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Exploring the differences in autobiographical memories between younger, middle aged and older people and how depressive symptoms are related to these memories

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Abstract

Background: Autobiographical memories are important for each individual because they enable human functioning. For this reason, autobiographical memories have to be studied in their totality across the whole life span, while taking into account their content, valence, specificity and integrative meaning as well as their relationship with depressive symptoms.

Objectives: The purpose of this study was to systematically examine the differences in younger, middle aged and older people regarding the content, valence, specificity and integrative meaning of their autobiographical memories as well as the memories' relationship with the experience of depressive symptoms.

Method: The data were used from 2302 Dutch participants from the general public who were aged between 16 and 91 (M= 56; SD= 16.8) and who participated in the LISS panel. The participants had to fill in the Self-Defining Memory Task (SDMT; Blagov & Singer, 2004). The peoples' autobiographical memories were coded for the content, valence, specificity and integrative meaning. Furthermore, the participants were asked to fill in the depression items of the Hospital Anxiety and Depression Scale (HADS; Spinhoven et al., 1997).

Data-analyses: In order to answer the research question, seven hypotheses were formulated which were tested by means of descriptive statistics, chi-square, ANOVA, Post-hoc and Pearson correlational analysis.

Results: 1. The results showed that older people focus more on social relations but younger people do not focus more on career issues. 2. Older people have less positive autobiographical memories than younger people. 3. There is no statistically significant difference between the younger and the elderly when it comes to the specificity of their memories. 4. Older people evaluate life periods more positively, whereas younger peoples' memories have a more positive meaning for life. 5. People who experience more depressive symptoms, have more negative memories. 6. Depressive symptoms are not related to the specificity of peoples' autobiographical memories and 7. The more depressive symptoms people experience, the less their autobiographical memories contain integrative meaning.

Conclusions: This study showed that the topic of autobiographical memories and its' relation to age and depressive symptoms is important and needs more attention in todays' society, especially in order 1) to prevent or decrease the experience of depressive symptoms and 2) to tailor even more future interventions and studies to the needs of the participants. Furthermore,

an intervention should be developed that is solely based on peoples' autobiographical memories. (Depressed) People should learn to positively re-construct their past, leading to less depressive symptoms, more happiness and satisfaction. Finally, an intervention tailored to the needs and age of the user should be developed preventing the development of depressive symptoms by focussing on autobiographical memories.

Keywords: autobiographical memories, content, valence, specificity, integrative meaning, age differences, depression, depressive symptoms

1. Introduction

Numerous studies have been performed in the field of autobiographical memories. However, this study is one of the first which concentrates on all aspects -content, valence, specificity and integrative meaning- of autobiographical memories to gain a clearer picture of the memories which people have developed during their lives and how they have contributed to that kind of person the individual is nowadays. Second, to ensure the representativeness of all age groups instead of only focussing on young and old people -as did previous studies-, this again is one of the first projects which includes the differences in younger, middle aged as well as older people regarding their memories. Studying age differences in all age categories plays an important role in order to investigate the influence of ageing on how people remember their past. Third, depressive symptoms will be taken into account in order to examine their relationship with autobiographical memories. While already existing literature studied autobiographical memories only in relationship to a diagnosed depressive disorder, the current paper examines the relationship between autobiographical memories and the experience of depressive symptoms, regardless of whether these symptoms indicate a diagnosed disorder or not. This is especially essential in order to see if the experience of depressive symptoms has such a great influence on peoples' memories that these affect their sense of self.

In order to be able to explore autobiographical memories in relationship to age differences and the experience of depressive symptoms, the first part of this paper will explain, based on previously published literature, important constructs to ensure that the reader understands what exactly was investigated. Furthermore, studies focussing on the relationship between autobiographical memories and age differences on the one hand and autobiographical memories and depressive symptoms on the other hand, will be discussed. Finally, the goal of this study will be explained which ends up with formulating the research question and hypotheses which will be tested.

Autobiographical memories are "central to human functioning [because they] contribute to an individuals' sense of self" (Williams et al., 2007, p. 122). Because of this, more attention is paid to the topic of autobiographical memories, life stories and their different components. A life story, based on autobiographical memories, is defined as "psychological construction co-authored by the person himself or herself and the cultural context within which that persons' life is embedded and given meaning" (McAdams, 2001, p. 101). Furthermore, McAdams (2001) stated that life stories are the most important

components of the individuality of every single person. They help to find coherence, meaning and a sense of unity and purpose in life by constructing narratives of the self which are internalized and evolving. Generally, life stories are broader narratives of an individuals' life.

In relation to life stories, an autobiographical memory is the „uniquely human form of memory that moves beyond recall of experienced events to integrate perspective, interpretation and evaluation across [the] self, others and time to create personal history [and therefore an individual life story]. […] Autobiographical memory is memory of the self interacting with others in the service of both short-term and long-term goals that define our being and purpose in the world" (Fivush, 2011, p. 560). In other words, autobiographical memories are building blocks for the life stories. Recent research has studied how, how much and with which accuracy people remember their past (Bluck, Alea, Habermas & Rubin, 2005). To be able to do this, the autobiographical knowledge base is assumed to be represented by two representation types, namely the episodic and the semantic memories (Conway, 2005). Reiser, Black and Abelson (1985) stated that autobiographical events are organized in the memory by different knowledge structures that guide the comprehension and planning during an experience.

Conway (2005), as already mentioned, found out that the autobiographical knowledge base consists of two memory systems, namely the episodic memory and the semantic memory. The episodic memory can be seen as "a memory system that retains highly detailed sensory perceptual knowledge of recent experience over retention intervals measured in minutes and hours. […] It has to be integrated with the autobiographical memory knowledge base and so takes as its' context or referent the immediate past of the experiencing self or the 'I'" (Conway, 2001, p. 1375). In contrast, the semantic memory focusses on keeping knowledge over longer lasting storage intervals, such as weeks, months, years and even decades. Therefore, semantic memories refer to the whole life span of an individual. "It represents the experienced self or the 'me', is always accessed by its' content and when accessed, does not necessarily gives rise to the re-collective experience" (Conway, 2001, p. 1375). Furthermore, Conway (2001) described the autobiographical memory as a pattern of activation which is temporary as well as stable.

Autobiographical memories -which are composed of episodic and semantic memories- also play an important role in the identity development of each individual. Identity development has the major task to integrate different aspects of the self either over different domains or over a longer period of time. Thus, when people engage in identity development, they create life stories in order to construct a sense of self and personal continuity by

balancing their past with their present life. Identity development therefore is the process where 1) personal continuity results in psychological well-being, 2) a lack of personal continuity increases the risk of developing depression and in the worst case also suicide and 3) integration means to incorporate experiences into ones identity. This can be done in two different ways. First, people can integrate their experiences by experiencing a change which leads to a revision of ones' identity. Second, they experience stability in their lives which leads to the confirmation of the individuals' pre-existing identity (McLean, 2008).

The autobiographical memory of each individual can be represented by four different characteristics: content, valence, specificity and integrative meaning (Blagov & Singer, 2004). Based on research by Blagov and Singer (2004) and Singer, Baddeley and Rexhaj (2007), the four characteristics will be explained in the following:

The first is content which refers more to the episodic memory. The content of self-defining memories refers to the "themes that run through the memories. These themes […] are thought to reflect their current concerns [unresolved conflicts (Blagov & Singer, 2004)] and goals" (Singer et al., 2007, p. 889). More specifically, the content only refers to the content of the memory, it has nothing to do with evaluation or learning. By studying the content of a memory, also a comparison between individuals or groups of individuals becomes possible.

