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Identifying distinct sets of predictors of specific functions of autobiographical memory

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Abstract

Grounded in the ecological approach, research has charted several adaptive functions of autobiographical remembering. Each represents a rather different psychosocial domain (i.e., self, social, directive). The goal of this research was to determine the contributions of each of a set of variables, controlling for all others, in predicting use of autobiographical memory to serve each specific function. In two studies, participants ($N = 100$; $N = 195$) rated frequency of functional use of specific event memories and completed a brief battery of memory-related measures. Most Study One results were replicated in Study Two. Self-relevance of memories was related to their functional use regardless of domain. Each function was also, however, predicted by a unique set of variables consistent with its use in a given psychosocial domain. Findings emphasize how a combination of factors come into play to allow humans to use autobiographical memory to serve various different functions in navigating daily life.

Keywords: autobiographical memory; function; self-continuity; social-bonding; directive

Autobiographical memory refers to recollecting episodes from one's past (Brewer, 1986). The functional approach (e.g., Baddeley, 1988; Pillemer, 1998) focuses on adaptive use of such memories. Previous research has delineated several ways individuals use memory in daily life including identification of at least three functions (i.e., forging self-continuity, maintaining social-bonds, directing future behavior; Bluck & Alea, 2011). From an ecological perspective, autobiographical remembering is seen as occurring in person-environment context (Berntsen, 2007). For a given specific memory to serve a particular function at a given time therefore relies on multiple factors: not only on characteristics of the person remembering but also on characteristics of the retrieved memory. As such, the next step to move this literature forward is to identify the factors that simultaneously come into play to determine when memories serve each particular function. Note that the three functions of autobiographical remembering connote very different psychosocial domains. As such, the use of memory to serve each function may be guided by some common but also some unique factors (Bluck, 2003).

Research has begun to address this issue (e.g., Rasmussen & Berntsen, 2009). No research, however, has taken a multifactorial approach that allows determining the independent contributions of each of a set of factors. The current study developed a brief battery of measures to begin that work (i.e., self-concept clarity, self-relevance of memory, whether the memory is recent or distant, and both memory valence and vividness). This is not an exhaustive set of variables but moves beyond use of single predictors. Below, each of three functions of autobiographical memory is reviewed with attention to the particular set of factors expected to be differentially associated with each.

Self-continuity function. Autobiographical memory has been theorized to play a primary role in helping people maintain self-continuity (e.g., Bluck & Liao, 2013; Neisser, 1986). The set of factors expected to relate to memory serving a self-continuity function can

be guided by previous literature. For example, people with a less clear self-concept use memories more frequently to forge continuity between past and present selves (Bluck & Alea, 2008). Highly self-relevant memories should also be more useful: individuals rely on personally relevant, *self-defining memories* (Singer, Blagov, Berry, & Oost, 2013) as critical markers in forging a continuous life story (McAdams, 2001). In addition, perhaps because they more closely match current self-conceptions (Conway & Pleydell-Pearce, 2000), recent memories may be more frequently used than distant memories (i.e., of childhood) to establish self-continuity (Demiray & Bluck, 2011). Valence of a memory may, however, not be important for serving a self-continuity function: self-continuity does not depend on seeing one's self positively (Bluck & Alea, 2011), only as continuous. Vivid memories should better serve self-continuity given that rich sensory memories are better recalled (Sutin & Robins, 2007).

Social-bonding function. The social-bonding function involves thinking and talking about memories to develop or maintain bonds (Pasupathi, Lucas, & Coombs, 2002). The set of factors related to using memory for social-bonding may thus be rather different than that predicting the self-continuity function. Self-relevance should remain important as sharing such memories creates feelings of intimacy more than sharing mundane events (Beike, Brandon, & Cole, 2016) and sharing significant self-information leads to greater intimacy (e.g., Omarzu, 2000). Memories of both recent and distant childhood events may serve social-bonding: memories need not be recent to be shared to enhance intimacy (Alea & Bluck, 2007). Memory valence may also play a role: when an acquaintance shares positive memories, listeners report a certain kind of social bond - greater liking; when the acquaintance instead shares negative memories, listeners feel greater empathy towards them (Alea, Bluck, Mroz, & Edwards, 2018). Thus, sharing both positive and negative memories promote social bonding. Finally, more vivid memories may more frequently serve social-bonding: detailed

memories are better communicated (Pillemer, 1998) and judged by others as more credible (e.g., Bruce, 1989).

