

Autobiographical Memory Functions Served by Multiple Event Types

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Summary: Autobiographical memories are thought to serve three basic functions: self-definition, social connection, and directing future behavior. Previous research suggests that the function a memory comes to serve may differ by the type of event recalled (e.g., single unique events vs. repeated or recurring events). In two studies, we compared memories for different event types on function served. Results from Study 1 suggest that narratives of single events serve more of a self and directive function compared with recurring events, whereas recurring events serve more of a social function. Extended events, however, were high on all three functions. Study 2 specifically examined single and recurring events. Results replicated and extended Study 1 using both narrative coding and questionnaire measures. Implications of the examination of multiple event types and functional approaches to autobiographical memory for understanding links between experiences and psychological outcomes are discussed. Copyright © 2013 John Wiley & Sons, Ltd.

As early as 1932, Fredrick Bartlett (1932) criticized the strategy of focusing memory research on simple, often meaningless, materials in restricted contexts. Nonetheless, this strategy persisted until Neisser's (1982) and Baddeley's (1988) works on the form and function of memory in natural contexts called attention to more complex and personally meaningful materials. This led to a substantial body of research on the accuracy and structure of autobiographical memory. Recent theoretical and empirical work on the ecological functions of autobiographical memory suggests that memories of personally significant events from our lives serve three basic functions—self-definition, fostering social connection, and directing future behavior (e.g., Bluck, Alea, Habermas, & Rubin, 2005; Hyman & Faries, 1992; Pasupathi, Lucas, & Coombs, 2002; Pillemer, 2001, 2003). To date, work on the self, social, and directive functions of autobiographical memory has focused primarily on demonstrating that people generally use their memory in these ways, typically assessed only by questionnaire (see Pillemer, 2009, for a discussion of this issue). However, it is unclear if, and how, these kinds of functional roles are expressed and used in relation to different types of specific autobiographical memories, or how these functions may be expressed in narrative recall as well as self-report questionnaires. Thus, the major goal of this research was to examine the functions served by specific autobiographical memories using multiple measures (i.e., narrative coding and questionnaires) and multiple types of event categories (e.g., unique vs. repeated events).

Functions of autobiographical memory

The functions of autobiographical memory have been defined in a variety of ways. Researchers have suggested that autobiographical memory serves a self function by creating a stable and enduring representation of self or identity (Bluck & Alea, 2008; McAdams, 1995; Wilson & Ross, 2003). The social function has been defined as the sharing of autobiographical memories both to create intimacy and to create and foster social relationships via a stable representation of a shared

history/shared experiences between individuals (Alea & Bluck, 2007; Bluck et al., 2005; Fivush, Haden, & Reese, 1996, 2006). Finally, the directive function is described as the use of/reflection on autobiographical memories to resolve problems or direct future behavior and goals (Kuwabara & Pillemer, 2010; Pillemer, 2003).

The majority of work on the functions of autobiographical memory takes a questionnaire approach. For example, Bluck et al. (2005) examined the self, social, and directive functions using the 'Thinking about Life Experiences Questionnaire' (TALE; Bluck & Alea, 2011). Participants rated statements designed to capture each function of autobiographical memory, and then, the underlying factor structure of the TALE was examined. The items produced four factors, a self function, two social (creating and nurturing relationships) functions, and a directive function. The findings of Bluck et al. (2005) provided some of the first empirical support for the proposed ecological functions of autobiographical memory (see also Rasmussen & Habermas, 2011; Bluck & Alea, 2011). Bluck and Alea (2008) examined the self function in younger and older adults, predicting that, because of the developmental demands of identity formation, younger adults would report using their memories for the self function more than the older adults. Their results were consistent with this prediction. Several studies suggest that individuals who use memories of their personal relationships to serve social functions tend to report closer and more satisfying relationships (Alea & Bluck, 2007; Alea & Vick, 2010). For example, Alea and Vick (2010) found that individuals who claimed to rehearse memories that defined their relationship with their romantic partner more often reported higher levels of marital satisfaction (also Alea & Bluck, 2007). Kuwabara, Rouleau, and Pillemer (2011) specifically examined the directive function of autobiographical memory in a sample of school-aged children who completed a set of problem-solving tasks. Children who reported recalling more problem-relevant autobiographical memories during the task also generated more potential solutions for the problems, indicating that these memories helped direct current behavior. In a related study, Kuwabara and Pillemer (2010) examined the directive function of autobiographical memory on donation behavior with an undergraduate sample.