The second aspect of autobiographical memories is the valence of the memories. The valence describes the rating of "how memory makes people feel at the time of recall" (Blagov & Singer, 2004, p.488) and therefore the question: is the valence of the memory more positively or negatively loaded? It is important to mention that there is a distinction between 1) if the memory itself is positive or negative and 2) the emotions which the memory still causes yet (Blagov & Singer, 2004). In this paper, valence focusses on the memory itself and therefore the question if the memory itself is positive or negative.

The third is the construct of specificity which refers to both the episodic as well as the semantic memory. This construct shows that memories can be specific which means that they are "rich in unique details and traceable to one precise moment in time" (Singer et al., 2007, p. 887) or memories which represent a series of happenings over a longer time period. This time period can refer to several days, weeks or even months. "They also can represent similar events separated in time into a single recollection" (Singer et al., 2007, p. 887). The former are known as specific memories whereas the latter are called general memories. Research regarding the specificity of autobiographical memories has shown that they are organized across three levels of detail: 1) the lifetime period which refers to general phases or stages of life time, 2) the general events which consist of days, weeks or months and where themes are

more narrowly presented and 3) the event specific knowledge where one can exactly and specifically imagine one certain moment (Blagov & Singer, 2004). Blagov and Singer (2004) also stated that most people, when recalling a certain memory, move from general to specific memories to cover all above mentioned levels of specificity. By taking semantic and episodic memories into account, it becomes clear that the autobiographical memory is representative for general memories whereas the episodic memory represents specific memories. This is supported by Conway (2005) who stated that the autobiographical memory has a better access to the general information of events. In other words, general events represent an optimal level of knowledge because they reveal a lot of information and are easier accessible.

The last and fourth aspect is integrative meaning which represents the connection between episodic and semantic memories. Integrative meaning focuses on how a certain memory is described. It is important to pay attention to two aspects: 1) does the person assign some meaning to the memory and 2) is this memory positively or negatively evaluated. "Meaning making allows individuals to integrate their memories and emotions into recognised and acceptable cultural patterns and prescriptions that help to consolidate and guide individual identity" (Singer et al., 2007, p. 888). Another detailed explanation regarding what exactly is meant with integrative meaning was given by Blagov and Singer (2004). They mention that people mostly convert memories into stories that they internally tell themselves or others. Whether or not these memories are also related to a moral or lesson which is learned is a separately working cognitive process. Following this, integrative memories are "narratives in which individuals take the additional step of ascribing meaning to their memories by relating them to lessons about the self, important relationships, or life in general" (Blagov & Singer, 2004, p. 486). When it comes to integrative meaning making, people mostly engage in autobiographical reasoning. They take distance from their memories and then try to give them some sort of meaning so that they can link them to their selves. Autobiographical reasoning therefore is "the ability to link the self to experiences" (Pasupathi & Mansour, 2006, p. 798).

After having received information over autobiographical memories in general and how they work, literature also has focussed on the differences between younger and older people in relation to their autobiographical memories. Concentrating on the content of autobiographical memories, research found out that only a non-significant difference exists between college students and older people when it comes to the focus on social relations in their memories (Singer et al., 2007). As there are currently no convincing studies measuring the differences between younger and older people and the content of their memories, the present study

assumes on the one hand that older and middle aged people focus more on social relations and on the other hand that younger people focus more on career issues.

The former because research revealed that social relations play an increasingly important role with increasing age because they contribute to mental health and well-being as well as to successful ageing. Furthermore, social relations help the elderly with the preparation, coping and recovering from upcoming changes (Antonucci, 2001). This was supported by McAuley et al. (2000) who stated that especially with increasing age, social relations are related to an increasing life satisfaction and subjective well-being. The latter because research has shown that career issues become increasingly important in adolescence, when young people think about their values, interests and abilities in order to find a career which is compatible with their sense of self (Patton & Creed, 2007). This was underlined by Gottfredson (2002) who found out that younger people pay much attention to career issues in order to finalise their inner self by changing from fantasy aspirations to real ones with the purpose of gaining a sense of control over their future life. Furthermore, Gottfredson (2002) stated that career awareness at an early age is important.

Regarding the characteristic of valence and its' difference between younger and older people, Carstensen et al. (2000) detected a steady decrease in the negativity of peoples' autobiographical memories between 18 and 60 years. In the present study, this age range is covered by means of the younger (<30) and the middle (30-60) age group. Carstensen et al. (2000) also stated that people who are aged over 60 years -which represents the older age group (>60) in the present study- show an upward trend of negative memories which indicates that their memories are less positive. This was supported by Charles, Reynolds and Gatz (2001) who found a steady decline of positive affect in people who were aged over 60 years.

Referring to the specificity of autobiographical memories across the life span, research by Singer et al. (2007) revealed that the autobiographical memories of the older people are less specific than those of the college students. This was supported by Luo and Craik (2009) who detected that specific information is less accessible to the older people and that older people in comparison to younger people have more difficulties recalling specific information.

Focussing on the characteristic of integrative meaning, Singer et al. (2007) found that college students' memories mostly do not contain integrative meaning whereas older people have more integrative and evaluating tendencies in their memories. In contrast, McLean (2008) revealed that older and younger people both engage in integrative meaning making and that they showed no significant differences regarding the frequencies of self-event connections. However, the older group was represented by more thematic coherence, personal

consistency and stories which represent stability. This because with increasing age, a story about the self which is characterized by consistence and coherence becomes increasingly important. Thus, older people engage in integrative meaning making by evaluating events positively -in order to stay personally consistent- instead of still searching for a meaning that an experience might have for their lives. In comparison, the younger population engages in integrative meaning making by stories which represent change. One reason for changing stories is that younger people are still uncertain about who they might become in the future. In order to find ones' self, younger people do more than evaluating their past. They integrate it for the purpose of gaining some kind of meaning from it (McLean, 2008).

Singer et al. (2007, p. 886) finally summarized the difference between younger and older individuals by mentioning that autobiographical memories of older adults (50+) are "more positive in emotional tone, more summarised and less detailed and more likely to contain integrative meaning than are those of college students". Singer et al. (2007) also gave an explanation for these findings. Regarding the positivity of older peoples' memories, they stated that older people often are affected by the positivity bias which helps them to better regulate their emotions. However, lower Neuroticism and higher Agreeableness levels have also been found in the older population. Focussing on the specificity, older people are characterized by a more bilateral activation of the hippocampus which impairs the capacity to recall specific memories (Maguire & Frith, 2003). Finally, older peoples' memories contain more integrative meaning because younger people do not possess the same ability to take distance from their memories in order to integrate meaning (Singer et al., 2007).

Autobiographical memories cannot only be studied in relationship to age but also in relationship to depression. Fava and Kendler (2000, p. 335) defined depression as "a transient mood state experience by virtually all individuals at some time in their life as well as a bio-behavioural syndrome, usually called major depressive disorder (MDD). MDD is a medical condition that includes abnormalities of affect and mood, neuro-vegetative functions (such as appetite and sleep disturbances), cognitions (such as inappropriate guilt and worthlessness) and psychomotor-activity (such as agitation and retardation)". But how are depressive symptoms related to the recall of memories?