Directing-behavior function. Directing-behavior involves retrieving past events to guide present or future behavior (Bluck, Dirk, Mackay, & Hux, 2008). Self-relevance of the memory is again likely to influence this function. Highly self-relevant memories can contain lessons (i.e., directives) that may provide guidance (Glück & Bluck, 2007). In addition, memories that are recent, not distant, may be more likely to serve a directing-behavior function because they contain content and potentially spur insights more plausibly applicable to one's current context (Conway & Pleydell-Pearce, 2000). With respect to valence, individuals often rely on slightly negative memories to guide behavior (Rasmussen & Berntsen, 2009), potentially learning from past mistakes. Finally, vivid memories are better recalled (Sutin & Robins, 2007) and may thereby be more easily mined to direct behavior.

The Current Research

Past research has often focused on single factors as predictors or examined only one of several autobiographical memory functions. A strength of the current research is the multifactorial approach. This allows determination of the contributions of each of a set of variables, while controlling for all others, in predicting functional use of autobiographical memory for self, social and directive functions. The research also includes both recent and distant memories, and replicates results in a second sample (Study Two).

Study One

Vividness of recalled memories was expected to relate to greater frequency of functional use, for all three functions. The unique sets of predictors expected to be related to each function include:

- (1) Frequency of using memory to serve self-continuity was expected to be predicted by lower self-concept clarity, greater self-relevance, and recall of recent more than distant

memories.

- (2) Frequency of using memory to serve a social-bonding function was expected to be related to self-relevance and memory valence.
- (3) More frequent use of memories to serve the directing-behavior function was expected to be associated with self-relevance, more recent than distant memories, and more negatively-valenced memories.

Method

Participants

Participants were 100 undergraduates (50 men, 50 women; $M = 21.30$, $SD = 1.02$) recruited through the Psychology Department at a large university and received course credit for participation. They reported as 59% Caucasian, 20% Hispanic, 7% African American, 9% Asian, and 5% Other.

Procedure

This research was approved by the university IRB. Participants completed an electronic Informed Consent before completing the study online in one sitting (approximately 30 minutes). Participants self-rated functions and characteristics of their memories based on the widely held assumption that such ratings reflect individuals' subjective understanding (e.g., Holm & Thomsen, 2018). Steps were taken to ensure data quality across studies. Five foil items were embedded to ensure participants were carefully reading items. All participants correctly answered at least three foils, and spent a reasonable time completing the study (i.e., more than ten minutes, less than one hour).

Autobiographical memory rating task. In counterbalanced order, participants recalled and rated a distant and a recent *specific* memory (Pillemer, 1998): an experience that occurred at a particular place, lasting no longer than one day. Participants wrote their memories to ensure that they fully brought the event to mind before completing ratings, to

increase validity. Recalled experiences could be unique or everyday occurrences (Conway & Pleydell-Pearce, 2000). The reported mean age of the Study One distant memories was 4.09 ($SD = 1.70$) and for Study Two, 4.49 ($SD = 2.02$). For the recent memory, participants identified an event that occurred three months to one year ago. For the distant memory, participants thought back to their childhood and recalled and rated a memory from that period.

