European Journal of Personality, *Eur. J. Pers.* (2016)
Published online in Wiley Online Library (wileyonlinelibrary.com) **DOI**: 10.1002/per.2079

On the Integration of Need-related Autobiographical Memories among Late Adolescents and Late Adults: The Role of Depressive Symptoms and Self-congruence

JOLENE VAN DER KAAP-DEEDER[1]*, MAARTEN VANSTEENKISTE[1], STIJN VAN PETEGEM[2], FILIP RAES[3] and BART SOENENS[1]

[1]*Faculty of Psychology and Educational Sciences, Department of Developmental, Social, and Personality Psychology, Ghent University, Ghent, Belgium*
[2]*Family and Development Research Centre, Institute of Psychology, University of Lausanne, Lausanne, Switzerland*
[3]*Faculty of Psychology and Educational Sciences, KU Leuven, Leuven, Belgium*

Abstract: Within self-determination theory, integration denotes the process through which people accept past and present experiences and harmonize these experiences within their sense of self. We investigated associations between indicators of successful and poor integration of need-related memories and memory-related affect. We also examined the role of depressive symptoms and self-congruence as antecedents of these indicators. Moreover, we investigated whether late adults, compared with late adolescents, were better capable of integrating need-frustrating memories through higher levels of self-congruence. Participants were 132 late adolescents (Mage = 17.83) and 147 late adults (Mage = 76.13), who reported on their level of depressive symptoms and self-congruence. Next, participants generated a need-satisfying and need-frustrating memory and reported on the memories' integration (in terms of acceptance, connection and rumination) and associated affect. Whereas depressive symptoms related mainly to the poor integration of need-frustrating memories, self-congruence related positively to the integration of both need-satisfying and need-frustrating memories. In turn, integration was related to more positive and less negative affect. Late adults scored higher than late adolescents on the integration of need-frustrating memories, an effect that was partly accounted for by late adults' elevated self-congruence. Results suggest that self-congruence, depressive symptoms and age play a role in the integration of need-based autobiographical memories. Copyright © 2016 European Association of Personality Psychology

Key words: autobiographical memories; integration; self-determination theory; depressive symptoms; self-congruence

According to self-determination theory (SDT; Deci & Ryan, 2000; Vansteenkiste, Niemiec, & Soenens, 2010), a broad theory on human motivation and socialization, the integration of past positive and negative experiences is crucial for individuals' current adaptive psychological functioning and thriving. Consistent with developmental theories such as Erikson's (1950) model of psychosocial development, SDT argues that coming to terms with negative experiences from the past and building an identity containing both positive and negative past experiences represent a crucial task throughout the lifespan.

Extant research on the integration of one's past experiences has focused either on indicators of high-quality integration (e.g. acceptance; Weinstein, Deci, & Ryan, 2011) or on indicators of poor integration (e.g. rumination; Mclaughlin, Borkovec, & Sibrava, 2007). Accordingly, a first aim of the present study was to examine indicators of both high-quality integration and poor integration in conjunction, and their relation with individuals' current affect concerning these past experiences. In doing so, we focused specifically on memories related to both the satisfaction and the frustration of the psychological needs for autonomy (i.e. experience of volition), competence (i.e. experience of effectiveness) and relatedness (i.e. experience of closeness), as these have been found to represent a crucial aspect of autobiographical memories (for an overview see Milyavskaya, Philippe, & Koestner, 2013). The second aim was to investigate whether personal characteristics would relate to individuals' degree of integration of past events. Specifically, we examined associations with depressive symptoms and self-congruence (i.e. experiencing oneself as the author of one's behaviours; Weinstein, Przybylski, & Ryan, 2013). Finally, although previous research has indicated that people become better capable of integrating (especially negative) past events as they grow older (e.g. Torges, Stewart, & Nolen-Hoeksema, 2008), the exact mechanism behind this developmental trend is less clear. Therefore, in the current mixed age group involving both late adolescents and late adults, we examined whether older individuals' higher display of self-congruent functioning (e.g. Sheldon & Kasser, 2001) may be a possible mechanism.

*Correspondence to: Jolene van der Kaap-Deeder, Faculty of Psychology, Department of Developmental, Social, and Personality Psychology, Henri Dunantlaan 2, B-9000 Ghent, Belgium.
E-mail: Jolene.Deeder@UGent.be

Received 7 June 2016
Revised 25 August 2016, Accepted 19 September 2016

The integration of autobiographical memories

The integrative process is a central aspect of many theories of personality development (e.g. Rogers, 1963) and autobiographical memory (e.g. Bauer, McAdams, & Pals, 2008; Pillemer, 1992). In this study, we drew upon SDT (Deci & Ryan, 2000; Ryan, 1995), where integration is defined as the process through which people acknowledge and come to accept various aspects (i.e. emotions, behaviours and cognitions) of their past, present and future functioning, and bring these aspects into harmony to form a unified sense of self (Deci & Ryan, 2000; Weinstein et al., 2013). This integrative process comes into play when individuals are confronted with past experiences that are at odds with one another or that are inconsistent with personally held ideals and values. Such a confrontation challenges individuals to integrate past experiences into a coherent whole. To illustrate, an experience of social exclusion may threaten a person's worldview that the world is trustworthy, an experience that needs to be acknowledged and integrated. The failure to do so may cause internal conflict, which then may manifest through rumination about the event. However, this process of integration can be painful because the full acknowledgement of negative memories may elicit feelings of sadness, fear and anger (Mills & D'Mello, 2014). In addition, also positive and rewarding experiences need to be assimilated within one's sense of self. In other words, this integrative process involves both positive and negative experiences, which together should nourish the formation of a meaningful and coherent life narrative (Bauer et al., 2008). Indeed, people with life narratives that include both positive and negative past events were found to experience greater overall well-being (e.g. McLean & Lilgendahl, 2008) and to have clearer goals for the future (e.g. Pillemer & Kuwabara, 2012).

In the present study, we focused on two indicators of adaptive integrative processing, namely, acceptance of past events and the degree to which one feels connected with oneself as a person when the event took place. To the extent that people accept a past event and feel a bond with the person they were at the time of the event, it indicates that the event has gained a more meaningful place within their personal life narrative. Weinstein et al. (2011; Study 5) asked students to reflect on a negative (i.e. shameful or regretful) or positive (i.e. a happy or contented) life event that had a strong impact on them, thereby indicating their acceptance of and connection with this event. Integration of both the positive and negative event, as indicated by greater acceptance and connection, was related to higher well-being (Weinstein et al., 2011).

The integrative process can also go awry. Two indicators of poor integration are rumination and intrusion. Whereas rumination refers to the tendency to think repetitively about one's feelings and problems (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008), intrusions refer to the involuntary recollection of past negative events (Brewin, 1998). Both phenomena have been found to mutually reinforce one another (e.g. Smets, Wessel, Schreurs, & Raes, 2012) and are both related to negative emotional outcomes (e.g. Mclaughlin et al., 2007; Michael, Ehlers, Halligan, & Clark, 2005).

Studies thus far have focused almost exclusively either on indicators of successful integration (e.g. acceptance; Weinstein et al., 2011) or on variables indicative of poor integration (e.g. rumination; Mclaughlin et al., 2007). A simultaneous examination of both sides is needed to get a more complete view on the integrative process, as the absence of poor integration does not by definition imply the presence of adaptive integration. To illustrate, a person who does not ruminate over a negative event (i.e. displaying an absence of poor integration) does not necessarily fully accept this event. Therefore, we examined both indicators of successful and poor integration and their relation with memory-related affect. We thereby examined the integration of experiences of need satisfaction and need frustration specifically, because such experiences would be vitally important to individuals' well-being.

Psychological need satisfaction and need frustration in autobiographical memories

A central tenet in SDT is that individuals' well-being largely depends on the satisfaction of their psychological needs of autonomy, competence and relatedness (Deci & Ryan, 2000; Vansteenkiste et al., 2010). Autonomy refers to the degree to which one experiences a sense of choice and volition when carrying out activities. Competence signifies the tendency to develop one's skills and to gain a sense of control over desired outcomes. Relatedness entails the inclination to connect to other people and to have loving and trustworthy relationships. While satisfaction of these psychological needs has been found to relate positively to a variety of beneficial outcomes (e.g. life satisfaction and vitality), their frustration has been found to relate to negative outcomes (e.g. anxiety and aggression; Chen et al., 2015; Deci & Ryan, 2000; Vansteenkiste & Ryan, 2013).

Recent research also suggests that need satisfaction and frustration play an important role in people's memories of past personal events. A number of studies examined people's experienced need satisfaction at the episodic level and found that participants' need satisfaction, as experienced in their memories, contributed uniquely to their well-being, above and beyond the contribution of people's concurrent need satisfaction (e.g. Philippe, Koestner, Beaulieu-Pelletier, Lecours, & Lekes, 2012). Similarly, need satisfaction as experienced in couple-related memories predicted relationship quality 1 year later (Philippe, Koestner, & Lekes, 2013), whereas need frustration in a loss-related memory (i.e. the loss of something or someone important) was related to more depressive emotions (Philippe, Koestner, Lecours, Beaulieu-Pelletier, & Bois, 2011). Thus, need satisfaction and frustration represent important and unique aspects of individuals' autobiographical memories that help to explain why recalling such memories engenders positive or negative feelings (cf. Philippe et al., 2012). We aim to examine whether the extent to which both need-satisfying (NSM) and need-frustrating memories (NFM) engender positive or negative feelings depends on the degree to which individuals have integrated or failed to integrate these past events.