Only few studies focussing on depressive symptoms and the content of peoples' memories are available. Hence, further insights in the content of autobiographical memories will be given in this project in order to fill this knowledge gap.

Regarding the valence of autobiographical memories, literature has shown that depressive symptoms affect how positively or negatively a memory is loaded for the

individual. Depressive people are often characterized by the retrieval of negative autobiographical memories (Blagov & Singer, 2004). Further studies showed that depressive people tend to respond faster to negative cues to retrieve personal memories than to positive ones (Williams & Scott, 1988). In addition, depressive people generally retrieve more negative autobiographical memories whereas non-depressive people retrieve more positive ones (Clark & Teasdale, 1982). Furthermore, depressed people can recall positive memories slower than non-depressive individuals (Lloyd & Lishman, 1975).

Regarding the specificity of autobiographical memories in depressed individuals, research found that depressed individuals often have difficulties to remember positive memories of specific events. Furthermore, working memory deficits lead to a lack of specificity in memories, whereas over-general memories also reflect a working deficit which is very often influenced by depression (Blagov & Singer, 2004). These findings can be supported by Williams et al. (2007) who found out that over general memories represent a consistent pattern which can be found in people with a diagnosed depression.

When it comes to the integrative meaning of autobiographical memories in relationship with depressive symptoms, Blagov and Singer (2004) revealed that depressed people have more difficulties to take a step back and think about the meaning of their actions and memories. In other words, the more depressed an individual is, the more difficult integrative meaning making becomes.

Currently, literature exists regarding the different characteristics which the autobiographical memory is composed of and how these differ between young and old people. However, regarding the content of memories there is only little literature available, especially in relation to age differences and depressive symptoms. Additionally, while previous literature focussed on some instead of all aspects of autobiographical memories, this project is one of the first which concentrates on the content, valence, specificity and integrative meaning of peoples' memories as well as their relation with age differences and depressive symptoms.

When it comes to the examination of age differences, previous studies concentrated on especially college students instead of focusing on age differences between younger, middle aged and older people. When groups of people were compared, mostly college students are compared to people older than 60 years while neglecting the middle aged people who should also be taken into account. Furthermore, most of these studies made use of convenience sampling methods which results in selective samples. Those studies therefore are not representative enough to be able to draw conclusions for the entire population, including younger, middle aged as well as older people. To overcome this gap, this population study

randomly includes the whole age group ranging from younger (<30) to middle (30-60) to older (>60) people which ends up in representative results and which makes this study unique.

Finally, the relationship between autobiographical memories and depressive symptoms is underexplored. Those studies which focussed on the relationship between memories and depression either included only restricted samples or only people with a diagnosed depressive disorder. This project however concentrates on people who experience depressive symptoms regardless of whether these symptoms represent a depressive disorder or symptoms of being depressed without being diagnosed.

To sum up, while previous research explored individual puzzle pieces, the current study integrates all pieces and takes autobiographical memories as well as their relationship with age differences and depressive symptoms into account. With this knowledge, it also becomes possible to do something in practice such as preventing the experience of depressive symptoms in different age categories. Thus, this paper is aimed at systematically studying the differences in autobiographical memories between younger, middle aged and older populations, as well as their relationship with depressive symptoms. In other words, this paper is aimed at answering the research question:
Which are the differences in autobiographical memories between younger, middle aged and older populations and how are depressive symptoms related to peoples' autobiographical memories? Thereby, based on previous literature, the following seven hypotheses will be studied:

1. *Older and middle aged peoples' autobiographical memories focus more on social relations whereas those of the younger people focus more on free time or career events.*
2. *Older people have less positive autobiographical memories than the younger and middle aged people.*
3. *Younger peoples' autobiographical memories are more specific than those of the elderly.*
4. *Whereas older people evaluate event or life periods more positively, younger and middle aged peoples' autobiographical memories have a more positive meaning for life than those of the elderly.*
5. *People who experience more depressive symptoms, have more negative autobiographical memories.*
6. *People who experience more depressive symptoms, have less specific autobiographical memories.*
7. *People who experience more depressive symptoms, have less integrative meaning in their autobiographical memories.*

2. Methods

2.1 Design and Procedure

This study worked with the LISS panel. All participants received access to the same LISS panel which consists of approximately 5000 households with together more than 9000 individuals. Regarding the panel, online questionnaires were filled in every month which took approximately 15 to 30 minutes. For each completed questionnaire, members received payment. The household data and information were regularly updated by one household member ("About the Panel | LISS Panel Data," n.d.). Randomly one person was selected within 2000 of the 5000 households. This number has been chosen to find enough people with elevated depressive and/or anxiety symptoms. Depression has a one-year prevalence of 6.7 % (De Graaf, ten Have & van Dorsselaer, 2010). In general, the study applied a longitudinal internet survey design with a period of data collection that was distributed over one year and three time points. The first measurement point was in May 2012, the second in December 2012 in order to address causal effects and the third in May 2013. However, because of the fact that only the first measurement point in May 2012 -which was at the same time with the core module on personality and which included all relevant psychological variables- was used in the current study, this project had a cross-sectional design.

2.2 Participants

This study made use of a-selective sampling by means of the LISS-Panel. A-selective means that every person who participated in the LISS-Panel randomly had the same chance of being included in the final sample. The current research was targeted at people in the age range between 16 and 91 years. One inclusion criteria for participating was that every participant had to reproduce three memories. The module from the LISS-Panel over autobiographical memory and mental health was submitted to a weighted sample from the total sample. However, it is important to mention that many participants, approximately half of them, were older than 60 years. This overrepresentation of older people allowed especially for comparisons within the oldest age group. Also comparisons between and within the three age groups became possible. Before starting the participation, the participant had to provide informed consent.

The data were used from an internet survey in a non-clinical and Dutch sample and were based on a cross sectional survey design. This study recruited in total 11614 participants.

Before start analysing the data, all respondents who did not recall three memories or did not answer the relevant questions from the autobiographical memories and mental health module were filtered out and excluded from the data set. After having cleared the data, the remaining number of participants was N= 2302. In this sample, the respondents were aged between 16 and 91, with a mean age of *M* = 56 years (*SD* = 16.8). Furthermore, 1079 participants were male (46.9%) and 1223 were female (53.1%). The employment status was distributed as followed: 34.9% were employed, 34.7% were pensioner and 4.1% attended school or university. The remaining sample were housekeeper, self-employer, too young to have an occupation, working or assisting in family business, unemployed, disabled to work or job-seeking.

2.3 Materials

For the current study, a module regarding autobiographical memories and mental health was used in order to be able to explore the relationship between autobiographical memories and age differences as well as their relationship with depressive symptoms. This module consisted of different questionnaires such as the *Self-Defining Memory Task (SDMT)* and the *Hospital Anxiety and Depression Scale (HADS)*.

