier prefers procuring cannabis inside her own personal network because that way quality is assured. She would continue to do so even if cannabis was regulated.

10.6   Conclusion

10.6.1   Informal rules about 'not-using': social accommodation?

This chapter confirms the existence of a range of informal rules and shared definitions of 'not-using' cannabis and the position of people that do not use cannabis. Drug market

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[38] The weed pass used to be a membership card which was required to access a coffee shop in the southern most provinces of The Netherlands, who share a border with Belgium. Since 1 January 2013 this approach was discontinued. Instead there came a residents criterion [in Dutch *ingezetenencriterium*]. This means that nowadays only people who can prove they live in The Netherlands can access a Dutch coffee shop. This proof includes an extract of the civil registration office, showing they are inhabitants of a Dutch town, and a valid identity card (Benschop, Wouters, & Korf, 2015; Van Ooyen-Houben et al., 2013).

literature indicates the perceptions of cannabis use are shaped by informal rules and controls (Coomber & Turnbull, 2007; Cullen, 2006; Mauss, 1990). For instance, studies of social learning and subcultural processes argue that not only techniques of use or perception of the effects are learned in a group, but also broader notions on issues like 'responsible use' are created in group interaction (Becker, 1963; Coleman, 1988; Mjåland, 2014; Zinberg, 1983). During the interviews, respondents defined alters that do not use cannabis as 'ex-users', 'temporary non-users' or 'those that have never used cannabis and are not likely to try it in the future'.

To what extent is the presence of these non-users an indication of a wider social accommodation of recreational cannabis use among young people? These non-users that are a member of the *cannabis network* might be more likely to be drug-wise. This might indicate a wider acceptance of recreational cannabis use among young people, or social accommodation, which is one of the key elements of a normalisation process (Parker et al., 2002). However, I cannot establish to what extent these abstainers are drug-wise because they simply cannot avoid having contact with substance users. Respondents for instance describe that pre-existing social relations do not tend to dissolve when a group evolves towards cannabis use.

Furthermore, the flexible reaction of members in a *cannabis network* when someone quits using cannabis suggests the social relation is prioritised above the user relation. The tie between ego and alter also exists outside the activity of using together. Though they do not share the activity of cannabis use any more, most respondents argue that these non-users are not less emotionally close to them. In other words, the mere fact of alters not using cannabis does not seem to influence the composition or structure permanently. That said, some respondents talk about a 'process of acceptance' when a cannabis user quits using cannabis. In that case, the social relation temporarily became weaker before it strengthens again. This process is linked to the members of the *cannabis network* wanting to accept the 'non-use', but struggling to find a way to adapt to this change.

10.6.2 Informal rules about use shape social relations

A small group of respondents indicate that 'sharing' cannabis use is something that can make a social relation stronger. Respondents suggest the use relation gets stronger specifically because two people share an *illegal* activity. However, most of the respondents nuance this immediately. Rather than making a specific social relation stronger, shared use tends to be more linked to the initiation of this social relation. In

other words, using together is a means to make a first contact. In line with this idea, respondents also tend to associate these kinds of connections with being a minor (i.e. younger than 18.) It seems less associated with getting to know new people as an adult.

Informal rules can result in control and sanctions if boundaries set in shared definitions are crossed (Hathaway, 2010). Social relations might (temporarily) dissolve when alters are using 'too much' or when alters start to use other types of substances. What is considered 'too much' is defined within the boundaries of the *cannabis network*. Thresholds for using 'too much' are associated with this social relation. For instance, the more an alter uses alone and skips group activities, the more likely this alter will become more isolated. This might lead to the dissolution of the social relation. However, in some cases the social relation is weakened temporarily but not ended. For instance, some respondents indicate that it is not because someone is using 'too much' and gets isolated from the group that the social relation ends (see below).

Taking into account the above considerations about abstainers, most respondents indicate recreational cannabis use is not the defining element of the social relation. This particular finding helps to explain why in chapter 8 I found a strong correlation between closeness and 'being a member of the cannabis network' but not between closeness and 'being a user'. Many respondents indeed argue their current network is not shaped by cannabis use. Most describe their own use as cyclical, as most of them had moments in their life they themselves were using 'too much'. At those moments, the composition and structure of their *cannabis network* also looked different, because other people were present when they used cannabis. However, social relations with the original *cannabis network* tend to stabilise again once they no longer use 'too much'. This finding is also illustrated by the accounts of respondents that alters that quit using cannabis, or never even use cannabis to begin with, can be friends just like anyone else.

Turning points and a pre-existing social relation further illustrate the complex interaction between social and use setting. For instance, respondents distinguish using for the first time and for the *real* first time. While the first time sometimes happened outside of the *cannabis network*, this *real* first time was often with friends they already had a social relation with. Furthermore, turning points that shape the composition and structure of the complete network (e.g. getting a job, going to university, falling in love) can also shape the *cannabis network*. This might lead to the complete dissolution of one cannabis network, only for another one to come into existence.

10.6.3   A 'personal choice' guided by informal rules

My findings indicate 'recreational' cannabis might not be as 'normal' as the normalisation thesis suggests it is. The normalisation perspective starts from a general acceptance of recreational cannabis use because 'it's there' (Parker et al., 2002). As Parker et al. (2002) noted, among abstainers as well as users, recreational cannabis use is perceived as a 'matter of fact'. There is still a general idea that drug use is deviant, as recreational cannabis use is only accepted as long as it does not harm anyone. What is meant by 'harm' seems to be not further specified by the authors. Conversely, my findings here show that, according to my respondents, wider society sees all cannabis use, thus also including recreational cannabis use, as taboo. This reflects the concept of deviance found among abstainers by Parker et al. (2002). An important nuance is that all of my respondents are users. In other words, also cannabis *users* might see cannabis use as deviant from wider society but accept it as 'responsible'. These reflections seem to emphasize that, though seemingly becoming *normalised*, recreational cannabis use is still surrounded by a form of stigma (Hathaway et al., 2011). What is 'responsible' and 'accepted' is defined through informal rules (see above) that exist as a way to deal with this 'stigma' or 'taboo'.

Cannabis use, when happening within the boundaries of these informal rules, is described by respondents as a 'personal choice' and a 'personal responsibility'. This perception of cannabis use as something 'personal' is the result of a changed meaning attributed to use itself. Instead of defining recreational cannabis use as part of a group process, they now define cannabis use in terms of a 'personal choice'. For instance, some respondents compare use when they were 'young', which means younger than 18 years old, with now, being an adult. While use back then was mainly something that was part of a social happening, it has now become a 'personal choice'. As a consequence, some argue, one should only use cannabis by oneself. This might explain why some choose to procure cannabis through coffee-shops or cannabis social clubs, as I find in chapter 11. A cannabis social club is perceived to be the least risky source to obtain cannabis, as no 'dealers' are involved.

These considerations suggest respondents think of cannabis use as an individual decision, much like Parker et al. (2002) argue. In that case one could argue that the perception of taboo might also reflect a mere neutralisation technique (Potter, 2009) or as I found in chapter 9, a risk avoidance strategy (Peretti-Watel, 2003). For instance, it might be the case that when talking about a taboo, respondents express that they know and adhere to

the social norms of this wider society but make a conscious choice to take a risk. For instance, these informal rules then might be used as techniques to justify their own behaviour. In line with what Peretti-Watel (2003) argues, respondents seem to use a set of risk avoidance strategies to justify their choice of using cannabis (e.g. scapegoating, self-confidence and comparison) (Peretti-Watel, 2003). As I found in chapter 9, these strategies might explain the existence of in-between structured *supply networks*.

The existence of informal rules and controls that are enacted upon based on this personal responsibility not to 'use too much' stimulates thinking about a possible continued relevance of Becker's (1963) ideas concerning deviant subcultures(Fitzgerald, Mazerolle, & Mazerolle, 2013; Gourley, 2004). In that case, the 'taboo' and perception of recreational cannabis use as something that happens outside of 'wider society' might be interpreted as an expression of a set of 'different social norms' that one might be keener to endorse.

Chapter 11 builds further upon the above reflections and explores the extent the collaborative setting, like the use setting, is guided by informal rules. This setting is, much like the social setting, shaped by shared meaning and histories among members of the supply network. There I for instance find that respondents further reflect on the above-described taboo. However, they argue that even if supply were to be culturally accommodated (e.g. not punishable at all), they would still want to keep it in their personal networks. This suggests their desire to keep it hidden, and their expectation that cannabis supply is unlikely to ever be free of stigma.

Chapter 11   Supply in a collaborative setting

11.1   Introduction

This final results chapter explores the setting that surrounds the actual exchange process. This setting is part of a network domain that is inextricably linked to meanings developed in the use or social setting (e.g. what is 'use', popular beliefs about the taboo surrounding cannabis) (see chapter 10). This chapter adds another layer of complexity by zooming in on how shared meanings of supply are formed in this interactive context and how exchange processes take place. Respondents do not spontaneously distinguish between specific types of supply. When prompted, however, most of them are able to make the distinction but argue it is not how they would describe their supply pattern themselves. However, as becomes clear in §11.5, most respondents combine at least two supply patterns.

The first section of this chapter zooms in on what is meant by 'not dealing' (see §11.2). Literature on supply suggests social supply is a *different* type of supply (Coomber & Turnbull, 2007). More specifically this type of supply tries to capture a wide variety of forms of supply that are '*not dealing*'. Respondents indeed mentioned 'doing favours' (see §11.2.1), but these favours were in many cases supposed to be rewarded (see §11.2.2). These processes of doing 'friends' a favour are guided by a set of informal rules (see §11.2.3) and strategies to avoid 'real dealers' (see §11.2.4).

The second section then zooms is on what is meant by 'dealing (see §11.3). Respondents define a range of thresholds before considering someone 'a dealer' (see §11.3.1). While discussing 'dealers' these respondents also stress the temporality of this label (see §11.3.2) and discuss the extent to which social relations are prioritised over supply relations (see §11.3.3).

The third section discusses the presence and position of brokers (see §11.4). Brokers are considered by many respondents as pivotal figures (see §11.4.1) that are relatively close to them (see §11.4.2) and who are mainly important because of their connection with the wider drug market (see §11.4.3).

11.2   Setting of supply: informal rules

11.2.1   Barter system of give-and-take

Some respondents situate these 'favours' or "give-and-take" in a broader system that exists in their *supply network*. Supply seems to be part of a social ritual that is inherent to the exchange interactions within the *cannabis network*. That said, as the discussion of supply patterns below shows, this system of favours is often not the only way egos procure cannabis. For instance, some buy cannabis from different suppliers in addition to swap it with others.

Besides the presence of a certain need, this type of supply is closely associated with the strength of the social relation between alters that are part of this exchange. Many respondents point out that the way you should exchange cannabis among 'friends' is something you should just know. This code or arrangement exists only among *real 'friends'*. The difference between *real 'friends'* and 'other people' appears to be key in the distinction between different types of supply. As a consequence, a key characteristic of this system is the fact only certain alters are part of it. Each of these systems have existed for a long time within the network and have grown throughout the years. For instance, in the case of one male grower, only the closest and oldest 'friends' are trusted enough to be part of this particular system.

Both growers and non-growers referred to these systems in multiple ways: barter systems silent systems, social institutions, or mutual exchanges. Some alters organise specific gatherings or smoke-downs where you share cannabis. Others, like this male supplier, have a weekly tradition of getting together, having dinner together and smoking cannabis:

> *"It's the six of us, one of use makes dinner and the other five do not have to look for dinner. Every week it changes. So then you have dinner every Tuesday, you see one another, and you only have to make it once every five weeks. It's the system of "Come Dine With Me" but without scoring each other's cooking and jumping on each other's bed and so on. That I don't do.*
> *A lot of 'friends' have it [cannabis] for when people come over. If you go somewhere for dinner, in principle you always bring a bottle of wine for the host, or something similar. Ok, you get food in return, but I would describe this more as a social institution rather than a trade."* (R3, M/S/NG)

This male supplier illustrates different ways 'sharing' cannabis can be rewarded, but this expectation if only made explicit under certain conditions. Some respondents elaborate

on this by saying returning cannabis is not expected explicitly but it is part of a system where it is normal for you to provide cannabis at one moment and for another person to provide at a different moment. As I described above, this kind of mutual loan only exists among close 'friends': people an ego really trusts. The expectation of a reward is only made explicit when someone never gives something in return. If somebody does not use much, it is accepted that they do not need to bring weed. But if one uses frequently, it is expected that they bring their own weed. If not, the group might decide that person is not trustworthy and exclude that person from smoking together.

11.2.2   Costs and benefits of 'buying': "avoid dealers" as a rule

Respondents associate 'buying' or 'selling' of cannabis with a different atmosphere. Two male suppliers describe this atmosphere as a particular feeling, something dodgy that you want to avoid:

> *"A dealer is someone that asks for money for his cannabis, whether he's a friend or not. But the feeling of 'going to a dealer' is different when you know the person than when you don't know him. For instance, I have never had the feeling of 'going to a dealer', though that person was a dealer because he sold to me. But someone who sells at this kind of scale, so also to people he doesn't know, and you are one of those people he doesn't know, it's more like the 'black market dealer economy'."* (R9, M/S/NG)

> *"I think a dealer is someone who you think that's a real… With those people I kind of know that somehow it has to be 'shifty' not that I feel 'shifty' at that moment, like, for me it does not feel 'shifty' at that time. You understand? [But when going to a dealer] It's like the feeling that, if you're not careful, the police can come in at any time."* (R16, M/S/G)

Respondents associate this particular atmosphere with the risks of going to or being a dealer. While describing these risks, respondents often refer to the perceived risk of getting caught by the police. 'Sharing' and 'gift-giving' are not perceived as risky whereas the whole 'buying' and 'selling' process are seen as far more prone to attracting police attention. Many respondents attribute their fear to past experiences described in the *cannabis network*. Some respondents refer to alters getting caught in the past but most refer to the general idea that the longer one continues to be a dealer, the greater the risk becomes of getting caught by the police. Other respondents refer to the consequences of getting caught, like losing a job, or being labelled as a 'dealer' or as a 'problematic user'.

In response to this perceived risk, some respondents develop a specific array of contact strategies or 'buying' strategies to minimize the chances of getting caught, such as

contacting different suppliers or developing a code language to talk about supply. Buying strategies include respondents 'buying' small amounts to avoid prosecution when getting caught, starting to grow their own cannabis to avoid contact with dealers and becoming a member of a cannabis social club as a perceived legal alternative. Some other respondents are more afraid of the shame it might bring on their parents rather than getting caught by the police. Another group of respondents state fear of getting caught does not influence the way they procure cannabis. For instance, a non-supplier contacts multiple suppliers as merely a practical solution, not a way to avoid getting caught. He only quit dealing because it was becoming too much work.

A first 'buying' strategy to avoid dealers when 'buying' cannabis is to not obtain it from a private seller or 'dealer' but through membership of a cannabis social club. The choice for this particular way of supply seems to be rooted in respondents' attitude towards cannabis use and supply. These respondents prefer cannabis social clubs over other types of supply because they perceive it as a legal alternative to other types of dealing. Other motivations include assurance of good quality cannabis and limiting the harms associated with supplying (e.g. violence, getting arrested).

Participating in a cannabis social club appears to be related to the composition of respondents' network. Besides the ego, not many alters are part of a cannabis social club. In four cases, the egos are the only members, while in two cases one alter is a member of the cannabis social club. Moreover, being a member of a cannabis social club does not seem to be the only way of supply. For example, one male grower as well as one female grower also go to coffee-shops and sometimes got cannabis from 'friends'. Additionally, one female supplier contacts *dealers* because she does not have the financial means to buy larger amounts at a fair or the social club. A male supplier added that being a member of a cannabis social club would not mean he would no longer supply cannabis to other alters in his *cannabis network*. He perceived a cannabis social club as just another supply method, similar to 'buying' cannabis by yourself.

A second strategy to avoid 'real dealers' is to obtain cannabis via coffee-shops in the Netherlands. About two-fifths of respondents mention these coffee-shops as a means to avoid contact with 'real dealers'. Most of them go together with 'friends' although some respondents also go by themselves. In some *supply networks* alters go to several coffee-shops in one day and bring cannabis with them for several other alters, including the ego. Coffee-shops are preferred to *dealers* because the cannabis is of a high quality, it's

perceived as more legal or because it's easier than finding *dealers*. Though in many cases a visit to a coffee-shop is only done on specific occasions (e.g. birthday, city trip, between harvests).