DOI: 10.1002/per

The role of depressive symptoms and self-congruence in the integrative process

As the integration of past events is crucial for individuals' psychological functioning, we sought to examine whether and how two potentially relevant individual difference variables, namely, depressive symptoms and self-congruence, may relate to the integration of need-satisfying and need-frustrating autobiographical memories. Depression has been characterized as a disorder involving disturbances in one's reflections of the past (Beck, Rush, Shaw, & Emery, 1979). Depressed individuals retrieve negative memories more frequently and, at the same time, are affected more strongly by this recollection of negative past events (Watkins, Grimm, Whitney, & Brown, 2005). This increased sensitivity to negative past events can be explained by the fact that individuals with elevated depressive symptoms or diagnosed with depression are more prone to intrusions of stressful memories (Brewin, Reynolds, & Tata, 1999) and are more likely to ruminate over past negative events (Watkins & Teasdale, 2001), suggesting that they often fail to integrate past negative or stressful events. A few studies have also focused on positive memories and found that individuals high on depressive symptoms identify less with such memories (e.g. Lemogne et al., 2006; Werner-Seidler & Moulds, 2012). For example, Janssen, Hearne and Takarangi (2015) found that depressive symptoms were related to a stronger feeling of distance from positive past events. Depression thus seems to be characterized by a repetitive dwelling on negative memories and a feeling of detachment from positive memories.

Whereas most studies on autobiographical memories have focused on vulnerability factors (e.g. depressive symptoms) for a poor integration of past events, we additionally focused on a potentially integration-promoting factor, that is, self-congruence. Self-congruence refers to individuals' tendency to regulate their behaviour on the basis of personally endorsed values, interests and preferences, rather than on the basis of externally imposed expectations (Weinstein et al., 2013). Self-congruent functioning is related to desirable outcomes, including higher psychological need satisfaction, greater acceptance of one's strengths and weaknesses, and higher well-being (Weinstein, Przybylski, & Ryan, 2012; Yu, Assor, & Liu, 2015).

As individuals high in self-congruence are aware of their own most fundamental values and interests, they have a clear criterion to evaluate and reflect upon important life events. As such, this awareness is likely to facilitate the assimilation of past life experiences into a coherent and meaningful sense of self (i.e. the process of integration). In addition, people high on self-congruence have been shown to be open to and interested in their own experiences and to take responsibility for their own actions (Weinstein et al., 2012). For these reasons, we expected that these individuals would be better capable of integrating both positive and negative past events. Although no study thus far investigated directly the relation between self-congruence and the integration of past events, indirect evidence was provided by Weinstein et al. (2011). They found that an autonomous personality orientation, a concept closely aligned with the notion of self-congruence, was positively related to the integration of central positive and negative life events.

Age and the integration of autobiographical memories: the role of self-congruence

Erikson (1950) identified the achievement of a sense of ego-integrity as the central developmental task of late adulthood. When achieving ego-integrity, people experience a sense of unity, harmony and completeness in their identity. Key to the successful resolution of this task is an exploration and contemplation of life as a whole and a capacity to reconcile positive and negative past events. This is also in line with socioemotional selectivity theory (Carstensen, Fung, & Charles, 2003), which states that, as people get older, they become more skilled in enhancing their current well-being, for example, by reappraising negative events and by remembering positive stimuli better than negative stimuli (for an overview, see Mather & Carstensen, 2005).

From these theories, it can be derived that late adults, compared with younger people, would be better at integrating past events. Research has shown that late adults indeed display a better integration of memories and of negative memories in particular. To illustrate, older, relative to younger, individuals reported memories that contained more statements about what the memory has taught the individual about the self or the world (e.g. Singer, Rexhaj, & Baddeley, 2007), which provides indirect evidence for the idea that they better accept the memory. Further, Torges et al. (2008) found that older (compared with younger) individuals were better able at accepting mistakes they had made towards a deceased loved one, with such acceptance relating to higher levels of well-being.

Although previous studies indicated that older individuals are better capable of integrating past events, the mechanisms behind this relation are less clear. SDT predicts that, as individuals grow older, they move towards higher levels of self-congruence, indicating that individuals act more according to personally endorsed values (Deci & Ryan, 2000). A number of studies have shown that people indeed display more self-congruent functioning with increasing age. For instance, older individuals have been found to feel more autonomous while voting, tipping and paying taxes (Sheldon, Kasser, Houser-Marko, Jones, & Turban, 2005) and more often strive for personally important and self-determined goals (Sheldon & Kasser, 2001). Older individuals were also found to attach less importance to extrinsic goals (e.g. status), that is, goals characterized by a focus on others' approval and by a lack of self-congruence (Kasser & Ryan, 1996). Based on this evidence, we expected that higher levels of self-congruence would explain, in part, why older individuals would be better at integrating past events.

The present study

The overall goal of this study was to investigate whether the integration of need-related memories relates to individuals' currently experienced positive and negative affect with

DOI: 10.1002/per

respect to these memories. We reasoned that, when a personal memory event still elicits negative affect today, there is a remaining scar and the event has not been fully processed and accepted yet. In contrast, when the event comes with more positive affect today, it has been processed more fully and more adequately. Thus, we expected that high-quality integration of past events would relate to positive affect and that poor integration would relate to negative affect. We also examined whether depressive symptoms, self-congruence and age would relate to this integrative process.

Specifically, the following three hypotheses were examined in a mixed sample of late adolescents and late adults. First, we examined to what extent different indicators of high-quality integration (i.e. connection and acceptance) and poor integration (i.e. rumination and intrusion) related to individuals' memory-related affect (Hypothesis 1). As need satisfaction and frustration represent crucial aspects of autobiographical memories (Milyavskaya et al., 2013), we focused on memories involving experiences of both need satisfaction and need frustration. We expected that connection to and acceptance of both NSM and NFM would relate to more positive and less negative affect, whereas an opposite pattern was expected for rumination and intrusions (which were only assessed with respect to the NFM).

Second, we investigated whether depressive symptoms and self-congruence related to this integrative process. We expected that self-congruence would relate to more positive and less negative affect, with better integration (as indicated by higher levels of connection and acceptance, and lower levels of rumination and intrusions) of both NSM and NFM accounting for this association (i.e. mediation). An opposite pattern of results was anticipated with regard to depressive symptoms (Hypothesis 2).

The sampling of a mixed age-group, involving both late adolescents and late adults, allowed us to investigate the role of age in two different ways. First, we examined whether the proposed theoretical model would hold across both late adolescents and late adults (Hypothesis 3a). Second, in terms of mean-level differences, we expected late adults to display more acceptance and connection and less rumination and intrusions than late adolescents, with this age difference being accounted for by the presence of higher levels of self-congruence among elderly people (Hypothesis 3b).

METHOD

Participants and procedure

Participants were late adolescents ($N = 132$; Mage $= 17.83$; $SD = .94$; range: 16–22 years) and late adults ($N = 147$; Mage $= 76.13$; $SD = 7.57$; range: 61–93 years). In both groups, there were slightly more women than men (late adolescents: 56.1%; elderly individuals: 66.0%). Of the late adolescents, 65 were first-year undergraduate students in psychology, and 67 were sixth-grade high school students.[1] All high school students were following an academic track (i.e. a track that prepares them for higher education). Among the elderly people, the highest level of education obtained was 17.4% primary school, 59.1% high school and 23.6% higher education.

Both the late adolescents and the late adults were recruited by undergraduate students in return for course credits. These students received a 1-h information session about the purpose of the study and the recruitment procedures to ensure that participants would be recruited in a standardized way. With respect to the late adults, students were asked to search for individuals of at least 65 years old who were willing to participate in the study. After informing participants that participation was voluntary, that they could withdraw their participation at any moment and that the data would be processed in a confidential way, undergraduate students were present to provide, if needed, assistance when participants were filling out the questionnaires.

