Policing Directions: A Systematic Review on the Efficacy of Quantitative Police Presence

Abstract

This systematic review assesses the efficacy of quantitative police presence. The review also investigates concepts of police presence and differences between reported effects. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines and protocols are used to systematically identify and review eligible studies on police presence. Further, quality assessment and findings synthesis are used to map limitations of current research as well as grounds for future avenues. The systematic search strategies yielded 49 studies focusing on testing the effects of police presence or evaluating its measurement. We find evidence that police presence has mostly positive effects on reducing crimes related to motor theft, property, violence, and guns. Police presence also reduces calls for service and improves traffic behaviour. Police presence focused on specific areas, times, and types of crime achieves maximum efficacy. The reviewed studies show a high degree of heterogeneity in reporting, which limits comparability of findings across studies. Research on police presence presents evidence for crime preventative effects of focused police actions. Police forces can be focused on certain areas, times, and types of crimes. We encourage future research to focus on police presence en route and its effects, including crime prevention, traffic regulation, and fear of crime.

Keywords: police presence, deterrence, patrol, crime prevention

Introduction

Throughout police research scholars agree that police presence matters, especially in preventing crimes (see, Andenæs 1974, Kelling *et al.* 1974, Pfuhl Jr 1983, Esbensen and Taylor 1984, Armour 1986, Koper 1995, Carrabine 2009, Ming-Jen Lin 2009). Criminological theory has placed police presence at its core. *Deterrence theory* suggests that criminal activity can be deterred through police presence (Durlauf and Nagin 2011). By elevating either the risk (*general deterrence)* of being caught in the act or the severity (*specific deterrence*) of punitive action, offenders are deterred from committing a criminal act as the expected costs outweigh expected

benefits (see, Durlauf and Nagin 2011, Nagin 2013, Nagin *et al.* 2015). Thus, police act as a symbol of general deterrence while they enforce the law (e.g., Ming-Jen Lin 2009, Braga *et al.* 2019a). Cohen and Felson (1979) argued that criminal opportunities arise through *routine activities* of offenders, victims, and guardians. Crimes can only take place when an offender, a victim and the absence of a 'capable' guardian (e.g., police officers) come together (Cohen and Felson 1979, p. 589, Felson 1986, p. 121). Therefore, police officers need to be at the right place at the right moment to prevent criminal acts. Although different believes on how to optimally deploy police forces exist, all these strategies, such as *community policing, broken window policing, pulling-levers policing,* or *hot spots policing* (e.g., Weisburd *et al.* 2011, Ariel *et al.* 2016, Braga *et al.* 2019a, Weisburd and Braga 2019), share the basic assumption that police presence affects social realities. Two questions remain: What social realities can be affected and how much presence is needed to do so?

Concepts of police presence have lacked clarity and neglected the very meaning of *presence,* in terms of physical presence of police forces (e.g., McPheters and Stronge 1974, Levine 1975, Levitt 2002). Neither police expenditures nor number of officers constitute a measure of physical police presence in the field. We present an incipient definition of police presence:

> Police Presence at core is less concerned with performative aspects of policing and patrols (i.e., how they police), but rather focused on the structural characteristics of it (i.e., where and when they police, how many officers are present, how long they are present). It describes social, spatial, and temporal aspects of police work, which can be measured as definite quantities

This systematic review investigates the state of the art in research on the efficacy of police presence. Thus, we want to know: *what are quantitative and qualitative effects of police presence?*

Methods

We conducted a systematic review in accordance to PRISMA guidelines (see Moher *et al.* 2010). To be eligible for this review, studies had to focus on:

(1) measurable police presence. Suitable studies reported police presence in quantitative measures, e.g., time of police presence, number of visits, hours of officers per police beat, or length of patrol shifts (e.g., Bowers and Hirsch 1987, Kaplan *et al.* 2000, McGarrell *et al.* 2001, Zech *et al.* 2005, Ratcliffe *et al.* 2011, Taylor *et al.* 2011, Novak *et al.* 2016, Stephensen 2017, Ariel *et al.* 2019, Collazos *et al.*

2020). This excluded studies that either focused on police expenditures (McPheters and Stronge 1974), police personnel (Levine 1975, Levitt 2002), or tried to infer a level of police presence from law enforcement actions such as arrests rates (Weisburd *et al.* 2016). These excluded measures do not allow for a precise measurement in specific spatial units, as they cannot distinguish between the proportion of time spent outside or inside police stations[1]

(2) physical police presence defined as a police officer or a (marked) police vehicle, in contrast to alternative ways of police presence such as a picture or cut-out of a police officer (e.g., Simpson *et al.* 2020)

(3) measures of qualitative (i.e. fear of crime, attitudes towards the police) or quantitative (i.e. reported crime rates, calls for service) effects of police presence or methodological considerations on measuring police presence (Wain and Ariel 2014, Davies and Bowers 2019)

(4) And, due to the authors' language proficiencies, eligible studies were limited to proceedings published in English, Dutch, and German[2].

Search Strategies and Databases

Discrete search strategies were deployed to extensively search for relevant literature. First, a keyword search[3] was conducted on eleven literature databases[4], with texts and abstract screening[5]. Second, references from reviews that focused on police programs, police practices, and patrol strategies were consulted (Famega 2005, Bradford 2011, Lee *et al.* 2013, Braga *et al.* 2014, Braga *et al.* 2015, Carriaga and Worrall 2015, Braga and Welsh 2016, Lee *et al.* 2016, Chalfin and McCrary 2017, Braga *et al.* 2019b, Braga *et al.* 2019a, Braga *et al.* 2019c, Kounadi *et al.* 2020). Third, a cross-reference search was conducted on the preliminary selection to identify relevant publications, which were not yielded during the search (e.g., Thaler 1977, Richards *et al.* 1985, Draca *et al.* 2007,

[1] In order to be visible and present, police forces need to be in the "field". For example, the officer-citizen ratio does not give a proper representation of physical police presence.
[2] Searches performed on abstract databases can yield studies written in other languages than the abstract.
[3] The search terms were: "Police Presence", "Police Patrol" AND "Presence", "Police Deployment", "Police Visibility", "Hot spots Policing", "Community policing" AND "Presence", "Broken windows policing", "Problem-orientated Policing", "Focused Deterrence", "Patrol"
[4] These databases were: *Elsevier (Science Direct), Emerald Publishing, JSTOR, National Criminal Justice Reference Service (NCJRS), ProQuest (Criminology Collection), Sabinet, Sage, Springer, Taylor & Francis, Web of Science, and Wiley*
[5] Due to limitations of search hit extraction, on three of the eleven databases abstract searches were performed.

Hinkle and Weisburd 2008, Rosenfeld *et al.* 2014, Blattman *et al.* 2017, Mitchell 2017). Ultimately, three of the co-authors critically judged the final selection and one of the co-authors validated the deployed search strategies.

The search was conducted in September 2020. Hence, the review includes studies that were published or available before end of September 2020. The list of variables was derived from examining other research on police and policing (e.g., Sacks 2000, Smith *et al.* 2005, Pullin and Stewart 2006, Staples and Niazi 2007, Braga and Weisburd 2014, 2015, Depraetere *et al.* 2020, Dewinter *et al.* 2020).

In contrast to systematic reviews on policing at large, we have included non-experimental research designs. Randomized controlled trials (RCT) represent the highest standard to evaluate programs and interventions (Kaptchuk 2001). As this systematic review aims at identifying all research directions and conceptualizations of police presence, excluding all studies other than RCT appeared overly restrictive.