Many respondents seem to have become more and more reluctant to visit coffee-shops because the quality of the cannabis was lower than expected, the prices were too high, the legal amount wasn't worth the effort or the perceived risk of apprehension was too high. In some cases respondents refer to the negative effects of the weed pass (see §10.5.3 for further explanation of the weed pass). For instance, for three respondents the drive to the closest coffee-shop where there were no weed pass restrictions was too long. Some respondents linked the weed pass to a rise in availability of cannabis on the black market. As a consequence the composition of their network changed because now it included more *dealers* than before the weed pass was introduced.

A third strategy mentioned involved 'buying' cannabis in a group. A number of male as well as female suppliers purchase cannabis together with their 'partner' or with a part of their network. A group purchase is often described in terms of a rotating system of buyers where everyone pays upfront, one person gets it and divides it among those who have paid. In three cases, the ego was never the buyer because of the perceived risk of apprehension or because one person in the group was close to the supplier. Some respondents also mentioned another type of group purchase: visiting one supplier with multiple people at the same time.

The main motivation to buy cannabis in a group appears to be because it is cheaper to buy larger amounts of cannabis. A male supplier further explains that a group purchase decreases the frequency of contacting a supplier, which consequently lowers the risk of apprehension. Other respondents explain they buy together with one problematic user in order to control his/her supply, or because it is difficult to find suppliers of small amounts of cannabis, which forces them to get the necessary funds to buy a larger amount.

11.3 'Not dealing'

11.3.1 Define 'favours'

'Sharing' is defined by all respondents as *"smoking cannabis together"*. Whose cannabis it is is defined in two ways: either everyone brings their own cannabis and rolls their own joint, or there is a pot from which everyone uses. Suppliers as well as non-suppliers do

not see 'sharing' as type of supply. However, some male suppliers and growers consider 'sharing' cannabis as a separate type of supply.

'Gift-giving' is defined as getting cannabis for nothing to use on a different occasion. Most respondents describe 'gift-giving' as something for specific moments or that happens with specific people, for example on special occasions such as birthdays, from growers giving away their excess harvest, or to alters who have financial problems. A specific aspect of 'gift-giving' is when cannabis is a reward for a service delivered by the alter to the ego or vice versa. In that regard, the exchange of cannabis is part of a communal relation, which is further discussed below.

The distinction between 'sharing' and 'gift-giving' seems difficult. Some male suppliers even argue the distinction between 'sharing' and 'gift-giving' is artificial. Many respondents also compare 'sharing' to ''gift-giving'', stating that this is actually the same. This group includes all kinds of respondents (male, female, supplier, non-supplier, growers). For them, it makes no difference whether someone smokes cannabis together with you at the same time or gives you something to use afterwards .

Likewise, the distinction between 'gift-giving' and 'swapping' seems blurry. Almost half of the respondents defined 'swapping' as a mutual loan where cannabis was given to a person in need with the inherent expectation of being rewarded for that exchange at the same moment or at a later moment in time. This group includes a wide variety of male and female suppliers and growers. The actual 'swapping' of cannabis is compared to alcohol. A number of suppliers describe 'swapping' weed as something similar to 'buying' someone a drink, where one does not have to return the favour immediately, but is expected to do so at a certain moment in time. One respondent describes this as a *code*:

> *"But I consider gift-giving as doing a friend a favour, uh, because it actually is a little bit like that. I know quite well who of my friends smoke weed and who does not and uuh, those people you already had a smoke with a few times, with them it happens that you say "look I don't have anything left but I would like to smoke something tonight at home, can't you miss something?". Well, I could consider this a gift, but in fact it's more like, hmm how would I say this... The code, hmm, I for example also know that if that person asked me the same thing, I'd give it to him as well".* (R11, M/S/G)

11.3.2   Conditional reward or unreciprocated gift

Favours to 'friends' happen under certain conditions. Respondents indicated that giving something in return is common and even expected. The reward is either given

immediately, or a while later, when the person who provided the cannabis is in need. It appears there is little actual control over who has returned the loan and who hasn't. However, if one fails to give a reward too often, in the view of the respondent, the respondent tends to stop this mutual loan.

Rewards can take different forms ranging from a sign of appreciation by saying thank you to money. Most commonly, one provides a different kind of weed. Other respondents indicated they buy someone a drink or do some kind of service (e.g. groceries, housekeeping, driving). Finally, some respondents swapped cannabis for other substances and a few suppliers, male as well as female, swap cannabis for luxury goods (mobile phone, expensive trousers, Xbox). For instance this respondent feels the need to buy someone a drink even if that person does not want a reward:

> *"Because I smoke rarely in comparison to him, I do not think that he looks at this as if I were to profit from his harvest. I think he shares out of friendship, and I do not have to give anything in return. Although I buy him a drink more often, that is something I sometimes do, but that's only because that makes ME feel better about it [using without giving back]."* (R9, M/S/NG)

Some respondents also expand the concept of 'doing a friend a favour' to exchanging monetary rewards. This is narrowly linked to the way brokerage is described (see below). For instance, one male supplier and grower describes a whole barter trade, in which everyone chips in and provides cannabis but the reward given can either be money or weed. Another male respondent does not supply cannabis himself, and considers 'swapping' as an indirect way of paying. For instance, if this respondent gives a joint to someone else who give a joint in return at a different moment, this is a form of paying for cannabis. A female non-supplier who grows cannabis also considers money as part of a system of 'swapping' weed. Someone can either give back some weed at some point in time, or can give some money.

At what moment and how large the reward is is defined within the boundaries of the *supply network*. For instance, one respondent thinks it's normal to share with 'best friends' and the people closest to you because "*sharing is caring"* (R49, male supplier, grower). It is also common to share with people that do not use frequently. However, if one asks too frequently or for too much cannabis in the eye of the supplier, they are also expected to give a reward. This idea of giving a reward 'when it is expected' is also illustrated by one female grower. She feels guilty about using cannabis from her 'friend'. This 'friend' insisted she did not expect any kind of monetary reward, but out of guilt the respondent

hid some money under a book during a visit. A male supplier also insisted on paying as a reward for the effort made by the supplier. One female grower even paid her closest 'friends' when certain amount is exchanged.

11.4 'Selling to friends' vs dealing

11.4.1 Defining 'dealing'

The intuitive distinctions respondents make between a favour to a 'friend', the exchange of money and an entrepreneur-like dealer further complicates the exploration of supply. For instance, in some cases a 'friend' can also be called a 'dealer'. Although the distinction between different types of suppliers seems intuitive, respondents describe some thresholds that influence the way an alter is perceived. As such all respondents have a clear idea of what a 'dealer' is, but stress different aspects. A 'dealer' is described as someone who…:

- Sells substances as a main activity or an important side activity income-wise;

- Actively searches for clients;

- Has weed all the time;

- Buys large amounts with the aim of 'selling' further;

- Buys weed frequently with the aim of 'selling' further;

- Earns monetary profit;

- Has no personal relationship with his/her clients;

- Also sells other substances

Taking all the above considerations into account, a 'dealer' is perceived as someone who actively searches for clients with whom he/she has a client-seller relation. This commercial relation is characterised by a supplier that always has cannabis available, does not really have a social relation with clients and for whom 'selling' cannabis is a major source of income.

Respondents describe a 'real dealer' as a supplier one contacts just for the sake of 'buying' cannabis and leaves immediately after the transaction is completed. Respondents contrast this to 'selling to friends', where 'selling' is often accompanied with smoking a joint together. Respondents often refer to 'real dealers' as people you want to avoid as much as possible. This influences not only the way they talk about supply, but suggests

respondents will not include people they consider to be a 'dealer' as members of their close network. This issue is discussed further below.

Respondents suggest three main reasons to avoid contact with 'dealers'. First, a range of respondents indicate they do not trust dealers to give the correct amount of cannabis or to supply good-quality cannabis. Second, some respondents refer to the supply context, and explain they do not like the atmosphere that surrounds dealing and do not want to be associated with this criminal environment. The third reason is associated with a more general belief that the concept of a 'dealer' has a negative connotation. These respondents refer to a 'dealer' as a stigma or a label they want to avoid being put on them. Other respondents nuance this, explaining this connotation is a misconception in wider society and that in reality these so-called dealers are just 'friends' doing each other a favour. Two male suppliers indicate that one can evolve from being labelled a 'dealer' to a 'friend' when you meet each other frequently.

To further explore respondents' perception of 'dealing', respondents were asked whether they consider themselves to be a 'dealer'. Some respondents say they perceived themselves as a dealer in the past or even in the present. However, most respondents state that in the present they are a broker or someone who helps out. Others describe themselves in terms of 'selling to 'friends' rather than 'dealing' for a variety of reasons: they do not actively search for clients, they do not sell large amounts of weed, they do not sell outside of their *cannabis network*, they do not sell but only give away, or they do not sell for monetary profit.

Respondents define monetary profit in different ways. Some refer to monetary profit in terms of earning money to pay for daily expenses (e.g. food for children, taxes, monthly costs of living) and distinguish this from 'selling' with the aim of gaining as much money as possible or for paying for one's own cannabis use. Two male suppliers further elaborate and state that 'selling' cannabis to be able to pay for daily expenses is a lower form of dealing or should even not to be considered as 'dealing' at all.

11.4.2 Being a dealer is temporary

As described above, respondents distinguish between 'dealing' and 'doing favours to friends'. This distinction however is not clear-cut, and is further complicated when taking into account the volatility of *cannabis networks*. As will be described below, respondents and alters drift in and out of 'dealing' and also appear to be labelled as a 'dealer' temporarily. As to why they start, respondents either say that they wanted to provide for

their own cannabis, because the money was easy or because of a particular occasion (e.g. excess of harvest, money to pay for travel)..

Several aspects contribute to one stopping 'dealing'. Putting aside the issue of how respondents define 'dealing', connections with 'dealers' or respondents' experiences as 'dealers' are limited in time. Some respondents who perceived themselves as a 'dealer' at some point in their past, quitted doing so because it was too much effort. *"Too much effort"* refers to two issues: frequency of requests, and level of closeness between ego and alter. When people ask for cannabis too frequently, arranging everything takes too much of a suppliers' time. In the perception of my respondents, that person would be more inclined to quit dealing. Besides that, some respondents state they do not like the idea people they did not know personally contacted them. Some respondents further explain that the effort became too much because their own frequency of use declined and they no longer needed to get cannabis for free by 'selling' cannabis to others. Another reason some respondents stop *dealing* is linked to the supply context. Several respondents perceived the risk of getting caught too high. Others refer to the atmosphere surrounding *dealing*—they didn't like the feeling of being associated with something illegal.

To conclude, as will be further described below, the temporality of being a 'dealer' is also associated with the question of whether someone is perceived a 'dealer' or a 'friend' who happens to sell cannabis. Some respondents, female as well as male, state explicitly that being considered as a seller is something that is limited to the actual exchange of cannabis. Outside from 'selling' cannabis, they considered these "dealers" as 'friends'.

11.4.3 Priority of social over supply relations

The size of the monetary profit gained or asked for seems to depend on the strength of the social relation between user and supplier. As was described above when discussing the concept of favour to 'friends', it is accepted to ask a higher price from people who one doesn't have a social relation with. Although paying some money might be considered normal, paying too much money is not and might lead to an alter being described as a *dealer*. More specifically, it is normal to ask some money to cover costs and efforts made but making profit from 'friends' (by asking more money than you yourself have paid to another supplier when 'selling' your cannabis) is not done. This issue of how much money is 'too much' initiated a reflection among the respondents on whether the social relation has priority over the supply relation. In chapter 10, I found that many respondents do not think that cannabis use is key to the strength of their social relations.

Some respondents state that 'selling' frequently or 'selling' for profit makes you a *dealer*, aside from any social relation that might exist. Others, like the example I gave above, indicate a *dealer* can become a 'friend' through the contacts where cannabis was exchanged. However, two male suppliers add these alters would still be labelled as *dealers.* These two suppliers have some experience 'selling' cannabis among 'friends'. Their accounts illustrate the nuanced and intuitive distinction they make between the general idea of a dealer and their personal situation:

> *"No, I don't consider that one as a dealer. I don't know what the general definition of when are you a dealer is. I think he might be a dealer, but I don't see him like that. I know he would only do it for friends and not for people he does not know or only knows a little… If I talk to people like that I would be able to arrange cannabis for friends, and then they could see me as a dealer as well, but I myself don't consider myself to be one."* (R4, M/S/NG)

> *"For me, nobody in my network is a dealer, that is, toward me, because they do not take any profit at that moment, but towards 'other people', than friends… I don't sell to people I don't know or something."* (R20, M/S/NG)

Others prioritise the social relation, and indicate that 'selling' among 'friends' is not dealing as long as someone does not start 'selling' to people outside the network. Closely related to 'doing a favour to friends', these respondents describe 'selling to 'friends' in terms of helping each other out. Although respondents find it normal to pay some money they expect to buy cannabis at a considerable discount. Some respondents further differentiate a *dealer* from a 'friend' because 'friends' do not sell on a regular basis and don't expect to be paid immediately. However, as one male supplier illustrates, an alter can combine 'selling' cannabis without profit within the network with 'selling' cannabis to people outside of the network for profit. This particular alter is seen as a *dealer*.

11.5 Middlemen between ego and 'supplier'

11.5.1 Pivotal figure

As the structural analysis in chapter 9 suggests, networks of suppliers seem to be structured in a wide variety of shapes, ranging from small tightly-knit networks to star-shaped networks. While describing the network structure of their *cannabis networks*, many respondents talk of a *"pivotal figure"*, whom they refer to as the key person when it comes to supply of cannabis within their respective *cannabis networks*. Some respondents have specific reasons why they contact this particular alter. For instance, the alters live in a larger town than they do, have better contacts to buy large amounts of cannabis, or a

better quality of cannabis. However, most respondents did not elaborate on why this alter was perceived as pivotal.

A *broker* seems to be something different than a supplier. Some male suppliers refer to a broker as an *"errand boy"*, *"runner"*, *"facilitator"* or a *"hook-up"*. Most respondents describe brokerage as an exchange where somebody, on the request of someone else, arranges cannabis. In this arrangement money is exchanged but no profit is made. A number of respondents perceive people who do not sell themselves but only pass on the name of a potential supplier as brokers. Some suggest brokerage does not always happen on request of someone else. For instance, some male suppliers also anticipate possible requests of specific alters. As such, these respondents are likely to bring something extra along when they buy cannabis themselves because they anticipate specific alters will probably ask them to arrange some cannabis for them in the near future. A number of respondents refer to brokers mainly as people who put their network in contact with another network. This connection between networks is perceived necessary because the ego does not know the end supplier at all or "*not well enough*". *"Not well enough"* refers in these cases to the extent an ego knows a supplier socially, apart from the context of supply.

11.5.2 Relative emotional closeness

Some respondents indicate that contacts with brokers might dissolve once ego got to know the end-supplier "*well enough*". For instance, a female non-supplier indicates alter 263 and 262 are pivotal in her *supply network* because they grow cannabis and only share it with what the ego refers to as *"close friends"*. These two alters give some of their cannabis to her in return for helping out with cutting the plants. On the other hand, alter 270 was becoming increasingly important for her own supply as he started growing cannabis himself. This meant the 'middleman', alter 274, was no longer a necessary contact as the ego could go directly to alter 270.

These middlemen are sometimes considered as not key to supply. A male supplier considers some alters who grow cannabis themselves as key to his supply but he perceives himself as *"not dependent"* on them. As it happens, the group of alters are not his sole exchange contacts because he also visits coffee-shops from time to time. Another male supplier suggests the importance of growers in his *supply network* might be explained by the fact growers are keen to share their excess harvest:

> *"For most cannabis users that I know, it does not work in that way with them, because they just grow cannabis themselves and at a certain moment they have like a 'mountain of weed'. Uh,*

> *then you have such an amount of weed and then most of them are like: what do you think? Try it. Take a little. And take enough for a couple of joints. That's how it works with us... then, by 'coincidence' people know when you have a lot of excess harvest. That's more like "sharing is caring" [instead of dealing].*"*(R49, M/S/G)*

The relative importance of a strong social relation with middlemen is further illustrated by the presence of isolated contacts. Besides these key alters, some respondents have a range of isolated contacts of "*people they know"* but who are not a member of their *cannabis networks* (see chapter 13). Other alters have a few mobile phone numbers they could ring in order to get access to cannabis, but did not but not really know the person behind the phone number. Still others have some old contacts who they might be able to reach out to if they could not find cannabis elsewhere. To conclude, two suppliers describe their ties with some alters as strict supply relations, and did not include them in their *cannabis networks*. Another male supplier describes that two growers, who he refers to as the two *"hobbyists"*, sometimes supply him with cannabis. However, these contacts are not strong because he only meets these people at parties of mutual 'friends'. Therefore he did not include them in his ego network.