We decided to let the participants first fill out the general questionnaires and subsequently the memory-related questionnaires because this order of presentation has been found to be most methodologically sound (Philippe, Bouizegarene, Guilbault, Rajotte, & Houle, 2015). With a reversed order of presentation, there is a greater likelihood that ratings on the general questionnaires (depression and self-congruence) will be affected by the valence of the retrieved memories. Thus, participants first filled out questionnaires assessing depressive symptoms and self-congruence. Next, participants were instructed to think of two need-related memories. We used a mixed design with the type of need-related memory (i.e. autonomy, competence or relatedness) representing a between-subject factor and with the valence of the memory (i.e. satisfaction or frustration) being a within-subject factor. Younger and older participants were distributed equally over the three between-subject conditions, χ^2 (2, $N = 274$) $= .16$, $p = .92$. In counterbalanced order, all participants were asked to generate one satisfying and one frustrating memory, which related to a single need.[2] Specifically, participants were instructed to think back to and shortly describe an event wherein they felt free to do things that were congruent with their personal interests and values (i.e. autonomy satisfaction condition), or successful in doing something that was important to them (i.e. competence satisfaction condition), or connected to other people who were important to them (i.e. relatedness satisfaction condition). Then, they generated an event during which they felt forced to act or think in a particular way (i.e. autonomy frustration condition), or as if they failed in something that was important to them (i.e. competence frustration condition), or rejected or excluded by people who were important to them (i.e. relatedness frustration condition). The instructions also stated that this event needed

[1] Results of independent samples t-tests indicated that there were no mean-level differences with respect to the outcome variables between the high school and undergraduate students (t-values ranging between -1.70 and 1.49, $p > .05$).

[2] Results of a MANOVA showed that the order of the retrieved memory (i.e. reporting first on either a need-satisfying or need-frustrating memory), which was entered as a between-subject factor, did not affect the degree of experienced autonomy, competence, and relatedness satisfaction and frustration in the reported memory ($F(6, 251) = .89$, $p > .05$, $\eta^2 = .02$).

DOI: 10.1002/per

to be personally important to them. We have provided some examples of the recalled memories in Table 1. After this short description, participants filled out questionnaires tapping into memory-related experiences, as explained in the succeeding discussion.

Measures

All items were answered on a Likert scale ranging from 1 (*not at all true*) to 5 (*completely true*), unless indicated otherwise.

General measures

Depressive symptoms. Participants were administered the Center for Epidemiological Studies-Depression scale (CES-D; Radloff, 1977) to assess depressive symptoms experienced during the past week. The CES-D has been shown to assess mostly trait instead of state depression and is suitable for non-clinical populations (Spielberger, Ritterband, Reheiser, & Brunner, 2003). We employed a shortened version of the CES-D consisting of six items (e.g. 'I felt depressed'; Van Hiel & Vansteenkiste, 2009). Items were rated on a 4-point Likert scale ranging from 0 (*rarely or none of the time*) to 3 (*most or all of the time*). This scale was reliable ($\alpha = .83$).

Self-congruence. Self-congruence was assessed with the 'authorship/self-congruence' subscale of the index of autonomous functioning (Weinstein et al., 2012). This subscale consists of five items (e.g. 'My decisions represent my most important values and feelings') and was reliable ($\alpha = .80$).

Memory-related measures

Memory characteristics: emotional intensity and centrality. Memories can differ in terms of emotional intensity (e.g. Talarico, LaBar, & Rubin, 2004) and centrality to individuals' identity and life story (Berntsen & Rubin, 2006). We measured these features of memories in order to control for them in the main analyses. Participants were asked to rate the emotional intensity of the event (one item) on a 5-point Likert scale ranging from 1 (*not at all intense*) to 5 (*very intense*). The centrality of the event was measured using four items of the seven-item version of the centrality of event scale (Berntsen & Rubin, 2006). This scale had an adequate reliability (satisfaction memory: $\alpha = .76$; frustration memory: $\alpha = .74$).

Need satisfaction and frustration experienced in the memory. To obtain a manipulation check and to examine whether participants indeed reported on the need as specified in the instructions, participants were asked to rate the degree of need satisfaction (three items; one per need) and need frustration (three items; one per need) they had experienced during the recalled event. These items were derived from a memory-related psychological need satisfaction scale (Philippe et al., 2011) and from the basic psychological need satisfaction and frustration scale (Chen et al., 2015). Items (e.g. 'I felt free to do things and to think how I wanted'; autonomy satisfaction) were rated on a 5-point Likert scale ranging from 1 (*don't agree at all*) to 5 (*completely agree*). Items assessing need frustration were reverse scored and averaged with the items assessing need satisfaction. This score, which reflects experiences of need satisfaction (versus need frustration), was reliable both for the NSM ($\alpha = .67$) and for the NFM ($\alpha = .66$).

Connection. Participants rated the degree to which they felt connected with the person they were in the memory using four items (e.g. 'I feel connected to the person I was then'), which were taken from Weinstein et al. (2011). This scale had an adequate reliability (satisfaction memory: $\alpha = .76$; frustration memory: $\alpha = .71$).

Acceptance. Acceptance of the reported event was assessed with six items (e.g. 'I accept this event'). These items were adapted from three previously used scales, namely, a scale assessing acceptance of a central past life event (Weinstein

Table 1. Examples of the recalled memories

Type of memory	Example	Reporter
Autonomy satisfaction	'My parents were always very strict about everything. I could make only a few decisions by myself. But when my godmother went to talk with my parents about going to the university, I was allowed to make my own decisions for the first time. As soon as I went to university, I really had a feeling of freedom.'	Late adult
Competence satisfaction	'When I received an award for Spanish in my last year of high school. Because I had invested a lot of effort and attached a lot of value to it.'	Late adolescent
Relatedness satisfaction	'A birthday party where we (I, my husband, children, and grandchildren), went out for a surprise diner and visited an amusement park afterwards. At that moment I was in a wheelchair because of a knee operation. It was winter and it had snowed. The grandchildren liked it a lot to guide me in my wheelchair through the park in the snow. I'm really grateful for this beautiful memory.'	Late adult
Autonomy frustration	'In the fourth year of high school I followed the track 'Latin-Mathematics'. I had chosen this track because I wanted to give it a try. When I wanted to change my track a year later, my father did not allow this. So I did this track another half year against my will. Eventually I changed my track without my father knowing.'	Late adolescent
Competence frustration	'At a certain moment I had a big fight with my son. Today, I feel like I was too rude towards him. I had beaten him, something I had never done before. At that moment I felt like a failure because I was unable to control my anger.'	Late adult
Relatedness frustration	'I was in the same class as both my best friends and my romantic partner. My friends thought that my partner changed me. During our last 100 days in the final year of high school they ran out on me and did not support me anymore. My partner did not understand that this rejection hurt me.'	Late adolescent

DOI: 10.1002/per

et al., 2011), the acceptance subscale of the Illness Cognition Questionnaire assessing the acceptance of an illness (Evers et al., 2001) and the acceptance subscale of the Cognitive Emotion Regulation Questionnaire assessing acceptance of a negative event (Garnefski, Kraaij, & Spinhoven, 2001). This scale was reliable (satisfaction memory: $\alpha = .79$; frustration memory: $\alpha = .87$).

Rumination and intrusions. Rumination, which was only assessed with respect to the NFM, was measured with four items (e.g. 'I tend to "ruminate" or dwell over this event') of the 12 item-rumination subscale of the Rumination–Reflection Questionnaire (Trapnell & Campbell, 1999; Luyckx et al., 2008). Intrusion was assessed with three items (e.g. 'I often think about this event without wanting to do so') of the seven-item intrusion subscale of the impact of event scale (Horowitz, Wilner, & Alvarez, 1979; Brom & Kleber, 1985). Items were selected based on their relevance for past events. As previous studies found rumination and intrusion to often go hand in hand (e.g. Smets et al., 2012) and because these two sets of items were highly correlated in the current study ($r = .77$; $p < .01$), they were averaged to form a composite score, which we refer to as 'rumination'. This scale had a good reliability ($\alpha = .89$).

Positive and negative affect. Current positive and negative affect when thinking back to the generated memory was assessed with, respectively, eight (e.g. 'happy') and seven (e.g. 'angry') items, which were partly based on the positive and negative affect schedule (Watson, Clark, & Tellegen, 1988). These items were preceded by the stem 'While thinking back to this event, I feel …' and were rated on a 7-point Likert scale ranging from 1 (*not at all true*) to 7 (*completely true*). The scale assessing positive affect was reliable (satisfaction memory: $\alpha = .88$; frustration memory: $\alpha = .89$), as was the scale for negative affect (satisfaction memory: $\alpha = .84$; frustration memory: $\alpha = .82$).

