We conducted two studies that identified some of the psychometric and psychodynamic correlates of the first memories of younger and older adults. Collectively, these studies revealed that: (a) performance on the Weschler Adult Intelligence Scale-Revised (WAIS-R) vocabulary and digit-span backwards tasks was negatively related to the age of younger and older adults' first memories, (b) performance on the death preparation subscale of the Reminiscence Function Scale was inversely related to age of older adults' first memories, but positively related to the age of younger adults' first memories, and (c) the use of internalizing defenses as measured by the Defense Mechanism Inventory was predictive of the age of younger, but not older, adults' first memories. The implications of these data for theories of infantile amnesia and life review are discussed.

Key Words: Defensive style, Reminiscence, Infantile amnesia.

Psychometric and Psychodynamic Correlates of First Memories in Younger and Older Adults

John M. Rybash, PhD,° and Kara L. Hrubi, BA°

Why does an individual's first recallable memory usually come from the middle of the fourth year of life? What psychological processes are responsible for an individual's recollection of his or her first memory? What factors influence an individual's estimation of the exact age at which this first memory actually occurred? Do the answers to the above-mentioned questions vary as a function of the age (or developmental level) of the individual? The aim of the research described in this article was to provide some preliminary insights into these intriguing questions.

Until recently, it was thought that infantile amnesia (IA) was purely a cognitive phenomenon that was caused by the neurological immaturity of the declarative memory system (Moscovitch, 1986). Several lines of more contemporary research, however, make it clear that the declarative memory system is operative within the first year of life (McKee & Squire, 1993) and that the offset of IA is coincident with the evolution of a rudimentary sense of personhood that is characterized by the phenomenological quality of self-consciousness (Howe & Courage, 1993). Thus, it may be concluded that the development of autobiographical memory involves a complex interaction of cognitive and psychosocial processes (Fitzgerald, 1996; Howe & Courage, 1993; Nelson, 1993; Webster & CappeLiez, 1993).

Curiously, the vast amount of research on IA has employed children, adolescents, or younger adults as participants (see Howe & Courage, 1993; Usher & Neisser, 1993). In the present study, we sought to examine the offset of IA by contrasting the age of the first memories of older adults to those reported by younger adults. More specifically, we conducted two separate studies that examined the roles played by cognitive/intellectual and psychodynamic factors in the first memories of younger and older adults. We assumed that cognitive factors would have a rather constant effect on the recall of first memories for individuals of different ages. On the other hand, we hypothesized that the influence of various psychodynamic factors such as defensive style and reminiscence would be mediated, to a large extent, by the psychosocial tasks that are associated with different development epochs. Thus, we expected that a defensive style based on the internalization of anxiety as well as the need to reminisce for the purpose of death preparation would be more typical (and more adaptive) for older than younger adults. Furthermore, we hypothesized that this profile of defensiveness and reminiscence would be negatively related to the age of first memories in older adults but positively related to the age of first memories in younger adults.

It should be emphasized that we do not make the strong claim that our participants' first memories represent completely accurate representations of specific life experiences. We assume, along with other memory researchers (Bruner, 1986; Fitzgerald, 1988, 1996; Schacter, 1996), that the conscious recollection of a personal life event from the distant past is best conceptualized as a reconstructive process in which traces of an original experience are inte-
grated with and transformed by the cognitive, personological, and social processes that operate at the time of retrieval. Consistent with this viewpoint, Rabbitt and McInnis (1988) have claimed that attempts to separate the original from the reconstructed aspects of remote autobiographical memories “are probably not only methodologically dubious, but logically mistaken” (p. 341). Thus, the overarching goal of the present research was to examine how cognitive and psychodynamic processes influence the manner by which younger and older adults reconstruct the earliest experience of their life.

Study 1

In Study 1 we examined the relationship between the age of younger and older adults’ first memories and their performance on three different subtests of the Weschler Adult Intelligence Scale—Revised (WAIS—R): digit-symbol substitution, digit-span backwards, and vocabulary. To a certain extent, our research may be conceptualized as an extension of the work of Rabbitt and McInnis (1988). These researchers reported an inverse relationship between IQ test performance and age of first memory in a group of older adults. Unfortunately, Rabbitt and McInnis (1988) did not include a young adult control group in their research. We corrected for this shortcoming in the present investigation. Thus, Study 1 provides a more powerful test of the hypothesis that the cognitive mechanics that provide people with access to their first memories are age invariant.