Results

[INSERT FIGURE 1]

Characteristics of selected Studies

The systematic database search yielded 118 eligible studies for full-text assessment. We identified 49 eligible studies for this review (see Figure 1[6]). The majority of identified studies were published after 2013 (53%), with the oldest study dating back to the early 1970's (Kelling *et al.* 1974). Since 2011 a rise in the number of studies on police presence can be noticed (see Figure 2).

Most studies analysed police presence in the United States (n = 33), the United Kingdom (n = 7), Australia (n = 2), and Canada (n = 2) (see Table 1[7]). A predominant number of studies was published as journal articles (n = 43)[8]. All eligible studies implemented quantitative research designs. About three quarters of the selected studies implemented experimental research designs (n = 36), of which 13 conducted randomized controlled trials (e.g., Sherman *et al.* 1995b, Sherman *et al.* 1995a, Ratcliffe *et al.* 2011, Taylor *et al.* 2011, Rosenfeld *et al.* 2014, Barnes

[6] See Table 3 for a complete list of all 49 studies
[7] See Table 2 for an overview of all assessed variables
[8] Including one preprint.

et al. 2020). On average police presence was monitored for approximately 350 days (SD ~ 483 days). Equally, sample sizes[9] differed. Studies document a mean sample size of 282 with a standard deviation of 975 spatial samples. Analyses were conducted on the micro (n = 30), meso (n = 13), and macro (n = 5) level.

[INSERT FIGURE 2]

The selected body of research comprises different types of policing such as *hot spots policing* (n = 20), *routine patrol* (n = 10*), or traffic patrol* (n = 8). Regardless of deployed strategies, motor patrol (n = 23) (e.g., Kaplan *et al.* 2000, Medina *et al.* 2009, Davies and Bowers 2019) and foot patrol (n = 20) (e.g., Kelling *et al.* 1981, Ratcliffe *et al.* 2011, Sorg *et al.* 2013) were most commonly evaluated. This comes as no surprise as motor patrol is wide spread (Ariel *et al.* 2019) and foot patrol manifests the most traditional way of policing (see, Kelling *et al.* 1974, Carrabine 2009). While crime still being the general focus of analysis (n = 33), around one quarter of studies concentrated on calls for service (n = 14) and almost a fifth on traffic violations (n = 9). A great number of studies attributed positive[10] effects to police presence (n = 37).

All but two studies focused on uniformed or marked police forces (n = 47). The number of officers per shift (n = 13) and the dosage (Ariel *et al.* 2019, Davies and Bowers 2019, Lum *et al.* 2020) of police presence (n = 13), for example, in minutes per spatial unit were used. Another approach is to determine physical police presence with the number of visits (n = 4) officers paid to a certain area or through designated length of police officer shifts (n = 9). Around a third of the studies measured police presence through information extracted from police staffing and deployment data (n = 15), followed by GPS (Global Positioning System) (n = 8), and officer radio log and call data (n = 6). Approximately half of the selected studies used low (n = 17) or very low precision (n = 9), while a third documented high (n = 15) precision measurement[11]. Research on police presence either focused on specific destinations within a jurisdiction (n = 33) or the entire jurisdiction (n = 16).

[9] Sample size here refers to the number of spatial units that were used to measure police presence
[10] Due to the variety of effects examined, we use *positive* as an indication of desired outcome (i.e., statistical negative effect between police presence and reduction in crime, or statistical positive effect between police presence and trust in the police)
[11] The here introduced categorization goes as follows:
Very low: no mention of measurement, unclear basis for calculations
Low: Staffing schedules, observations, hand written patrol logs
Medium: Deployment data, Radio log and call data
High: GPS tracking, experimental placement

[INSERT TABLE 1]

Focused (on) Crime Deterrence

Evaluations of police presence focused predominantly on reducing reported crimes (n = 33). Apart from four studies (Schnelle *et al.* 1977, Esbensen and Taylor 1984, Fritsch *et al.* 1999, Rosenfeld *et al.* 2014), all studies state that police presence reduces crime (e.g., Koper 1995, Santos 2013, Rosenfeld *et al.* 2014, Mitchell 2017, Weisburd *et al.* 2017). As various hot spots experiments have stated (e.g., Braga *et al.* 2014, Braga *et al.* 2019a, Braga *et al.* 2019b), crime can be reduced through focused police actions (Ratcliffe *et al.* 2011, Taylor *et al.* 2011). Focused police strategies aim their efforts at locations that experience elevated levels of crime and often focus on specific crime types (Sorg *et al.* 2013).

Further, Ariel et al. (2019) pointed out, that reduction effects and their statistical significance depend on the baseline of police levels. Essentially, when area *x* already receives a high level of police presence in the first place any added police forces will most likely show relatively little effects. Therefore, baseline levels of reported crime and police presence have to be considered before evaluating police actions (Ariel *et al.* 2019).

Police action does not just work best when focused on target areas but also when focused on certain types of crime. Police presence has particular strong crime reduction effects on *motor vehicle theft* (Di Tella and Schargrodsky 2004, Collazos *et al.* 2020, Piza *et al.* 2020), *violent crimes* (Ratcliffe *et al.* 2011, Taylor *et al.* 2011, Novak *et al.* 2016), and *property crime* (Andresen and Lau 2014). Similarly, *gun related crimes* (Sherman and Rogan 1995, Rosenfeld *et al.* 2014) and *liquor inflictions* (Fitterer *et al.* 2017) experienced substantial reductions.

Length vs. Frequency of Police Presence

The reviewed studies indicate that length of police visits matters more than frequency (see, Koper 1995, Williams & Coupe 2017). Koper (1995) provided an optimal police stop length of 11 to 15 minutes and showed that police stops have to last for more than ten minutes to generate significant deterrent effect and be shorter than 20 minutes, as added presence does not add additional reduction effects. Williams & Coupe (2017), further,

determined that increasing the average stop length by 85% (from 5.2 to 9.6 minutes) can reduce reported crime by up to 20 %.

Ariel et al. (2019, p. 22) introduced the 'London Underground Paradox' referring to the works of Koper (1995), stating that police forces have a statistically larger effect on crime while there was no police presence recorded. This can be well linked to the extension of the *Koper curve* (Koper 1995) and *residual deterrence.* Residual deterrence describes the effects of police presence, e.g., reduction in crime, persist for a certain amount of time even after officers left the place (Stephensen 2017, Williams and Coupe 2017, Barnes *et al.* 2020). *Initial deterrence decay* deals with the duration of reduction effects and is interested in how fast deterrent effects decay (Sisiopiku and Patel 1999, Sorg *et al.* 2013, Novak *et al.* 2016). Sherman et al. (1995a) analysed police raids and reported that twelve days after the crackdowns crime reduction effects went back to baseline.

Displacement of Crime

One major concern with increased police presence is the displacement of crime, which describes the transition of reported crime from treatment to neighbouring areas (e.g., Haworth et al., 2013). Criminal activity is not prevented but merely *pushed around the corner* (Blattman *et al.* 2017). This has been the case for Sherman et al. (1995a) and Sorg et al. (2013). Both studies hypothesized that crime displacement resulted as a consequence of police actions. Consistent with this finding, Ratcliffe et al. (2011) reported a total of 37 displaced crimes during the Philadelphia foot patrol project. In spite of displaced crimes, the net reduction effect stood at 53 prevented violent crimes (Ratcliffe *et al.* 2011). Many studies accounted for crime displacement or found no support of this side-effect (e.g., Esbensen and Taylor 1984, Rosenfeld *et al.* 2014, Ariel *et al.* 2016, Collazos *et al.* 2020).