Plan of analyses

The main hypotheses were examined by modelling three structural path models using MPlus 7 (Muthén & Muthén, 1998–2012) using maximum-likelihood estimation. First, we ran a model with our three indicators of (poor) integration (i.e. connection, acceptance and rumination) as predictors of memory-related affect (positive and negative; cf. Hypothesis 1). Thereby, we allowed variables at the same level to covary. In a second model, we added self-congruence and depressive symptoms as predictors of the indicators of integration (cf. Hypothesis 2). These first two structural models were tested separately for the NSM and for the NFM. As rumination was only assessed for the NFM, this variable was not included in the NSM models. Additionally, for both models, we performed a multigroup comparison to examine whether the observed associations would be (dis)similar for late adolescents and late adults (cf. Hypothesis 3a). To do so, we compared an unconstrained model, in which all path coefficients were allowed to vary across the two subsamples with a constrained model, in which all path coefficients were set equal across both subsamples. Both models were compared using the difference in chi-square ($\Delta\chi^2$), which should be non-significant, and with the difference in comparative fit index (ΔCFI), which should be lower than .01 (Cheung & Rensvold, 2002) in order to favour the constrained over the unconstrained model. When the model fit was significantly different (which would indicate that the relations were moderated by subsample), we estimated partially constrained models, where we gradually constrained path coefficients, as to determine which specific relations were significantly different across subsamples. Subsequently, we examined by means of MANCOVAs the existence of significant mean-level differences between the adolescent and elderly subsample with regard to the study variables. Finally, in a third and final model, we examined whether subsample (i.e. the adolescent and elderly subsample) related to self-congruence, which in turn would relate to our indicators of integration (cf. Hypothesis 3b). In total, 3.01% of the data was missing. These missing data were missing completely at random, as the normed χ^2/df (164.14/129) was 1.27 (i.e. smaller than the recommended cut-off of 2; Ullman, 2001). Because missing data were missing at random, the use of the full information maximum likelihood procedure was appropriate to estimate missing data (Schafer & Graham, 2002). We employed several indices to evaluate the fit of the path models, namely, the χ^2 test, the CFI, the standardized root mean square residual (SRMR) and the root mean square error of approximation (RMSEA). An acceptable fit was indicated by χ^2/df ratio of 2 or below, CFI values of .95 or above, SRMR values of .08 or below and RMSEA values of .06 or below (Hu & Bentler, 1999; Kline, 2005). To test the significance of indirect effects, we used bootstrapping (using 1000 draws), a nonparametric resampling procedure that is currently highly recommended (Preacher & Hayes, 2008).

RESULTS

Descriptive statistics and preliminary analyses

First, a paired-samples *t*-test indicated that individuals reported more experienced need satisfaction in the need satisfaction condition ($M = 4.09$; $SD = .65$) than in the need frustration condition ($M = 2.68$; $SD = .79$), $t(261) = 22.67$, $p < .01$.[3] The bivariate correlations between the study variables, separated by subsample, can be found in Table 2. Further, results of two repeated measures ANOVAs with type of memory (i.e., NSM and NFM) as a within-subject factor and with population as a between-subject factor showed that although there was no difference in the emotional intensity between the generated NSM and NFM ($F(1, 259) = .05$, $p > .05$, $\eta^2 = .00$), the two types of memories did differ with respect to centrality ($F(1, 256) = 56.02$, $p < .001$, $\eta^2 = .18$). More specifically, NSM ($M = 3.61$; $SD = .93$) were rated to be more central than NFM ($M = 3.02$;

[3]When entering the type of recalled need-satisfying or need-frustrating memory (i.e. autonomy, competence or relatedness) as a between-subject factor in a MANOVA, participants were found to report more satisfaction or frustration of the need that was specified in the instructions compared with the satisfaction or frustration of the other two needs ($F(12, 502) = 7.89$, $p < .01$, $\eta^2 = .16$).

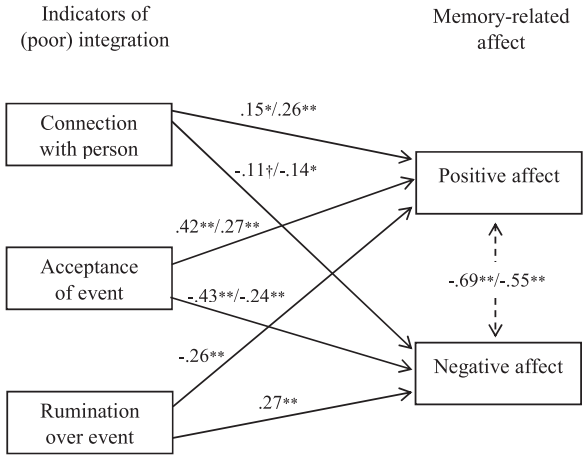
DOI: 10.1002/per

Table 2. Correlations between the study variables

Memory characteristics	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Emotional intensity – NSM	—	.12	.30**	.02	.09	−.08	.15†	.08	.02	−.05	.07	−.11	−.04	.14	.08
2. Emotional intensity – NFM	.28**	–	.17†	.45**	.00	.29**	−.20*	−.14	.13	−.26**	.55**	−.02	−.32**	.04	.41**
3. Centrality – NSM	.07	.09	—	.17†	.28**	.12	.30**	−.00	.23**	−.02	.23*	.18*	−.05	.04	.03
4. Centrality – NFM	−.09	.09	.12	—	−.19*	.25**	−.11	−.03	−.03	−.23*	.55**	−.08	−.21*	.09	.38**
Personal characteristics															
5. Self-congruence	.09	−.07	.00	.07	—	−.16†	.33**	.16†	.35**	.16†	−.11	.20*	−.02	−.07	−.00
6. Depressive symptoms	−.12	.16†	−.20*	.21*	−.18*	—	−.22*	−.03	.04	−.26**	.42**	.05	−.26**	.05	.34**
Indicators of (poor) integration															
7. Connection with person – NSM	.03	−.03	.24**	−.11	.18*	−.23**	—	.07	.23*	.18*	−.12	.35**	.10	−.20*	−.25**
8. Connection with person – NFM	.07	−.02	.09	.08	.23**	−.16†	.27**	—	.10	−.13	.26**	−.04	.07	−.00	.01
9. Acceptance of event – NSM	.01	.09	.23**	−.04	.29**	−.05	.23**	.20*	—	.20*	.03	.41**	−.07	−.35**	.08
10. Acceptance of event – NFM	.07	−.10	.25**	.02	.27**	−.15†	.18*	.20*	.54**	—	−.58**	−.03	.43**	.04	−.39**
11. Rumination over event – NFM	−.16†	.18*	.06	.48**	−.06	.27**	−.12	.01	−.20*	−.35**	—	.05	−.36**	−.01	.47**
Memory-related affect															
12. Positive affect – NSM	.07	.07	.20*	−.13	.14†	−.05	.17*	.06	.54**	.35**	−.13	—	−.13	−.74**	−.01
13. Positive affect – NFM	−.05	−.15†	.09	.19*	.17†	−.10	.03	.31**	.24**	.39**	−.25**	.08	—	.22*	−.64**
14. Negative affect – NSM	−.05	−.13	−.14†	.15	−.16†	.02	−.18*	.01	−.50**	−.31**	.16†	−.76**	−.02	–	.05
15. Negative affect – NFM	−.01	.12	−.11	−.04	−.19*	.01	−.12	−.11	−.24**	−.33**	.29**	−.05	−.61**	.19*	—

Elderly individuals' measures are reported below the diagonal, while late adolescents' measures are reported above the diagonal. NSM, need-satisfying memory; NFM, need-frustrating memory.
†$p < .10$;
*$p < .05$;
**$p < .01$.

DOI: 10.1002/per



Note. Standardized coefficients appearing before and after the slash refer to, respectively, the need-satisfying and need-frustrating memories. Only one coefficient is reported for the paths relating to rumination, as this construct was only assessed in the need-frustrating memories.

†$p < .10$. *$p < .05$. **$p < .01$.

Figure 1. First structural model depicting the relation between indicators of (poor) integration and memory-related affect in need-satisfying and need-frustrating memories.

$SD = 1.03$). The interaction between type of memory and population was non-significant (emotional intensity: $F(1, 259) = 2.29$, $p > .05$, $\eta^2 = .01$; centrality: $F(1, 256) = .44$, $p > .05$, $\eta^2 = .00$). Elderly individuals did report more emotionally intense (NSM: $M = 4.38$; $SD = .97$ and NFM: $M = 4.24$; $SD = 1.08$) and central memories (NSM: $M = 3.82$; $SD = .91$ and NFM: $M = 3.17$; $SD = .98$) than late adolescents (intensity: NSM: $M = 3.70$; $SD = 1.02$ and NFM: $M = 3.81$; $SD = 1.05$; centrality: NSM: $M = 3.39$; $SD = .91$ and NFM: $M = 2.85$; $SD = 1.04$; $F(1, 259) = 30.76$, $p < .001$, $\eta^2 = .11$ and $F(1, 256) = 17.29$, $p < .001$, $\eta^2 = .06$, respectively).

Finally, independent-samples *t*-tests indicated that men and women differed with respect to depressive symptoms, with women (elderly individuals: $M = .65$; $SD = .62$; late adolescents: $M = .77$; $SD = .64$) experiencing more depressive symptoms than men (elderly individuals: $M = .41$; $SD = .50$; late adolescents: $M = .47$; $SD = .44$), $t(145) = 2.42$, $p < .05$ and $t(130) = 3.04$, $p < .01$. In the adolescent subsample, women experienced less acceptance ($M = 3.51$; $SD = 1.15$), less positive affect ($M = 2.07$; $SD = 1.05$) and more negative affect ($M = 4.80$; $SD = 1.32$) with respect to the NFM than men ($M = 3.87$; $SD = .73$; $M = 2.60$; $SD = 1.06$; $M = 4.27$; $SD = 1.29$, respectively), $t(125) = -2.07$, $p < .05$; $t(127) = -2.83$, $p < .01$; $t(127) = 2.27$, $p < .05$. Given these findings, we controlled for gender, emotional intensity and centrality in our main analyses.