2.3.1 Self-Defining Memory Task (SDMT)

The Self-Defining Memory Task (SDMT) developed by Jefferson Singer (Blagov & Singer, 2004) consists of two open questions. The first open question asks the participant to *characterize a certain memory in a few words*. In other words, the participant was asked to give the memory a title. The second question is *Imagine that you want to describe the memory to someone else in order to explain what kind of person you really are. Please describe the memory in as much detail as possible and explain why this memory is related to the kind of person you are now*. With the second open question, the participant therefore was asked to write down, as detailed as possible, three self-defining memories which are at least one year old and through which it becomes clear, what kind of person the participant is now. The only criteria which has to be fulfilled is that the memory leads to strong feelings and that the memory is still important for the respondent. In this study, the SDMT was in Dutch because of the Dutch nationality of the respondents. The original SDMT has been used in many studies around the world with good psychometric properties. Research by Westerhof et al. (in preparation) found out that it was more attractive for participants being asked to give autobiographical information instead of only answering closed questions.

The three memories given by the participants were manually coded. For all aspects of autobiographical memories, individual coding schemes exist which subdivided content, valence, specificity and integrative meaning into a number of codes (Westerhof et al., in preparation). A more detailed description of the different codes can be seen in Table 1.

Table 1. *Coding scheme for the content, valence, specificity and integrative meaning of autobiographical memories.*

Content	**Valence**	**Specificity**	**Integrative Meaning**
1 social relations	1 positive event or period	1 specific memory	1 description
2 school, education, study, work	2 neutral event or period	2 generic memory	2 positive evaluation of the event or period
3 free time activities	3 negative event or period		3 negative evaluation of the event or period
4 health			4 positive meaning for the self or own life
5 material and historical circumstances			5 negative meaning for the self or own life
6 certain life period			
7 something else			
9 inapplicable	9 inapplicable	9 inapplicable	9 inapplicable

The intercoderreliability -based on 50 memories and coded by two independent, trained coders- for the content was $\kappa = .86$, for the valence $\kappa = .85$, for the specificity $\kappa = .89$ and for the integrative meaning $\kappa = .92$. All four internal consistency coefficients represented a strong reliability.

In total 2302 people participated in the study from whom all described three memories. Therefore, in total 6906 memories were used for further analysis. In order to be able to analyse the frequencies of the coded memories (see Table 2, 4, 6 and 7), first the youngest age group was filtered out. With only the younger people in the dataset, frequencies of the first, the second and the third memory were separately computed for each code of the content, valence, specificity and integrative meaning of the peoples' memories. Thereafter, the percentages from all three memories and for each code were manually summed up and divided by three in order to calculate the mean percentages of the different codes of the content, valence, specificity and integrative meaning. The same was done for the middle aged and older people.

Furthermore, for each of the four aspects of autobiographical memories code 9

represented that a memory was inapplicable. This meant that a memory which was given by the participant, did not fit into the coding structure. Although the percentages with which memories were coded as inapplicable were represented between brackets in the frequency tables, in SPSS code 9 was handled as a missing value which lead to the exclusion of these memories for further analysis.

2.3.2 Hospital Anxiety and Depression Scale (HADS)

Because the study was conducted with Dutch participants, the Dutch version of the Hospital Anxiety and Depression Scale (HADS) was used in this study (Spinhoven et al., 1997). The HADS measures the severity of the anxiety and depressive symptoms a person experiences. These are the two most prevalent mental illnesses in the Netherlands. The scale consists of 14 items which have to be answered on a 4-point response scale with higher scores indicating more symptoms. The respondent was asked to answer the questions regarding how often the person has experienced a certain feeling during the last week. Because of the purpose of this study which focussed on the experience of depressive symptoms, only the items regarding depression were used for further analyses. Therefore, the used scale consisted of seven items measuring depression. One example item for the severity of depression is *I still enjoy the things I used to enjoy* (item 2) and *I feel as if I am slowed down* (item 8). The scores of the depression scale were calculated by computing the total score over the seven depression items.

Bjelland et al. (2002) found out that the HADS is a good screening instrument for assessing the severity of anxiety and depression in the general population. Regarding its' reliability, the internal consistency coefficient for the depression scale lied in the range between $\propto = .82 - .90$. This indicated a good reliability. It is important to mention that although the scale was used in various languages and various countries all over the world, the findings were stable which indicates the "robustness of the scale as screening instrument" (Mykletun, Stordal & Dahl, 2001). In this paper the reliability for the depression scale was $\propto = .77$ which supports a good internal consistency.

2.3.3 Demographic questions

The demographic questions at the beginning of the survey referred, among other aspects, to the age, gender, employment status and the domestic situation of the participants.

2.4 Data analysis

In order to be able to answer the above mentioned research question which is composed of seven hypotheses, statistical analyses were conducted with a programme called *SPSS.* After having cleaned the data, the 2302 remaining participants were divided into three age groups: 1) people younger than 30 years (younger age group), 2) people in the age group between 30 and 60 (middle age group) and 3) participants older than 60 (older age group). Another step before start analysing was to review the scales' internal consistency. Finally, the total score of the depression scale was calculated in order to be sure that Pearson correlational analyses can be run.

After everything was prepared to carry out the analyses in order to test the hypotheses and answer the above mentioned research question, the main statistical analyses were executed. First, descriptive statistics were computed to get a picture of the content, valence, specificity and integrative meaning of the memories of all three age groups. Thereafter, a chi-square analysis was executed in order to test the differences between the three age groups regarding the content of their autobiographical memories (hypothesis 1). This was done by means of an online calculation tool (Preacher, 2001). Furthermore, an analyses of variance (ANOVA) was executed with the three different age groups as independent variable (IV) and the valence and specificity as dependent variables (DV). ANOVA analyses were used to test if there are any statistically significant differences between the means of the younger, the middle and the older age group regarding the valence and specificity of their autobiographical memories (hypotheses 2 and 3). After having run the ANOVA, in case there is a significant difference between the groups, the Bonferroni Post-hoc test will give more detailed information over the location of this difference. In order to test the differences between the three age groups regarding the integrative meaning of their autobiographical memories (hypothesis 4), again a chi-square analysis was executed. Finally, Pearson correlational analyses with the total score of the depression items and the total scores of the valence, specificity and re-coded integrative meaning were executed to test if there are any relationships between those constructs. In detail, hypotheses 5, 6 and 7 were tested by means of Pearson correlational analyses. For each analysis, a level of significance of $\propto = 5\%$ was used.

3. Results

3.1 Descriptive statistics, Chi-Square, ANOVA and Post-hoc analysis

For all four aspects of autobiographical memories, coding schemes exist which subdivide content, valence, specificity and integrative meaning into a number of codes (see Table 1). Their descriptive statistics help to find out which codes are the most prevalent in the three different age groups. By means of the Chi-Square, ANOVA and Post-hoc analysis, the differences between the groups as well as the locations of these differences were tested.