Contrary to hypotheses of displacement, scholars have argued for spillover effects of police presence in form of diffusion of benefits, positive effects extending into neighbouring areas around the target area (Eck and Weisburd 1995). Piza et al. (2020) demonstrated that motor vehicle thefts decreased in neighbouring areas around the business improvement district in Newark. The 'London Underground Paradox' from Ariel et al. (2019) frames the diffusion of crime reduction effects as an outcome of expected police presence in adjacent police areas. Hence, police presence can generate crime reduction effects outside of treatment areas (Ariel *et al.* 2019, Piza *et al.* 2020).

Route and Patrol Choices

Reviewed studies suggest that officer discretion influences police practices. Davies & Bowers (2019) analysed police presence and police demand, modelled as the proportion of calls for service per street segment in a street network. Their evaluation attempted to analyse any potential match or mis-match of police resources. Overall, police presence and calls for service were rather balanced across all boroughs in the London Metropolitan area, with slightly higher proportions of police presence than calls for service. For cases of an evident mismatch, two rationales were presented. First, streets that connected a high number of streets, were in close proximity of a police station, and classified as major roads received more police presence. Therefore, these streets function as main routes of police while on patrol or responding to calls for service because of their position in the road network (Davies and Bowers 2019). Second, officer discretion was used to explain different provisions across street segments after controlling for road network characteristics. Davies & Bowers (2019) suggested that officers directed their presence consciously away from certain places, as they might house some form of undesirable social or environmental condition (e.g., land use, 'no-go' areas, or low collective efficacy).

Fear of Crime and Feeling of Safety

The investigation into more qualitative effects of police presence on, for example, citizens' feeling of safety or satisfaction with police services remains at the side lines. Only about 12% (n = 6) of all reviewed studies focus partially on broader themes of safety and public perceptions. In line with publicly held opinion, elevated police levels can lead to a decrease in the feeling of safety (Hinkle and Weisburd 2008, Blattman *et al.* 2017). However, in many cases no change in the feeling of safety nor fear of crime was detected (Kelling *et al.* 1974, Kelling *et al.* 1981, Weisburd *et al.* 2011). Collazos et al. (2020) reported an increase in the perceived level of safety in crime hot spots for the six-month intervention period. After that, no differences in perception were examined between treatment and control area.

Interestingly, while reporting no changes in police legitimacy, fear of crime, nor in collective efficacy, Weisburd et al. (2011) found a positive association between police interventions and perceived physical disorder (i.e., litter or broken windows). Thus, police presence might present a key factor in the individual perception of increased physical disorder and the priming to experience certain areas as more disorderly (see, Weisburd et al. 2011).

Appearance matters

Research results suggest that police presence can reduce crime and traffic speeds (Armour 1986, Kaplan *et al.* 2000, Ariel *et al.* 2016, Ravani and Wang 2018), even when the presence regards unmanned police vehicles (Kaplan *et al.* 2000). Armour (1986), Kaplan et al. (2000), and Ravani & Wang (2018) have reported that effects of police presence are not associated with whether a police vehicle is occupied by an officer or not. The mere presence of a police car seems to suffice as a symbol of law enforcement, especially so in high speed areas such as highways.

Interestingly, effects of stationary police presence versus mobile police presence have yielded mixed results (see, Richards *et al.* 1985, Sisiopiku and Patel 1999). Sisiopiku & Patel (1999) reported that a stationary police vehicle would lead to a short term speed reduction. However, after passing the vehicle drivers accelerated back to their prior driving speed or above. Thus the impact on traffic speeds remained little (Sisiopiku and Patel 1999). In contrast, Richards et al. (1985) examined driving speeds at work zones and found that a police traffic controller and a stationary police car could reduce the mean speed by up to 26% and 22%, respectively. Although direct comparisons were not made for all six test sites, circulating patrol cars were only able to reduce the mean speed up to 5% (Richards *et al.* 1985).

As only one study (Ariel *et al.* 2016) has reported on the uniform style of patrol officers, or the vehicle paint for that matter, no conclusive or comparative results are available for the relationship between officer uniform style or police vehicle colouring and effects of physical police presence. Nevertheless, promising explorations into the significance of flashing lights have been made (Medina *et al.* 2009, Nakano *et al.* 2019). Nakano et al. (2019) found that drivers perceived police forces as more noticeable while flashing lights were active. Medina et al. (2009) observed distinct differences between the use of flashing lights and driving behaviour. An enforcement setup of a trailer equipped with activated flashing lights resulted in smaller effects than the deactivated setup. Rather than arguing for a high risk of apprehension, it is hypothesized that activated flashing lights indicate present police forces are already busy with ongoing incidences and thus not available to enforce regulations on other passing vehicles (Medina *et al.* 2009).

Tracking and analysing Police Presence

Myriad approaches and technologies exist to measure police presence: staffing schedules (e.g., Kelling *et al.* 1974, Fritsch *et al.* 1999, Andresen and Lau 2014, Ariel *et al.* 2019), officer radio data (e.g., Kelling *et al.* 1981,

Santos 2013, Rosenfeld *et al.* 2014, Schaefer *et al.* 2019), or GPS data (e.g., Ariel *et al.* 2016, Mitchell 2017, Williams and Coupe 2017, Davies and Bowers 2019). In controlled experimental trials, police presence can be set as an experimental condition and measuring might not be necessary, i.e., when a stationary police car is placed in the test area. This, however, was mostly the case for traffic-orientated research (see, Richards *et al.* 1985, Zech *et al.* 2005, Walter *et al.* 2011, Ravani and Wang 2018).

GPS-based technologies have been confirmed as the most precise option to track and measure police presence, as they can collect positional and temporal information at a high rate (Ariel *et al.* 2016, Collazos *et al.* 2020). Trackers can be used in body-worn officer radios (Hutt 2020) or installed in police vehicles as AVL (Automated Vehicle Locators) (Mitchell 2017). The lower the ping[12], the more precise the tracked geoinformation. Barnes et al. (2020) have been able to track police activity with a ping of nine seconds using smartphones as the tracking device.

Data can be linked to a certain level of spatial abstraction. Research has shown that analyses on the microlevel, i.e. street segments or intersections, yield more conclusive results and detect small spatial changes (e.g., Weisburd *et al.* 2011, Ariel *et al.* 2019, Davies and Bowers 2019). This trend also becomes evident throughout research on police presence, as around 60% of studies in this review focused on microgeographic units. However, depending on the research design and effect of interest, using microlevel units is not always feasible (see, Schnelle *et al.* 1977, Thaler 1977, Sherman and Rogan 1995, Novak *et al.* 2016).

The level of police can be determined by measuring the number of officers per shift (see, Thaler 1977, Esbensen and Taylor 1984, Bowers and Hirsch 1987, Fitterer *et al.* 2017), the shift length of officers in the target areas (e.g., Armour 1986, Weisburd *et al.* 2011, Sorg *et al.* 2013) or by the amount of minutes spent or visits conducted by police forces (e.g., Ariel *et al.* 2016, Ariel *et al.* 2019, Schaefer *et al.* 2019, Barnes *et al.* 2020). The level of police presence is dependent on tracking precision. The tracking technology needs to be so precise that detailed information, i.e., minutes spent in location *x*, can be retrieved.