Primary analyses

Hypothesis 1: The Relation between integration and memory-related affect

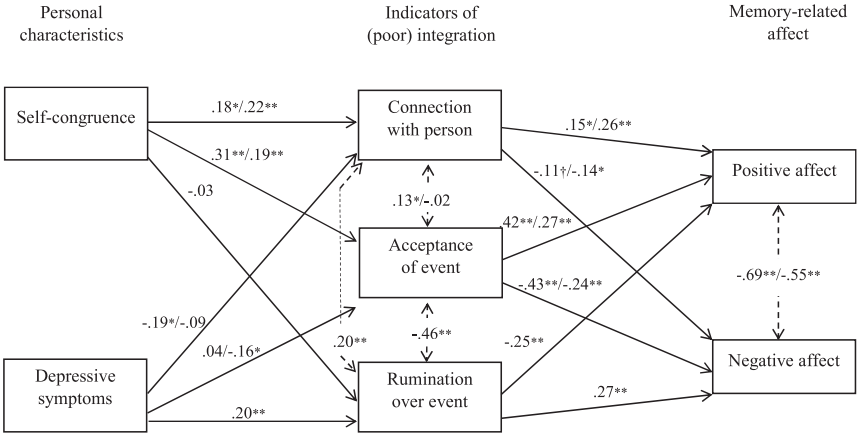
In a first structural model, we examined the unique relation between the three integration variables and current memory-related positive and negative affect. Both the NSM and the NFM model had a perfect fit because they were fully saturated. As displayed in Figure 1, in line with our expectations, connection and acceptance with respect to both the NSM and NFM were related to more positive affect and less negative affect (although connection only yielded a marginally significant relation with negative affect in the NSM). Rumination about the NFM showed the exact opposite pattern of associations. Then, we performed a multigroup comparison to examine whether the observed associations would be similar for late adolescents and late adults. The constrained model fitted the data equally well as the unconstrained model, both for the NSM ($\Delta\chi^2$ (5) = 7.32, $p > .05$ and $\Delta CFI = .01$) and for the NFM ($\Delta\chi^2$ (7) = 12.24, $p > .05$ and $\Delta CFI = .02$), suggesting that the observed associations in Figure 1 applied similarly to late adolescents and late adults.

Hypothesis 2: The role of self-congruence and depressive symptoms

The second model built upon the first by adding self-congruence and depressive symptoms as predictors of connection, acceptance and rumination.[4] Both the NSM and NFM models had a good fit (NSM: $\chi^2/df = .40$; CFI = 1.00; SRMR = .01; RMSEA = .00; NFM: $\chi^2/df = .29$; CFI = 1.00; SRMR = .01; RMSEA = .00). As displayed in Figure 2, self-congruence related positively to connection and acceptance, both with respect to the NSM and with respect to the NFM, while it was unrelated to rumination in the NFM. The relation between depressive symptoms and integration indicators was mixed and dependent on the type of memory. That is, whereas depressive symptoms related negatively to connection with NSM (but was unrelated to connection with NFM), it related negatively to acceptance of NFM (but was unrelated to acceptance of NSM). Finally, depressive symptoms related positively to

[4]When re-analysing the second structural model this time using either only rumination or intrusion (instead of the averaged score), we found evidence for a similar pattern of findings.

DOI: 10.1002/per



Note. Standardized coefficients appearing before and after the slash refer to, respectively, the need-satisfying and need-frustrating memories. Only one coefficient is reported for the paths relating to rumination, as this construct was only assessed in the need-frustrating memories.

†$p < .10$. *$p < .05$. **$p < .01$.

Figure 2. Second structural model depicting the relation between personal characteristics, indicators of (poor) integration and memory-related affect in need-satisfying and need-frustrating memories.

rumination over NFM. The relations between the indicators of integration and affect were similar to these relations as observed in the first model.

Next, we allowed in a stepwise fashion direct paths from self-congruence and depressive symptoms to positive and negative affect. None of these direct paths were significant, indicating that self-congruence and depressive symptoms were related to affect only indirectly, through the integration variables. Bootstrapping procedures indicated that, as for self-congruence, the most robust indirect associations were found via acceptance: self-congruence was related indirectly to both positive and negative affect via acceptance, a finding observed in both the NSM (95% CI [.064, .195] for positive affect; 95% CI [−.204, −.068] for negative affect) and NFM (95% CI [.011, .094] for positive affect; 95% CI [−.083, −.006] for negative affect). Additionally, self-congruence also related indirectly to positive affect via connection in the NFM (95% CI [.010, .104]). As for depressive symptoms, only the indirect effects for the NFM were significant and were carried by both acceptance and rumination. Specifically, depressive symptoms were related indirectly to negative affect through rumination (95% CI [.008, .099]) and to positive affect through acceptance (95% CI [−.089, −.001]) and rumination (95% CI [−.090, −.008]).

Similar to the first model, we performed a multigroup analysis to examine whether the associations in this second model would be similar for late adolescents and late adults. For the NSM, this was indeed the case as the constrained model fitted the data equally well as the unconstrained model ($\Delta\chi^2$ (14) = 12.62, $p > .05$ and ΔCFI = .00). For the NFM, the fit of the unconstrained model was significantly better than the fit of the constrained model ($\Delta\chi^2$ (20) = 36.47, $p < .05$ and ΔCFI = .03), but was similar to the fit of a partially constrained model ($\Delta\chi^2$ (17) = 21.98, $p > .05$ and ΔCFI = .01). More specifically, in this latter model, the negative relation between rumination and positive affect was stronger among the elderly individuals ($\beta = -.29$, $p < .01$) than among the late adolescents ($\beta = -.18$, $p < .05$).[5]

Hypothesis 3: The role of self-congruence in the relation between age group and integration

To shed further light on the possible intervening role of self-congruence, we examined whether any age-related differences in integration could be accounted for by self-congruence. First, a series of MANCOVAs (controlling for gender, emotional intensity and centrality) indicated that elderly individuals, when compared with late adolescents, scored higher on self-congruence and reported more connection, greater acceptance, more positive affect and less negative affect with respect to NFM (Table 3). There were no significant mean-level differences between the two age groups with respect to depressive symptoms, integration of the NSM and affect related to the NSM. In a next step, we examined the intervening role of self-congruence in the relation between subsample and integration. As the elderly only displayed greater integration of NFM and as no difference between both subsamples was found with respect to rumination, we limited ourselves to a structural model involving NFM only and including both indicators of high-quality integration (i.e. connection and acceptance). Specifically, we inserted self-congruence as an intervening variable in the relation between subsample and integration. Additionally, direct paths from subsample to both integration indicators were allowed. Because this model was fully saturated, it had a perfect fit. As illustrated in Figure 3, subsample related positively to self-congruence, with self-congruence, in turn, relating to more connection with and acceptance of NFM. Both indirect relations were significant (connection: 95% CI

[5]As connection correlated significantly with acceptance ($r = -.18$, $p > .05$) and rumination ($r = .46$, $p < .01$) among the late adolescents, but not in the elderly individuals (respectively, $r = .12$ and $r = .02$, both $p > .05$), these paths were also unconstrained.

DOI: 10.1002/per

Table 3. Comparison between the late adolescents and elderly individuals with respect to the study variables

	Late adolescents	Elderly individuals	
	M (*SD*)	*M* (*SD*)	*F*-value
Personal characteristics			
Self-congruence	3.73 (.55)	3.97 (.57)	13.40**
Depressive symptoms	.64 (.58)	.57 (.59)	1.93
Indicators of (poor) integration			
Connection with person – NSM	3.93 (.84)	3.97 (.87)	.81
Connection with person – NFM	2.95 (.92)	3.44 (.92)	17.81**
Acceptance of event – NSM	4.27 (.59)	4.34 (.71)	.03
Acceptance of event – NFM	3.66 (1.00)	3.92 (.83)	6.94*
Rumination over event – NFM	2.58 (1.13)	2.63 (1.01)	3.23
Memory-related affect			
Positive affect – NSM	5.59 (1.29)	5.51 (1.33)	.91
Positive affect – NFM	2.30 (1.08)	3.05 (1.61)	21.45**
Negative affect – NSM	1.97 (1.10)	2.06 (1.31)	.31
Negative affect – NFM	4.57 (1.33)	3.92 (1.52)	21.56**

NSM, need-satisfying memory; NFM, need-frustrating memory.
*$p < .05$;
**$p < .01$.