Consistent with the previous work of Rabbitt and McInnis (1988), we expected that the age of our younger and older participants’ first memories would be negatively correlated with their WAIS—R performance. This hypothesis was based on Rabbitt and McInnis’s (1988) claim that the recollection of one’s first memory is a highly reconstructive process that involves a great deal of “inference, elaboration, and … social negotiation [that] should begin earlier and should permanently be more effective for intellectually gifted than for less gifted individuals” (p. 341). Importantly, we assumed that the intelligence plays the same facilitative role when younger and older individuals attempt to reconstruct their personal past.

Method

Participants

Forty-eight younger (M = 19.9 years; SD = 1.2 years) and 48 older (M = 75.31 years; SD = 7.59 years) adults participated. Younger adults were students from Hamilton College who had more years of formal education than older adults (M = 13.8 years vs 12.6), t(94) = 2.73, p < .003. Older adults were community-dwelling volunteers recruited from the membership of local senior organizations. All participants provided informed consent, rated themselves to be in good or excellent physical health, and were paid $5.

Materials

The digit-symbol substitution, digit-span backwards, and vocabulary subtests from the WAIS—R, along with the Early Memory Questionnaire (EMQ), were employed in Study 1. The EMQ required participants to (a) write a narrative description of the first (i.e., earliest) memory that they could remember from their early life, (b) indicate the age at which their first memory occurred, and (c) provide some sort of evidence that corroborated their claim that their first memory did, indeed, happen at the age that they indicated.

Procedure

Participants were told that the purpose of the study was to examine the relationship between various mental abilities and people’s memory for real-life events. Then, the WAIS—R tasks were administered on an individual basis under standard conditions. After the administration of the psychometric tasks, participants completed the EMQ in a self-paced manner.

Results

Analyses of Variance

A one-way analysis of variance (ANOVA) was conducted in which Age (younger, older) was the independent variable and Age of First Memory was the dependent variable. The ANOVA revealed a main effect for Age, F(1,94) = 11.26, p < .0004, such that older adults had later occurring first memories (M = 4.4 years, SD = 1.7 years) than younger adults (M = 3.3 years, SD = 1.1 years).

A series of ANOVAs were also performed that examined the effect of Age on performance on the three psychometric tasks. These ANOVAs indicated that younger adults scored higher than older adults on WAIS—R digit-symbol substitution, F(1,94) = 126.31, p < .0001; WAIS—R digit-span backwards, F(1,94) = 14.56, p < .0002; and WAIS—R vocabulary, F(1,94) = 7.75, p < .007.

Correlational Analyses

Correlational analyses were used to examine the relationship between the ages of younger and older participants’ first memories and their scores on the three psychometric measures. Results indicated an inverse relationship between age of first memories and scores on the WAIS—R digit-span backwards and vocabulary tasks (see Table 1). Additional analyses showed that, for younger adults, a significant relationship obtained between age of first memory and digit-span performance when vocabulary was partialed out, r(46) = +.26, p < .05, and between age of first memory and vocabulary when digit-span performance was taken into account, r(46) = +.24, p < .05. In contrast, when older participants’ data were considered, the relationship between age of first memory and digit-span was not reliable when vocabulary performance was partially out, r(46) = +.16,
Table 1. Correlational Findings Concerning the Relationship Between WAIS-R Performance and Age of First Memory for Younger and Older Adults

<table>
<thead>
<tr>
<th>WAIS-R Tasks</th>
<th>Younger Adults</th>
<th>Older Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digit-symbol substitution</td>
<td>- .10</td>
<td>- .14</td>
</tr>
<tr>
<td>Digit-span backwards</td>
<td>- .31*</td>
<td>- .29*</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>- .29*</td>
<td>- .32*</td>
</tr>
</tbody>
</table>

Note: WAIS-R = Weschler Adult Intelligence Scale-Revised. *p < .02.

n.s. Likewise, the relationship between age of first memory and vocabulary did not reach significance when older participants' digit span scores were controlled for, r(46) = + .22, n.s.

Given these correlational findings, we conducted two analyses of covariance (ANCOVAs) in which Age was the independent variable, Age of First Memory was the dependent variable, and WAIS-R digit-span backwards and vocabulary were the covariates. Results of both ANCOVAs confirmed a significant age difference in age of first memory, favoring younger adults even when digit-span backwards performance, F(1, 93) = 10.73, p < .002, and vocabulary performance, F(1, 93) = 14.31, p < .0003, were taken into account.