Williams & Coupe (2017) introduced a distinction between measured presence as patrol minutes versus officer minutes. This presents two important results and considerations. First, the use of police dosage as minutes spent or visits paid constitutes the best practice to measure actual presence. Second, this distinction allows to

[12] In the case of GPS tracking, a ping refers to the frequency of contacting satellites and sending positioning signals to the receiver. Thus, a ping of ten seconds means that the GPS tracking device sends GPS coordinates every ten seconds to the receiver.

adjust findings by the number of police officers or vehicles present and addresses a prevalent problem within police research. Many studies did not mention the size of the police units nor gave detailed descriptions of other characteristics (Mehay 1979, Stephensen 2017, Davies and Bowers 2019, Hutt 2020).

Schaefer et al. (2019) and Collazos et al. (2020) reported on initiated measures to enhance officer compliance. Williams & Coupe (2017) provided evidence that officer compliance was relatively low, for officer minutes and patrol minutes recorded at 90% and 54%, respectively. On average, when officers reported back to be engaged in 15-min patrols, they actually just spent 10 minutes on patrol (Williams and Coupe 2017). This constitutes an overall compliance rate for 15-minute patrols of 67%. Ariel et al. (2016) reported average patrol time per visit to be at 8 min, which constitutes a compliance rate of 53%.

[INSERT TABLE 3]

Discussion

Longer and focused Police Presence

Police presence is most effective when focused on specific places and specific types of crime, in particular motor vehicle theft, violent crimes, property crime, gun related crimes and liquor infractions (see, Ratcliffe *et al.* 2011, Taylor *et al.* 2011, Sorg *et al.* 2013, Novak *et al.* 2016, Fitterer *et al.* 2017). All mentioned crime types have one aspect in common, they are rather easily detectable in public spaces and, thus, more policeable for officer. Further, police actions can be focused on a temporal scale. Deriving from routine activity theory, certain times of the day, or seasons, appear to be more prone to specific criminal activity (e.g., Felson 2002, 2008, Felson and Eckert 2018).

When police forces focus on specific places, times, and crimes, their visits in the target areas have larger effects on crime reduction when they are longer rather than more frequent (Koper 1995, Mitchell 2017, Williams and Coupe 2017). Optimal visits last between 11 and 15 minutes each and deterrent effects of these visits can last up to four days (see Koper 1995, Barnes *et al.* 2020). Three considerations emerge here. First, officer compliance with given patrol orders can possibly be a great factor in their efficacy, both, on crime and traffic enforcement (see, Davies & Bowers 2019). Williams & Coupe (2017) have provided estimates that officers' compliance lies at 67%. Cutting visits by these 33% might substantially alter police presence efficacy, as ordered police visits of

10 to 15 minutes may result in actual police presence of 6.7 to 10.05 minutes. Thus, optimal visit length, theoretically, can only be achieved when assigning officers with visit lengths of 14.9 to 22.3 minutes. Second, as past research has shown that deterrence effects demonstrate a slow decay in the first four days and will diminish after 12 days (Sherman *et al.* 1995a, Barnes *et al.* 2020), research and practitioners can learn from this to adapt general deployment patters. One possible aim is to focus police presence on a specific place, time, crime type, and ensure physical presence of 10 to 15 minute per visit. Accounting for slow decays can free police resources and provide departments with more capabilities to respond to incidents or develop more specific policing strategies. Third, questions regarding the reasons why longer visits are more effective than more frequent ones potentially hold pathbreaking insights into policing. For instance, police forces might benefit from a disruptive momentum as their visits suddenly change the current environmental setup and citizens become aware of their presence. After a certain amount of time the police presence might be regarded as inherent to the place and police forces are less consciously recognized.

Characteristics of Presence

Police presence is influenced by its nuanced characteristics. Evidence was presented that unit size (Armour 1986, Kaplan *et al.* 2000, Williams and Coupe 2017, Ravani and Wang 2018), use of flashing lights (Medina *et al.* 2009, Nakano *et al.* 2019), and vehicle mobility (Richards *et al.* 1985, Sisiopiku and Patel 1999) influence crime reduction, traffic regulation, or perception effects of police presence. Simpson (2019) and Simpson et al. (2020) found that police cars with a black and white vehicle paint are more positively received than white and blue models and that the placement of an officer 'dummy'[13] can reduce traffic speed on busy urban roads. Thus, it is fair to assume that extrinsic details of police presence are an important factor to consider.

Which vehicle colour can produce the greatest deterrent effects or reduce fear of crime most effectively? Will the use of flashing lights and sirens be perceived as an indicator for watchful guardians or busy law enforcers? Should officers drive more slowly through certain areas to enhance their level of presence or remain stationary during their focused visit? The answering of these questions requires more detailed reporting of police actions.

[13] Simpson et al. (2020) have placed a metal police cut-out or "Constable Scarecrow" to test effects of inanimate police presence.

Officer-led Policing

Officer time is accounted for very little and a proportions of their time remains unassigned (e.g., Kelling *et al.* 1974, Cordner 1979, Cordner 1981, Famega 2005, Famega *et al.* 2005). Officer compliance with orders in terms of patrol time appears to be rather low (Williams and Coupe 2017). Patrol and routing decisions seem to lie at the officers' discretion (Davies and Bowers 2019) and officers regard this discretion and freedom to patrol quite highly (Koper *et al.* 2020). Further, Koper et al. (2020) showed that just 56% of larger police departments in their nationwide survey use crime analysis regularly. Without proper crime analysis police forces cannot be optimally guided while on patrol. This evidently leaves a margin for subjective bias. We suggest two improvements.

First, practitioners and researchers alike can benefit from using state of the art technology to examine officers' compliance with policing directives. Past research has indicated that not all data types allow to gather information on actual police presence (see, Kelling *et al.* 1974, Schnelle *et al.* 1977, Esbensen and Taylor 1984, Fitterer *et al.* 2017). GPS tracking of police activities allows for precise measurement of presence and utilizing big data analyses can shed new light on traditional assumptions of police work (Williams and Coupe 2017, Davies and Bowers 2019, Barnes *et al.* 2020). For quite some time now, research has been interested in what officers do and how they patrol (Groff *et al.* 2015, Wuschke *et al.* 2018). Making use of precise tracking technology and big data analytics can help researchers to pinpoint effects of different policing styles and enable police departments whether police directives are carried out effectively. Several reviews have confirmed the effectiveness of policing strategies, such as hot spots or community policing (see, Braga *et al.* 2014, Braga and Welsh 2016, Braga *et al.* 2019b, Braga *et al.* 2019a). Logically, these strategies have to be implemented as planned to generate effects on crime, disorder, or traffic violations.

Second, as almost half of the larger police departments do not deploy sophisticated crime analysis, the prevalence rate of crime analysis can be assumed to be lower in smaller police departments due to limited resources (see, Koper et al. 2020). Weisburd et al. (2015) have shown that the concentration of crimes differs between larger and smaller cities. While 6% and 1.6% of street segments in larger cities caused 50% and 25% of all reported crime, respectively, only 3,5 % and 0.7% did so in smaller cities (Weisburd 2015). It remains important that findings are not blindly adapted across structurally different departments and cities but that police are enabled to conduct local crime analysis in order to focus their resources optimally.