3.1.1 Content of autobiographical memories and age differences

Table 2. *Valid frequencies of the memories' content in the younger (N= 80), the middle (N= 1025) and the older age group (N= 706); total percentages (N= 2302) between brackets.*

Age	**Content (%)**							
	1 social relations	**2 school, education study, work**	**3 free time activity**	**4 health**	**5 material and historical circum-stances**	**6 certain life period**	**7 some-thing else**	**9 In-appli-cable**
<30	34.6 (23.2)	12.7 (8.8)	35.6 (24.1)	7.1 (4.9)	4.9 (3.9)	2.7 (3.4)	2.4 (5.3)	(26.4)
30-60	46.1 (35.7)	15.5 (12.2)	19.5 (15.1)	6.7 (5.2)	6.6 (5.1)	3.8 (2.9)	1.8 (4.3)	(19.5)
>60	43.5 (34.5)	13.2 (10.8)	20.5 (16.7)	8.0 (6.5)	11.0 (9.1)	3.1 (10.4)	0.7 (1.8)	(10.2)

Note: X^2 (12, N = 1811) = 29.13, $p < .001$

Hypothesis 1 *older and middle age group peoples' autobiographical memories focus more on social relations whereas those of the younger age group focus more on free time or career events* was tested by means of Chi-square analysis. The results of the chi-square analyses revealed that there is indeed a statistically significant difference between the younger, the middle and the older people regarding the content of their autobiographical memories (X^2 (12)= 29.13, p= <.001). To be able to draw conclusions regarding the location of the difference, Table 2 has to be included.

Table 2 shows that the middle and the older age group focus more on social relations compared to the younger age group. Therefore, the first part of hypothesis 1 can be accepted. However, Table 2 also revealed that, compared to the other two groups, younger people focus, as expected, more on free time activities, but against the expectation less on career issues. Because of this, the second part of hypothesis 1 has to be rejected. Due to the fact that not both hypothetical parts are statistically supported, hypothesis 1 has to be partially rejected.

Furthermore, although it goes beyond testing hypothesis 1, it is interesting to notice that, in comparison with the younger and the middle age group, the content of material and historical circumstances is assigned in the older age group twice as much to the participants' autobiographical memories.

3.1.2 Valence of autobiographical memories and age differences

Table 3. *Descriptive statistics [mean, (standard deviation)] and ANOVA with the three age groups as IV and the memories' valence as DV.*

	Young age group (<30)	**Middle age group (30-60)**	**Old age group (>60)**	**Degrees of freedom (df)**	**F**	**Sig.**
Valence	*1.87 (.57)*	*2.00 (.60)*	*2.09 (.62)*	2, 1926	8.625	< .001

Table 4. *Valid frequencies of the memories' valence in the younger (N= 80), the middle (N= 1025) and the older age group (N= 706); total percentages (N= 2302) between brackets.*

Age	**Valence (%)**			
	1 positive event or period	**2 neutral event or period**	**3 negative event or period**	**9 inapplicable**
<30	44.9 (31.3)	23.7 (16.5)	31.4 (22.0)	(30.2)
30-60	42.4 (32.9)	16.8 (13.0)	40.8 (31.7)	(22.4)
>60	37.0 (30.0)	18.9 (15.6)	44.1 (36.0)	(18.4)

Hypothesis 2 *the older age group people have less positive autobiographical memories than the younger and middle age group people* was tested by means of ANOVA and post-hoc analysis. In Table 3, the results of the ANOVA analysis can be seen. The findings revealed that there is a statically significant difference between the younger, the middle and the older people (F (2,1926) = 8.63, p= < .001) regarding the valence of their autobiographical memories.

The frequencies regarding the memories' valence which can be seen in Table 4 revealed that approximately for 75% of the younger age groups sample, the memories were coded as being positively or negatively loaded rather than neutral. More specifically, for most of the younger age group participants, the memory was associated with a positive event or period. The same is true for the middle age group. Here, more than 80% of the whole group associated their memories with a positive event or period or with a negative event or period but less with a neutral event. Finally, the greatest percentage of the older age group associated their memories, as well as the other two age groups, with a negative event or period or with a

positive one. Compared to the younger and the middle age group however, whereas associating a memory with a positive event or period occurs in the older age group the rarest, associating a memory with a negative event or period occurs the most often. This difference is even stronger when concentrating on the younger and the older age group. It seems as if with higher age, people associate their memories more often with a negative event or period.

The results of the post-hoc analysis gave statistical support for the above made assumptions. The post-hoc analysis revealed that there is a statistically significant difference between the younger (<30) and the older age group (>60) ($p < .05$) as well as the middle (30-60) and the older age group ($p < .05$) regarding the valence of their autobiographical memories (-.22, 95%-CI [-.39, -.05]; -.09, 95%-CI [-.17, -.03]). However, between the younger and the middle age group, there is no statistically significant difference ($p > .05$) in how positively or negatively the participants' memories were coded (-.12, 95%-CI [-.29, .04]). The negative difference between the younger and the older age group as well as the middle and the older age group, supports the expectation that older people have more negative autobiographical memories than the younger and middle age group people. Therefore, hypothesis 2 has to be accepted.

3.1.3 Specificity of autobiographical memories and age differences

Table 5. *Descriptive statistics [mean, (standard deviation)] and ANOVA with the three age groups as IV and the memories' specificity as DV.*

	Young age group (<30)	**Middle age group (30-60)**	**Old age group (>60)**	**Degrees of freedom (df)**	**F**	**Sig.**
Specificity	*1.67 (.32)*	*1.66 (.34)*	*1.71 (.33)*	2, 1926	5.297	< .001

Table 6. *Valid frequencies of the memories' specificity in the younger (N= 80), the middle (N= 1025) and the older age group (N= 706); total percentages (N= 2302) between brackets.*

Age	**Specificity (%)**		
	1 specific memory	**2 generic memory**	**9 inapplicable**
<30	32.9 (22.9)	67.1 (47.0)	(30.1)
30-60	31.8 (26.2)	68.2 (51.3)	(22.5)
>60	28.7 (23.4)	71.3 (58.2)	(18.4)

Hypothesis 3 *the younger age group peoples' autobiographical memories are more specific than those of the elderly* was also tested by means of ANOVA and post-hoc analysis. As can be seen in Table 5, the results of the ANOVA analysis revealed that the specificity of

the participants' autobiographical memories is significantly different between younger, middle and older people (F (2,1926) = 5.30, p= < .001).

The calculated frequencies in Table 6 show that for the younger, the middle as well as the older age group, most of the participants' autobiographical memories were coded as being generic in nature instead of specific. It is interesting to notice that whereas the percentage in specific memories does not differ enormously between the three age groups, the memories seem to become increasingly generic with raising age.

However, this assumption was not supported by the results of the post-hoc analysis. These results show that there is no statistically significant difference between the younger and the middle age group (p > .05) as well as between the younger and the older age group (p > .05) regarding the specificity of their autobiographical memories (.02, 95%-CI [-.07, .11]; -.03, 95%-CI [-.12, .06]). Because of the fact, that there is no significant difference between the younger and the elderly, hypothesis 3 has to be rejected. However, there is a statistically significant difference between the middle and the older age group (p < .05) in their specificity (-.05, 95%-CI [-.09, -.01]). The negative difference reveals that the middle age group people are more specific in their autobiographical memories than the older age group people.