Measures

Thinking about Life Experiences (TALE). The TALE is a 15-item scale (Bluck & Alea, 2011) assessing frequency of thinking and talking about autobiographical events to serve three psychosocial functions (Self-Continuity, Social-bonding, Directing-Behavior). The original TALE instructions are to rate functional memory use in general. In the current study participants provided TALE ratings on each of two memories shared in the Autobiographical Memory Rating Task. Ratings were made on Likert-type scales from 1 (*almost never*) to 5 (*very frequently*). Cronbach's alphas were: Self-Continuity (distant memory = .91, recent memory = .86), Social-Bonding (distant = .85, recent = .85) and Directing-Behavior (distant = .82, recent = .85). Note that these are in the acceptable range for alpha (Tavakol & Dennick, 2011) though some are high.

Confirmatory Factor Analysis of TALE ratings for recent and distant memories using AMOS 25 (Arbuckle, 2012) showed factor loadings for the TALE, when rating individual memories, are comparable to the original TALE (Bluck & Alea, 2011). Goodness-of-fit indices were acceptable to marginal with some fit indices just below cut-offs.

Self-Concept Clarity Scale (SCCS). The SCCS (Campbell et al., 1996) consists of 12-items assessing the extent self-concept is clearly defined and internally consistent. Likert-type rating scales range from 1 (*strongly disagree*) to 5 (*strongly agree*). Reliability was good, Cronbach's alpha = .87.

Self-relevance. Three items focus on the extent to which the event influenced who the

participant has become as a person (Glück & Bluck, 2007), says something about them as a person, and is personally meaningful to them (Autobiographical Memory Questionnaire; Rubin & Siegler, 2004). Items are rated from 1 (*not at all*) to 5 (*very much*). Cronbach's alpha was: distant memory = .80, recent memory = .76.

Memory time: recent vs. distant event. Events in the Autobiographical Memory Rating Task were recent or distant so this was a within-participants dichotomous variable.

Memory valence and vividness. A modified Memory Quality Questionnaire (Bluck, Levine & Laulhere, 1999) was administered, containing items used in past research (e.g., Glück & Bluck, 2007; Sutin & Robins, 2007), including items from the Autobiographical Memory Questionnaire (AMQ; Rubin & Siegler, 2004) and the Memory Characteristics Questionnaire (Johnson, Foley, Suengas, & Raye, 1988). Memories were rated in reference to eleven items on scales from 1 (*not at all*) to 5 (*very much*).

Exploratory factor analysis (EFA; Promax rotation) resulted in a two-factor solution (i.e., eigen values > 1, inspection of the scree plot, retaining items with factor loadings > .4, resulted in dropping two items). Valence includes three items assessing how positive participants felt during this experience, the extent to which the emotions in the memory were positive, and the extent to which emotions were negative (reversed).

Vividness includes six items assessing extent to which the memory was vivid and relived. Variance explained by the Valence and Vividness factors were, respectively 19%, and 38% (distant memory) and 21%, and 32% (recent memory). Cronbach's alphas for Valence and Vividness were good (distant = .81 and .88; recent = .89 and .81).

Results

Preliminary analyses

Potential sex differences in the major dependent variables were explored using MANOVA with memory time (distant memory, recent memory) as a within-subjects variable,

sex as a between-subjects variable, and each of the TALE subscales as dependent variables.

There was no main effect of Sex, $F(3, 89) = 0.74, p = .53$, and no Sex x Memory Time interaction, $F(3, 89) = 0.42, p = .74$. Thus, sex was not used in major analyses.

Major analyses

To examine the relation between each predictor and one of the three memory functions, accounting for all other predictors, we ran three hierarchical regressions. One memory function was entered as the criterion variable in each regression. Order of administration in the Autobiographical Memory Rating Task (i.e., recent, distant event first) was always entered in the initial step. In the second step, self-concept clarity, self-relevance, distant versus recent, valence, and vividness were entered. Table 1 shows results with only the final step of each model for brevity.

In line with expectations, more self-relevant memories were more frequently used to serve all three functions (Line 3) and having lower self-concept clarity was related to reporting more frequent use of memory to serve a self-continuity function (Table 1, Line 2, left column). Also as expected, (Line 1), recent memories were more frequently used than distant ones to serve self-continuity and directing-behavior functions but distant and recent memories were just as frequently used for social bonding. For valence, there were no effects for self-continuity or social-bonding, but less positive memories were more frequently used to direct behavior (Line 4). Unexpectedly, vividness was unrelated to reports of functional use (Line 5).