A number of respondents mention a sibling or 'partner' as their main broker. In four cases this key broker is the ego's brother. However, these respondents seem to find it difficult to differentiate between describing this brother as a broker or a supplier. For instance, one male supplier describes his brother sometimes as a broker, according to the definition described above, but sometimes this brother also gives cannabis to him as a gift. 'gift-giving' is considered by the respondent as *"something different than brokerage but not supply as well"*. Besides their brothers, some respondents describe their 'partner' as the main person who brokers access to cannabis for them. Most of these respondents are female cannabis users whose male 'partner' has a network of suppliers which predates the romantic relationship between an ego and alter. Before this relationship, the ego did not have access to this particular network. In the case of one male supplier, his girlfriend facilitates access for him as well as a number of other alters in his *cannabis network*.

About half of the respondents comments on their own experiences with brokerage. A number of respondents distance themselves from a description as a *dealer* but do describe themselves as a broker. These respondents argue that despite their reluctance of getting in touch with a 'dealer', they do broker access to cannabis for a small group of close 'friends' who have difficulties finding a supplier themselves. In that case they describe

brokerage as *"helping out"*. In some cases, over the years the ego becomes the *main access point for alters* to get access to cannabis. Others indicate they only rarely facilitate alters getting access to cannabis.

11.5.3 Knowledge of the 'wider' drug market

Users do not always know by whom their suppliers were supplied. In some networks, there are multiple alters who broker access not only for the ego but also for other alters. For instance, one male supplier has four alters who each have contacts in separate networks. These four alters are each able to facilitate access to cannabis for one another. More often, however, respondents identify only one key broker who arranges access to cannabis for most other alters. Some alters have a limited overview of one or two steps up the supply chain. Almost half of the respondents indicate they do not know the original supplier of the cannabis they use. Some respondents indicate that this was mainly because they do not want to know. This keeps them away from the *"drug milieu"*. Other respondents argue they know some aspects of the process further up the supply chain (e.g. suppliers are 'friends' of the ego's broker) but brokers do not talk about this openly.

In some cases, respondents indicate they know where the cannabis in their *cannabis network* originates. Some suppliers on the other hand indicate they only know the suppliers from some brokers, but not everyone. Others, like one female supplier, used to be the main provider of her own network. At the time of the interview some of her former clients had become her supplier. She knows quite well where they get their cannabis from.

11.6 Conclusion

11.6.1 Exchange processes: from 'give-and-take' to 'dealing'

Supply relations are influenced by informal rules and shared definitions on thresholds when talking about supply. Instead of describing supply in terms of 'swapping', 'sharing', ''buying'/selling' or 'gift-giving', respondents discussed three main processes of exchange: a 'favour to friends', 'selling to friends' and 'dealing'. These processes reflected according to them much more how they perceive supply than the above-mentioned supply patterns. Respondents link these processes to particular transactions, as put forward by the tentative definition of 'supply' that guides the conceptual framework of this study[39].

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[39] In the general introduction and the conceptual framework I tentatively defined 'supply' as "*a transaction moment which is the result of an exchanging process and can take multiple forms. Supply is part of multiplex ties between two individuals, embedded in multiple social circles, part of a collaborative setting and shaped by the wider relational context*" (see also §5.5).

Supply networks can include mainly one, two or all three of these exchange processes. In the description of these exchange processes, respondents confirm the strong connection between the social relation (ranging from absent to very strong) and supply relation which is suggested by other social supply studies (Coomber & Turnbull, 2007; Harrison et al., 2007; Hough et al., 2003; Parker, 2000; Potter, 2009; Werse, 2008). As such, both the social and exchange dimensions that are put forward in the conceptual framework are further explored.

A first exchange process is referred to as 'give-and-take'. This exchange process is described by respondents as 'doing friends a favour'. As such, it corroborates with how for instance Parker et al. (2002) described social supply: a system of 'sharing', and reciprocating when needed. 'Sharing' and 'gift-giving' are linked to 'acts of friendship'. ''sharing' cannabis' is thereby seen as embedded in the social relation. As social supply and network literature suggest, respondents also mentioned additional advantages like ensuring good quality and quantity, and minimising the risk of getting caught (Mauss, 1990; Potter, 2006, 2009; Sahlins, 1972; Taylor & Potter, 2013; Werse, 2008). In this particular kind of 'give-and-take' system, social relations are crucial. Often only the most trusted alters, who are already in a long-term-relation with an ego, are part of it. Besides 'doing friends a favour', this 'give-and-take' system is also referred to as 'swapping' cannabis. 'Swapping' is thereby perceived as some sort of 'mutual loan' or 'extended gift-giving'.

The key to this 'give-and-take' system is that rewards are non-monetary but part of a *generalised reciprocity* (Mjåland, 2014). Most rewards are weed, or in case of 'swapping', other non-monetary goods. But rewards do range from intangible rewards like 'saying thank you' to more tangible rewards giving back weed or even a small amount of money (e.g. Hough et al., 2003; Potter, 2006; Weisheit, 1992). The process is a 'give' and 'take', meaning that even when cannabis exchange is part of 'doing friends a favour', one does expect a reward. This so-called 'return of the favour' discerns 'swapping' from 'gift-giving', where no reward is expected. 'gift-giving' is considered by most respondents as happening on a rare occasion (e.g. a birthday present) or as something that happens between romantic 'partners'. This system of 'give-and-take' is conditional (Mjåland, 2014). For instance, if one does not give a reward (e.g. cannabis) than it is possible this process stops and the social relation might be under pressure as well (see below). This form of *generalised reciprocity* might stimulate social relations, and create solidarity

(Mjåland, 2014; Sahlins, 1972). In other words, this process is considered part of a *communal relation*, where cannabis is exchanged without the explicit expectation of a reward but with the implicit expectation of 'returning the favour' when the other party is in need (Clark & Mills, 1993; Mjåland, 2014).

In their discussion of rewards in the case of a 'give-and-take' system, respondents distinguished a second exchange process: 'selling to friends'. This process is, even more than the 'give-and-take' process, used to refer to supply that is 'not dealing'. The key to this process is a form of *balanced reciprocity*: instead of some general expectation, it is accepted that you pay right away or at an agreed moment (Mjåland, 2014; Sahlins, 1972). The description of this process is closely linked to what Coomber & Moyle (2014) describe as *minimally commercial supply*, Hough et al. (2003) see as *socio-commercial supply* and what others refer to as *user-dealers* (e.g. Dorn et al., 2005; Pearson, 2007; Potter, 2006). It does seem that within the network some informal rules are in place to keep one from 'drifting into dealing' as Taylor and Potter (2013) put it. These informal rules include both rules concerning the social relation (e.g. not 'selling' outside of the *cannabis network*, not actively searching for clients, not 'selling' large amounts of weed) as well as the kind of reward that can be asked for (see below).

'Selling to friends' is also situated in a range of informal controls considering rewards. The size of the monetary profit gained or asked for seems to depend on the goal and the strength of the social relation between user and supplier. For instance, money to cover daily living expenses or to cover the costs of growing is considered 'normal'. This indeed reflects what in other studies is referred to as *minimally commercial supply* (Coomber & Moyle, 2014). It is also accepted to ask a higher price to people who one has a weak social relation with than those you have a strong social relation with. However, if one crosses the boundary of asking 'too much' money or fails to return the favour too many times, this affects the social relation as well. Much like I found in chapter 10, social relations are affected by the supply relation. In the case one does not return the favour once too often the friendship relation might be dissolved. In the case one asks too much money, too often, this alter might be perceived a 'dealer'. As a 'dealer' is perceived as someone you want to avoid, social relations tend to become weaker during the time someone 'deals'.

The third exchange process is 'dealing', a term used to describe an exchange where thresholds considering the social relation, type and frequency of reward are crossed and which involve a change in the initial motivation. My respondents define a 'dealer' as

someone who actively searches for clients with whom he/she then has a client-seller relation. This commercial relation is characterised by a supplier that always has cannabis available, does not really have a social relation with his/her clients,and for whom 'selling' cannabis is a major source of income. This process is along the lines of traditional definition of commercial supply (e.g. Coomber, 2006; Hough et al., 2003; Potter, 2006; Weisheit, 1992). At the same time this definition is enriched with some additional thresholds: the matter of frequency, the matter of ''selling' to "others" outside the personal network' and an added initial motivation to buy the weed to begin with, in addition to the motivation of 'selling' it on.

Informal rules about what is considered 'dealing' tend to be applied in a flexible way. This is illustrated by the temporal character of 'being perceived as a dealer'. In chapter 10 I found that social relations with users that use 'too much' cannabis at a given moment might weaken temporarily. However, once this user no longer uses 'too much' according to the other members of the *cannabis network,* social relations strengthen again. Similarly, respondents often described alters that 'used to be a dealer'. They thereby emphasise these alters are 'no longer a dealer'. Similar to the perception of 'using too much', the social relation with alters that are perceived as a 'dealer' might weaken. Social relations might strengthen again when someone is no longer perceived as a 'dealer'. However, social relations might dissolve completely if alters persist in doing so. The line between 'selling to friends' and 'dealing' is then defined based on the above-described additional aspects: 'selling' outside 'the network', 'selling' frequently, asking more than is necessary to cover costs.

Immaterial risks (i.e. losing friendships) are also taken into account when deciding to 'move up the supply chain'. Respondents seem to follow the same reasoning when talking about their own 'dealer' experiences. As when they describe alters' experiences, most respondents tend to limit the time they describe themselves as 'being a dealer'. Most of them drifted into 'dealing' for a short period of time (e.g. in high school). What kept them from 'moving up the supply chain' was the elevated risk of apprehension and the risk of losing friendships. This finding enriches the findings considering structure in chapter 9, where I describe how structural analysis indicates some respondents prioritise social relations over increasing their opportunities to obtain cannabis from a wider range of otherwise unconnected sources.

Informal rules considering 'dealing' are also flexible to the extent they are formulated within a time and place. For instance, some respondents indicate that the same alter can be considered as a 'dealer' when supplying to people outside 'the network' while being considered a 'friend' at moments they provide cannabis to people inside this network. Furthermore, some respondents consider all alters as 'dealers', regardless of the social relation. Others only consider someone a 'dealer' at the moment of the exchange of cannabis. This finding confirms the importance of looking into the nature of supply, and not only into the mere *presence* of ego-alter relations (Mische & White, 1998).

11.6.2   Supply network as shield from a wider drug market?

As Taylor & Potter (2013) suggest, my findings seem to indicate that social supply is not easily discernible from the wider drug market. I did not find a separate arena of transactions (Coomber & Turnbull, 2007; Parker, 2000), although some respondents seem to perceive it that way. Thresholds between 'selling to friends' and 'dealing' are subjectively formulated. These thresholds are also flexible to the extent that after being crossed, an alter can 'come back' once they are 'no longer crossed'. That said, 'dealing' and 'dealers' are described by all respondents as something or someone you want to avoid. While indicating that they do buy cannabis, and in this process have contact with 'dealers', this is a person you avoid as much as possible. This finding helps to explain why many respondents do not include suppliers in their first name generator. These are people they do not want to come in touch with in their general leisure time. Consequently, respondents only add them when prompted by the researcher. This illustrates the added value of using two name generators, allowing the respondent to add alters at multiple moments in time during the interview (see chapter 6).

This wider drug market is assumed to be reachable mainly through 'middlemen'. These are perceived to be able to shield a *supply network* from the wider drug market, while simultaneously also being the gateway to it. These middlemen, much like Pearson & Hobbs (2001) describe, serve different functions ranging from 'errand boys' to 'pivotal figures'. The key to these alters is that they are a member of personal networks that do not overlap with the personal network of the ego. The findings further suggest that these 'pivotal figures' are quite close to this 'wider drug market'. Most of the supply chains that respondents know of are quite short (two to three steps). Almost half of the respondents indicate they do not know the original supplier of the cannabis they use. However, some respondents indicate that this was mainly because they do not *want* to know. This keeps

them away from the 'drug milieu'. Other respondents argue they know some aspects of the process further up the supply chain (e.g. suppliers are *'friends'* of an ego's broker) but these middlemen do not talk about this openly. The level of secrecy about the 'source' of the cannabis further seems to indicate that at least some forms of exchange seem not to be 'normal'.

The exchange processes described above reflects the continuous process of shielding oneself from the wider drug market and simultaneously depending on it. For instance, the 'give-and-take' process is considered a way to avoid direct contact with 'dealers'. This process is indeed what Parker (2000) refers to as 'sorting out friends', and describes it as a means to put distance between the user and the 'criminal drug market'. In that case, one prefers to rely on close 'friends' who sell rather than 'dealers'. Other strategies to avoid these dealers are going to coffee-shops, cannabis social clubs or to start growing cannabis oneself. The other two exchange processes, 'selling to friends' and 'dealing', help to explain the three types of structures I found in chapter 9. These strategies to avoid 'dealers' also help to explain why supply networks have structures that are 'in-between' open and closed networks. Respondents describing an 'in-between' structure include a set of alters they know, often have strong social relations with, and who know each other as a 'steady base'. Aside from this set of alters, these respondents also like to have the opportunity to contact alters that can broker access to other networks if necessary (Morselli, 2007).

A further possible explanation might be along the lines of what I found regarding the perceived 'taboo' of cannabis use in chapter 10. Part of this perceived 'taboo' is that anyone who supplies cannabis is defined a 'dealer'. The accounts of the respondents indicate most of them recognise this definition and tend to agree with it. Additionally, when describing their personal situation, most respondents describe multiple strategies to avoid these dealers. Within the boundaries of their own personal network there is a shared meaning in what 'being a dealer' includes.

The findings in chapter 10 seem to suggest respondents consider themselves as agents of their own behaviour, but at the same time they are aware of a range of informal rules with which they attempt to conform. The findings above inform about how a similar process goes on when respondents describe supply. This indicates that rather than neutralising or rationalising their behaviour, respondents acknowledge the existence of dealers and accept that 'buying' from a 'dealer' puts you at risk of getting caught by the police. In doing so respondents seem to admit that they recognise they are responsible for their own

behaviour. However, in their definition of 'selling to friends' they seem to attempt to conform a set of rules, which if they are not formulated in wider society are set within the boundaries of their own personal network.

Chapter 12 General conclusion: setting, individual and relation

12.1 Introduction

Is there something like a 'dealer'? Is this 'dealer' different from suppliers that are 'friends doing each other a favour'? Or is this apparent dichotomy not a dichotomy at all? Over the years different conceptualisations of social supply have stimulated further debate on the extent to which there is a separate arena where supply is social rather than commercial (Coomber & Turnbull, 2007). Whereas some argue 'not-for-profit' for instance mainly refers to non-monetary exchanges, others argue 'a little bit of money' does not transform supply into 'dealing'. The social aspect or 'social network' then refers to 'friends', 'family' as well as 'acquaintances', while some argue all 'non-strangers' can be part of it (Coomber & Turnbull, 2007; Harrison et al., 2007; Hough et al., 2003; Parker, 2000; Potter, 2009; Werse, 2008).

Not only is its conceptualisation debated, but until today it also remains discussed as to why suppliers tend to describe their supply in 'social' terms. While some argue supply is motivated individually, others point to a continued relevance of Becker's (1963) work on deviant subcultures (Fitzgerald et al., 2013; Gourley, 2004). This study aimed to disentangle the concept of 'social supply' by adopting a network perspective. As such, I aim to develop its definition and theoretical framework. In computer-assisted interviews I explored the interaction between individual attributes of an ego and alter, the relations present between an ego and alter, and those relations in the wider network that connect alters with each other in 50 personal networks. This network analysis is guided by two research questions: *"How are personal networks of young people in which cannabis use and supply is present composed and structured?"*; and *"What is the nature of this supply tie between young cannabis users and their suppliers?"*

An initial discussion of the findings was part of the concluding sections of chapters 7 to 11. This general conclusion first puts all these aspects together in order to formulate a tentative definition of supply (see §12.2). Next, I reflect on the nature of the supply tie in an attempt to further develop the theoretical framework surrounding social supply (see §12.3). In the fourth section I reflect on the added value of network analysis in the

development of methodological tools in criminology (see §12.4). I conclude this report with some general suggestions for policymakers (see §12.5), as well as ideas for further research (see §12.6).