3.1.4 Integrative meaning of autobiographical memories and age differences

Table 7. *Valid frequencies of the memories' integrative meaning in the younger (N= 80), the middle (N= 1025) and the older age group (N= 706); total percentages (N= 2302) between brackets.*

Age	**Integrative meaning (%)**					
	1 description	**2 positive evaluation of the event or period**	**3 negative evaluation of the event or period**	**4 positive meaning for the self or own life**	**5 negative meaning for the self or own life**	**9 inapplicable**
<30	19.8 (13.9)	25.4 (17.7)	17.6 (12.2)	29.5 (20.6)	7.7 (5.5)	(30.1)
30-60	28.0 (21.7)	29.4 (22.7)	16.2 (12.5)	17.5 (13.7)	8.9 (7.0)	(22.4)
>60	35.1 (28.7)	32.0 (25.9)	17.7 (14.5)	8.4 (6.8)	6.8 (5.7)	(18.4)

Note: X^2 (8, N = 1811) = 52.43, p < .001

Finally, hypothesis 4 *whereas older age group people evaluate event or life periods more positively, younger and middle age group peoples' autobiographical memories have a more positive meaning for life than those of the elderly* was tested by means of chi-square analysis. The results of the chi-square analysis revealed that there is a statistically significant

difference between the younger, middle and older people regarding the integrative meaning of their autobiographical memories (X^2 (8)= 52.43, p= <.001). To be able to draw precise conclusions regarding the location of this difference, Table 7 has to be included.

The frequencies which can be seen in Table 7 show that within the younger age group, the greatest percentage has been distributed over the memory being associated with a positive evaluation or the memory having a positive meaning for the participants. In the middle age group, approximately a quarter was coded as a description of the memory and another as positive evaluation of the event or period. Finally, the results of the older age group are comparable with those of the middle age group. Most often the memory was a description or a positive evaluation of the event or period. When it comes to answering hypothesis 4, it can be concluded that whereas evaluating an event or period positively occurs more frequently with increasing age, assigning a positive meaning for the self or the own life decreases enormously with increasing age. Because of this, hypothesis 4 has to be accepted.

3.2 Pearson correlational analysis

Table 8. *Pearson correlation coefficients for depression and the valence, specificity and integrative meaning of autobiographical memories.*

	N	*M* *(SD)*	1. r	2. r	3. r	4. r
1. Valence	1682	*6.03* *(1.75)*	1			
2. Specificity	1682	*5.03* *(.99)*	.029	1		
3. Integrative meaning	1682	*10.73* *(2.76)*	-.213**	.013	1	
4. Depression	2043	*5.16* *(3.75)*	.179**	.013	-.069**	1

Note: *p < .05, **p < .001

Hypotheses 5, 6 and 7 were tested by means of Pearson correlational analysis. Regarding hypothesis 5 *people who experience more depressive symptoms, have more negative autobiographical memories,* Table 8 shows that there is a significant positive correlation between depression and the valence -how positively or negatively a memory is experienced by the person- of autobiographical memories (r= .18, p= <.001). In other words, people who experience more depressive symptoms, have more negative autobiographical memories. Therefore, hypothesis 5 has to be accepted.

Focussing on hypothesis 6 *people who experience more depressive symptoms, have less specific autobiographical memories,* the results indicate that no significant correlation

exists between depression and the specificity of autobiographical memories -how specifically people remember their past- (r= .01, p= >.05). Therefore, hypothesis 6 has to be rejected.

Regarding hypothesis 7 which states that *people who experience more depressive symptoms, have less integrative meaning in their autobiographical memories,* Table 8 shows that depressive symptoms are significantly and negatively correlated with the integrative meaning people assign to their memories (r= -.07, p= <.001). In other words, the more depressive symptoms are experienced, the less integrative meaning making takes place. Therefore, hypothesis 7 has to be accepted. In sum, the results of the Pearson correlational analysis revealed that the memories of people who experience more depressive symptoms, are more negative, not less specific and they contain less integrative meaning.

4. Discussion

4.1 Conclusion

The goal of this paper was to systematically study the differences in the content, valence, specificity and integrative meaning of autobiographical memories between younger, middle aged and older populations. Furthermore, the relationship between depressive symptoms and peoples' autobiographical memories was studied to examine how depressive symptoms affect remembering the past. This project concentrated on testing seven hypotheses. Some of these hypotheses were accepted and some not. More specifically, this study supported the expectation that 1) older people have less positive autobiographical memories than younger people, 2) older people evaluate life memories more positively, whereas younger peoples' autobiographical memories have a more positive meaning for life, 3) people who experience more depressive symptoms, have more negative memories and 4) people who experience more depressive symptoms assign less integrative meaning to their autobiographical memories.

As with supported expectations, this research also revealed findings which contradicted the expectations. 1) Although it is true that older peoples' autobiographical memories focus more on social relations than those of the younger population, and although younger people concentrate more on free time than the older population, it is not true that younger people also focus more on career issues. Younger people concentrate, compared to middle and older people, the least on career topics. 2) No significant difference exists between the younger and the elderly regarding the specificity of their autobiographical memories. However, the results indicated that the middle aged people are more specific in their memories than the older aged people. 3) This study found out that depressive symptoms are not related to the specificity of peoples' autobiographical memories.

4.2 Interpretation of results

In the following paragraph, the findings of the current study will be discussed and interpreted. Hypothesis 1 *Older and middle aged peoples' autobiographical memories focus more on social relations whereas those of the younger aged people focus more on free time or career events* was only partly supported by the current study. Regarding the first part of the hypothesis, Antonucci (2001) and McAuley et al. (2000) discovered that social relations become increasingly important with increasing age. This underlines the current findings.

However, there is also literature which is not in accordance with the present results. For example, Thorne et al. (2004) found out that younger peoples' memories focus the most often on social relationship issues. This was supported by Blagov and Singer (2004) who revealed that themes around recreation, romance and family were the most present in the memories of students. The second part of the hypothesis -younger people focus more on career issues- was not supported by the current study. This can be supported by de Vries et al. (1995) who revealed that the older peoples' memories focus more often on career issues than those of the younger population. One explanation for those findings could be that older people did not only concentrate on their current life state and their relationships with other people. Rather they were asked to write -as well as younger and middle aged people- over meaningful and important topics which they have collected during their whole life span and which had a great influence. Those memories also included career and health issues (Singer et al., 2007).

The second hypothesis *Older people have less positive autobiographical memories than the younger and middle aged people* referred to the valence of peoples' autobiographical memories and was supported by the current findings. Other research has already shown that from the age of 60, the amount of negative memories increases slightly (Carstensen et al., 2000). Furthermore, individual physiological and environmental factors exist which can explain the decline of positivity with increasing age. One of these factors is that older adults often have the feeling of losing control over what happens in their lives and their environment (Charles et al., 2001). In contrast, research also has shown that older people in general recall only a few negative memories and that these memories were loaded positively or neutral rather than negative (Schlagman, Schulz & Kvavilashvili, 2006). One possible explanation is that older peoples' memories often are affected by the so called positivity effect. Older people who are affected by this bias selectively remember more positive memories, reconstruct memories by making them more positive, and "attribute remembered choice features to options in ways that should satisfy emotional goals" (Martha & Carstensen, 2005). Because of these different findings, future research is necessary which further explores the valence of autobiographical memories in relationship to age differences.

When it comes to the specificity of autobiographical memories, hypothesis 3 *Younger peoples' autobiographical memories are more specific than those of the elderly* and hypothesis 6 *people who experience more depressive symptoms, have less specific autobiographical memories* were tested. The third hypothesis was not supported by the current findings but by previous literature. Literature often revealed that older people have more difficulties to remember details and are therefore less specific in their autobiographical

memories than the younger population. More specifically, the more specific autobiographical knowledge becomes -ranging from the more general semantic to the more specific episodic aspects- the more difficulties older people will experience (Piolino et al., 2010). This was underlined by Levine et al. (2002) who found out that younger people have less difficulties when working with the episodic memory than the older population.