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Students who were prompted to think of memories associated with their current school were more likely to donate to their school rather than another charity, compared with controls. Interestingly, these effects were more or less independent of the valence of the memories recalled. These results suggest that the quantity of autobiographical memories cued by a situation/problem prompts the directive function in ways that influence current behavior.

Regarding the measurement of the functions of autobiographical memory, previous research has relied almost exclusively on questionnaire measures of each function. This is limited for several reasons, as pointed out by Pillemer (2009). First, questionnaires only address conscious uses of memory to serve a specific function. There is research to suggest, however, that people are often not aware of the functions a memory may have served or be serving (Kuwabara & Pillemer, 2010). Secondly, questionnaire measures assume that participants are accurate at estimating the frequency or regularity that they use their memories for self, social, or directive functions. Finally, because questionnaire items are specified by the experimenter, participants are restricted to respond only to the items presented. Narrative assessment provides several complements to these limitations. First, narratives allow for the integration of both explicit and more implicit goals and associations (Bruner, 1986, 1990; Conway, Singer, & Tagini, 2004). Narrative measures do not rely on participants making accurate estimates of functions served. Narratives are also open ended, allowing for ecologically valid assessment of how functions may be integrated spontaneously into our memories of everyday life. Thus, both questionnaire and narrative assessments of function are important and may each provide unique information about the functions of autobiographical memories. Thus, the major objective of Study 1 was to examine functions of autobiographical memory as expressed in narratives. Because this involved developing new coding schemes, Study 2 served as a test for replication of the initial findings and to extend and relate these findings to questionnaire measures of memory functions.

Function and event type

The majority of research on autobiographical memory has focused on personally significant autobiographical memories that are discrete, usually unique, often dramatic or traumatic, events or episodes (but see Stein, Ornstein, Tversky, & Brainerd, 1997, for a discussion of memory for everyday events). However, studies that have examined open-ended autobiographical memory recall indicate that extended events (e.g., a three-day car trip with your father) and recurring events (e.g., Sunday dinners with family) are also common in autobiographical memory (Barsalou, 1988; Brewer, 1986, 1988). Furthermore, individuals often attach substantial meaning to such events. This suggests that extended and recurring events may also shape self-definition, create social connections, and play a directive role in behavior. Thus, a second major goal of this study was to assess the multiple functional roles (self, social, and directive) of single, recurring, and extended event memories.

The self function served by single event memories has received significant theoretical and empirical attention. McAdams' (1995) model of adult personality outlines a strong link between single unique events and the self function of autobiographical memory. Specifically, he maintains that autobiographical narratives are constructed and combined to form a stable enduring identity, or self, beginning in adolescence and early adulthood and continuing across the life span. Essentially, self is represented in autobiographical narrative and conveyed to others, and to the individual, through expressing or sharing autobiographical narratives (see Singer & Blagov, 2004, for a detailed discussion of self-defining memories).

Although single events have received the majority of empirical attention in autobiographical memory research, some studies have examined the other types of events that make up the contents of our memories. Barsalou (1988) asked undergraduate students returning in the fall to describe what they did over the summer in the order that the events come to mind, for 5 minutes. Students produced specific, single-event-related statements only about 20% of the time. Thirty per cent of the statements were summaries of recurring events ('I played a lot of softball'), another 30% of the statements described general aspects of the events ('the house we rented was beautiful'), and 9% of the statements referenced an extended event ('I went to San Francisco for two weeks').

In a second study, Barsalou (1988) required undergraduate students to produce information about their summer vacation during three sessions that were each 2 weeks apart. Participants were first asked to provide a list of either as many people, places, activities, or times when things happened over their summer vacation. Two weeks later, they were given each item from the list they produced as cues and asked to retrieve as many related memories as possible. In the final visit, participants were asked to categorize each event they recalled as either a specific event or a summarized event (recurring event). About 60% of all the cued memories were summarized events. These results suggest that although single events account for a significant proportion of autobiographical memories in both cued and free-recall conditions, recurring and extended events are also an important part of representations of the personal past (see Conway & Pleydell-Pearce, 2000; Conway, 2005, for further discussion of autobiographical memory organization).