Discussion

The major findings obtained in Study 1 were that selective aspects of psychometric intelligence (i.e., vocabulary and digit-span backwards) predicted the age of first memories in both younger and older adults, and that older adults had later-occurring first memories than younger adults. These results, which are consistent with the data reported by Rabbit and McInnis (1988), support the hypothesis that cognitive/intellectual factors have similar effects on younger and older adults’ ability to recall the distant past. It should be noted, however, that age differences in age of first memory still obtained significance even when vocabulary and digit-span backwards scores were employed as covariates. This suggests that the age of first memory is not influenced by cognitive/intellectual factors alone — at least not by those aspects of intelligence selected for inclusion in the current research.

The WAIS-R digit-symbol substitution task has been regarded as one of the most sensitive psychometric indicators of cognitive aging (Salthouse, 1988). Furthermore, measures of perceptual speed such as the digit-symbol substitution task have been found to be powerful mediators of adult age differences in intelligence (Lindenberger, Mayr, & Kliegl, 1993) and free recall (Bryan & Luszcz, 1996). Thus, we were somewhat surprised to find that digit-symbol substitution performance did not predict the age of our younger or older participants’ first memories. We offer two tentative post hoc explanations for this null finding. First, strategic factors might play a seminal role in the process by which individuals reconstruct their first memory, both in everyday contexts and on a non-speeded questionnaire such as the EMQ. It may be the case, therefore, that the vocabulary and digit-span backwards tasks were better able to tap this strategic/elaborative dimension of intelligence than was the digit-symbol substitution task. Second, it is possible that certain demand characteristics of the EMQ (e.g., having participants provide a verbal description of their first memory under self-paced conditions) reduced the chance that a speeded visual-spatial task such as digit-symbol substitution would predict the age of first memory.

Study 2

Several theorists (Butler, 1963; Erikson, 1963) have proposed that older individuals reminisce about the past in order to help them deal with the salient psychosocial tasks (e.g., generativity, death preparation, etc.) associated with this portion of the lifespan. Consistent with this viewpoint, empirical evidence suggests that older adults, in comparison to their younger counterparts, are more likely to approach life events by adopting a “mature” defensive strategy that entails the internalization of anxiety along with an inhibition of aggressive and impulsive tendencies (Cramer, 1991; Diehl, Coyle, & Labouvie-Vief, 1996; Vaillant, 1977). An inner-directed defensive style would seem to be consistent with the self-reflective qualities of the life review process. Furthermore, it could be argued that a developmentally adaptive desire for reminiscence (e.g., a desire for reminiscence that is focused on ego integrity and death preparation) as well as a developmentally adaptive defensive style (e.g., a defensive style based on the internalization of anxiety) might give older individuals better access to memories of early life experiences than would a developmentally atypical need for reminiscence or defensive style. Thus, in Study 2, we decided to examine adult age differences in reminiscence and defensive style, and to determine if a relationship exists between these psychodynamic constructs and the age of the first memories reported by younger and older adults.

We accomplished the above-mentioned goals by having younger and older participants complete the Reminiscence Functions Scale (RFS), the Defense Mechanism Inventory (DMI), and the EMQ. The RFS is a self-report measure developed by Webster (1993) that quantifies the extent to which an individual uses reminiscence in order to reduce boredom, prepare for death, promote self-identity, create conversations, maintain intimacy, revive feelings of bitterness, and teach others. The DMI is an objective instrument created by Ihilevier and Glesser (1993) that measures the extent to which individuals use a defensive style that is based on the internalization versus the externalization of anxiety.

We expected that the adoption of an internalizing defensive style as well as the need to reminisce for the purpose of death preparation would be more typical (and more adaptive) for older than younger adults.
adults. Also, we hypothesized that this profile of defensiveness and reminiscence would be negatively related to the age of first memories in older adults, but positively related to the age of first memories in younger adults.

Method

Participants and Materials

Thirty-four younger (\(M = 20.2\) years; \(SD = 0.9\) years) and 34 older (\(M = 73.5\) years; \(SD = 5.0\) years) adults participated. Younger adults were students from Hamilton College. Older adults were volunteers who attended an Elderhostel that was held at Hamilton College. All participants provided informed consent, rated themselves to be in good or excellent physical health, and were paid $5.

The RFS consists of 43 statements that describe different reasons for thinking about the past (e.g., When I reminisce it is to pass the time during idle or restless hours). Participants are required to rate each statement on a 6-point scale (1 = I have NEVER used reminiscence for this purpose; 6 = I have VERY FREQUENTLY used reminiscence for this purpose). Webster (1993) has shown that clusters of items on the RFS measure the extent to which individuals reminisce in order to reduce boredom, prepare for death, promote self-identity, create conversations, maintain a sense of intimacy, revive feelings of bitterness, and teach others.