12.2   Social supply: friendship networks with an *edge*

12.2.1   A networked cannabis market

Personal networks, as perceived by recreational cannabis users and suppliers, seem to be multiplex in the sense that use and supply is embedded in more than one *network domain* (Mische & White, 1998). This is for instance illustrated by the lack of a complete overlap between the *complete*, *cannabis* and *supply networks*. In most networks these three domains overlap partially; the difference in actual size is very small in only a few personal networks. A range of informal rules and controls as formulated in one setting also seem to influence other settings (Crossley, 2010). In chapter 5 I explain that setting in this study refers to 'domain' or 'circle'. The use setting then includes the domain in which cannabis use (by the ego and/or alters) takes place while the supply or collaborative setting is the domain where supply is exchanged. The social setting includes the shared definitions and meanings that exist in the complete network. For example, informal rules formulated in a use or supply setting tend to influence the social setting as well. When alters become 'dealers', in the eyes of others, this temporarily weakens social relations or even leads to the dissolution of the social relation. Likewise, changes in the social setting might also influence the use setting or supply setting. For instance, respondents indicate that when getting older their 'lifestyle' changed (e.g. steady job, steady romantic relation). With that lifestyle, the meaning of leisure time changes as well. And with that comes a conceptualisation of cannabis use as a 'solo' activity rather than a group activity.

My findings illustrate the difficulty of assessing how social, use and supply relations mutually influence each other. The interaction between (emotional) closeness, a measure of strength, and closeness in terms of density illustrates how constraints on an ego might come from one setting as well as from the overlap between different *network domains* (see *multiplexity*, Krohn, 1986). For instance, a closed supply network does not necessarily include alters that are also emotionally close to the ego. Likewise, some respondents have strong social relations with alters in their supply network but these alters are not connected with each other. This suggests that while structure mainly reflects what the network does 'in action', social relations or emotional closeness reflect the dyadic relations that are present underneath. The complex interpretation of

multiplexity in terms of ties is also illustrated by the finding that 'use is not crucial to the social relation'. My findings not only show that abstainers seem to be present when an ego uses cannabis, but most respondents also indicate using cannabis is not key to the development of social relations. This particular finding explains why I found a strong correlation between closeness and 'being a member of the cannabis network' but not between closeness and 'being a user'.

Supply in the cannabis market under study seems to be 'the business of males'. Gender heterophily among female respondents and gender homophily with male respondents seems to confirm the male-domination concerning supply (Dahl & Sandberg, 2014; Grundetjern & Sandberg, 2012). These gender bonds seem to be stronger than bonds created through similarity in age, shared use or mutual supply bonds. This suggests that the connection with male alters is a typical characteristic of personal networks of females in cannabis markets. Furthermore, I found that female respondents tend to be supplied by their male 'partners' rather than the other way around. Moreover, few female respondents have a supply relation with their partner that is reciprocated, meaning supply is going both ways. This suggests that males do not perceive supply as a 'feminine' action. For instance, few respondents are supplied by females. It thus seems both males as well as females perceive supply as 'a guy thing'.

Gender in this cannabis market is also reflected by the lack of difference in the composition and structure of male and female personal networks. I found indications some female respondents are part of similar positons in their *supply network.* I note that for instance *complete, cannabis* as well as *supply networks* of female respondents do not seem to be focused more on risk minimisation (e.g. by including mainly strong or very strong social relations) than male respondents (Eck, 1995). Like among male suppliers, their *complete networks* have an open structure, while *cannabis* and *supply networks* have closed structures but also 'in-between' or even open structures. It then seems respondents are not required to rely on strong social relations for supply of cannabis (Dahl & Sandberg, 2014). Instead, it seems that these *supply networks* with an open or 'in-between' structure are focused on creating multiple opportunities to obtain or provide cannabis (Griffin & Rodriguez, 2011).

It seems that in this cannabis market, growing your own cannabis has become 'normal', in a sense that growing cannabis is an accepted way to try to avoid having to contact dealers. Likewise, respondents consider getting cannabis from a grower they know in

person an accepted way to ensure good quality, variety and a low price while also decreasing the risk of apprehension. Most of the respondents know people who grow cannabis or have tried to grow it themselves. This acceptance is reflected by the finding that unlike gender, 'being a grower' does not seem to shape the *complete, cannabis* or *supply network*. Growers and non-growers seem to be part of similarly composed and structured networks. Growers' *complete networks* for instance tend to follow the general tendencies of the complete group of respondents: gender homophily/heterophily (when a respondent is female), a mild tendency towards age homophily, use heterophily and supply heterophily. Unsurprisingly, all *cannabis networks* are characterised by use homophily and all *supply networks* are homophilous in supply. Growers also seem not to be part of particularly strongly connected personal networks. For instance, social relations are also not stronger in the personal networks of growers than in those of non-growers. Likewise, I find among growers' network, like those of non-growers, all three types of network structures to the same extent as among non-growers: open, closed and in-between.

The cannabis market found in my study aligns with the image of highly flexible, loosely structured cannabis markets (May et al., 2000; Ruggiero & South, 1994). Instead of a large presence of closed, tightly-knit networks I found open and 'in-between structures' in *complete, cannabis* and *supply networks*. This reflects Morselli's (2009) argument on the security-efficiency trade-off between trying to avoid getting apprehended and simultaneously trying to create opportunities for supply. For instance, open *supply networks* often include alters that are not associated with general leisure time activities but rather with cannabis use and/or supply. The 'in-between' structures formally resemble what Morselli et al. (2007) describe as organisations that build upon long-term relations but are flexible when needed. In-between structured *supply networks* for example include weak social relations with some alters. This makes the network efficient when action is needed as there are many opportunities for supply. Aside from these weak social relations, these *supply networks* also include a strongly connected group of alters that might provide security as supply within this tightly-knit group offers protection from getting apprehended. It follows that this security-efficiency trade-off seems not only present at the organisational level but also applies to individual decisions in exchange processes.

The perception of the structure might be influenced by the perspective one takes. For instance, egos that are the main supplier tend to be part of tightly-knit *supply networks* rather than openly structured ones. These networks tend to be characterised by a high density and low efficiency score. This finding is in line with what I would expect a social supplier would be part of: tightly-knit *supply networks* where everyone knows everyone (Parker, 2000). In other networks, alters are more likely to supply an ego than the other way around. When an ego is *not* the main supplier, *supply networks* tend to be more open. These networks are characterised by a lower density and higher efficiency score. Though some level of reciprocity is present, the ego in this network has access to other networks with potential resources through this supplier. I would expect this type of network in cannabis markets that include more traditional 'dealer' networks where efficiency prioritises the risk of apprehension and/or the risk of losing friendship relations (Morselli, 2007).

The cannabis market under study is also characterised by a duality in the way supply is defined. There are some indications that supply in this cannabis market is ruled by a cost-benefit analysis (Parker et al., 2002). At the same time, the findings also suggest this cannabis market might look like a *mutual society* where informal rules guide supply that is part of friendship building (Dorn et al., 1992). The structure of *supply networks* reflects how privacy and risk minimisation is balanced against efficiency and risk taking (Morselli, 2009). For instance I found that, in line with the normalisation thesis, individuals do tend to define use as well as supply in terms of a 'personal choice' (see below). With this choice comes a responsibility, which is acknowledged but actively *dealt with* through the development of informal rules (see below). The definition of supply in personal terms is reflected in the finding that most *complete networks* as well as *cannabis* and *supply networks* are characterised by an open or in-between rather than a closed network structure. These networks include isolated alters and small groups of alters that are only connected through the ego. This is not what I would expect based on the argument that 'social supply' is part of friendship building (Parker et al., 2002). However, a small group of *supply networks* is tightly-knit and not efficiently structured. These *supply networks* thus seem to rely on friendship relations. Though this impedes an ego when looking for new ways to procure cannabis, these networks tend to create longstanding friendships characterised by systems of favours. This is consistent with studies emphasizing the *social*

aspect of social supply (Coomber & Turnbull, 2007), as well as those pointing to elements of social learning of cannabis use (Cullen & Agnew, 2005; Goode, 2007).

The formation of these networks seems to follow Kirke's (2006) idea of a *chain*. Kirke (2006) argues peer selection and influence are part of a *chain* where selection of friends predates cannabis use. The initial personal network is formed by peer selection, which is based on other characteristics (e.g. gender) than shared cannabis use. This process of selection is followed by a socialisation of use within the already existing network. Some respondents pointed out that their social relation dates back from before either they or the alters started smoking cannabis. An ego often has a long and strong social relation with that specific part of the *cannabis network*. The presence of abstainers in the *cannabis network* further suggests that shared cannabis use is not considered as the most important element in the continuous development of social relations in *cannabis* and *supply networks*. This is unlike one would expect based on literature on *peer influence* (e.g. Kandel & Davies, 1991; Bauman & Ennett, 1996). Nevertheless, my findings do indicate new connections in *cannabis networks* are sometimes made based on the shared characteristic of cannabis smoking. Selection processes and influence processes thus might follow each other multiple times and even happen quite simultaneously.

12.2.2 'Social' supply is not equal to 'friends', 'kin' and 'acquaintances'

Social suppliers are 'friends', 'best friends', 'kin' or 'acquaintances' (Coomber & Turnbull, 2007; Harrison et al., 2007; Hough et al., 2003; Parker, 2000; Potter, 2009; Werse, 2008). However, limiting social suppliers to these social roles is both too narrow and too broad (like Potter, 2009 argues). The presence of **social roles** like 'partner' and 'colleague' adds to our understanding that seeing suppliers merely in terms of 'kin', '(best) friends' or 'acquaintances' is too limited. The findings indicate all social roles are quite similarly spread among *complete*, *cannabis* and *supply networks*. As literature suggests, this wide variety of social roles is applied in a subjective way (Crossley, 2010; Papachristos & Smith, 2012). This is illustrated by the way 'friends', 'other people' and 'colleagues' are defined by the interviewees. Some respondents use the social role 'friend' in a very strict sense, while others include almost all alters as friends. The subjectivity of social roles is also illustrated by the overlap between social roles. Most of the time, the social role 'friend' or 'best friend' is applied to describe other social roles as well. For instance, 'household members' or 'colleagues' are also considered 'friends'. The results indicate that 'friends' both refer to people who are emotionally close as well as those alters in a weak social

relation with the ego, making this particular role 'too broad' to be useful. Moreover, as Mische & Crossley (2010) argue, the social role 'friends' takes on different meanings across networks but also in different situations. This dynamic character of roles is also found in the way 'dealing' is defined below. For instance, some respondents indicate that during the exchange an alter is perceived a 'dealer', while outside this exchange these alters are seen and defined as 'friends'.

Measures of **strength** seem to capture the social aspect of supply in a more nuanced way than social roles. By looking at the 'social' aspect of supply via measures of strength I seem to find a more aligned definition of 'social supply'. These measures might then provide an answer to the subjectivity found and the overlap between social roles. To a network researcher, '(best) friend' and 'kin' refer to core or very strong relations (Crossley, 2010). I find that this social role is linked both to a wide range of very weak to strong social relations. The social roles 'best friends' and 'partners' are associated with strong and very strong social relations. I also found 'best friends' that have a neither weak nor strong or even a weak social relation with an ego. This suggests that some alters are considered to be 'best friends' over the years, but they are in a weaker social relation with the ego at the moment of the interview. 'Kin' relations are found in all echelons of emotional closeness. However, in most *supply networks* they are in the inner circle. While 'kin' and 'friends' are considered 'core social relations', the more general term 'acquaintances' or 'non-strangers' refers to a wide range of weak and peripheral social relations that show little homogeneity (Granovetter, 1973). In my study, 'colleagues' and 'other people' are predominantly situated at the lowest levels of closeness in *complete* and *cannabis networks*. But, if these alters are part of the *supply network*, they tend to be in strong social relations with the ego.

Respondents link the strength of a social relation to the way supply is described. The quantitative findings suggest emotional closeness is higher in *supply networks* than in *complete* or *cannabis networks*. Some respondents indicate 'sharing' cannabis is something that can make a social relation stronger although personal networks of cannabis users are characterised by supply heterophily. Furthermore, to some extent the strength of a social relation is associated with reciprocity. It seems that in many cases reciprocated supply takes place when the social relation is strong to very strong. However, I do want to note that I found this mechanism in networks with predominantly weak social relations as well.

12.2.3 Supply as a balanced or generalised reciprocated gift

Like the social aspect, 'supply' as a term is both too broadly and too narrowly defined. My findings suggest the pre-defined supply patterns (i.e. 'sharing', 'swapping', 'selling' and 'gift-giving') do not capture the complexity of cannabis supply. Social supply recognises the existence of and aims to capture these kinds of supply that are considered 'not (real) dealing'(Coomber & Turnbull, 2007; Harrison et al., 2007; Hough et al., 2003; Parker, 2000; Potter, 2009; Werse, 2008). Besides the social relation, the key to these exchange processes is the 'motivation' of the exchange, and more precisely the extent to which money is exchanged. In the general introduction and the conceptual framework I propose a tentative definition of social supply in an interactionist sense:

> *"a transaction moment which is the result of an **exchange process** and can take multiple forms. Supply is part of multiplex ties between two individuals, embedded in multiple social circles, part of a collaborative setting and shaped by the wider relational context"* (emphasis added)

Exchange processes in personal networks where cannabis is present are usually reciprocated. 'Unreciprocated gifts' are mainly linked with specific occasions (e.g. birthdays) (Mjåland, 2014). Sometimes they are also associated with experimental use (e.g. someone only smokes cannabis during a festival) though even in those cases supply tends to be reciprocated to some extent (e.g. buying a beer). More commonly supply is framed in a *generalised reciprocity* or *communal relation* (Clark & Mills, 1993; Mjåland, 2014; Sahlins, 1972). Reciprocity of supply is in that case implicit: it takes the form of 'returning the favour' when the original supplier is in need. This form of *generalised reciprocity* stimulates the formation of social relations and creates solidarity. This is in line with the idea of 'exchange as friendship building'. Aside from this implicit expectation, supply can also include an explicit expectation of reciprocity, or *balanced reciprocity* (e.g. money is exchanged at the moment cannabis is exchanged). This *balanced reciprocity* is for instance vital in a commercial relation between 'dealers' and 'customers'.

The size of the monetary profit seems to be linked with the goal of the exchange and the strength of the social relation between user and supplier. Like other social supply studies, I find that rewards range from intangible rewards like 'saying thank you' to more tangible rewards such as giving back weed or even a small amount of money (e.g. Hough et al., 2003; Potter, 2006; Weisheit, 1992). The key to a 'give-and-take' system is that rewards are mostly weed or other non-monetary goods. The distinction between 'selling to friends'

and 'dealing' seems consistent with the suggestion of Coomber & Moyle (2014) to extend 'social supply' to *minimally commercial supply*. For instance, money to cover daily living expenses or to cover the costs of growing is not seen as 'dealing'. This is similar to how *user-dealers* (Potter, 2006) are defined. Respondents also deem it acceptable to ask a higher price when supplying someone you do not have a strong social relation with. On the other hand, supply where gaining money is the most important drive is more likely to be considered 'dealing'.

Respondents see 'dealing' as an exchange process that includes crossing thresholds considering the social relation, type and frequency of reward as well as a specific initial motivation. 'Dealing' is described in terms of *commercial supply* (e.g. Coomber, 2006; Hough et al., 2003; Potter, 2006; Weisheit, 1992). At the same time this definition is enriched with some additional thresholds: the matter of frequency, the matter of ''selling' to "others" outside the personal network' and an added initial motivation to buy the weed to begin with. This final consideration suggests not only the financial gain that comes out of the exchange but also the motivation for the initial purchase might be a threshold. My respondents define a 'dealer' as someone who actively searches for clients with whom he/she has a 'client-seller' relation (see §11.4.1 for an exact definition). This commercial relation is characterised by a supplier that always has cannabis available, who does not really have a social relation with his/her clients, and for whom 'selling' cannabis is a major source of income.

Though these informal rules about what is considered 'dealing' are strict, they tend to be applied in a flexible way. This is illustrated by the temporal character of 'being perceived as a dealer'. Much like what is the seen as 'problematic use', respondents often describe alters who used to 'deal' but who now only obtain cannabis through 'sharing'. When asked about their own experiences, most respondents describe that they 'drifted into dealing' for a short period of time (e.g. in high school). As Taylor & Potter (2013) indicate, an ego's 'dealer' experiences are mostly situated in a closed market. The line between 'selling to friends' and 'dealing' is then defined based on the above-described additional aspects: 'selling' outside the network, 'selling' frequently, and asking more than was necessary to cover costs. Furthermore, some respondents argue that an alter can be considered as a 'dealer' when supplying to people outside the network while also being considered a 'friend' when he/she provides cannabis to people inside the network. This finding

confirms the importance of looking into the nature of supply, and not only into the mere presence of relations (Mische & White, 1998).