Study Two

The aim of Study Two was to examine stability of Study One findings. A new and larger sample was employed.

Method

Participants

The sample was comprised of 195 young adults (62 men, 133 women) ranging from 18 to 25 years ($M = 21.58$, $SD = 1.08$) recruited from the Psychology Department participant pool and received course credit; 60% were Caucasian, 13% Hispanic, 11% Asian, 5% African American, and 5% reported as Other.

Procedure and Measures

The study was again administered online. Measures and procedures for the Autobiographical Memory Rating Task were the same as in Study One. As such, only reliability information appears here.

Thinking About Life Experiences (TALE). Cronbach's alphas were high: Self-Continuity (distant memory = .86, recent memory = .88), Social-Bonding (distant = .87, recent = .86) and Directing-Behavior (distant = .82, recent = .84).

Self-Concept Clarity Scale (SCCS). Cronbach's alpha was .89.

Self-relevance. Cronbach's alphas for self-relevance ratings were .76 (distant memory) and .74 (recent memory).

Valence and vividness. Exploratory factor analyses (EFA; Promax rotation) resulted in the same two-factor solution as in Study One. Variance explained by the valence and vividness factors were respectively 18% and 38% (distant memory) and 18% and 36% (recent memory). Cronbach's alphas for valence and vividness subscales were: distant = .85 and .86, recent = .85 and .82.

Results

Preliminary analyses

MANOVA was run using sex as a between-participants variable, and recent-distant memory as a within-group variable. As in Study One, there was no main effect for sex, $F(3, 311) = 1.18$, $p = .32$, and no sex interaction. Sex was therefore not used in major analyses.

Major analyses

The analytical approach was the same as that used in Study One. Regressions were run with each memory functions as a criterion variable. Order of administration was entered in the initial step. In the second step, self-concept clarity, self-relevance, memory time, valence and vividness were entered. Regressions appear in Table 2 with only the final step presented for brevity.

Replicating Study One, memories that were highly self-relevant were more frequently used to serve all three functions (Table 2, Line 3). Individuals with lower levels of self-concept clarity more frequently used memories for the self-continuity function (Table 2, Line 2, left column) and recent memories were more frequently used than distant ones to serve self-continuity and directing-behavior functions (Table 2, Line 1). As a further replication, the social-bonding function was again equally served by recent and distant memories, and more negative memories were more frequently used to serve the directing-behavior function (Table 2, Line 4). Unique to Study Two, less positive memories were more frequently used to serve the self-continuity function and less often used to promote social-bonding (Table 2, Line 4). Vividness of memories was, as in Study One, unrelated to frequency of use to serve functions (Table 2, Line 5). Note that, though not fully reported here due to space limitations, when the Study Two sample was broadened to include 159 community-dwelling middle-aged adults and the above analyses re-run, the results remained the same. This further strengthens the replicative power of this second study.

Discussion

Rooted in the ecological perspective (Neisser 1986), the current research moves research on the functions of autobiographical memory forward by implementing and replicating a multifactorial approach to determine unique sets of factors simultaneously associated with memory serving each of three functions (i.e., self-continuity, social-bonding, directing behavior). Findings that replicated across studies are briefly discussed.

Across the two studies, findings point to common (i.e., self-relevance) but also unique sets of predictors that may be seen as congruent with each specific function memory is serving. For example, individuals with a less clear self-concept may use memory more frequently to maintain continuity between their past and present selves (e.g., Bluck & Alea, 2008). Using recent instead of distant memories to do so may align more with the person's current goals (Conway & Pleydell-Pearce, 2000) and thus more effectively establish feelings of self-continuity. Whereas the self-continuity function more frequently involves recent memories, the age of the memory may not be as important for serving social-bonding: individuals may share recent but also distant memories to create bonds. For using memory to direct behavior, more recent memories and one's that are not particularly positive appear to be more frequently used. This may signal that they are being used to avoid repeating past mistakes. In sum, this research thus begins to map how different types of autobiographical memory are flexibly used to serve functions in very different psychosocial domains.