Police en route

All identified research on police presence concentrated either on evaluations in specific destinations or across entire jurisdictions. The majority (n = 33) examined effects of police presence in small destinations such as crime hot spots or busy streets (e.g., Cohen *et al.* 2003, Ariel *et al.* 2016, Williams and Coupe 2017, Ravani and Wang 2018, Ariel *et al.* 2019, Barnes *et al.* 2020, Collazos *et al.* 2020). The scope of 'destination-orientated' research is inevitably limited to small proportions of officers' time during shifts. Police officers have to move often between destinations, when they are implementing optimal length visits of around 15 minutes. Ariel et al. (2016) have shown that distances between destinations averaged at 1.6 km and Barnes et al. (2020) noted average distances of 2.5 km, with a maximum of 5.2 km. Assuming, conservatively, an actual visit length of 15 minutes per destination and a distance of 2 km at a travel speed for foot patrols of 5 km/h, presence at destinations account for approximately 39% of the officer time per shift[14]. Thus, the remaining 61% of officer time is spent travelling between destinations or back to police stations. Although patrol and response is mostly carried out with police vehicles, this proportion presumably will be lower in rural jurisdictions with larger distances between destinations (Schaefer *et al.* 2019).

It could be relevant to study police efforts by not just looking at what are effects of police presence at destination but *en route.* This holds leastwise three potential improvements. First, shift time is included in its entirety. Destination-orientated approaches focus on a small fraction of shift time and more general perspectives, i.e. at the police beat or city level, mask differences in the microlevel effects of police presence in particular destinations and in transit. Considering that patrol officer compliance was estimated to be around 53 to 67%, evaluations have so far focused on small windows of officer time. Second, police routes can experience novel research, apart from classic framing of routes as shortest paths between response events (Melo *et al.* 2006, Reis *et al.* 2006, Lee *et al.* 2017, Dewinter *et al.* 2020, Wu *et al.* 2020). Perhaps police presence on routes has important effects we do not know anything about yet. Third, encompassing police presence in destinations and *en route* might facilitate an extension of analysis to look at effects not just in terms of crime reduction but traffic safety, citizen satisfaction with police services, accounts of personal fear of crime and police trust. Thus, a more conclusive picture on the effects of police presence and its optimal allocation can be drawn, for all types of police work.

[14] Calculation based on data available from Ariel et al. (2016).

To achieve the differentiation between time spent in destinations and *en route*, police presence can be tracked with high precision on the microlevel, i.e., street segments. However, analysing police presence on this level might not always be feasible due to lack of data or small sample sizes (see, Bernasco and Steenbeek 2017). Thus, variables of interest, crimes, calls for service, traffic data, police presence, can be collected at the most detailed level and, if needed, abstracted to an appropriate unit of analysis.

Seeing and being seen

The greatest limitation of police presence analysis is that solely by looking at the data we cannot decode what police officers are doing in the field. This requires more qualitative empirical research and reconsiderations of integral assumptions of deterrence as well as routine activity theory. Following these theories, potential offenders must recognize police officers and be deterred from conducting crimes or notice the absence of police forces and deem the risk low enough to act (see, Felson and Clarke 1998, Felson 2002, 2008, Durlauf and Nagin 2011, Nagin 2013, Paternoster and Bachman 2013). These perspectives focus strongly on offenders' action and perception of risk. Although one limitation of motor patrol was acknowledged to be the inability to detect crimes due to high travel speeds (see, Schnelle *et al.* 1977), no research has been identified that investigates into the effects of more proactive officer behaviour in terms of actively detecting criminal activity. Borrowing from Jacobs (1962), police officers can have their and can be our 'eyes on the street'. Research could examine whether police can deter crimes, regulate traffic, or improve citizen perception of safety through the actions they perform or through merely being present.

Limitations

Although more than ten academic databases were searched, it is possible that information was missed due to the database selection. Further, the keyword selection and thus the entire search was influenced by classic and contemporary terminologies in criminology research. This could be one explanation for the high representation of studies that focus on the link between police presence and crime rates (n = 33). We encourage future research to explore into more nuanced terminologies of police presence. Due to a lack of consistency in reporting, this systematic review does not include a meta-analysis of effect sizes (Forero *et al.* 2019).

Recommendations & Future Avenues

Practice

i. Deploy police forces in a focused manner, in terms of area, time, and crime type.

ii. Utilize traditional and novel methods for crime analysis to identify pressing problems within local jurisdictions.

iii. Deploy police resources to generate optimal police dosage of around 15 minutes per visit.

iv. Evaluate departmental compliance with policing and patrolling directives and offer high-quality officer training to make officers capable of acting at their discretion.

Research

v. Report general information and characteristics of police department and patrol strategies at focus (i.e., unit size, vehicle appearance, use of flashing lights, uniform style, etc.).

vi. Conduct more holistic analyses, to distinguish between officer time or patrol time spent in patrol or service destinations and *en route*.

vii. Pursue interdisciplinary research to obtain more conclusive results on the effects of police presence and link different types of effects (i.e., crime prevention, traffic regulation, public feeling of safety).

Policy

viii. Reassess and consolidate key performance indicators for police work. Extent the scope beyond crime rates to evaluate success of deployed police actions.

ix. Prompt a public discussion of what the police can and should contribute to society. Do we need tactical crime fighters to ensure public order or prevention-orientated agents to report on and solve social problems?

x. Raise public funding for police forces and set up clearly defined police programs. Ensure that police departments, from small to large, have the resources to conduct the appropriate level of crime analysis to identify local problems and develop evidence-based solutions.

Conclusion

This systematic review of 49 studies provides evidence that police presence generates positive effects for crime prevention, traffic regulation, and citizens' feeling of safety, when police efforts are focused on specific areas, times, and crime types. To achieve significant impact on crime prevention and extend deterrent effects, requires longer rather than more frequent police visits. Further, compliance with police directives can ensure that police are present in the target areas for the ordered amount of time. We see that effects of police presence are more complex than reported in the past. Both, the appearance of police as well as the type of effect studied are interdependent and require more inter-disciplinary research. Evidence-based research into police presence, with a focus on, both, the locations where they are spending time as well as the routes which connect these locations can draw a clearer picture of what police can do about crime, traffic violations, and public fear of crime. Police presence affects along different dimensions and mapping all of these can improve police practices and policing strategies.