Hypothesis 6 was also not supported by the current findings but again by previously published literature. In other words, this study did not support the assumption that depressed people are less specific in their memories. However, several studies have already shown that depression leads to over-generality in memory recall and that self-rated depressed mood can be associated with less specificity in autobiographical memories (van Vreeswijk & de Wilde, 2004). This was supported by Blagov and Singer (2004) who found out that the working memory deficit by which depressed people often are affected is associated with less specificity in peoples' memories.

One possible explanation for why this project contradicts the previous findings could be that previous studies used the autobiographical memory test which asks the participant specific questions until a specific memory is recalled. This study however used the Self-Defining Memory Test (SDMT) which does not ask the participant until a specific memory is recalled. Instead, it only asks to describe a certain memory. Therefore, it is random and spontaneous if people recall a generic or a specific memory. Furthermore, when it comes to studying age differences, this study included all age groups, ranging from younger to middle aged to older people instead of focussing on only college students and a few older people. Finally, by using the SDMT, also the non-depressed people could have recalled generic memories because they did not care about the memories' specificity, whereas depressed people possibly have recalled generic memories because they were not able to specify them.

Hypothesis 4 concentrated on integrative meaning making. The assumption *Whereas older people evaluate event or life periods more positively, younger and middle aged peoples' autobiographical memories have a more positive meaning for life* was accepted. The first part was supported by research which stated that it is especially important for older people to evaluate and review life periods, certain events and their whole life positively in order to appreciate the lived life, rather than over-thinking what life could have been (Pasupathi & Mansour, 2006). Regarding the second part, literature revealed that already in childhood people have developed a sense of themselves (Marsh, Parada & Ayotte, 2004) which makes it possible to integrate meaning. In addition, Habermas and Paha (2001) discovered that adolescents recall memories in ways that represent the influence of a certain period, event or

experience on their own person, characteristics and identity. This supports the finding that adolescents not only evaluate life periods -as older people do- but that they integrate some meaning from those events and life periods for themselves and their lives.

Hypothesis 5 *people who experience more depressive symptoms, have more negative autobiographical memories* was accepted and is in accordance with already published literature which revealed that depressed people are characterized by an increased use of negative instead of positive autobiographical memories (Blagov & Singer, 2004). This was supported by Clark and Teasdale (1982) who found out that people who experience more depressive symptoms, generally focus more on negative autobiographical memories whereas the opposite is true for non-depressed people.

Finally, hypothesis 7 *People who experience more depressive symptoms, have less integrative meaning in their autobiographical memories* was accepted. This finding is underlined by Tavernier and Willoughby (2011) who found out that non-depressed people make use of their ability to develop some kind of positive moral or lesson even though they were confronted with negative life experiences. In other words, non-depressed people are more able to engage in integrative meaning making. In addition, to integrate meaning, especially in the case of negative life periods or events, allows for a "restored sense of identity" and "for the possibility of restoring a sense of coherence and meaning in life" (Tavernier & Willoughby, 2011, p. 2). This is more difficult for depressed people which supports the current findings.

To conclude, this broad representative sample enabled discovering new insights. On the one hand, these insights contradict with previous literature when it comes to the content and specificity of autobiographical memories. On the other hand the current results support already existing findings regarding the valence and integrative meaning of peoples' memories.

4.3 Integration of Results

After having interpreted the results separately, it is also interesting to pay attention to how the results of the content, valence, specificity and integrative meaning of autobiographical memories as well as the experience of depressive symptoms are integrated. First, it is supposed that the content and valence of peoples' memories function independently from the memories' specificity. Second, it can be assumed that the content and valence of peoples' memories were related in such a manner that focussing amongst other things on social relations, career issues, health or historical circumstances corresponds to more positive

or more negative memories. Third, although the correlation between the two aspects is non-significant in the present study, it seems as if the specificity and integrative meaning could be integrated as well. The current findings revealed that most of the memories were generic in nature and that most of the participants memories' were coded as a positive evaluation of an event or the memory having a positive meaning for the self or own life. This suggests that generic memories might be linked to integrative meaning making in the sense of evaluation and lessons learned. Finally, it can be assumed that the experience of depressive symptoms functions interactively with the valence and integrative meaning of peoples' memories. This because people who experience more depressive symptoms, have more negative memories and their memories contain less integrative meaning.

4.4 Strengths and Weaknesses

Although this study revealed several statistically significant results, it also faces some methodological limitations, which will be explained in the following. First, the present research only used one instead of all three measurement points. Thus, this study did not make use of the longitudinal character and instead focussed on a cross-sectional design. This aspect could especially represent a weakness when it comes to the examined relationship between the components of autobiographical memories and depressive symptoms. Because of the fact that this study only made use of one measurement point and therefore did not focus on the one year period, the causal location of the examined relationships cannot be demonstrated. This lets the question arise if 1) the participants were characterized as being depressed because of their recalled autobiographical memories or 2) the participants recall certain autobiographical memories because of their depressive symptoms. To overcome this limitation and to answer the question described above, the inclusion of all three measurement points and therefore making use of the longitudinal character of the study could be one possible solution.

A second limitation which also could be the result of using only one instead of all three measurement points, is the studies' focus on the differences in autobiographical memories between younger, middle aged and older people. Although this is interesting and important to examine, the question arises if 1) participants recall certain memories because they always did so or 2) participants recall certain memories because their recall is influenced by their personal development during their life. Thus, making use of the longitudinal character again becomes important in order to ensure that the current findings are not the result of some kind of snapshot.

Third, as already mentioned in the method section, the memories of the participants

were manually coded so that they fit into one of the categories which are described in Table 1. Nevertheless, there were many memories which were coded as being inapplicable because they did not perfectly fit into the coding structure. On the one hand, this did not seriously influence the results because the inapplicable memories were excluded from the analysis. On the other hand, excluding the inapplicable memories entails a reduction in the number of memories used. Especially in the younger age group, the reduction in memories is causing attention. This because even more memories from the younger participants were excluded although the number of this group -compared to the middle aged and older group- is already relatively small (N= 115). Comparing the three age groups thus might become less representative as the differences in amount of participants increases. This limitation can be overcome by making use of computerized coding programmes which minimize errors and therefore prevent the distortion of results.

Fourth, this study used the Self-Defining Memory Test (SDMT) in order to get insight into the autobiographical memories of the participants. The SDMT only asks the participant 1) to characterize a memory in a few words and 2) to describe the memory in such a way that another person can understand how the experience has contributed to that kind of person the participant is now. However, compared to other instruments in previous studies which ask the participant further questions until the memory is really described in as much detail as possible, the SDMT did not control for the richness of details and for how precisely a person described a certain experience. Therefore, it could also be the case that some of the participants did not describe their memories specifically because they thought that their specificity and level of detail are not important for the purpose of the study. This could be a possible explanation for the results which were revealed when it comes to examining the relationship between the specificity of autobiographical memories and age differences. However, also this limitation can be overcome by including more questions which really focus on asking the participant to be more specific and to describe a memory with as much detail as possible. This in turn will lead to a better representation and clearer results.