The DMI contains 10 vignettes, each of which describes a stressful situation. Participants are asked to indicate which type of behavioral, fantasy, cognitive, and affective response that they would be most (and least) likely to make if they were actually in the situation depicted within each of the vignettes. The DMI yields scores that range from 0 to 80 for each of five different categories of defenses: principalization, reversal, turning against self, projection, and turning against objects. Based upon an extensive review of the empirical literature involving the DMI, several authors (Cramer, 1988; Ihilevier & Glessner, 1993) have maintained that it is useful to characterize individuals on two general defensive styles: internalization and externalization. The internalization score was obtained by summing participants’ scores on the defenses of principalization, reversal, and turning against the self, whereas an externalization score was constructed by summing participants’ scores on the defenses of projection and turning against objects.

The EMQ was configured in a manner identical to that described in Study 1.

Procedure

Participants were informed that the purpose of the study was to examine people’s memory for real-life experiences, reasons for remembering the past, and reactions to stressful events. After this general orientation, participants completed the RFS, DMI, and the EMQ in a self-paced manner. Older participants were contacted by mail and asked to complete the aforementioned materials. The return rate for older adults was approximately 50%.

Results

Analyses of Variance

A 2 X 2 mixed ANOVA was performed in which Age (younger, older) was the between-subject variable and Defensive Style (internalizing, externalizing) was the within-subject variable. The ANOVA yielded a main effect for Defensive Style, \(F(1,66) = 172.37, p < .0001\), as well as an Age X Defensive Style interaction, \(F(1,66) = 6.97, p < .01\). This interaction indicated that older adults had higher scores on internalizing defenses than younger adults, but lower scores on externalizing defenses than younger adults (see Figure 1).

Next, we calculated 2 X 7 mixed ANOVA with Age (younger, older) as the between-subject variable and Reminiscence Function (boredom, identity, bitterness, teaching, death preparation, intimacy, conversation) as the within-subject variable. The dependent variable was performance on each of the reminiscence functions on the RFS expressed as \(t\)-scores. The ANOVA yielded an Age x Reminiscence Function interaction, \(F(6,396) = 11.48, p < .0001\). Analysis of the interaction revealed that older adults were more likely to reminisce for the purposes of death preparation and teaching others, whereas younger adults were more likely to think of the past in order to reduce boredom, develop an identity, and maintain feelings of bitterness (see Figure 2). Age differences were not obtained for the reminiscence functions of intimacy and the conversation.

![Figure 1. Age differences in the strength of internalizing and externalizing defenses as measured by the Defense Mechanism Inventory (DMI).](http://gerontologist.oxfordjournals.org/ download)
Finally, a one-way ANOVA was conducted in which Age (younger, older) was the independent variable and age of first memory was the dependent variable. The ANOVA revealed a marginally significant main effect for Age, $F(1,66) = 3.33, p < .07$, such that older adults showed a trend toward later occurring first memories ($M = 3.7$ years, $SD = 1.2$ years) than younger adults ($M = 3.2$ years, $SD = 1.1$ years).

**Correlational Analyses**

Correlational analyses were used to examine the relationship between the ages of younger and older participants' first memories and their scores on the RFS and DMI. Table 2 shows that, for younger adults, age of earliest memory was positively related to reminiscing for the purpose of death preparation and the use of internalizing defenses. Furthermore, it should be noted that the relationship between reminiscing for the purpose of death preparation and the use of internalizing defenses proved to be unreliable for younger adults, $r(32) = +.02$, n.s. This suggests that these two variables predict age of first memory independent of each other. When older adults are considered, Table 2 indicates that age of first memory was inversely related to reminiscing for the purpose of death preparation. However, age of first memory was not related to the use of an internalizing defensive style among our older participants.

**Discussion**

Study 2 showed that older adults reminisced in order to prepare themselves for death and teach others, whereas younger adults thought about the past in order to reduce boredom, develop an identity, and maintain feelings of bitterness. These findings are consistent with age differences in reminiscence functions reported by Webster (1993). Also, older adults were found to use internalizing defenses more than younger adults, but externalizing defenses less than younger adults. These findings are consistent with previous research and theory that suggests that older adults become more inner-directed and less impulsive (Cramer, 1991; Diehl et al., 1996) than their younger counterparts as they engage in the life review process (Butler, 1963; Erikson, 1963; Webster, 1993; Wong & Watt, 1991).