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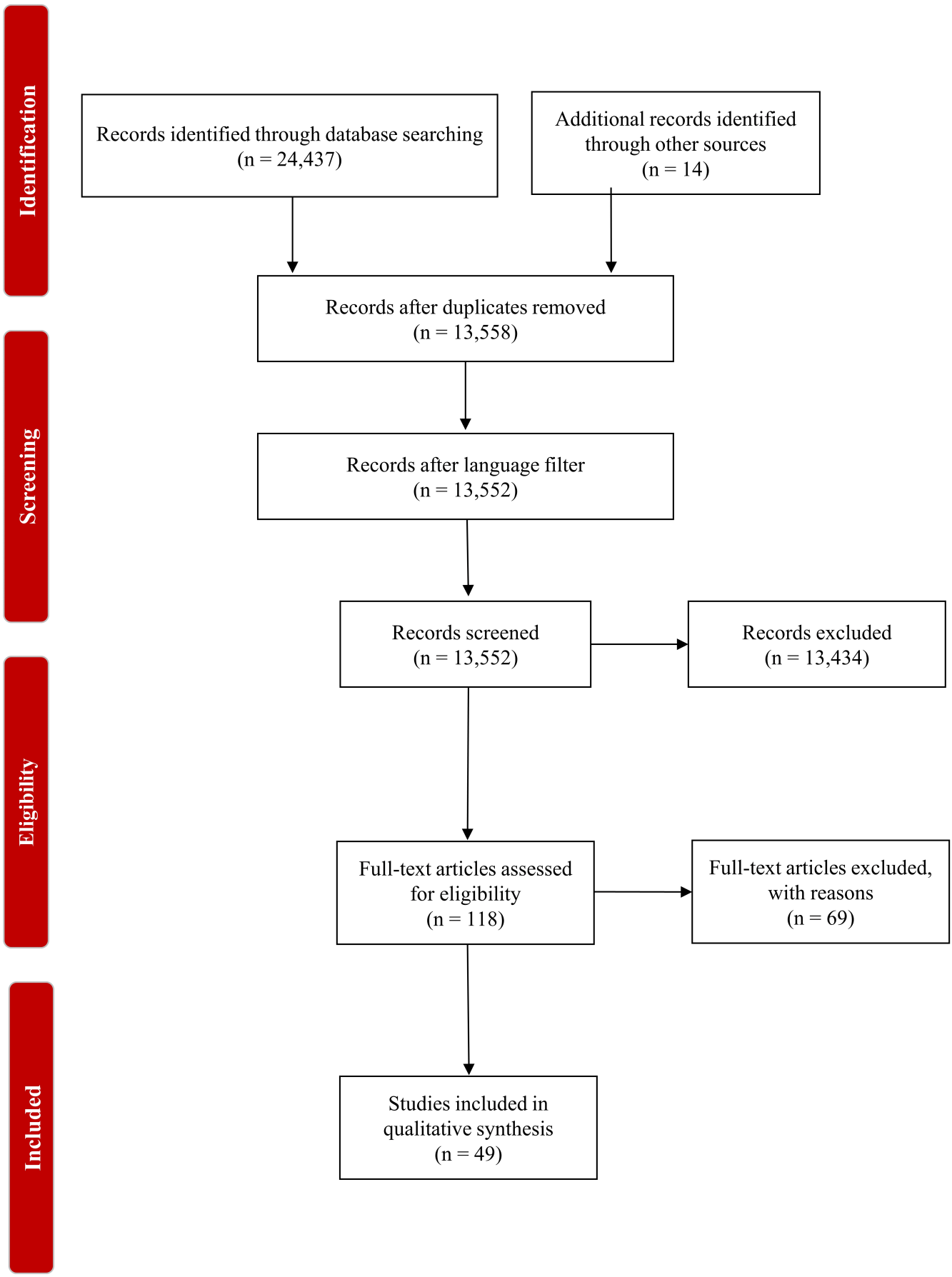
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Screening
Eligibility
Included
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Additional records identified through other sources (n = 14)
Records after duplicates removed (n = 13,558)
Records after language filter (n = 13,552)
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Studies included in qualitative synthesis (n = 49)

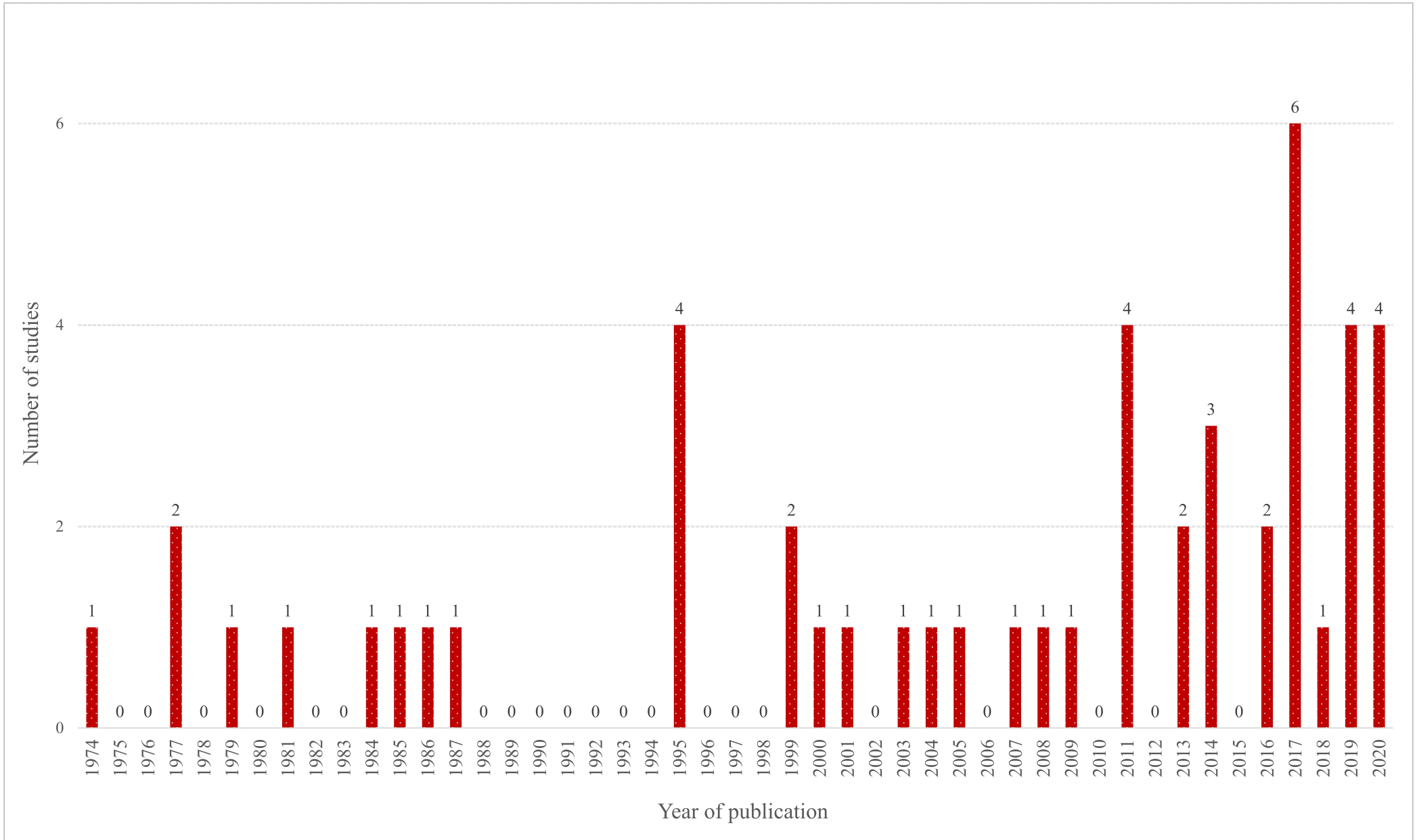
Number of studies
Year of publication
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Table 1: Comprised summary of reviewed studies (n = 49)

Characteristics		N	Percent
Evaluation country			
	United States	33	67.3
	United Kingdon	7	14.3
	Australia	2	4.1
	Canada	2	4.1
	Colombia	2	4.1
	Other*	3	6.1
Publication type			
	Journal article	43	87.8
	Dissertation/Thesis	3	6.1
	Report	2	4.1
	Book	1	2.0
Research design			
	Experimental	36	73.5
	Randomized controlled trial	13	26.5
	Quasi-experimental	16	32.7
	Non-experimental	13	26.5
Policing type			
	Hot spots policing	20	40.8
	Routine Patrol	10	20.4
	Traffic Patrol	8	16.3
	Crackdowns	4	8.2
	Other**	7	14.3
Evaluated effect			
	Reported crime	33	67.3
	Calls for service	14	28.6
	Traffic violations	9	18.4
	Fear of crime & security	6	12.2