As Taylor & Potter (2013) concluded, the findings seem to indicate that social supply is not easily discernible from the wider drug market. The informal rules mentioned above are in place to keep alters from 'drifting into dealing' as Taylor and Potter (2013) put it. However, I did not find a separate arena of transactions (Coomber & Turnbull, 2007). Although some respondents seem to perceive it that way, I found thresholds between 'selling to friends' and 'dealing' to be subjectively formulated and easily crossed. Moreover, even if these thresholds have been crossed, one can 'go back' to 'not being a dealer'. These thresholds are present to some extent in all *supply networks* in my study. Moreover, many respondents sometimes or regularly buy cannabis and in this process have contact with 'dealers'. That said, most respondents agree you avoid 'dealers' as much as possible. Accordingly, they develop a range of strategies to avoid contact with this wider drug market. For instance, many respondents do not include all suppliers in the first name generator. This suggests these respondents want to 'keep' these alters separate from their general leisure time network. Other strategies include going to a coffee-shop, growing cannabis themselves or in some cases joining a cannabis social club.

12.2.4 Outcome of supply: a two-dimensional framework

I opt to use the initial conceptual framework but look at supply outcomes at a network level rather than at the individual outcome of exchanges (see chapter 5). In the conceptual framework I discerned four possible types of supply: *commercial supply*, *socio-commercial supply*, *social supply,* and *ideological supply* (see also chapter 5). All these types of supply are recognised and to some extent discussed by the respondents. However, respondents tend to define outcomes of supply at the network level rather than in terms of a dyadic relation. During the interviews however respondents spontaneously discuss outcomes of supply in holistic terms. As such, outcomes are defined based on past interactions in the *supply network*, rather than in terms of an individual exchange. What is illustrative is the way respondents discuss supply, even when describing personal experiences between two specific individuals, as having multiple outcomes. In other words, even in an individual relation, supply might on one occasion be more similar to *ideological supply*, but on another occasion lean towards *socio-commercial supply*. This made it particularly difficult for respondents to reflect on how supply takes place in their personal network. Monetary versus non-monetary rewards reflects the extent to which supply at the

network level is characterised by the exchange of money. The social relation, the second dimension, reflects the second major threshold between 'selling to friends' and 'dealing'. This is the number of weak social relations versus the number of strong social relations in a supply network.

The figure below visualises the interaction between social relation, supply relation and the structure of the *supply network*. Defining the outcome of a transaction moment takes into account this strength of social relations and the type of reward at the network level. Each point represents a specific *supply network* with a level of strength (vertical axis) and the number of exchanges for which money (sometimes) is exchanged (horizontal axis). The more a network is on the left hand side of the figure, the more supply relations include the exchange of money. The more a network is below the horizontal line, the weaker the overall social relations are. The colour indicates the presence of supply patterns (red = mainly monetary transactions; yellow = monetary transactions and 'gift-giving'; orange = 'swapping'; grey = all pre-defined supply patterns are present; blue = no money is exchanged). The shape indicates structure (round = open; square = closed; diamond shape = in-between structure). In some cases more than one *supply network* has the same score. In the upper-left quadrant, where *supply networks* are mainly characterised by *socio-commercial supply*, one marker is shaded red and orange. This marker represents three *supply networks* with a closed structure. Another marker, in the upper-right quadrant that includes *social supply networks,* combines two networks: one with an open structure, and the other with a closed structure. A third marker combines yellow with grey. This represents two *social supply networks:* one with an open structure, and the other with a closed structure.
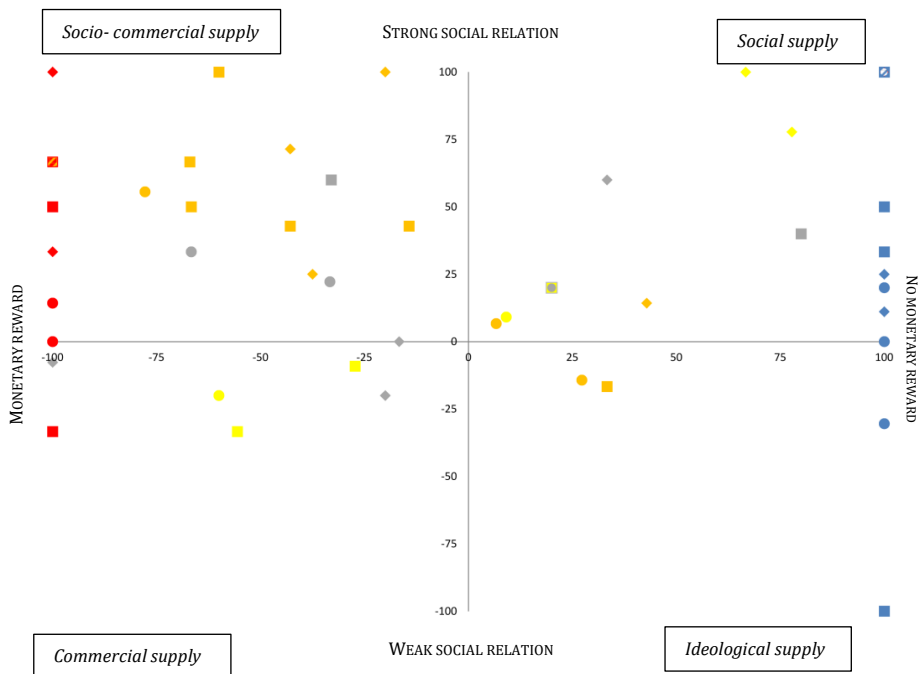
Figure 11 Social supply as a two-dimensional concept

The upper two quadrants of the figure above represent *socio-commercial supply* on the left-hand side and what was assumed as *social supply* on the right-hand side*.* As my findings suggest, most *supply networks* tend to include mainly strong to very strong social relations rather than weak social relations. The shape of the markers (square, round and diamond-shaped) shows how the structure of a network is not consistent with how exchange processes are defined. For instance, networks with predominantly strong social relations might have an open structure. This is in line with the finding that strong social relations between an ego and alters do not necessarily mean these alters are connected to each other as well.

My findings further support the idea that the social relations should be given more attention than the monetary gain in evaluating the extent social supply is present in a network. The above figure also illustrates the presence of monetary exchanges even in those *supply networks* where supply seems to be part of friendship-building (Parker, 2000). For instance, *social supply networks* (upper-right corner) in many cases include monetary exchanges aside from non-monetary exchanges. The upper-left quadrant illustrates how the mere exchange of money might be less important in the distinction

between social forms of supply and 'dealing'. These *socio-commercial supply networks* do tend to include more monetary exchanges than non-monetary exchanges. As such, the upper half of the quadrants might reflect what is meant by Coomber and Moyle's (2014) *minimally commercial supply*.

Although many *supply networks* are indeed characterised by strong social relations I do note that in some *supply networks* social relations tend to be weak rather than strong. In a few cases *supply networks* lean towards a more *ideological supply* (bottom-right quadrant). Contrary to in the majority of the *supply networks,* social relations are not that important, and the exchange of cannabis takes place without the exchange of money. Again, all types of structures are present, and all types of supply patterns are found. In some *supply networks* monetary exchanges are associated with weak social relations, which is in line with a *commercial supply* (bottom-left quadrant). This group of *supply networks* does not necessarily include only 'dealers' as in all of these *supply networks* non-monetary exchange processes are also present. Even in the two *supply networks* where all supply relations seem to include an exchange of money, respondents make clear that this is not *always* the case. Most of their supply relations include an exchange of money at least *sometimes*.

12.3 Nature of supply: networks as balancing the social against the individual

12.3.1 Limitations of social accommodation

Not only is the definition of social supply still subject to debate, it also remains unclear why people seem to perceive suppliers in this particular way. My findings suggest definitions of use and supply in personal networks are inextricably linked. I thus not only find illustrations of how supply is perceived but simultaneously how use is defined. These findings allow me to reflect on how supply is given meaning within shared definitions that are developed in a wider social network. A number of questions remain. Is social supply part of a wider normalisation of recreational cannabis use? Are these informal rules part of a process of risk minimisation? Has supply become *normal* in the sense of Parker's (2000) 'sorting out among friends'? Or is supply 'accepted' as part of a 'normal activity' but something that happens in the periphery of *cannabis networks*?

Recreational cannabis use seems to be socially accommodated to a certain extent. One of the defining elements of the normalisation thesis as put forward by Parker et al. (1998) is

that cannabis use is socially accommodated among abstainers. Parker (2000) gives the example of drug-wise abstainers who have knowledge of the techniques of using cannabis and also consider 'recreational' cannabis use acceptable. The presence of non-users in *cannabis networks* shows that alters who do not use cannabis might be drug-wise themselves. The qualitative findings related to the use setting and social setting indicate cannabis use is not seen as the defining element of social relations with alters. In most *cannabis networks* I note that the social relations run deeper and wider than the mere aspect of using cannabis together. Furthermore, I found that cannabis users do not flock together in a separate 'group' or some sort of sub-culture, but tend to maintain meaningful social relations with people they do not associate with cannabis use or supply. For instance, 'best friends' are the second-largest group of alters in most personal networks. However, in most networks not all 'best friends' are also part of the *cannabis network* or *supply network*.

Though I find indications of social accommodation of use, I cannot establish to what extent these abstainers are drug-wise because they simply cannot avoid having contact with substance users, as Parker et al. (2002) suggest. Pre-existing social relations with abstainers do not tend to be dissolved when a group evolves towards cannabis use (Kirke, 2006). The flexible reaction of the *cannabis network* towards someone who decides to stop using cannabis indicates that the tie between alters also exists outside the activity of using cannabis together. Most of the time, respondents argue that these non-users are not less emotionally close to them. In other words, the mere fact alters are not using cannabis does not seem to permanently influence the composition or structure of their personal network. Nevertheless, some respondents for instance mention a 'process of acceptance' where the social relation with someone who quits cannabis becomes temporarily weaker before it strengthens again. This process illustrates how the shape and structure of networks evolves as a result of interactions.

Furthermore, recreational cannabis use is defined by respondents as a 'personal choice'. The normalisation perspective stipulates that the decision to use cannabis recreationally is the result of a cost-benefit analysis, much like one would do when deciding to take up a sport (Measham & Shiner, 2009; Parker et al., 1999). Cannabis use, when 'recreational' (see below), is described by my respondents as a 'personal choice', and therefore also a personal responsibility. Respondents associate this perception of cannabis use as something 'personal' with a change in the meaning they attribute to cannabis use. As a

minor cannabis user, they define cannabis use as part of a group process. But now, in their twenties, respondents see cannabis use as an individual activity. As a consequence some respondents argue one should only use cannabis by oneself. These considerations suggest respondents think of cannabis use as a rational decision, much like Parker et al. (2002) argue.

Supply in this use setting in some cases corroborates with how Parker et al. (2002) describe social supply as a system of 'sharing' which is reciprocated when needed. 'Sharing' and 'gift-giving' are then seen as 'acts of friendship', thus embedded in the social relation. My respondents describe this *communal relation* as a 'give-and-take system' (Clark & Mills, 1993). In agreement with the findings of other social supply and network research, respondents see this system as part of friendship building but also use it to ensure good-quality cannabis and to minimise the risk of getting caught (Mauss, 1990; Potter, 2009; Sahlins, 1972; Werse, 2008). Though these exchange processes are framed in social relations, only in few cases are they defined in terms of unreciprocated gifts (Mjåland, 2014). This illustrates the importance of *generalised reciprocity* in the framework of building friendships when being in a supply relation.

Supply however seems to be less socially accommodated than recreational cannabis use. Many alters in a supply relation are also included in the *cannabis* and *complete networks*. However, these alters are quite often not considered part of a broader leisure time environment. Both the secrecy surrounding the sources of supply as well as the presence of multiple exchange processes illustrate this different view. Although all respondents are recreational users, the large part of the *supply networks* seem to include at least some monetary exchanges (see also above). Some of these *supply networks* even include mainly weak social relations which seem to be far away from 'acts of friendship'. Exemplary of this secrecy is that respondents are willing to talk about the way they obtain cannabis, but talk about the actual source of their cannabis in a vague way. For example, many respondents claim not to know or are not willing to know the source of the cannabis, as long as the middleman can be trusted (see also below).

12.3.2   Setting the boundaries for normality: informal rules

The informal rules described and explored above illustrate the need to further theorise about mechanisms through which groups influence individual choice (Fitzgerald, 2013). Respondents deal with these perceived risks through a range of informal rules. This set of shared definitions takes the shape of a collection of social rituals (Sandberg, 2013; Mische

& White, 1998). These thresholds of perceiving someone as a 'dealer' are defined within the boundaries of their personal network. Drug market literature indicates the perceptions of cannabis use are shaped by informal rules and controls (Coomber & Turnbull, 2007; Cullen, 2010; Mauss, 1990). For instance, studies of social learning and subcultural processes argue not only that techniques of use or the perception of the effects are learned in group, but that broader notions on issues like 'responsible use' are also part of a group interaction (Becker, 1963; Coleman, 1988; Cullen & Agnew, 2005; Goode, 2007; Gourley, 2004; Mjåland, 2014; Zinberg, 1983). Likewise, I found supply is given meaning by a range of shared definitions and social rituals (Dunlap et al., 2006; Mische & White, 1998; Potter, 2009; Zimmerman & Wieder, 1977). Much like they do with 'problematic use', most respondents conceive dealers as outsiders who they have weak social relations with and people who should be avoided.

Informal rules can result in informal sanctions if someone does not act in conformity or within the boundaries set by these shared definitions (Hathaway, 2010). Social relations might (temporarily) dissolve if alters are using 'too much' or if alters start to use other types of substances. What is considered 'too much' or 'problematic use' is defined within the boundaries of the cannabis network. Thresholds for using 'too much' are associated with this social relation. For instance, the more an alter uses alone and skips group activities, the more likely this alter will become more isolated. It does seem that within the network some rules are in place to keep one from 'drifting into dealing' as Taylor and Potter (2013) put it. These informal rules include both rules concerning the social relation (e.g. 'not 'selling' outside of the cannabis network') as well as the kind of reward that can be asked (e.g. amount of financial profit, implicit reciprocity) (Coomber & Moyle, 2014; Mjåland, 2014; Sahlins, 1972).

12.3.3   'Personal choice', agency and stigma: a network perspective

The two-dimensional definition of social supply illustrates the continued relevance of Becker's (1963) work on deviant subcultures (Fitzgerald et al., 2013; Gourley, 2004). The findings indeed show how social interactions shape shared understandings of and values surrounding recreational cannabis use. These findings follow the critiques of the normalisation hypothesis, which is that it emphasises individual behaviour or agency too much in weighing the costs and benefits of using drugs, at the expense of taking into account more structural influences (Measham & Shiner, 2009; Shildrick, 2002).

My findings indicate how individuals are not merely passive responders to *peer pressure.* Instead, in their descriptions of use as well as supply, respondents regularly cite 'personal choice' and 'responsibility'. By stressing this aspect of 'personal choice', respondents seem to reflect on how moral regulation of the pursuit of pleasure becomes a matter of developing rationalized strategies to control risks (Hathaway, 2011; Peretti-Watel, 2003). The findings appear to reflect a search for balancing an internalized moral duty to avoid hurting others with using cannabis for pleasure. Respondents seem to formulate a strong need to define the limits of their pursuit of pleasure. Informal rules then express to what extent pleasure is 'accepted' and at what time it is perceived as crossing the boundaries of 'responsibility' and 'rationality'(Bramham & Wagg, 2011).

The personal networks under study reflect a duality: on the one hand use and supply is defined as a 'personal issue', but on the other hand respondents strive to conform to shared definitions of use and supply. The development of informal rules and controls illustrates how recreational cannabis *use* seems to be *normalised* within the boundaries of the *cannabis* and *supply network*. However, supply seems to be not normal, even within the *cannabis network.* It does seem to be accepted and surrounded by strategies to shield but also interact with the wider drug market. This apparent duality suggests *normalisation* of supply is limited but also points to recreational cannabis users and even more suppliers as perceiving themselves as subject to stigma and trying to manage this by constructing a micro-reality or *transparent bubble* (Goffman, 1963; Hathaway et al., 2011).

When talking about strategies to avoid 'dealers' and avoid 'getting caught', respondents discuss strategies of risk denial rather than the classic neutralisation techniques as developed by Sykes and Matza (Peretti-Watel, 2003; Sykes & Matza, 1957). Respondents tend to use three techniques of risk denial: scapegoating, expressing self-confidence, and comparison between risks (Peretti-Watel, 2003). They use these techniques when talking about recreational cannabis use as well as about social supply. The thresholds distinguishing 'recreational use', 'problematic use' and 'selling to friends' from 'dealing' illustrate how respondents seem to stigmatise others by drawing a border between 'them' ('risky people') and 'us' ('safe people'). Likewise, many respondents argue they are in control of their own use and are confident about not getting caught because they make use of these strategies to avoid 'dealers'. Some also compare their situation as cannabis

users to alcohol users and argue smoking cannabis is less risky than something as socially accepted as alcohol use (e.g. 'you do not become aggressive when stoned').