This conclusion is supported by a large literature on scripts. Although originally described with the development of artificial intelligence in mind, Schank and Abelson's (1977) script concept has been a generative model for understanding human memory (see Waters, 2011, for a review). Schank and Abelson (1977) described a script as a cognitive structure (a form of schema) that contains temporal causal information about a recurring class of personally experienced events and guide behavior and expectations, serving a directive function (Abelson, 1981). Scripts such as the 'restaurant script' contain information to help direct an individual's behavior at any given restaurant. The behaviors (and their specified order) are derived by automatic generalization processes that occur as a class of events, in this case, eating at a restaurant, is repeatedly experienced. Scripted events

may indeed come to serve multiple functions in a more personally significant sense. One might grow up watching 'Saturday Night Live' with one's family as a child and then establish that as a tradition with roommates at college, or perhaps annual fishing trips with dad become annual fishing trips with son. Thus, according to Schank and Abelson (1977), a recurring event can come to serve self-defining and social, as well as directive, functions over time.

Several predictions can be made from the existing literature regarding the relations between autobiographical memory event types and the functions served by those memories. For the self function, research on self and identity suggests that single events will serve the strongest self function (e.g., Singer & Blagov, 2004). Yet it is reasonable to argue that recurring or extended experiences also play an important role in self-definition simply because these experiences have occupied a larger proportion of an individual's life. In addition, recurring events may serve a self-defining function because these are events in which the self has engaged multiple times and therefore may lead to a more rehearsed and accessible concept of self. In terms of the directive function, research on cognitive scripts and work on children's memory (Nelson, 1986) suggest that recurring events will play an important directive role. That said, Pillemer (2003) has argued for the directive power of the specific episode on the basis of several case studies. Finally, there are no clear hypotheses from research on the social functions of autobiographical memory that suggest how people use single, recurring, or extended events to create representations of the importance of social relationships or to facilitate intimacy, bonding, and closeness. However, we predicted that recurring and extended events may serve these functions mostly because they represent longer periods and often represent ongoing relationships, making them better suited to represent the development of relationships over time.

STUDY 1

The major objective of Study 1 was to examine the expression of the functions of autobiographical memory across autobiographical narratives of multiple event types. Previous literature suggests that autobiographical memory consists of a hierarchical organization of multiple event types (e.g., Barsalou, 1988; Conway & Pleydell-Pearce, 2000) and that these different event types may lend themselves to serve certain functions more than others. Currently, however, there has been no empirical examination of this issue, and it is unknown how single, recurring, and extended event types are used to serve the self, social, and directive functions in everyday life. Furthermore, to date, there is little research on how functions are expressed in autobiographical narratives, and this is a critical question for extending the research on autobiographical memory function beyond a single type of measure.

Participants

Fifty-two undergraduate students (26 women) were recruited through a subject pool at a mid-size private university. Twenty-nine of the participants self-identified as Caucasian,

seven as Asian, four as African-American, and one as Indian, and 11 did not provide ethnicity information or described themselves as part of multiple ethnic groups. Participants were compensated with credit toward their introductory psychology courses. The participants' ages ranged from 18 to 23 years ($M=19.3$; $SD=1.35$). All participants gave written informed consent as approved by the Institutional Review Board.

Procedure

The data were collected in groups of up to 10 participants in a 60-person university lecture hall. Upon arrival, each participant received a narrative workbook and instructions to write narratives about six different important personal experiences: two single events, two recurring events, and two extended events. The order of the event type (single, recurring, and extended) was counterbalanced, yielding six different orders. The procedure took approximately 60 minutes to complete.

Narrative elicitation

For each narrative, participants were encouraged to provide as much detail as possible. Each event type was first described to the participant (i.e., this single event should be a specific happening or significant episode that happened to you in your past, set in a particular time and place; this recurring event should be an event that you experienced multiple times in your life with mainly the same people and setting; and this extended event should stand out to you as an important experience or period in your life; for full instructions, please contact the authors). Participants were then instructed to provide a narrative with as much detail as possible, including 'what happened, where you were, who was involved, what you did, and what you were thinking and feeling during the event' and to try and convey the impact the event has had in their life. Full instructions are available upon request from the authors.

Narrative coding

All narratives were transcribed verbatim from the written workbooks into word documents, and word documents were spot checked for accuracy of transcription before coding. Each narrative was coded on three 4-point continuous scales developed for this study, assessing the expression of self, social, and directive functions (available upon request from the authors). The coding scheme was developed on a subset of the narratives collected, and reliability was assessed on narratives not used for coding development.