[.004, .076]; acceptance: 95% CI [.006, .075]). In addition to these indirect effects, subsample also related directly to both connection and acceptance. Thus, elderly individuals displayed better integration, which was partly explained by higher levels of self-congruence.[6]

DISCUSSION

Several organismic theories in the domains of developmental psychology (Erikson, 1950), clinical psychology (Rogers, 1963), personality psychology (Ryan, 1995) and cognitive psychology (Ehlers & Clark, 2000) highlight the importance of integration, a process involving the acknowledgement of past negative events and the capacity to synthesize these events with positive events into a coherent whole. In spite of its importance, this complex process of integration has only recently begun to receive increasing empirical attention (Weinstein et al., 2011). The general aims of the present study was to study different indicators of both successful and poor integration of need-related positive and negative memories and to examine how these indicators relate to individuals' current positive and negative affect about these memories. Moreover, in addition to investigating the role of a potentially integration-impeding factor (i.e. depressive symptoms), we investigated the role of a personal characteristic hypothesized to foster this process (i.e. self-congruence). Finally, because previous studies (e.g. Singer et al., 2007) have found that elderly people are better capable of integrating (especially negative) memories, we examined whether self-congruence could be part of the mechanism explaining this age-related effect.

[6]We performed multigroup analyses based on the type of need (i.e. autonomy, competence and relatedness) addressed in the memory for both Models 2 and 3. These results showed that, in general, the relations in the models were similar across the three need-related memories.

Further insights in the process of integration

A contemporary and empirically driven framework that assigns a pivotal role to the process of integration is SDT (Deci & Ryan, 2000). Integration is assigned an important role in individuals' psychological functioning as this process enables them to achieve a greater sense of unity, thereby allowing individuals to function in a more volitional way (Weinstein et al., 2013). Indeed, to experience a full sense of volition and psychological freedom in one's current functioning, one needs to acknowledge and accept both positive and negative past events. Non-synthesized events may come with internal conflict, which may surface through (unwanted) rumination about the event. Previous studies have indicated that the integration of past events, as indicated by higher acceptance, is related to well-being (Weinstein et al., 2011) and that poor integration of previous events, as indicated by repetitive ruminative thinking, is related to ill-being (Michael et al., 2005). In this study, we aimed to shed a more comprehensive view on the process of integration, by focusing simultaneously on indicators of high-quality integration and poor integration.

Consistent with our hypotheses, we found that both acceptance of the event and experiencing a sense of connection with the person one was at the time of the event were related positively to current positive affect and negatively to current negative affect. These findings were obtained for both the NSM (i.e. positive) and the NFM (i.e. negative) and emerged even after controlling for the emotional salience and the centrality of the recalled event. In contrast, ruminating over NFM was related to less positive and more negative affect.

Although all three indicators related uniquely to both positive and negative memory-related affect, we found that, across both types of memories, acceptance of the event was the most robust predictor (although rumination was equally important in the NFM). Possibly, acceptance may be the most direct indicator of the process of integration, as it indicates that one has currently given the event a meaningful place within one's personally held values, ideals and self-views. That is, acceptance indicates that one takes responsibility for what happened, thereby achieving a greater sense of authorship over the event (see also Erikson, 1950).

Although we focused on the unique contribution of these different indicators of integration, it is likely that in reality they do not function in isolation but are interdependent. For example, acceptance of and rumination over need-frustrating events may reciprocally relate to one another, an issue that could be examined in a longitudinal design. Continuous dwelling over a negative event may preclude its acceptance, whereas a fuller acceptance may lead one to ruminate less about this event. Interestingly, although feeling connected

DOI: 10.1002/per

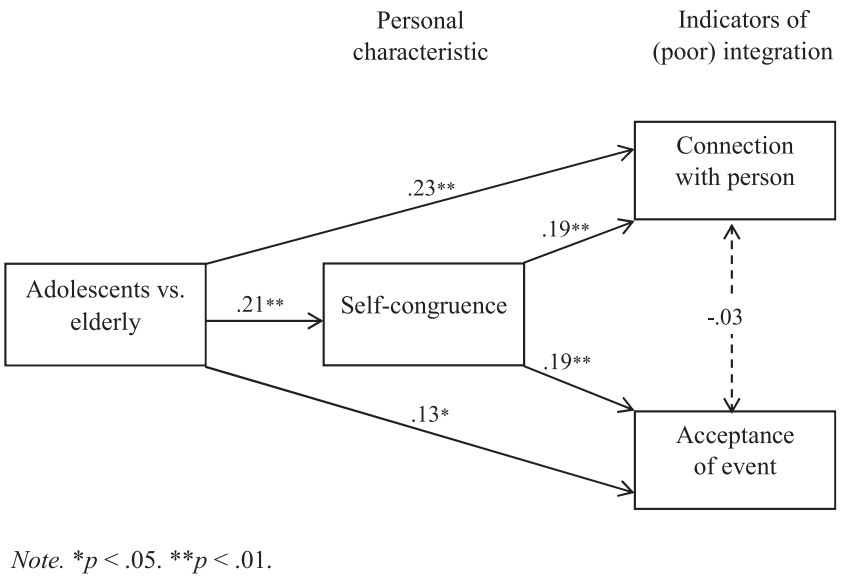


Figure 3. Third structural model depicting the relation between subsample, self-congruence and indicators of integration in need-frustrating memories.

with a negative memory related to more positive affect, it also related to more rumination (although only among late adolescents). The latter relation may make sense because ruminating over a past event requires thinking back about one's emotions and thoughts at that time, which might come with feelings of connection with one's self in that past event. Future studies could further look into the relations between these different indicators of integration.

These findings have therapeutic implications, as integration of (past) events plays a central role in different treatments. For example, in life review therapy, a central goal is to emotionally process events from one's past (Karel & Hinrichsen, 2000), which has indeed been found to increase well-being (e.g. more life satisfaction; Serrano, Latorre, Gatz, & Montanes, 2004). It is less clear to date what the precise mechanisms underlying this positive effect are and whether it is possible to differentiate between adaptive and maladaptive styles of reminiscence (Karel & Hinrichsen, 2000). Based on the results of this study, treatments involving reminiscence could focus on increasing a style characterized by acceptance and connection, while simultaneously reducing ruminative thoughts. The present findings also fit within acceptance and mindfulness-based interventions, such as acceptance and commitment therapy (Hayes, Strosahl, & Wilson, 1999). Within acceptance and commitment therapy, 'patients are encouraged to embrace unwanted thoughts and feelings – such as anxiety, pain, and guilt – as an alternative to experiential avoidance' and '… to end the struggle with unwanted thoughts and feelings without attempting to change or eliminate them' (Hofmann & Asmundson, 2008, p. 5).

The role of depressive symptomatology and self-congruence in the integrative process

A second goal was to identify personal characteristics that either impede or foster the integrative process. First, we examined the role of depressive symptoms because research has shown that depression is related to rumination and intrusions of negative memories (e.g. Moulds & Krans, 2015) as well as to decreased identification with positive memories (e.g. Lemogne et al., 2006). The present study focused on both types of memories (i.e. negative and positive) and on different aspects of integration (i.e. poor and high-quality integration). Consistent with our hypotheses, we found that depressive symptoms were related to difficulties to integrate NFM and, to a lesser extent, NSM. Specifically, whereas individuals scoring higher on depressive symptoms were less accepting of and ruminated more over NFM, they reported feeling somewhat less connected with NSM.

As previous studies mostly focused on personal characteristics that *impede* the integrative process, we focused on a possible protective factor as well, that is, self-congruence. Self-congruence refers to the extent to which individuals regulate their behaviour on the basis of personally held ideals, values and interests (Weinstein et al., 2012; Yu et al., 2015). Much like individuals high in self-congruence take responsibility for their current behaviour, it seems that they also take greater responsibility over past events. Indeed, the current study indicated that self-congruence relates to greater integration of both NSM and NFM. More precisely, individuals high in self-congruence experience a greater sense of connection with the person they were during the event and also have accepted the event itself to a greater degree.

Combining the findings concerning depressive symptoms and self-congruence, there seems to be some evidence for a dual-route model, with one route representing the dark side of the integrative process and with the other route representing the bright side (Vansteenkiste & Ryan, 2013). Whereas depressive symptoms relate to memory-related affect partly through poor integration (i.e. rumination), self-congruence relates to memory-related affect only via high-quality integration (i.e. connection and acceptance). Future research is needed to confirm the distinction between these adaptive and maladaptive paths.

DOI: 10.1002/per

Integration among late adolescents and elderly individuals

Although previous research has indicated that older individuals display a better integration of memories, and especially of negative ones, compared with younger individuals (e.g. Torges et al., 2008), the mechanism behind this age difference is less clear. Based on SDT's (Deci & Ryan, 2000) and Erikson's (1950) tenet that integrative functioning increases with age and previous studies showing a higher level of autonomous functioning among older individuals (Sheldon et al., 2005), we proposed that higher levels of self-congruence might enable older individuals to better integrate past events.

First, our findings showed that elderly, when compared with late adolescents, were indeed better capable of integrating past need-frustrating (but not need-satisfying) events. Said differently, the scar of the need-frustrating event was less deep for them, in spite of the fact that they had elicited a more emotionally intense and more central event. Second, we found that these effects were partially accounted for by self-congruence. Because elderly individuals experience their current behaviour to be more congruent with their core values and interests, they seem to gain greater authorship over their past: that is, they reported more feelings of acceptance of and connection to negative past events. However, there remained a direct association between subsample and connection and acceptance, indicating that other mechanisms also may play a role, which could be examined in future studies. One candidate mechanism is older people's selective attention to the benefits of past negative events and to the lessons that can be retrieved from these events (e.g. Mather & Carstensen, 2005).