As Sykes and Matza (1957) and Becker (1963) already pointed out, respondents perceive themselves as 'insiders' to society (Measham & Shiner, 2009; Parker et al., 1999). As respondents also see their suppliers as part of the same universe, as Goode (1970) argues, suppliers might be considered as part of this wider society as well. What is illustrative here is how respondents mention that events in one setting influence interactions in a second setting (see *multiplexity* discussion above; Krohn, 1986). For instance, turning points that shape the composition and structure of the *complete network* (e.g. getting a job, going to university, falling in love) can also shape the *cannabis network*. Furthermore, by stating that cannabis is not what identifies social relations, respondents seem to suggest they do not necessarily see the use of cannabis for pleasure as defining the 'master status of their identity' (Becker, 1963). They perceive cannabis use as just one of the activities they do, and not as the focus of their own biography (Hathaway et al., 2011).

My findings indicate recreational cannabis use and its supply are situated in a *risk society* that is characterised by uncertainty and the pressure to control risk (Beck, 1992). The way use and supply are defined suggests recreational cannabis users and their suppliers might be targeted by these attempts to control risks (Peretti-Watel, 2003). The normalisation perspective starts from a general acceptance of recreational cannabis use because 'it's there' (Parker et al., 2002). This reflects the concept of deviance found among abstainers by Parker et al. (2002), as cannabis use is argued to be acceptable if 'recreational' and 'responsible'. However, many respondents refer to the wider society as seeing cannabis *supply* as 'taboo'. An important aspect of perceiving oneself as 'insiders' to society includes respondents' adoption or internalisation of this 'taboo'. This element of 'taboo' seems to be present mainly when talking about supply. A wider cultural accommodation appears more likely to exist for 'recreational cannabis use' than for supply. This apparent duality illustrates how although recreational cannabis use and its supply are perceived as a 'practice of the self', they are also defined by others as a risk and might evoke cultural anxiety (Duff, 2005; Hathaway et al., 2011).

Identities in this *risk society* are constructed and reconstructed to suit different times and settings. These constituted identities can be seen as a reflexive project, comprising elements of choice and responsibility in the construction of a narrative of the self (Beck, 1992). The interaction of supply and social relation goes in both directions. What is

illustrative here is that one can be considered a 'dealer' at one given moment but not at another moment. Many respondents for instance refer to a period in time they themselves were, according to their own definition, a 'dealer'. Some respondents express a feeling of guilt and a need to rationalise their choice for 'dealing' (e.g. out of temporary economic necessity).

These informal rules are also adopted when looking at use. For instance, the end of the social relation is not because someone is using 'too much' and gets isolated from the group. Some suggest their *cannabis network* looks different when they are using 'too much'. However, social relations with the 'original *cannabis network'* tend to stabilise again once this person no longer uses 'too much'. This particular finding explains why I found a strong correlation between closeness and 'being a member of the cannabis network' but not between closeness and 'being a user'. This finding is also illustrated by the accounts of respondents telling that alters that quit using cannabis, or have never even used cannabis to begin with, can be 'friends' just like anyone else.

Defining supply in terms of social supply seems to be associated with what is considered *normal* within the flexible boundaries of one's personal network, rather than the result of a wider societal transformation. Respondents often refer to their use in terms of a 'personal choice'. In describing 'how to avoid a dealer' and 'what is a dealer', respondents also refer to this 'personal choice'. For instance, they talked about the cost and benefits and weighing risks against possible benefits. In this weighing, they also seem to include 'immaterial' risks (e.g. risk of losing friendships). However, it seems that this personal choice is rooted in a shared history of definitions of what is 'not-a-dealer' as much as 'what is a dealer'. By emphasising this wider 'taboo' in society about recreational cannabis use and its supply, these respondents seem to link supply with a stigma. This suggests that defining supply as social, and moreover, stressing the importance of trying to keep supply social, is an example of the lack of a societal transformation rather than an example of a wider social and cultural accommodation of recreational cannabis use and its supply. Indeed, these findings seem an illustration of how users try to assimilate with society (Hathaway et al., 2011).

This apparent lack of a wider societal transformation is also described in studies that propose to nuance the scope of the *normalisation* perspective. Some authors stress normalisation is something typical for young (underage) recreational users of cannabis (Duff, 2005; Shildrick, 2002; 1997; Van Hout, 2011). Others argue a wider cultural

accommodation, which is assumed by this normalisation perspective, is not present as society as a whole has not transformed into accepting recreational cannabis use (Hathaway, 2010). Instead it is suggested to talk about *differentiated normalisation*, stressing the limited applicability of the concept, or *normification*, a term borrowed from Goffman (1963). In line with Hathaway et al. (2011), my findings suggest that notwithstanding processes of normalisation (e.g. social accommodation), cannabis users have also internalised mainstream conventional views that define cannabis use as risky. Having internalised these views, users then present themselves as *normal*. However, this is not *full normalisation* according to Hathaway et al. (2011). Building upon the ideas of Goffman (1963), they argue recreational cannabis use is not *normalised* because 'others' do not seem to accept users as if they were the same, and thus without stigma. Rather than talking about normalisation, these authors stress that it is not because someone presents themselves as 'normal' that everything is 'normal'. This aspect is key to normalisation as Parker et al. define it: "*normalisation is about stigmatised or deviant individuals or groups (and to some degree their social behaviour) becoming included in as many features of conventional everyday 'normal' life as possible, from life's rhythms and routines to economic and environmental 'standards' of life*" (Parker, 2002, p. 942).

Mische and White's (1998) notion of *Goffman publics* seems to capture the underlying process of defining supply (see also chapter 10). Respondents describe their own situation as it were some sort of *transparent bubble*, a social-space state that decontextualizes underlying longer-term relations. Though this concept is developed and used within conversational and discourse analysis, it does seem to reflect how by framing their use in a range of informal rules, users and suppliers create highly ritualised interactions. These interactions seem to temporarily suspend the longer-term processes that are part of the wider network domains the alter and ego are embedded in. In these 'bubbles', time is temporarily suppressed, which decouples actors from the multiple temporalities they are embedded in.

In my study, respondents seem to mainly assimilate and 'normify' behaviour by making use of these *transparent bubbles* to explain to themselves and their personal network why this behaviour of social supply is more acceptable than 'dealing'. Illustrations of the presence of such transparent bubbles include the above-described internalisation of cannabis as taboo, the in-between structures, the temporality of considering someone as a 'dealer', the careful distinction of someone being a 'dealer' only at the moment of

transaction, the overlap of social roles, and the importance of strength rather than social roles. These illustrations reflect how respondents build upon longer-term social relations that seem to be in place to buffer the ambiguity of an apparent *normality* of use against a mere *acceptance* of supply. These transparent bubbles then might be part of a public called a public of substance use and supply. This public then reflects as well as possibly stimulates a shift in socio-cultural formations by making the management of ambiguity easier. In that way, the attempts of assimilation I found might reflect aspects of a broader shift in socio-cultural formation towards a cultural accommodation that Parker (2005) argued to be already present.

12.4   Network analysis as a method: added value?

My findings show how social network analysis aids in developing further understanding of 'social supply' and 'supply' more broadly. According to Papachristos (2012) the main added value of network analysis in criminology lies in the study of substantive topics, for instance *peer influence.* I tend to agree that network analysis can contribute to a broader understanding of the interactions between agency and group processes. As such, it is possible to look into how at a micro-level setting, relations and individuals further elaborate our understanding of how social interactions create shared definitions. A network perspective allowed the formulation of suggestions for the development of a two-dimensional conceptualisation of supply.

A pragmatist research design and a focus on ego networks allowed the research problem to be explored in a more complete, holistic way. Qualitative methods are as important as quantitative methods for the further methodological and theoretical development of the network perspective. Until now, studies into network analysis predominantly make use of quantitative methods (Crossley, 2010; Mische & White, 1998; Salvini, 2010). These methods for instance improved my insight in the structure and composition of *supply networks* and resulted in a more nuanced understanding of the *social* aspect of supply by looking at it in terms of the strength of social relations rather than social roles. Exploring the composition of supply networks also aids in developing further understanding of defining supply at the *network* level rather than at the dyadic level. However, it is through qualitative methods that I am able to theorise about the mechanisms that lead to these conceptualisations. For instance, the way I collected data on how respondents give meaning to the structure of their *supply network* provided a more nuanced understanding of the concept of multiplexity.

Data collection through a software programme captures additional layers of complexity which are more difficult to analyse using traditional paper and pencil methods. In this study data was collected with a software programme called VennMaker. By using the software programme I was able to conduct the interviews in a slightly more structured way. This made it easier for respondents to get acquainted with the research method. As is often the case, using software to collect data includes compromising on the lay-out of the questionnaire. I acknowledge that a paper and pencil method might have been more flexible. Yet VennMaker made collecting a large amount of data on many alters (over 30,000 relations) easier. Extracting the data and consequently performing network analysis on this data requires a careful and tedious manipulation of the extracted files. Data cleaning proved to be a far more exact process than when data is collected through paper-pencil methods because the data was already put in files that can be easily exported, for instance to SPSS (Hogan et al., 2007).

VennMaker also proved a useful tool for participatory mapping (Hogan et al., 2007). For me as a researcher it was relatively easy to develop the questionnaire in the programme. Respondents also reacted positively and found it intriguing to be able to create their own network on a laptop (see below *respondent burden*). The technicality and practical arrangements (e.g. sitting in front of a laptop the whole time) did not seem to dominate the interview. Moreover, none of the respondents had difficulties with assessing the strength of social relations through emotional closeness. The use of concentric circles to indicate how close one is to the alters did not require additional explanation.

Though the interviews were lengthy, respondents did not perceive this as a burden. Data was collected at one point in time. Interviews were quite long and required respondents to concentrate for a long time because all data was collected at once.. Though this could have implied a high burden for respondents, the respondents themselves did not seem to see it that way. This becomes clear in their appreciation of the interview. Most saw it as an opportunity to reflect on their own behaviour, or emphasized that they agreed to cooperate and wanted to help as much as possible. They often mentioned that they liked the exercise. Some respondents mainly participated because they knew and trusted the reputation of researchers within the Institute for Social Drug Research. The reward they received at the end of the interview (two movie tickets) was perceived by respondents as a nice present but not the main reason to cooperate.

Nevertheless, the assumed high respondent burden and one (long) moment of data collection made it essential to build a good rapport with the respondents. Some characteristics are not bound to the interviewers' role but can also influence the question-answer process (Billiet & Carton, 2003). However, I noticed that being honest about my lack of personal experiences with cannabis use aided in establishing trust with respondents. If anything, it gave them the feeling of being an expert. Moreover, by being present throughout the interview, I was also able to answer any remarks concerning question wording or meaning attributed to concepts.

Question wording was important in establishing trust between the interviewer and the respondent. To prevent the misinterpretation of the questions, the instrument was tested thoroughly (see chapter 6). Despite thorough piloting, some questions needed further explanation during the interview. For instance, indicating the strength of a social relation seemed easier for the respondents than identifying social roles. Identifying social roles often evoked comments on the definition of 'friend' and 'best friends'. Most respondents asked for clarification about what was meant by emotional and practical support. While most had no issues with the question, others reflected that it was very difficult to differentiate between "might" get emotional or practical support from a specific alter and "actually get from" them. The questions considering the frequency of particular exchange processes, as stated above, proved to be too difficult to assess for many. Most respondents could differentiate between "most" and "sometimes", but few could give more precise estimations.

Besides a lack of respondent fatigue, a high respondent burden also did not seem to cause a tendency towards social desirability (Tourangeau & Yan, 2007). Some did find it confronting to see how many people in their personal network use cannabis. These respondents gave remarks like *"you'll probably think that everyone is smoking weed all the time"* or *"this sounds bad"* when they were talking about the frequency they used cannabis together. These reflections show how even when participating in the study they are aware of what society might think of them. Some respondents added that, despite the anonymity of the study, talking about others is *"odd"*. For some respondents the questions about emotional and practical support were very difficult because they only perceived a few people this way. Some even found it *"painful to see"* and felt the need to give at least 'one answer' or 'more answers' because they thought of themselves as rather abnormal.

To counteract memory effects, I explored *active* social networks (Brashears, 2013; Fiske, 1995). But even when talking about the past six months, network members are not easy to recall. Research indicates that forgetting network members is however not random, as taken-for-granted members (e.g. spouses) are often forgotten. The closest, most frequently and recently contacted members are better recalled. Respondents indeed mentioned that they found it difficult to think of 25 people. That said all of them succeeded in doing name 25 alters in a short amount of time.

Respondents regularly stressed the importance of anonymity (see chapter 6), and I put strategies in place to ensure this. Through a process of anonymisation all alters' names were transformed into a code of four digits: the first two digits represent the ego network they are part of (ranging from 1 to 50), and the last two digits are random. Most respondents wrote the first two or three letters of the first name and last name. Others opted to write down the full first name, though this was confusing when more than one alter had the same first name. Some choose to write down the names on a paper and only write codes in the name generator. Regardless of the names that were put in the software programme, in the analysis and further reports only the four digits are used.

Due to the nature of the sampling strategy (snowball sampling), the study might be characterised by a self-selection bias as well as a volunteer bias (Atkinson & Flint, 2001). Despite the use of a wide recruitment strategy, the final sample included many growers, many females and some respondents associated with cannabis social clubs. These respondents might define the way cannabis is procured differently and therefore bias the findings. I did not study the role cannabis social clubs might play in defining social supply. My study namely focused on the process of acquiring cannabis between egos and alters and less on how external sources might influence this definition. I want to note here that the length of the recruitment chains varied along with the type of recruitment strategy used. Non-digital strategies more often resulted in longer recruitment chains, while digital strategies often successfully recruited a zero stage respondent but did not lead to any further referrals.

It is difficult to assess to what extent an expansiveness bias (Feld & Carter, 2002) and attractiveness bias (Brewer, 1995) is present. The attractiveness or alter bias refers to the tendency to over-report relationship strength and interactions with attractive, desirable people and/or to overlook their relationships with undesirable people (Brewer, 1995). For example, in my research respondents could have over-reported the strength of the

relationship with people who are popular or are perceived important (e.g. fellow cannabis users, suppliers). But the fact that alters are in all echelons of emotional closeness might suggest attractiveness bias is limited in this study. The ego or expansiveness bias refers to the tendency for egos to over- or underreport one's interactions with others (Feld & Carter, 2002). I cannot measure to what extent the ego bias is present. For instance, the presence of exchange processes might be over- or underreported. Because I do not have another set of data (e.g. alters views) to compare respondents' statements with, I cannot conclude to what extent for instance respondents overestimate the frequency they exchanged cannabis with a specific alter.

12.5   Suggestions for developing legal, prevention and aid strategies

In the past, social supply research has often included a plea for diversifying the legal regulations dealing with the prosecution and sentencing of cannabis supply (Hough et al., 2003; Lenton et al., 2015; Potter, 2009). However, translating a concept built upon the subjective perception of users and suppliers to the normative context of the law is not easily done (Potter, 2009). Social supply literature makes some suggestions about objective indicators (e.g. weight of crop, number of plants) for diversifying sentences as well as for guidelines the police can use when they exert their discretionary powers (; Hough et al., 2003; Lenton et al., 2015). It is thereby acknowledged that both strategies might create inequity. For instance, setting a strict limit on the total grams of cannabis one might possess for personal use might stimulate someone to procure stronger strains of cannabis. On the other hand, a reliance on police discretion might result in a lack of transparency and consistency in decisions, which makes it important to have clear and detailed guidelines (Hough et al., 2003).

A key issue is to clarify what is meant by 'social supply'. In the upper two quadrants of the above figure, a form of supply that is mainly socially motivated is shown. In these networks the 'give-and-take' system or 'selling to friends' is the main way to provide and procure cannabis. This seems to suggest that when defining thresholds for supply one should also look into the strength of a social relation. As Hough et al. (2003) conclude, information on the strength of a social relation might inform prosecutors or police officers when exploring options for diversification. Simultaneously, I want to emphasise that my study took place in a protected environment. Respondents had nothing to gain or to lose by describing their suppliers in a particular way. This limits the potentiality of using these kinds of thresholds when applying sentences.