Only one reminiscence function — death preparation — predicted the age of first memories for the participants in Study 2. More interestingly, scores on the death preparation subscale of the RFS were negatively related to the age of older adults’ first memories, but positively related to the age of younger adults’ first memories. Furthermore, and contrary to our initial hypothesis, the use of internalizing defenses was positively related to the age of younger, but not older, adults’ first memories. It makes intuitive sense that older adults who think about the past to prepare themselves for death would have deeper, richer, and earlier memories of their childhood in comparison to those who do not reminisce for this purpose. In an Eriksonian sense, these individuals may be facing the final portion of the lifespan with a sense of ego integrity.

The data obtained from younger participants in Study 2 stand in sharp contrast to those gathered from older participants. Perhaps younger individuals who have a developmentally inappropriate way of dealing with anxiety and reminiscence have a difficult time gaining access to their personal past. The legitimacy of this claim, of course, awaits the results of future research.

A final point to consider is that the trend for younger adults to have earlier first memories than older adults in Study 2 only attained borderline statistical significance. However, when the first memory data were combined for Studies 1 and 2, a significant age effect, $F(1,162) = 14.28, p < .0002$, was...
found, such that younger adults (M = 3.3 years, SD = 1.1 years) had earlier first memories than older adults (M = 4.1 years, SD = 1.5 years).

General Discussion

Results obtained from the present research lead to the inescapable conclusion that cognitive and psychodynamic mechanisms affect first memories in different ways. The cognitive/intellectual processes that provide access to first memories seem to be age invariant. We showed that performance on various psychometric indices of intelligence was negatively correlated with age of first memory for both younger and older adults. In contrast, the psychodynamic processes that affect the retrieval of first memories may have facilitative (or inhibitory) influences that vary by age or developmental level, or both. More specifically, we found that, for older adults, reminiscence for the purpose of death preparation was negatively related to age of first memory, but for younger adults, reminiscence for the purpose of death preparation as well as the use of an internalizing defensive style was positively related to age of first memory. These findings reinforce the tentative speculation that individuals who reminisce about the past and defend themselves against anxiety in a manner that is adaptive (or non-adaptive) relative to their developmental level will experience differential levels of success (or failure) in their attempt to access memories from their remote past. Future investigators might wish to explore the potential link between successful aging and access to early memory, and whether intellectual and personality factors that are synchronous or nonsynchronous with current developmental level play a crucial role in mediating this relationship. This line of inquiry would reinforce Webster and Cappeliez’s (1993) assertion that research on life review and autobiographical memory should occupy a central position at the interface of cognitive, developmental, and clinical psychology.

Another important point to consider is that we found a significant difference in the estimated age of younger and older participants’ first memories. This finding could reflect a true age difference favoring younger adults in the ability to remember the actual details of a specific personal experience, or a liberal response bias in younger adults’ willingness to estimate the age of their earliest memory. Whatever the basis for the age effect, it should be emphasized that the EMQ was structured in such a way that it assessed the “narrative” rather than the “historical” truth about the exact age at which our participants’ first memories occurred (cf. Bruner, 1986). This is consistent with our assertion that the retrieval of early memory is a reconstructive process that represents the interaction of diverse processes that operate according to similar (or different) rules across different developmental periods. The dating of one’s first memory is the end result of the same reconstructive processes that are responsible for the thematic structure and emotional tenor of that memory.

One theme that runs throughout this article is that memory of the distant past is a highly reconstructive process. We presented data consistent with this claim in that we showed that age of first memory is influenced by both cognitive and psychodynamic factors. However, there may be other dependent measures that might also capture the reconstructive nature of remote autobiographical memory. For example, investigators could examine age differences in the reliability of first memories: Do younger and older adults, depending on various cognitive and psychodynamic factors, respond with the “same” first memory if they are tested on several occasions, or do they recollect “different” first memories (possibly of the same event) if they are tested many times? Are younger and older persons consistent in their ability to date the same first memory that is recalled on more than one occasion? Furthermore, it would seem that a content analysis of first memories might yield some valuable information: Do more intelligent individuals tend to offer longer, more intricate descriptions of their first memories than their less intelligent counterparts? Do the themes and emotional expressiveness of individuals’ first memories vary in accordance with their dominant defensive style and reminiscence function? These questions, along with a number of other provocative issues, await the attention of future researchers.

References


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