Another limitation of the present study was that the SDMT asked the participant to recall only three memories. However, other studies ask the participant to recall much more memories which leads to more representative and even stronger results. Nevertheless, an increased number of recalled memories can easily be included in future research to gain even more insight into the autobiographical memories of the participants.

Finally, although the number of participants in this study is a real strength, it can also be interpreted as a kind of limitation. By including so many people which leads to an

enormous amount of memories, it becomes more difficult to deeply analyse all of these memories. Therefore, another way to study autobiographical memories could be to include a smaller sample but to analyse their memories more deeply. This will reveal even more detailed information regarding the relationship between the different components of autobiographical memories, age differences and depressive symptoms.

Next to the limitations, there were also several strengths which represent the importance of this study. First, all participants had a good comprehension of the Dutch language which prevents distortion of the results. This was ensured by means of the LISS panel from which the participants were sampled. Second, the used materials are detailed described and the used scales are all represented by good psychometric properties with high internal consistency coefficients.

Third, the overall sample size with 2302 participants was representative for the Netherlands population and had a great power. Although the sample size of the younger aged people is with 115 participants not that big that the findings could be universalized, it is great enough to make some first and important assumptions which can be used for future research.

Finally, connected to the number of participants, the three different age categories represent a real strength of the current research. Whereas previous studies mainly focussed on 1) young people, especially college students or 2) the difference between college students and people older than 65 while neglecting the range between college students and people who are older than 65, this study included all age categories ranging from younger than 30 years old, to being aged between 30 and 60 to be older than 60. This is one of the first studies which really focussed on all three age groups which leads to greatly representative results and a great power.

4.5 Future research

Although this research gave interesting and important insights in how the content, valence, specificity and integrative meaning of autobiographical memories differ between younger, middle aged and older people and how these components are related to the experience of depressive symptoms, there are many interesting topics for future research regarding autobiographical memories. First, because of the fact that previous literature partly contradicts the current findings, it is important to deeper study if age and depressive symptoms decrease the specificity of autobiographical memories or not.

Second, it could be interesting to investigate if the content, valence, specificity and integrative meaning are also influenced by the culture a person belongs to or the gender a

person has and not only by the age of a person. Culture differences could be especially interesting because each culture focusses on different values and norms and these differences can reflect themselves in peoples' autobiographical memories.

Third, as already mentioned in paragraph 4.4, it could be worth the effort to explore whether the results would be different if the longitudinal character of the study will be used instead of only one measurement point. By doing so, it would also become clearer 1) if people recall certain memories because they always recalled them like this or 2) if people recall certain memories in a certain way because of their personal development during the last year. Furthermore, making use of the one-year period will also give more detailed information over 1) if people experience depressive symptoms because they recall certain memories or 2) if people recall certain memories because they are affected by depressive symptoms. In other words, by making use of the longitudinal character of the study, long-term effects of age and depressive symptoms could be explored.

Fourth, as already mentioned in paragraph 4.2, it could be interesting to explore 1) whether older people (>60) retrieve more negative memories because of some physiological and environmental factors which lead to a decrease in positive memories or 2) whether all older people are in one way or another affected by the positivity effect which would lead to an increase in positive memories.

Finally, it could be interesting to not only explore the relationship between depressive symptoms and the content, valence, specificity and integrative meaning of peoples' autobiographical memories -as was the case in this study- but to also have a look at the influence which certain memories can have on the amount of depressive symptoms a person experiences at a time. In other words, it could be worth studying if -and how- certain autobiographical memories can decrease symptoms of depression and thereby increase the well-being of individuals.

4.6 Practical implications

The results of this study show that the topic of autobiographical memories as well as their link to age differences and depressive symptoms is an important one in todays' society. It affects how people remember their past which in turn affects their future life. If people only remember negative experiences and neglect their positive past, this could negatively affect their well-being. If all people -regardless of their age- have to work, as was the case in the present study, with exactly the same Self-Defining Memory Test which is composed of the same instructions for every participant, individual differences will be neglected which are

important for being able to treat people individually and tailored to their needs. Because of this, two practical implications will be given in the following to prevent people from becoming unhappy, unsatisfied or depressed.

First, in case future research will reveal that autobiographical memories in fact can have a positive influence on the experience of depressive symptoms, an intervention for depressive people could be developed to decrease their amount of depressive symptoms and increase their psychological well-being by means of working with their autobiographical memories. This could be done by asking the client to concentrate on the detailed recall of positive memories and experiences and for example writing them down (as detailed as possible) or recalling these positive experiences every night before going to sleep. By continually strengthening the focus on the positive instead of the negative past and by selectively remembering more positively loaded memories, the 'patients' can learn to positively re-construct their past which in turn will lead to more happiness, more satisfaction and a better well-being while decreasing the experience of depressive symptoms. Of course, there are already reminiscence interventions which focus on the increase of well-being and the decrease of depressive symptoms by means of working with the patients' memories. However, these interventions mainly focus on older people while neglecting the middle and younger aged people although there are differences between younger, middle aged and older people regarding their needs and symptomatology. Thus, individual interventions are needed which focus on the individual needs of younger, middle aged as well as older people.

Second, not only depression influences peoples' autobiographical memories, but also age does. While depressive symptoms especially affect how positively or negatively people remember their past, age(ing) can also have a negative influence on peoples' autobiographical memories. To ensure that ageing does not have a negative influence on how positively or negatively and how specifically or generically people remember their past, even more individual interventions have to be developed which are tailored to the age, needs and functions of the different age groups. Whereas younger people mostly do not have difficulties to recall specific memories, older people need interventions which make it easier to recall specific information. When people remember their past and certain experiences only generically, they are not able to recall as much positive details or to connect as much positive feelings with a certain experience as do people who remember certain experiences specifically and rich in positive details. By developing interventions which are tailored to the individual needs of the different age groups and thereby focus on 1) the specific instead of generic recall of memories and 2) the recall of memories which have a positive valence for an individual

-while also permitting negative experiences to be part of a persons' past-, the participants age and needs will be taken into account as well as their psychological well-being will be increased.

4.7 General conclusion

Despite all strengths and weaknesses of the study, this paragraph focusses on the most important findings: 1) Whereas older people focus more on social relations, younger people do not focus more on career issues, 2) older peoples' memories are less positive than those of younger people, 3) age as well as depressive symptoms are not related to the specificity of peoples' memories although past literature revealed the opposite, 4) older people evaluate life periods more positively, while younger peoples' autobiographical memories have a more positive meaning for life, 5) people who experience more depressive symptoms, have less positive memories and 6) people who experience more depressive symptoms, integrate less meaning in their memories.

Because of these findings, it is important to further study peoples memories' as well as its' relationship with age and depressive symptoms. Additionally, next to research concentrating on the content, valence, specificity and integrative meaning of memories in relationship to age differences and depressive symptoms, it is even more important to become active by means of the development of different interventions. The first intervention should help depressive people to positively re-construct their past in order to become happier, satisfied and less depressed by focussing on the recall of autobiographical memories instead of engaging in some kind of long lasting therapy. The second intervention should concentrate on the individual treatment regarding the different age groups while focussing on the specific and positive recall of memories in order to treat the participants' tailored to their age and needs as well as to increase their psychological well-being.

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