Limitations and Conclusion

Note that the TALE assesses only three adaptive functions. Some researchers argue for a fourth function (i.e., emotion regulation) or investigate maladaptive memory uses. Future studies may also benefit from collecting more than two memories per participant, and performing narrative coding to examine the content of memories likely to serve each function. Despite limitations, this research begins an examination of the multiple factors (i.e., ecology) that influence memory serving very different ends. Findings show that distinct sets of factors are at work when individuals use memory to serve diverse psychosocial functions to adaptively navigate everyday life.

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Table 1

Study One - Summary of three hierarchical multiple regressions predicting distinct memory functions

	Self-Continuity function				Social-Bonding function				Directing-Behavior function			
Step 2	B	SE B	β	<i>t</i>	B	SE B	β	<i>t</i>	B	SE B	β	<i>t</i>
1. Memory Time (Distant, Recent)	.35	.13	.17	2.64*	.16	.15	.08	1.10	.66	.14	.31	4.78**
2. Self-Concept Clarity	-.20	.09	-.13	-2.21*	.04	.10	.03	.39	-.07	.09	-.04	-.75
3. Self-Relevance	.55	.07	.59	8.52**	.36	.07	.41	4.93**	.50	.07	.52	7.30**
4. Valence	-.03	.02	-.09	-1.55	.03	.02	.10	1.48	-.07	.02	-.25	-4.23**
5. Vividness	.00	.09	.00	.03	.06	.10	.06	.61	-.07	.10	-.06	-.69

Note. Memory Time: 1 = distant, 2 = recent. SCC = Self-Concept Clarity. Valence: higher = more positive.

* $p < .05$, ** $p < .001$.

$R^2 = .02$ for Step 1 ($p < .05$); $\Delta R^2 = .45$ for Step 2 ($p < .05$); $\Delta R^2 = .01$

$R^2 = .01$ for Step 1 ($p > .05$); $\Delta R^2 = .25$ for Step 2 ($p < .05$); $\Delta R^2 = .01$

$R^2 = .01$ for Step 1 ($p > .05$); $\Delta R^2 = .44$ for Step 2 ($p < .05$); $\Delta R^2 = .00$

Table 2

Study 2- Summary of three hierarchical multiple regressions predicting distinct memory functions

Step 2	Self-Continuity function				Social-Bonding function				Directing-Behavior function			
	B	SE B	β	t	B	SE B	β	t	B	SE B	β	t
1. Memory Time (Distant, Recent)	.24	.07	.12	3.30**	.13	.07	.07	1.78	.37	.08	.18	5.29**
2. Self-Concept Clarity	-.20	.05	-.15	-4.49**	-.08	.05	-.06	-1.82	-.08	.04	-.06	-1.88
3. Self-Relevance	.57	.04	.61	16.23**	.47	.04	.53	12.88**	.55	.04	.59	15.82**
4. Valence	-.10	.03	-.13	-3.76**	.05	.03	.07	1.95*	-.22	.03	-.28	-8.42**
5. Vividness	-.06	.05	-.04	-1.15	-.00	.05	-.01	-.09	.00	.05	.01	.06

Note. Memory Time: 1 = distant, 2 = recent. SCC = Self-Concept Clarity. Valence: higher = more positive. * $p < .05$, ** $p < .001$.

$R^2 = .00$ for Step 1 ($p > .05$); $\Delta R^2 = .40$ for Step 2 ($p < .05$); $\Delta R^2 = .01$

$R^2 = .00$ for Step 1 ($p > .05$); $\Delta R^2 = .32$ for Step 2 ($p < .05$); $\Delta R^2 = .01$

$R^2 = .00$ for Step 1 ($p > .05$); $\Delta R^2 = .43$ for Step 2 ($p < .05$); $\Delta R^2 = .01$