*Argentina, Japan,
Theoretical Model
** Broken windows policing, Liquor Patrol, Random Patrol, Saturation Patrol, Terror Patrol

Table 2: Detailed summary of reviewed studies (n = 49)

Characteristics		N	Percent
Evaluation country			
	United States	33	67.3
	United Kingdom	7	14.3
	Australia	2	4.1
	Canada	2	4.1
	Colombia	2	4.1
	Other*	3	6.1
Publication type			
	Journal article	43	87.8
	Dissertation/Thesis	3	6.1
	Report	2	4.1
	Book	1	2.0
Research design			
	Experimental	36	73.5
	Randomized controlled trial	13	26.5
	Quasi-experimental	16	32.7
	Non-experimental	13	26.5
Days of evaluation			
	Min.	7	
	Max.	2,387	
	Mean	349.7	
	SD	482.9	
Policing type			
	Hot spots policing	20	40.8
	Routine Patrol	10	20.4

	Traffic Patrol	8	16.3
	Crackdowns	4	8.2
	Other**	7	14.3
Mode of policing	Foot Patrol	20	40.8
	Bike Patrol	1	2.0
	Motor Patrol	23	46.9
	Unknown	13	26.5
Evaluated effect			
	Reported crime	33	67.3
	Calls for service	14	28.6
	Traffic violations	9	18.4
	Fear of crime & security	6	12.2
Effect direction			
	Positive	37	75.5
	Negative	10	20.4
	Zero	2	4.1
Number of police			
	Increased	42	85.7
	Decreased	2	4.1
	No difference	5	10.2
Police recognizability			
	Visible officers	47	95.9
	Covert & Visible officers	2	4.1
Unit of police presence			
	Officers per shift	13	26.5

	Dosage	13	26.5
	Shift length	9	18.4
	Visits	4	8.2
	Logged hours	2	4.1
	Not measured	8	16.3
Measure of police presence			
	Staffing & deployment	15	30.6
	GPS-Tracker	8	16.3
	Radio logs & calls	6	12.2
	Experiment condition	6	12.2
	CAD	3	6.1
	Oberservation	3	6.1
	CCTV	1	2.0
	Other	7	14.3
Accuracy of measure	very low	8	16.3
	low	17	34.7
	medium	8	16.3
	high	16	32.7
Unit of analysis			
	Micro	30	61.2
	Meso	13	26.5
	Macro	5	10.2
	Not mentioned	1	2.0
Sample size (n=49)	Min.	1	
	Max.	5,697	
	Mean	282.3	
	SD	974.5	

Spatial focus	Destination	33	67.3
	General	16	32.7

*Argentina, Japan, Theoretical Model

** Broken windows policing, Liquor Patrol, Random Patrol, Saturation Patrol, Terror Patrol

Table 3: Overview of all Reviewed Studies (n = 49)

Authors (sample size, period of analysis, research design)	Country	Evaluation Effect	Effect direction	Level of Police	Measure of Presence	Unit of Analysis	Accucracy	Spatial Focus	Type of Police/ Policing Strategy	Population
Andresen & Lau (2014) (N = 1), Days: 155, NE	Canada	- CfS	+	+	Shift length	Meso (Neighborhood)	Staffing duty (low)	General	Foot Patrol/ Hot spots	10 - 50k
Ariel et al. (2016) (N = 115), Days: 183, E	UK	- Reported Crime - CfS	+	+	Dosage	Micro (Underground station)	Officer log (low)	Destination	Foot Patrol/ Hot spots	> 5 million
Ariel et al. (2019) (N = 72), Days: 365, E	UK	- Reported Crime - CfS	+	+	Dosage	Micro (150-meter radius polygon)	GPS (ping: 1 Minute) (high)	Destination	Foot Patrol/ Hot spots	100 - 500 k
Armour (1986) (N = 3), Days: 70, NE	Australia	- Traffic Speed	+	+	Shift length	Micro (Street slip)	na (very low)	Destination	Motor Patrol/ Traffic Patrol	< 5000
Barnes et al. (2020) (N = 3,720), Days: 248, E	Australia	- Reported Crime - Crime Harm Index	+	-	Dosage	Micro (Hot spot square)	GPS (ping: 9 sec) (high)	Destination	Bike & Motor Patrol/ Hot spots	1 - 5 million

Blattman et al. (2017) (N = 1), Days: 249, E	Colombia	- Reported Crime - Crime Risk	-	+	Dosage	Micro (Street Segments)	GPS (ping: 30 sec) (high)	Destination	Foot & Motor Patrol/ Hot Spots	> 5 million
Bowers & Hirsch (1987) (N = 1), Days: 581, NE	USA	- CfS	o	+	Officers per shift	Macro (City)	Staffing duty (low), shifts	General	Foot Patrol/ General Patrol	500 k - 1 million
Cohen et al. (2003) (N = 102), Days: 1,066, NE	USA	- CfS	+	+	Not measured	Micro (1/8 mile radius)	na (very low)	Destination	Unknown/ Crack Down	100 - 500 k
Collazos et al. (2020) (N = 967), Days: 200, E	Colombia	- Reported Crime - Fear of Crime	+	+	Dosage	Micro (Street Segment)	GPS (ping: 30 - 120 sec) (high)	Destination	Motor Patrol/ Hot spots	1- 5 million
Davies & Bowers (2019) (N = Not), Days: 153, NE	UK	- CfS	o	o	Dosage	Micro (Street Segment)	GPS (ping: 15 sec) (high)	General	Motor Patrol/ General Patrol	> 5 million
Di Tella & Schargrodsky (2004) (N = 876), Days: 275, E	Argentina	- Reported Crime	+	+	Not measured	Micro (Block)	na (very low)	Destination	Unknown/ Terror Patrol	> 5 million

Draca et al. (2007) (N = 1), Days: 731, NE	UK	- Reported Crime	+	+	Logged hours	Macro (City)	Deployment data (medium)	General	Foot & Motor Patrol/ Terror Patrol	> 5 million
Esbensen & Taylor (1984) (N = 3), Days: 1,295, E	USA	- Reported Crime	o	+	Officers per shift	Meso (Police Zones)	Staffing duty (low)	General	Foot Patrol/ General Patrol	50 - 100 k
Fitterer et al. (2017) (N = 1), Days: 1,095, E	Canada	- Reported Crime	+	+	Officers per shift	Micro (Block)	Staffing duty (low)	Destination	Foot Patrol/ Liqour Patrol	100 - 500 k
Fritsch et al. (1999) (N = 2), Days: 731, E	USA	- Reported Crime	o	+	Not measured	Meso (Police beats)	Staffing duty (low)	General	Unknown/ General Patrol	1- 5 million
Hinkle et al. (2008) (N = 2), Days: NA , E	USA	- Fear of Crime	-	+	Officers per shift	Micro (Street blocks)	Deployment data (medium)	General	Unknown/ Crack Down	100 - 500 k
Hutt (2020) (N = 5697), Days: 60, E	UK	- Reported Crime	+	+	Shift length	Micro (Grid 250x250m)	GPS (ping: 5 minutes) (high)	General	Foot Patrol/ Hot spots	> 5 million