In the final stages of this PhD, I was made aware of a Circular of the College of General Prosecutors in Belgium[40] which advises further diversification of prosecution of 'minor cannabis sales' based on the motivation of the sale. In this document, it is suggested that prosecutors should distinguish between 'selling' cannabis 'to cover the costs of the own use' and 'selling' it 'driven by financial gain only'. If 'selling' cannabis is 'driven by financial gain only', it is proposed to treat this type of offence as it were part of organised crime and thus to take an explicitly repressive approach. However, if 'selling' cannabis is mainly 'to cover the costs of one's personal use', prosecutors should treat this in the same way as one would treat possession of an amount of substances for personal use (e.g. no prosecution, probation or conditional release). The decision between one of these options is to be made at the moment the cannabis is discovered. However, the guidelines put forward in the circular to inform this decision are quite vague. It is stated that: *"The quantity of the cannabis found is important but should not prevail. Instead one should take into account the techniques of the purchase (e.g. 'drug runners', widespread sale...)"*[26]. As is discussed above, to improve equity in the decisions, it is important to add detail to these guidelines.

My findings might aid in developing guidelines for Belgian prosecutors to be better informed and exert discretionary power in a consistent way. As Lenton et al. (2015) argue, any such programme should be subject to evaluation to determine its viability and effectiveness in terms of the individuals apprehended, the workability from a policing point of view, the effects on other stakeholders such as drug treatment agencies, and the views of the wider community. These evaluation procedures are necessary in order to increase the transparency of these judgements about the intentions of suppliers (Hough et al., 2003).

However, these findings seem to suggest we are a long way from an actual 'anti-stigma' campaign, which would integrate users and suppliers in society as Emmerson (1992)—who inspired Parker's conceptualisation of social supply—indicated to be necessary to empower those perceived as 'outsiders' to become 'insiders' or 'normal' people. A diversification in sentences might reflect the current structure of cannabis markets and focus the present means and money on the more 'criminal structures'. But respondents expect a change in the legal status might not lead to a wider change in the *immoral* status of recreational cannabis supply (Bramham & Wagg, 2010). As suggested by Hathaway et

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[40] Circular n°15/2015 of the College of General Prosecutors at the Courts of Appeal (December 2015)

al. (2011), one can argue that for this transformation to take place diversification of measures is not sufficient; one should work towards a decriminalisation of recreational cannabis use and its supply. This might stimulate a broader shift in socio-cultural formations (Parker, 2005).

My findings suggest measures for diversification might matter more than expanding 'legal' ways to procure cannabis (e.g. through coffee-shops or by a membership of a social club). Most respondents seem to be keen on keeping supply within the boundaries of their own personal network, regardless of what the law dictates. Moreover, one can take into account that recreational cannabis use is seen as a 'personal choice', as is the way one obtains cannabis. This would suggest regulations considering the amount of cannabis one can possess, and the number of plants one grows, might be the most adequate way to diversify legal strategies (see also Hough et al., 2003). As discussed above, one should develop detailed guidelines to avoid discretionary powers being 'misused' as well as to counteract issues like growers adhering to the limits of number of plants but growing stronger strains. It is therefore that these 'informal rules' that were described by my respondents might become important. In developing adequate sentencing levels, one should take into account the two-dimensional scale I developed above and the boundaries between 'real dealing' and 'not *real* dealing' as suggested by the informal rules and sanctions. That way suppliers might 'accept' punishment and 'take responsibility' to develop adequate sentencing levels.

Besides informing the development of legal strategies, the results and techniques for data collection used in my study might inform professional actors who work on a daily basis with (recreational) cannabis users and suppliers. Cannabis users in Belgium are increasingly present in treatment facilities (Van Deun, 2014). Cannabis suppliers are also referred to these facilities in the framework of diversification of sentences (see above). A key aspect here is the finding that all respondents tend to define cannabis use, recreational as well as what they refer to as 'using too much', in terms of 'personal choice'. Although this research does not have a biological focus, an examination of individual and structural aspects of use suggests this perception keeps them from defining use in pathological terms which might make it more difficult for them to approach therapeutic centres.

My findings, though focused on recreational use, might also inform for instance about how studying strength and multiple settings aids in the search for meaningful others that

might contribute in the process of rehabilitation. This idea of social support through meaningful others is often studied, but seems to mainly focus on the contribution of 'family members'. Recent studies indicate other meaningful people, like friends, might also contribute to this process (Soyez, De Leon, Broekaert, & Rosseel, 2006) studying strength instead of role relations, one can look at those people that matter the most to an ego, regardless of their social role. The method of participatory mapping might help in finding these meaningful others.

One might also consider taking the results into account when developing prevention strategies. For instance, the insights gained regarding selection and influence processes as well as the rich understanding of supply might stimulate development of targeted prevention, such as. a public education campaign as proposed by Lenton et al. (2015), or school prevention programmes.

12.6 Suggestions for further research and final comment

The results of this study might inform other drug market studies about how to question supply in a more nuanced way. For instance, if one is interested in the social aspect of supply, a measure of emotional closeness informs about the extent to which this relation is social in a more comprehensive way than questioning social roles. Additionally, the commercial aspect of supply might be studied through questions about the additional thresholds that are part of defining individual exchange processes (e.g. the matter of ''selling' to "others" outside the personal network' and an added initial motivation to buy the weed to begin with). This type of question can be used in further qualitative research as well as quantitative research (e.g. by adding a network clause, as was done for instance in the Dutch Social Behaviour Study).

A next step in studying social supply might include a further exploration of the thresholds concerning 'dealing'. These are more complex than the mere exchange of money. As described above, respondents are unable to estimate either the frequency of monetary exchanges or the amount of money that is exchanged. For instance, by asking a range of respondents to keep a contact diary of their interactions during a fixed period of time, one can get a clearer image of how the composition and structure of *supply networks* change. In this kind of research it is crucial to develop adequate strategies to protect the anonymity of all participants.

My study focuses on a specific population, namely those users that perceive themselves as 'recreational' users. Looking at the wide variety of use patterns, it might be interesting

to examine to what extent social supply is present among 'problematic users', as they are named by the respondents,. As they become more isolated in the group, what happens? Does the network they were part of become more closed in an attempt to protect the members from the possible risks of arrest? Do these isolated alters look for contact with a different network? Does the weakening of a social relation go together with a rise in monetary exchanges?

Likewise, I found some indications that 'cannabis' is still perceived as a 'different' drug than other illicit drugs. The extent to which social supply is present among this group is not clear. Some studies suggest it might be present in the dance drug scene (Measham et al., 2000). Those respondents in my study with other experiences did mention that the use of other substances shapes the structure and composition of the social, use and supply settings. As supply is defined at the crossroads of these settings, one might assume social supply in these personal networks is either defined differently or less present.

Further research might also extend exploration into the role individual attributes play in shaping the composition and structure of *supply networks* and in doing so shape supply definitions. For instance, I find that many respondents attribute the way they perceive cannabis supply now is rooted in a changed meaning of cannabis use. They associate this apparent change with getting older. For instance, mapping the networks of different age cohorts in a cross-sectional or longitudinal design might further explore how definitions of supply change over the course of a lifetime. For instance, one can study to what extent *supply networks* are more openly structured in older age cohorts.

Besides age, respondents in my study sometimes reflect on their geographical location (rural versus urban areas) (Campos, 1996; Fischer, 1982). As is suggested in some studies, a study of location might contribute to our understanding of the limitations of social accommodation (Cheung & Cheung, 2006; Duff, 2005; Fitzgerald et al., 2013). Through network analysis, one can for example analyse the extent social relations are concentrated in the same geographical area the respondent resides in, but also the extent to which these social relations influence the way supply is defined. For instance, it might be that *supply networks* covering two geographical locations include small groups of otherwise not connected alters who are in strong social relations with the ego.

Aside from geographical location and age, ethnicity might play not only shape wider cannabis markets but also individual *supply networks* (Maher & Hudson, 2007; Murji, 2007). Some of my respondents were not born in Belgium, but all of them only included

alters that were living in Belgium. It might be interesting to see whether supply networks that include mainly alters of a different origin are composed and structured differently than those including both alters that were born in Belgium and alters who are not. For instance, do they include more kin? Are *supply networks* more openly structured? To what extent is supply defined as a 'personal choice'? This group of networks also might include cross-border contacts. In that case it might be interesting to study the nature of these contacts and the extent to which they influence the way supply and use is defined.

Network research indicates that socio-economic status is linked to the flexibility of a network. People with higher educational achievements tend to have a better range of people who they can contact when they are searching for information (Campbell, Marsden, & Hurlbert, 1986). This might influence how supply networks are structured and thus might shape the way supply is defined as well.

Furthermore, female 'partners' seemed to have quite similar supply networks to their male counterparts. However, most of them were on the receiving end of the supply relation. It might be interesting to look at how females 'do gender' in their supply relation in order to explore how this might shape the way supply is defined further (Measham, 2002). One aspect here might be that same-sex partners have a differently structured network to networks where a male partner is present. For instance, it might be that these *supply networks* are characterised by a stronger gender homophily.

Respondents sometimes also referred to turning points as the main elements in the formation and changing composition of the *supply network*. Turning points were described in terms of getting a job, going to university, moving in with a 'partner', or having children. Longitudinal analysis or a cross-sectional study with respondents in different phases of their life (e.g. without a job or with a job), using instruments as developed in my research, might further inform about the extent defining supply is for instance associated with economic necessity and romantic relationships. Respondents did for instance state that supply out of economic necessity is more likely to be seen as 'selling to friends' than 'dealing'.

My findings suggest an explanation for 'social supply' might be situated in this interaction between the individual and relational context. Further research might aid in a better understanding of how the different types of structures found ('open, 'in-between' and 'closed') reflect both sides of this duality. For instance, it might shed a light into the extent

to which *closed supply networks* are to be understood as a way to manage risks and stigma as well.

To be able to further align suggestions towards policy as well as develop our understanding of informal rules, future studies might focus on comparative network research in different settings. My findings show respondents expect that even if recreational cannabis use and its supply became 'legal', they would still choose to obtain their cannabis within the boundaries of their social network. For instance, one might study how perceptions on 'taboo' might differ in settings where recreational cannabis supply is more regulated (e.g. in Colorado in the US, or in the Netherlands). Through network analysis, one can for example explore the extent to which the shape and structure of *supply networks* as well as informal rules surrounding this structure might be more in favour of obtaining cannabis in a way that is perceived as more legal.

Complete network analysis of predefined groups might aid our understanding of reciprocity and would allow a study of the formation of cliques and substructures in networks. One could for instance start with a technique of participatory mapping in order to establish the perceived border of one personal network. In this way, one can study more in-depth how structure might influence the way supply is defined. Some network analysts use diary methods to examine the frequency of contact between an ego and alters.

The above suggestion on the moral regulation of pleasure as a possible underlying explanation of social supply requires further research (Bramham & Wagg, 2011). This refers to a Foucauldian perspective of use, where one acknowledges one's own pleasure as long as it does not "harm" anyone (including oneself). Future research might inform about the extent to which social supply is associated with harming oneself or others. It might for instance be that this aspect of morality, as developed in the 1960s and '70s, is overestimated because of the insiders' perspective of this study.

Throughout the discussion of the reasons *why* one would perceive supply in social terms, many respondents describe supply in terms of a *personal choice*. However, the extent that this is an expression of an internalised 'taboo' and a strive for self-control of a morally wrong action needs to be further explored. The findings did show some indications that respondents want to act in accordance with societal norms. Though many of their reflections show they make a considerable attempt to do so it might be interesting to explore these issues further, for example through ethnographical research.

Are social suppliers and dealers extremes on a continuum? My findings suggest they aren't. They can be present in the same *supply network* and even within one and the same person. My first impression was that my respondents, who were in their twenties, developed a specific understanding of recreational cannabis use as *normal within their network*. But through exploration of supply patterns and definitions I found that their standpoints might have more to do with attempts to assimilate in society, and seemingly justify their own choices through the formulation of a range of informal rules. It is in discussing these rules that I find conceptualisations of supply as *social*. This social aspect seems to be prioritised in the use as well as the supply settings. Use is not seen as shaping current social relations and supply is less likely to be called 'dealing' when in a protective social relations. This idea is strengthened by the finding of structural differences between the ego as the main supplier and alters as main suppliers. It seems suppliers are keener on keeping the options open while non-suppliers are more likely to look for protective social relations.

As a final remark, I want to reflect on the extent to which this study revisits Becker (1963; Fitzgerald et al., 2013; Gourley, 2004). It is difficult to re-evaluate the emphasis put on agency by the original *normalisation* thesis without falling into structural determinism instead (Measham & Shiner, 2009). As suggested by Hathaway et al. (2011), I indeed find some remarkable parallels with Becker's (1963) study. The presence of informal rules that seem to shape and structure supply resemble the processes of social learning that Becker (1963) used to explain how people learned to enjoy the pleasure of using substances. Stressing this aspect of 'personal choice', respondents seem to reflect on how moral regulation of the pursuit of pleasure has become a matter of developing rationalized strategies to control risks (Hathaway et al., 2011; Peretti-Watel, 2003). In their discussion of 'taboo', one sees how the lack of future expectations considering a wider acceptance of recreational cannabis use and its supply shapes the way supply is structured and defined. It is in this rationalisation discourse that one should not lose sight of the point of view of users and suppliers, who perceive themselves at the receiving end of this pressure to control. Instead of formulating informal rules as expressions of confirmation within a subculture that disagrees with the norms put forward in wider society, the same strategies seem to be used by recreational users and their suppliers in an attempt to deal with the stigma they experience when trying to assimilate in *normal* society.

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ATTACHMENT: INSTRUMENT

Start of the interview

<u>Introduction: (this is also the first screen one sees before starting the interview):</u>

The goal or this PhD research (supervisor: prof. dr. Tom Decorte, University or Ghent) is to gain insight in social networks where cannabis use is present. A correct understanding or your personal experiences could contribute to adjusting stereotypical opinions that exist among the wider population as well as aids in sketching a nuanced imaged or how people obtain cannabis. The study aims to contribute to the development or theory concerning the role cannabis plays in social networks.

The study includes two parts. The first part questions are asked about yourself and the people you spent your leisure time with. In the second part a number or questions follow about your relation with the people you usually use cannabis with.

Your participation is completely anonymous and voluntarily. At any given moment you will be asked to give the full name or one or your friends. You will be asked to use abbreviations, like the first three letters or their first and family name (e.g. MarVla). This will help you to maintain oversight when answering questions about the people within your network. All data collected during the interview is analysed anonymously and treated confidentially. All names you mention during the our conversation are converted into a numerical code immediately afterwards. In all publications, only this numerical code will be used. This way nobody can find out any information that might identify these people. You can choose to quit the interview or refrain from answering some questions.

At the end or the interview you can indicate whether you would like to receive a summary or the complete report. If you would like that, you can at that time also receive an anonymised copy or your personal network.

Thanks in advance for participating in this study!

<u>Oral explanation:</u>

- Goal of the interview
- Structure or the interview
- Ask admission to record with audio equipment
- Stress anonymity strategies
- Stress importance of personal perception
- Ask consent

1. Characteristics of the respondent

1.1 Socio-demographic data

Question	Answer categories
I am a…	○ Man ○ Woman ○ I do not wish to answer
I what year were you born?	…………………………………………
What is your highest degree obtained?	○ Primary school ○ Professional education – lower secondary school ○ Professional education – higher secondary school ○ Technical education – lower secondary school ○ Technical education – higher secondary school ○ General education – lower secondary school ○ General education – higher secondary school ○ Technical college ○ University – bachelor ○ University – master ○ Other ○ I do not wish to answer

<u>Oral explanation:</u> If you follow a training at university or technical college and you are in your final year (e.g. 3rd Bachelor, Master), you may consider this training as your highest completed degree.

<u>Interviewer:</u> If the respondent answers "Other", ask what is meant.

Question	Answer categories
What is your current employment status?	○ Full time student ○ Part time student, Part time employee ○ Full time employee, ○ Part time employee, ○ Unemployed ○ Unemployed, but not searching for a job ○ Other ○ I do not wish to answer

Question	Answer categories
Which of these categories describes your current living situation the best?	○　In rooms ○　With parents ○　By myself ○　Together with partner (and children) ○　Together with partner, in rooms ○　Together with friends ○　Other ○　I do not wish to answer
In which country were you born?	○　Belgium ○　Other ○　I do not wish to answer
In which country is your father born?	○　Belgium ○　Other ○　I do not wish to answer
In which country is your mother born?	○　Belgium ○　Other ○　I do not wish to answer

1.2 General leisure time

> **Introduction: How many times did you these leisure time activities the past 3 months?**
>
> **Indicate how many times you did these activities when they apply to you. You can choose between "very often", "often", "sometimes", "rarely" or "never".**

Question	Answer categories
1.　Watching TV 2.　Listening to music 3.　Visiting friends/having friends over 4.　Spending time on the computer 5.　Shopping 6.　Reading a book 7.　Going to a pub 8.　Playing sports in a club 9.　Going to theatre/museum 10. Youth movement 11. Going to a youth club 12. Going to a party/dancing 13. Other activity	○　Very often ○　Often ○　Sometimes ○　Rarely ○　Never ○　I do not wish to answer

1.3 Substances: alcohol and regular tobacco

Question	Answer categories
How often do you drink alcohol?	○ Never ○ Less than once a month ○ 1 or a few times a month ○ 1 or a few times a week ○ Every day ○ I do not wish to answer
How often do you smoke regular tobacco?	○ Never ○ I tried it, but do not do it anymore ○ Sometimes ○ Every day, less than 5 ○ More than 5 a day ○ I do not wish to answer

Filter: If the respondent never drinks alcohol or does not wish to answer. Go to questions about cannabis use.