Limitations and directions for future research

As our study had a cross-sectional design, no causal inferences can be made. This is important because studies have shown that depressive symptoms do not only predict indicators of integration (e.g. rumination), but that these indicators also predict depressive symptoms (Hamlat et al., 2015). Future experimental or longitudinal studies could further shed light on the temporal ordering of, on the one hand, the two personal characteristics examined in this study (i.e. depressive symptoms and self-congruence) and, on the other hand, the indicators of the integration of need-related memories. Additionally, the memory-specific affect ratings by participants could be partially coloured by individuals' global affect. To generate a purer measure of memory-specific affect, future studies could also include a pre-measure of general affect, thereby treating general affect as a covariate in the analyses. Further, we only focused on relatively young individuals (on average 18 years) and elderly individuals (on average 76 years), thereby excluding a large age group in between these groups, that is, midlife adults. Stewart and Vandewater (1999) argued that conducting a life review at middle age is common and may lead individuals to make minor or even major changes in their life. Even among children, meaning-making of stressful events is apparent (Mossige, Jensen, Gulbrandsen, Reichelt, & Tjersland, 2005). Future studies could, therefore, include additional age groups to get more insight into the life-span development of the integration of need-related memories. Additionally, because participants in the current study provided only a brief account of the memories, it would be interesting for future research to gather (besides questionnaire data) fuller accounts of these memories to enable qualitative coding of integration indicators. Finally, to gain a deeper and more comprehensive understanding of high-quality and poor integration, future studies could include additional integration indicators, such as avoidance (Carvalho, Dinis, Pinto-Gouveia, & Estanqueiro, 2015) and positive interpretation (Lilgendahl & McAdams, 2011).

CONCLUSION

The present study suggests that integration of past events may play a role in individuals' current functioning and well-being (Deci & Ryan, 2000; Weinstein et al., 2013). The current findings show that self-congruence relates positively to this capacity for integration, while depressive symptoms show a negative relation. This integrative capacity was more present among late adults, which seems at least partially driven by older people's increasing display of self-congruence.

ACKNOWLEDGEMENTS

The authors wish to thank Jolien Annaert for her assistance in the data collection and Dorthe Berntsen for her comments on the manuscript.

REFERENCES

Bauer, J. J., McAdams, D. P., & Pals, J. L. (2008). Narrative identity and eudaimonic well-being. *Journal of Happiness Studies*, *9*, 81–104. doi:10.1007/s10902-006-9021-6.

Beck, A. T., Rush, A. J., Shaw, B., & Emery, G. (1979). *Cognitive therapy of depression*. New York: Guilford.

Berntsen, D., & Rubin, D. C. (2006). Centrality of event scale: A measure of integrating a trauma into one's identity and its relation to post-traumatic stress disorder symptoms. *Behaviour Research and Therapy*, *44*, 219–231. doi:10.1016/j.brat.2005.01.009.

Brewin, C. R. (1998). Intrusive autobiographical memories in depression and posttraumatic stress disorder. *Applied Cognitive Psychology*, *12*, 359–370.

Brewin, C. R., Reynolds, M., & Tata, P. (1999). Autobiographical memory processes and the course of depression. *Journal of Abnormal Psychology*, *108*, 511–517. doi:10.1037/0021-843X.108.3.511.

Brom, D., & Kleber, R. J. (1985). De Schok Verwerkings Lijst. *Nederlands Tijdschrift voor de Psychologie*, *40*, 164–168.

Carstensen, L. L., Fung, H. H., & Charles, S. T. (2003). Socioemotional selectivity theory and the regulation of emotion in the second half of life. *Motivation and Emotion*, *27*, 103–123. doi:10.1023/A:1024569803230.

Carvalho, S., Dinis, A., Pinto-Gouveia, J., & Estanqueiro, C. (2015). Memories of shame experiences with others and depression symptoms: The mediating role of experiential avoidance.

DOI: 10.1002/per

Clinical Psychology & Psychotherapy, *22*, 32–44. doi:10.1002/cpp.1862.

Chen, B., Vansteenkiste, M., Beyers, W., Boone, L., Deci, E. D., Van der Kaap- Deeder, J., … Verstuyf, J. (2015). Basic psychological need satisfaction, need frustration, and need strength across four cultures. *Motivation and Emotion*, *39*, 216–236. doi:10.1007/s11031-014-9450-1.

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, *9*, 233–255.

Deci, E. L., & Ryan, R. M. (2000). The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*, 227–268. doi:10.1207/S15327965PLI1104_01.

Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, *38*, 319–345. doi:10.1016/S0005-7967(99)00123-0.

Erikson, E. H. (1950). *Childhood and society*. New York: Norton.

Evers, A. W. M., Kraaimaat, F. W., van Lankveld, W., Jongen, P. H. J., Jacobs, W. W. G., & Bijlsma, J. W. J. (2001). Beyond unfavorable thinking: Illness cognition questionnaire for chronic diseases. *Journal of Consulting and Clinical Psychology*, *69*(6), 1026–1036. doi:10.1037/0022-006X.69.6.1026.

Garnefski, N., Kraaij, V., & Spinhoven, P. (2001). Negative life events, cognitive emotion regulation, and emotional problems. *Personality and Individual Differences*, *30*, 1311–1327. doi:10.1016/S0191-8869(00)00113-6.

Hamlat, E. J., Connolly, S. L., Hamilton, J. L., Stange, J. P., Abramson, L. Y., & Alloy, L. B. (2015). Rumination and overgeneral autobiographical memory in adolescents: An integration of cognitive vulnerabilities to depression. *Journal of Youth and Adolescence*, *44*, 806–818. doi:10.1007/s10964-014-0090-2.

Hayes, S. C., Strosahl, K., & Wilson, K. G. (1999). *Acceptance and commitment therapy*: *An experiential approach to behavior change*. New York: Guilford Press.

Hofmann, S. G., & Asmundson, G. J. G. (2008). Acceptance and mindfulness-based therapy: New wave or old hat? *Clinical Psychology Review*, *28*, 1–16. doi:10.1016/j.cpr.2007.09.003.

Horowitz, M. J., Wilner, N., & Alvarez, W. (1979). The impact of event scale: A measure of subjective stress. *Psychosomatic Medicine*, *41*, 209–218.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*, 1–55.

Janssen, S. M. J., Hearne, T. L., & Takarangi, M. K. T. (2015). The relation between self-reported PTSD and depression symptoms and the psychological distance of positive and negative events. *Journal of Behavior Therapy and Experimental Psychiatry*, *48*, 177–184. doi:10.1016/j.jbtep.2015.04.002.

Karel, M. J., & Hinrichsen, G. (2000). Treatment of depression in late life: Psychotherapeutic interventions. *Clinical Psychology Review*, *20*, 707–729. doi:10.1016/S0272-7358(99)00065-3.

Kasser, T., & Ryan, R. M. (1996). Further examining the American dream: Differential correlates of intrinsic and extrinsic goals. *Personality and Social Psychology Bulletin*, *22*, 280–287. doi:10.1177/0146167296223006.

Kline, R. B. (2005). *Principles and practice of structural equation modeling*. New York: The Guilford Press.

Lemogne, C., Piolino, P., Friszer, S., Claret, A., Girault, N., Jouvent, R., et al. (2006). Episodic autobiographical memory in depression: Specificity, autonoetic consciousness, and self-perspective. *Consciousness and Cognition*, *15*, 258–268. doi:10.1016/j.concog.2005.07.005.

Lilgendahl, J. P., & McAdams, D. P. (2011). Constructing stories of self-growth: How individual differences in patterns of autobiographical reasoning relate to well-being in midlife. *Journal of Personality*, *79*, 391–428. doi:10.1111/j.1467-6494.2010.00688.x.

Luyckx, K., Schwartz, S. J., Berzonsky, M. D., Soenens, B., Vansteenkiste, M., Smits, I., & Goossens, L. (2008). Capturing ruminative exploration: Extending the four-dimensional model of identity formation in late adolescence. *Journal of Research in Personality*, *42*, 58–82. doi:10.1016/j.jrp.2007.04.004.

Mather, M., & Carstensen, L. L. (2005). Aging and motivated cognition: The positivity effect in attention and memory. *Trends in Cognitive Sciences*, *9*, 496–502. doi:10.1016/j.tics.2005.08.005.

McLaughlin, K. A., Borkovec, T. D., & Sibrava, N. J. (2007). The effects of worry and rumination on affect states and cognitive activity. *Behavior Therapy*, *38*, 23–38. doi:10.1016/j.beth.2006.03.003.

McLean, K. C., & Lilgendahl, J. P. (2008). Why recall our highs and lows: Relations between memory functions, age, and well-being. *Memory*, *16*, 751–762. doi:10.1080/09658210802215385.