Kaplan et al. (2000) (N = 1), Days: 29, E	USA	- Traffic Speed	+	+	Shift length	Meso (Street slip)	Placement (high)	Destination	Motor Patrol/ Traffic Patrol	50 - 100 k
Kelling et al. (1974) (N = 12), Days: 424, E	USA	- Reported Crime '- Fear of Crime	o	+	Dosage	Meso (Patrol beats)	Deployment data (medium)	General	Foot Patrol/ General Patrol	1 - 5 million
Kelling et al. (1981) (N = 15), Days: 365, E	USA	- Reported Crime - Fear of Crime	o	+	Shift length	Meso (Patrol beats)	Staffing duty (low)	General	Motor Patrol/ Routine Patrol	100 - 500 k
Koper (1995) (N = 100), Days: 365, NE	USA	- Reported Crime	+	+	Dosage	Micro (Address cluster)	Observation (low)	Destination	Foot & Motor Patrol/ Hot spots	100 - 500 k
McGarrell et al. (2001) (N = 5), Days: 93, E	USA	- Reported Crime	+	-	Logged hours	Meso (Police Beats)	Observation (low)	General	Motor Patrol/ General Patrol	500 k - 1 million
Medina et al. (2009) (N = 4), Days: 11, E	USA	- Traffic Speed	+	+	Not measured	Micro (Work zones)	Placement (high)	Destination	Motor Patrol/ Traffic Patrol	na

Mehay (1979) (N = 46), Days: na, NE	USA	- Reported Crime	+	o	Not measured	Macro (State)	Survey to Police of visible (low)	General	Unknown/ General Patrol	> 5 million
Mitchell (2017) (N = 42), Days: 180, NE	USA	- Reported Crime - CfS	o	o	Dosage	Micro (Street Segments)	GPS (ping: 90 s)(high)	Destination	Motor Patrol/ Hot spots	500 k - 1 million
Nakano et al. (2019) (N = 367), Days: na, E	Japan	- Traffic Behavior	+	+	Not measured	Micro (Point at Street)	Not appropiate	Destination	Foot & Motor Patrol/ Traffic Patrol	na
Novak et al. (2016) (N = 8), Days: 90, E	USA	- Reported Crime	+	+	Shift length	Meso (Police Beats)	Staffing duty (low)	Destination	Foot Patrol/ Hot spots	100 - 500 k
Piza et al. (2020) (N = 2), Days: 2,387, NE	USA	- Reported Crime	+	+	Officers per shift	Micro (Street block)	Summons (directed patrol) logs (medium)	General	Foot & Motor Patrol/ Saturation Patrol	100 - 500 k
Ratcliffe et al. (2011) (N = 120), Days: 60, E	USA	- Reported Crime	+	+	Shift length	Micro (Street block)	Staffing duty (low)	Destination	Foot Patrol/ Hot spots	1 - 5 million

Ravani & Wang (2018) (N = 4), Days: 11, E	USA	- Traffic Speed	+	+	Not measured	Micro (Street slip)	Placement (high)	Destination	Motor Patrol/ Traffic Patrol	na
Richards et al. (1985) (N = 4), Days: 16, E	USA	- Traffic Speed	+	+	Officers per shift	Micro (Work zones)	Placement (high)	Destination	Foot & Motor Patrol/ Traffic Patrol	na
Rosenfeld et al. (2014) (N = 32), Days: 275, E	USA	- Reported Crime	+	+	Dosage	Micro (Street blocks)	Radio call data (medium)	Destination	Unknown/ Hot spots	100 - 500 k
Santos (2013) (N = 417), Days: 1827, E	USA	- Reported Crime	+	o	Visits	Micro (Hot spots)	Response log (very low)	Destination	Unknown/ Hot spots	100 - 500 k
Schaefer et al. (2019) (N = 94), Days: 90, E	USA	- Reported Crime - CfS	+	+	Visits	Micro (Street Block)	Radio call data (medium)	Destination	Unknown/ Hot spots	500 k - 1 million
Schnelle et al. (1977) (N = 4), Days: 52, E	USA	- Reported Crime	o	+	Officers per shift	Meso (Patrol Zones)	Staffing duty (low)	General	Motor Patrol/ Random Patrol	100 - 500 k

Sherman & Rogan (1995) (N = 2), Days: 205, E	USA	- Reported Crime	+	+	Officers per shift	Meso (Patrol beats)	Staffing duty (low)	General	Motor Patrol/ Hot spots	100 - 500 k
Sherman et al. (1995a) (N = 207), Days: 199, E	USA	- Reported Crime - CfS	+	+	Officers per shift	Micro (Street block)	na (very low)	Destination	Unknown/ Crack Down	100 - 500 k
Sherman et al. (1995b) (N = 110), Days: 365, E	USA	- CfS	+	+	Dosage	Micro (Address cluster)	Observation (low)	Destination	Foot & Motor Patrol/ Hot spots	100 - 500 k
Sisiopiku et al. (1999) (N = 1), Days: 7, E	USA	- Traffic speed	+	+	Not measured	Macro (Highway slip)	Placement (high)	Destination	Motor Patrol/ Traffic Patrol	50 - 100 k
Sorg et al. (2013) (N = 120), Days: 60, E	USA	- Reported Crime	+	+	Shift length	Micro (Street blocks)	Staffing duty (low)	Destination	Foot Patrol/ Crack Down	1 - 5 million
Stephensen (2017) (N = 24), Days: 245, E	USA	- Reported Crime - CfS	+	+	Officers per shift	NA (Not Mentioned)	na (very low)	Destination	Foot & Motor Patrol/ Hot spots	100 - 500 k

Taylor et al. (2011) (N = 83), Days: 90, E	USA	- Reported Crime - CfS	+	+	Dosage	Macro (Land parcel)	na (very low)	Destination	Motor Patrol/ Saturation Patrol Problem-orientated Policing	500 k - 1 million
Telep et al. (2014) (N = 42), Days: 90, E	USA	- Reported Crime - CfS	+	+	Visits	Micro (Street Block)	GPS (ping: unknown) (high)	Destination	Foot Patrol/ Hot spots	100 - 500 k
Thaler (1977) (N = 1), Days: 365, NE	USA	- Reported Crime	o	o	Officers per shift	Meso (Census tracts)	Calculation (very low)	General	Unknown/ General Patrol	100 - 500 k
Walter et al. (2011) (N = 1), Days: 23, NE	UK	- Traffic Speed - Traffic Safety	+	+	Visits	Meso (Street slip)	Observation (low)	Destination	Motor Patrol/ General Patrol	> 5 million
Weisburd et al. (2011) (N = 1), Days: 365, NE	NA	- Reported Crime	+	+	Officers per shift	Meso (Borough)	Model Variable (high)	Destination	Unknown/ Hot spots	10 - 50 k
Weisburd et al. (2017) (N = 110), Days: 215, E	USA	- Fear of Crime	o	+	Shift length	Micro (Street Segments)	Deployment data (medium)	Destination	Unknown/ Broken Windows Policing Hot spots	100 - 500 k

Williams & Coupe (2017) (N = 7), Days: 100, E	UK	- Reported Crime	+	+	Dosage	Micro (Hot spot grid)	GPS (ping: unknown) (medium)	Destination	Unknown/ Hot spots	1 - 5 million
Zech et al. (2005) (N = 2), Days: 26, E	USA	- Traffic Speed	+	+	Officers per shift	Micro (Street slip)	Placement (high)	Destination	Motor Patrol/ Traffic Patrol	na

+ = increase, positive, - = decrease, negative, o = no change, no effect