Question	Answer categories
If you drink alcohol during the weekend (Friday to Sunday evening), how many glasses do you drink on average?	○ I do not drink alcohol during the weekend ○ 1 ○ 2 ○ 3 ○ 4-5 ○ 6 ○ 7-10 ○ More than 10 ○ I do not wish to answer
On how many days during the week (Monday to Thursday evening) do you drink alcohol?	○ I do not drink alcohol during the week ○ 1 day ○ 2 days ○ 3 days ○ 4 days ○ I do not wish to answer
If you drink alcohol during the week, how many glasses do you drink on average?	○ Not applicable ○ 1 ○ 2 ○ 3 ○ 4-5 ○ 6 ○ 7-10 ○ More than 10

	○ I do not wish to answer

1.4 Substances: cannabis

> **Introduction:** **The following questions are about your experiences with cannabis use.**
>
> **Type "x" if you do not wish to answer an open question. Type "y" if the open question is not applicable.**

Question	Answer categories
How old were you when you used cannabis for the first time? Type "x" if you do not wish to answer this question.	…. year
How often did you use cannabis during the 30 days prior to this interview (marihuana as well as hashish)?	○ Not once ○ Less than once a week ○ Once a week ○ More than once a week ○ Every day ○ I do not wish to answer
How often did use cannabis during the week prior to this interview (marihuana as well as hashish)? Type "x" if you do not wish to answer this question.	Open question
Did you use during the past 30 days other Substances u	○ Yes ○ No ○ I do not wish to answer
If yes, which ones? Type "x" if you do not wish to answer this question, "y" if this question is not applicable.	Open question
When do you usually use cannabis? If you have the habit to use cannabis at more than moment, you can order these moments according to frequency (0 = never – 5 = most of the times). Type "x" if you do not wish to answer this question.	○ During the week, after class/work ○ During the week before I leave for class/work ○ During the weekend (Friday evening to Sunday evening) ○ Every day ○ Other
Where do you usually use cannabis? If you have the habit to use cannabis at more than place, you can order these places according to frequency (0 = never – 5 = most of the times). Type "x" if you do not wish to answer this question.	○ At home ○ At a friends' place ○ At a party/club ○ In a pub ○ On the street/in a park

Question	Answer categories
	○ Other
How did you obtain cannabis during the 3 months prior to this interview? If you have the habit to obtain cannabis in more than one way, you can order these ways according to frequency (0 = never – 5 = most of the times). Type "x" if you do not wish to answer this question	○ I swap it for something else ○ I buy it by myself ○ I buy it together with other people ○ I receive it as a gift ○ I grow it myself ○ If someone else brings it along ○ Other

1.5 Experiences with growing

> **Introduction:** **The next questions focus on your personal experience with growing cannabis.**
>
> **Type "x" if you do not wish to answer an open question. Type "y" if the open question is not applicable.**

Question	Answer categories
How long ago did grow cannabis for the last time?	○ I currently grow cannabis ○ Less than 1 year ago ○ 1 to 5 years ago ○ I do not wish to answer
Filter: If a respondent does not grow cannabis, go immediately to the next part.	
How many times in total did you try to grow cannabis?	○ Once ○ 2 times ○ 3 to 5 times ○ More than 5 times ○ I do not wish to answer
How many plants do you grow usually at the same time?	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ More than 5 ○ I do not wish to answer
Which proportion of the cannabis you consumed during the past 12 months, did you grow yourself?	...... % Respondents writes down a number, "x" or "y".

Question	Answer categories
<u>Oral explanation:</u> Please give a rough estimation.	
What do you usually do with your harvest? Order according to amount (nothing = 0; most of it = 6). Type "x" if you do not wish to answer this question.	○ Personal use ○ Swap with other growers ○ Give away ○ Share ○ Sell for profit ○ Sell to cover the costs of growing ○ Other

2. Personal network: general

2.1 Name generator

<u>Oral explanation:</u> We have now arrived at the second part of the interview. The previous questions were about you and your personal experiences. The next part focuses on the social network of which you are part of. We will discuss this network in three steps:

- First we map the people you spent your general leisure time with
- After that I ask a few follow-up questions about these people (e.g. to what extent do they know each other?).
- Next we put all of the people you mentioned on a network map. Afterwards you will be asked to add some extra information on the relation you have with the people you just mentioned.

> **First I would like you to think about all the people you spend time with outside of school or work (e.g. playing sports, going for a drink, youth movement, art school ...) during the last three months. Start with the people whom you spend most of your time with.**
>
> **I ask you to name exactly 25 people. Give only the first three letters of their first and last name. This way you can easily remember who this person when we will talk about them individually. These abbreviations are converted into numerical codes immediately after this interview. This way nobody can find out who you were talking about.**

<u>Interviewer:</u> probing questions if ego names less than 25 people:

- Think about the last time you went out? Who was with you?
- Think about the question about how you spent your general leisure time with. Is there anyone with whom you spent a part of your leisure time with?
- Think about different groups of friends you are part of. Is there anyone you did not mention yet?
- Think about people you hang out with after class/work.
- Think about those people you meet up with frequently.

2.2 Alter characteristics

<u>Oral explanation:</u> Now we move on to the second step. I'm going to ask you questions about the people you just mentioned.

Question	Answer
How long have you known this person?	.... years

2.3 Relation generator

<u>Oral explanation:</u> Now I want to ask you to indicate to what extent people in your network know each other. It is possible that you don't know this very well; in that case choose "I don't know".

Example: If they would meet up in a shopping street, would they talk to each other?

Question	Answer categories
If [NAME1] and [NAME2] met each other, would they talk without you present?	o Yes o Maybe o No o I do not know

2.4 Adding alter attributes and dyadic relational characteristics on network map

<u>Oral explanation:</u> The map visualises all the people you just mentioned as well as the relation they have with each other. They are placed random on the network map. At the end of the interview I will ask you to order them.

First I want to ask you to indicate gender, age and the role this person plays in your life. You can do this by clicking on the symbol representing this person (circle) and click on the right button of the mouse. You can choose multiple roles for one person. Additionally I want you, as far as you know, to indicate whether this particular person uses cannabis him- or herself.

Question	Answer categories
Gender?	o Man o Women
Age?	....
Who?	o Colleague o Friend o Household (brother/sister/parent) o Family o Partner o Best friend o Other

Question	Answer categories
Cannabis user?	○ Yes ○ No ○ I don't know

Oral explanation: Please check whether those people you spend the main part of your leisure time with are on the map. You can add people by clicking on the map.

If, according to you, the map is complete, I would like to ask you some more information on how you perceive your relation with these people.

The first relation tries to capture those people in your network that help you out when you have a *practical* problem (e.g. tasks, problems with your house, study or work issues,…). After that I would like you to indicate who helps you when you are dealing with some *personal* issues (e.g. someone you go to talk about something that is very important to you). It is possible you can go to one person for both *practical* as well as *personal* issues, but it also possible you can go to this person for one of these issues or none of them.

To add a relation you first click this relation in the left menu. Then the programme 'knows' you want to add a relation. Next, you go to the middle of the network map, click on the symbol representing 'ego' (that is yourself), and drag the mouse to the symbol representing the person you want to add a relation for.

Question	Answer categories
Do you go to [NAME] when you have a practical problem?	○ Yes ○ I think he/she might do that ○ No ○ I don't know
Do you go to [NAME] when you have a personal problem?	○ Yes ○ I think he/she might do that ○ No ○ I don't know

Follow-up question: Why did you answer "no"?

3. Cannabis network

Oral explanation: You now have drawn the network of people you spend your general leisure time with. We now are going to repeat the same three steps (selecting people, adding some data about these people and indicating the relation you have with them) but for a specific group of people, namely those that are present when you use cannabis.

3.1 Name generator

> **Now, I am going to ask you about another group of people, those who you use cannabis with.**
>
> **To use cannabis with, means being in the same place when using cannabis. These individuals may be close friends or casual acquaintances. These might be people who use cannabis themselves at that moment or not.**
>
> **These might be people you have listed before or they could be new names.**
>
> **I want to remind you that this research aims to sketch a nuanced image of networks where cannabis is present. It does not aim to provide concrete recommendations towards policymakers.**

Additional questions to motivate the respondent to be complete:

- When you use cannabis with [NAME], who else is usually there?
- Who did you do cannabis with last month?
- Is there anyone there [at the location you use cannabis] who you do cannabis with on a regular basis?
- So can you think of anyone else that you did cannabis with in the last couple of months? How about 3 months ago, who were you doing cannabis with then?
- Think about the place where you got cannabis the last time and the people who you were with.
- Who are the people that you regularly buy or use cannabis with?
- Think about all the different places where you used last week. These might be friends' places, abandoned houses, your place …

3.2 Alter characteristics

You now have named people a second time. No I want to ask you some questions about this group of people.

Question	Answer categories
If you used cannabis together with one of the people you just mentioned, how often did you do this during the three months prior to this interview?	○ Never ○ Rarely ○ Sometimes ○ Often ○ Always
How often do meet up with these people during your leisure time (in general)?	○ Less than once a month ○ Twice or three times a month ○ More than once a week ○ Every weekday ○ Every weekend ○ Every day

Question	Answer categories
Where do you usually use cannabis with each of these people?	Respondent describes for each of these people the type of locations where they usually use cannabis together.

3.3 Relation generator

<u>Oral explanation:</u> Think about the people you just mentioned. Some might not know each other well, while others do. Some even might use cannabis together without you being present.

Question	Answer categories
If [NAME1] and [NAME2] met each other, would they use cannabis together without you present?	○ Yes ○ Probably ○ Probably not ○ No ○ I do not know

3.4 Adding alter attributes and dyadic relational characteristics on network map

<u>Oral explanation:</u> The map visualises all the people you just mentioned as well as those you just added. They are placed random on the network map. At the end of the interview I will ask you to order them.

Of each additional person I want to ask you to indicate gender, age and the role this person plays in your life. You can do this by clicking on the symbol representing this person (circle) and click on the right button of the mouse. You can choose multiple roles for one person. Additionally I want you, as far as you know, to indicate whether this particular person uses cannabis him- or herself.

Question	Answer categories
Gender?	○ Man ○ Women
Age?	………………………………………
Who?	○ Colleague ○ Friend ○ Household (brother/sister/parent) ○ Family ○ Partner ○ Best friend ○ Other
Cannabis user?	○ Yes ○ No ○ I don't know

To conclude I want to ask you to what extent you go to these people you just added when you have a practical or personal issue.

Question	Answer categories
Do you go to [NAME] when you have a practical problem?	○ Yes ○ I think he/she might do that ○ No ○ I don't know
Do you go to [NAME] when you have a personal problem?	○ Yes ○ I think he/she might do that ○ No ○ I don't know

3.5 Adding supply relation

<u>Oral explanation:</u> Please check again whether all people that are usually present when you use cannabis are on the map. You can add extra people by clicking on the map.

We now mainly talked about who you are together with when you use cannabis. In the final part of this interview, if the map is complete according to you, I would like to explore together with you how you obtain cannabis

First I want you to indicate who provided you with cannabis and, conversely, who was provide by you with cannabis. This time I want you to think about the **six months** prior to this interview.

Like before, you can add a relation by clicking on it in the left menu. Then the programme 'knows' you want to add a relation. Next, you go to the middle of the network map, click on the symbol representing 'ego' (that is yourself), and drag the mouse to the symbol representing the person you want to add a relation for.

Question	Answer categories
Did this person provide you with cannabis?	○ Yes ○ No ○ I don't know
Did you provide this person with cannabis?	○ Yes ○ No ○ I don't know

<u>Oral explanation:</u> You now indicated who provided you with cannabis and, conversely, who was provide by you with cannabis. Now I would like to further explore these

relations. This time you are asked to think about the different ways you obtained cannabis or provided cannabis during the past six months.

Possible ways are swapping, selling/buying, sharing or gift giving/receiving. It is possible you obtained from or provided cannabis to the same person in more than one way. Please read the questions carefully. There is no right or wrong answer. I am only interested in the way you look at this relation.

Interviewer: If the respondent wants to give further details about a "provide to" relation, these options are shown for each person:

Question	Answer categories
Shared cannabis during the past six months?	Respondent indicates how many times this happened.
Gave cannabis during the past six months, as a gift?	Respondent indicates how many times this happened.
Swapped cannabis for something else during the past six months (e.g. tickets for concerts, other kinds of cannabis, in return for a favour)?	Respondent indicates how many times this happened.
Provided him/her with cannabis during the past six months, and the other person paid you for it?	Respondent indicates how many times this happened.

Interviewer: If the respondent wants to give further details about a "provided by" relation, these options are shown for each person:

Question	Answer categories
Shared cannabis during the past six months?	Respondent indicates how many times this happened.
Received cannabis during the past six months, as a gift?	Respondent indicates how many times this happened.
Swapped cannabis with you for something else during the past six months (e.g. tickets for concerts, other kinds of cannabis, in return for a favour)?	Respondent indicates how many times this happened.
Obtained cannabis during the past six months, and you paid for it?	Respondent indicates how many times this happened.

4. Type of supply relation

Interviewer: The extent of these questions depends on the previous answers already given by the respondent. If a topic is already dealt with during the creation of a the network map, this topic is mentioned again and further questioned. If not previously mentioned, the interviewer follows the structure to the extent it is applicable to the respondent.

4.1 Cannabis network: general questions

- How did your current network into being?

    o Did anyone introduce you in this network? Who?

    o Did you know these people before you started using cannabis?

    o In which way does your current network differ from (a) previous network(s)?

    o Did the relation between you and these people change since you started using cannabis? In which way?

- Are there people in your network that are present when you use cannabis but do not or rarely use cannabis themselves? Please describe such a situation. How do you feel about that?

- Do you use cannabis sometimes by yourself? Why (not)?

4.3 Alter as a provider

About each person that provides cannabis to ego:

- How does this usually go? Does it always go the same way?

    o If not, in what different ways do you obtain cannabis?

- Does this person ask something in return?

    o If yes, what does this person ask?

    o Does this person always ask the same thing?

- Does this person also provide cannabis to other people? If yes, to whom? Art these people also part of your network?

- Do you consider this person as a 'dealer'? Why (not)?

- Are there other people, aside from the ones you mentioned, you would consider a 'dealer'? Why (not)?

4.4 Ego as a provider

You mentioned you sometimes provide cannabis yourself.

- How does this usually go? Does it always go the same way? If not, in what ways does it happen as well?

- How did you decide to start doing this?

- How long do you do this? When did you do it for the last time?

- How often do you act as an in-between?

- Do you ask something in return? If yes, what do you ask?

- How do you feel about acting as a provider?

- Do you consider yourself as a 'cannabis dealer'? Why (not)?

- Did you ever have the opportunity, or were you ever asked, to do more than you are doing now?

4.5 Middlemen

- Are there people in your network who help you or others to get in touch with other people who can provide cannabis? If yes, who are they?

  o How does a contact go? Does it always go the same way?

  o How long is this going on?

  o Why do you go through this person?

- Do you act as an in-between? If yes:

  o How does a contact go? Does it always go the same way?

  o How did you decide to start doing this?

  o How long do you do this? When did you do it for the last time?

  o How often do you act as an in-between?

  o Do you ask something in return? If yes, what do you ask?

  o How do you feel about acting as an in-between?

5. Wrap up of the interview

<u>Oral explanation:</u> We arrived at the end of the questions about your network. This map gives an overview of all people we talked about, their relation with you and their relation among each other.

The final thing I want to ask you is to check whether everyone is situated on the network map where he or she is supposed to. There are five circles on the network map, with the symbol representing you in the middle. People that you perceive as close to you should be positioned in the circle the closest to you, people you consider less close should be situated a bit further away from you.

You can move the symbols by clicking on them dragging them to the circle which represents your perception.

If there are certain groups of people in your network, you can move them together as well. Please explain the way you restructured the symbols on the network map

<u>Interviewer:</u> Thank the respondent for his or her cooperation. Hand over the tickets and explain the time line of the research.