Michael, T., Ehlers, A., Halligan, S. L., & Clark, D. M. (2005). Unwanted memories of assault: What intrusion characteristics are associated with PTSD? *Behaviour Research and Therapy*, *43*, 613–628. doi:10.1016/j.brat.2004.04.006.

Mills, C., & D'Mello, S. (2014). On the validity of the autobiographical emotional memory task for emotion induction. *Plos One*, *9*e95837. doi:10.1371/journal.pone.0095837.

Milyavskaya, M., Philippe, F. L., & Koestner, R. (2013). Psychological need satisfaction across levels of experience: Their organization and contribution to general well-being. *Journal of Research in Personality*, *47*, 41–51.

Mossige, S., Jensen, T. K., Gulbrandsen, W., Reichelt, S., & Tjersland, O. A. (2005). Children's narratives of sexual abuse: What characterizes them and how do they contribute to meaning-making? *Narrative Inquiry*, *15*, 377–404. doi:10.1075/ni.15.2.09mos.

Moulds, M. L., & Krans, J. (2015). Intrusive, involuntary memories in depression. In L. A. Watson & D. Berntsen (Eds.), *Clinical perspectives on autobiographical memory* (pp. 154-171). Cambridge: University Press.

Muthén, L. K., & Muthén, B. O. (1998-2012). *Mplus user's guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.

Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science*, *3*, 400–424. doi:10.1111/j.1745-6924.2008.00088.x.

Philippe, F. L., Bouizegarene, N., Guilbault, V., Rajotte, G., & Houle, I. (2015). The chicken or the egg? Systematic investigation of the effect of order of administration of memory questionnaires and well-being scales. *Memory*, *23*, 1056–1069. doi:10.1080/09658211.2014.953547.

Philippe, F. L., Koestner, R., Beaulieu-Pelletier, G., Lecours, S., & Lekes, N. (2012). The role of episodic memories in current and future well-being. *Personality and Social Psychology Bulletin*, *38*, 505–519. doi:10.1177/0146167211429805.

Philippe, F. L., Koestner, R., Lecours, S., Beaulieu-Pelletier, G., & Bois, K. (2011). The role of autobiographical memory networks in the experience of negative emotions: How our remembered past elicits our current feelings. *Emotion*, *11*, 1279–1290. doi:10.1037/a0025848.

Philippe, F. L., Koestner, R., & Lekes, N. (2013). On the directive function of episodic memories in people's lives: A look at romantic relationships. *Journal of Personality and Social Psychology*, *104*, 164–179. doi:10.1037/a0030384.

Pillemer, D. B. (1992). Remembering personal circumstances: A functional analysis. In E. Winograd & U. Neisser (Eds.), *Affect and accuracy in recall*: *Studies of* "*flashbulb*" *memories* (pp. 236-264). New York: Cambridge University Press.

Pillemer, D. B., & Kuwabara, K. J. (2012). Directive functions of autobiographical memory: Theory and method. In D. Berntsen & D. C. Rubin (Eds.), *Understanding autobiographical memory*: *Theories and approaches* (pp. 181-201). New York: Cambridge University Press.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple

DOI: 10.1002/per

mediator models. *Behavior Research Methods*, *40*, 879–891. doi:10.3758/BRM.40.3.879.

Radloff, L. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, *1*, 385–401. doi:10.1177/014662167700100306.

Rogers, C. R. (1963). The actualizing tendency in relation to "motives" and to consciousness. In M. R. Jones (Ed.), *Nebraska symposium on motivation* (Vol. *11*, pp. 1–24). Lincoln: University of Nebraska Press.

Ryan, R. M. (1995). Psychological needs and the facilitation of integrative processes. *Journal of Personality*, *63*, 397–427.

Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods*, *7*, 147–177. doi:10.1037//1082-989X.7.2.147.

Serrano, J. P., Latorre, J. M., Gatz, M., & Montanes, J. (2004). Life review therapy using autobiographical retrieval practice for older adults with depressive symptomatology. *Psychology and Aging*, *19*, 272–277. doi:10.1037/0882-7974.19.2.272.

Sheldon, K. A., & Kasser, T. (2001). Getting older, getting better? Personal strivings and psychological maturity across the life span. *Developmental Psychology*, *37*, 491–501. doi:10.1037//0012-1649.37.4.491.

Sheldon, K. M., Kasser, T., Houser-Marko, L., Jones, T., & Turban, D. (2005). Doing one's duty: Chronological age, felt autonomy, and subjective well-being. *European Journal of Personality*, *19*, 97–115. doi:10.1002/per.535.

Singer, J., Rexhaj, B., & Baddeley, J. (2007). Older, wiser, and happier? Comparing older adults' and college students' self-defining memories. *Memory*, *15*, 886–898. doi:10.1080/09658210701754351.

Smets, J., Wessel, I., Schreurs, E., & Raes, F. (2012). The interplay between rumination and intrusions in the prediction of concurrent and prospective depressive symptoms in two nonclinical samples. *Psychological Record*, *62*, 777–787.

Spielberger, C. D., Ritterband, L. M., Reheiser, E. C., & Brunner, T. M. (2003). The nature and measument of depression. *International Journal of Clinical and Health Psychology*, *3*, 209–234.

Stewart, A. J., & Vandewater, E. A. (1999). "If I had it to do over again …": Midlife review, midcourse corrections, and women's well-being in midlife. *Journal of Personality and Social Psychology*, *76*, 270–283. doi:10.1037/0022-3514.76.2.270.

Talarico, J. M., LaBar, K. S., & Rubin, D. C. (2004). Emotional intensity predicts autobiographical memory experience. *Memory & Cognition*, *32*, 1118–1132. doi:10.3758/BF03196886.

Torges, C. M., Stewart, A. J., & Nolen-Hoeksema, S. (2008). Regret resolution, aging, and adapting to loss. *Psychology and Aging*, *23*, 169–180. doi:10.1037/0882-7974.23.1.169.

Trapnell, P. D., & Campbell, J. D. (1999). Private self-consciousness and the five-factor model of personality: Distinguishing rumination from reflection. *Journal of Personality and Social Psychology*, *76*, 284–304.

Ullman, J. B. (2001). Structural equation modeling. In B. G. Tabachnick & L. S. Fidell (2001). *Using multivariate statistics* (4th ed.) (pp. 653-771). Needham Heights, MA: Allyn & Bacon.

Van Hiel, A., & Vansteenkiste, M. (2009). Ambitions fulfilled? The effects of intrinsic and extrinsic goal attainment on older adults' ego-integrity and death attitudes. *International Journal of Aging and Human Development*, *68*, 27–51. doi:10.2190/ag.68.1.b.

Vansteenkiste, M., Niemiec, C., & Soenens, B. (2010). The development of the five mini-theories of self-determination theory: An historical overview, emerging trends, and future directions. In T. Urdan & S. Karabenick (Eds.), *Advanced in motivation and achievement*, vol. *16*: The decade ahead (pp. 105-166). UK: Emerald Publishing.

Vansteenkiste, M., & Ryan, R. M. (2013). On psychological growth and vulnerability: Basic psychological need satisfaction and need frustration as a unifying principle. *Journal of Psychotherapy Integration*, *23*, 263–280. doi:10.1037/a0032359.

Watkins, P. C., Grimm, D. L., Whitney, A., & Brown, A. (2005). Unintentional memory bias in depression. In A. V. Clark (Ed.), *Mood state and health* (pp. 59-86). Nova Science Publishers, Inc.

Watkins, E., & Teasdale, J. D. (2001). Rumination and overgeneral memory in depression: Effects of self-focus and analytic thinking. *Journal of Abnormal Psychology*, *110*, 353–357. doi:10.1037//0021-843X.110.2.353.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Psychology*, *54*, 1063–1070. doi:10.1037/0022-3514.54.6.1063.

Weinstein, N., Deci, E. L., & Ryan, R. M. (2011). Motivational determinants of integrating positive and negative past identities. *Journal of Personality and Social Psychology*, *100*, 527–544. doi:10.1037/a0022150.

Weinstein, N., Przybylski, A. K., & Ryan, R. M. (2012). The index of autonomous functioning: Development of a scale of human autonomy. *Journal of Research in Personality*, *46*, 397–413. doi:10.1016/j.jrp.2012.03.007.

Weinstein, N., Przybylski, A. K., & Ryan, R. M. (2013). The integrative process: New research and future directions. *Current Directions in Psychological Science*, *22*, 69–74. doi:10.1177/0963721412468001.

Werner-Seidler, A., & Moulds, M. L. (2012). Characteristics of self-defining memory in depression vulnerability. *Memory*, *20*, 935–948. doi:10.1080/09658211.2012.712702.

Yu, S., Assor, A., & Liu, X. P. (2015). Perception of parents as demonstrating the inherent merit of their values: Relations with self-congruence and subjective well-being. *International Journal of Psychology*, *50*, 70–74. doi:10.1002/ijop.12074.

DOI: 10.1002/per