Overall, the function-coding schemes focused on the participants' evaluations and reflections of what functions each event came to serve. Although the entire event narrative was read by each coder, scores were only assigned when the participants indicated in some way that the event came to serve one of the three functions of autobiographical memory (Table 1). The self-coding scheme focused on related content, specifically to aspects of self esteem, identity, and self-understanding contained in the narrative. The social function scheme focused on narrative content that conveys a sense of valuing specific social relationships or enhanced

Table 1. Autobiographical Narrative Examples of Self, Social, and Directive Functions

Function	Narrative examples
Self	<p>'[this event] made me realize that I can do pretty much anything because I was able to get through that. At the time it was just something that happened to me, but now I realize that it was more than that and it was something that changed me'</p> <p>'[this event] has a significant meaning to me because it taught me what a wicked and sinful person I am...'</p>
Social	<p>'I still feel most connected to him when I think about all those hours spent in my room, listening to his enthusiasm as he told the story of Frodo and the ring'</p> <p>'The impact this had on me increased the importance of family in my life. I appreciate how close my dad's family is and that I get to be a part of it. My aunt and everyone else always made me feel loved and appreciated.'</p>
Directive	<p>'Since that event, I've tried to be more careful watching my other dogs and making sure they don't go out in the street'</p> <p>'In the future, I will not be hosting any [parties] where personal property has the potential to be damaged.'</p>

closeness when recalling the event. The directive function scheme scores narrative content that described changes in behavior as a result of the events contained in the narrative. Each narrative received a score on self, social, and directive function scales (80% of the narratives received at least one nonzero score on the function scales).

As this was the first use of this coding scheme, reliability was established between two independent coders on a large subset of 90 narratives (29%) to provide adequate experience in coding narratives of each event type (30 of each). In cases of disagreement, scores were taken from the expert coder (i.e., the developer of the coding system). The reliability analyses on the narrative measures of self, social, and directive functions produced intraclass correlations of 0.76, 0.80, and 0.37, respectively. Following reliability, the remaining narratives were divided between the two coders and coded independently. Note that the low alpha for the directive function scale was due to a large proportion of zeros in the data. The coder's scores matched on 90% of the narratives for the directive function and were therefore considered reliable. The range of scores obtained during coding on each scale was 0–3.

Results

Analyses focused on how self, social, and directive functions were expressed in the narratives of each type of event, single, recurring, and extended. All analyses are based on the mean scores across the two events provided in each category. Preliminary analyses indicated no significant relations between the function coding and either the number of words per narrative (single: $M=190.63$, $SD=69.07$; recurring: $M=169.76$, $SD=72.03$; and extended: $M=203.75$, $SD=91.39$)

or gender of participant, so these variables were not considered in the function analyses.

Event type and narrative function

Figure 1 displays the mean score of each event type on each of the three functions. An initial 3×3 (event type: single, recurring, and extended \times function: self, social, and directive) repeated-measures analysis of variance (ANOVA) revealed a significant main effect for function, $F(2, 102)=70.51$, $p < .001$, and a significant interaction between event type and function, $F(4, 204)=12.39$, $p < .001$. There was also an effect for event type, $F(2, 102)=3.10$, $p = .049$. Thus, repeated-measures ANOVAs on each function were conducted across event type, followed up by post-hoc comparisons at the $p < .05$ level (Bonferroni correction applied). The ANOVA on the self function revealed a significant main effect, $F(2, 50)=7.21$, $p = .001$; simple comparisons indicated that single and extended events expressed significantly more self function compared with recurring events, $F(1, 51)=10.34$, $p = .006$; $F(1, 51)=13.39$, $p = .003$, but did not differ from each other, $F(1, 51) = .02$, $p = 1.00$. For the social function, there was again a significant main effect, $F(2, 50)=15.53$, $p < .001$, and simple comparisons indicated that recurring and extended event narratives expressed significantly more social function than did single events, $F(1, 51)=30.47$, $p < .001$; $F(1, 51)=20.21$, $p < .001$, but did not differ from each other, $F(1, 51)=1.64$, $p = 1.00$. Finally, a comparison of directive function content across event types showed a trend toward significance, $F(2, 50)=2.86$, $p = .06$. Simple comparisons revealed that directive function content appeared marginally more in single event narratives compared with recurring events, $F(1, 51)=5.74$, $p = .06$. Single events did not significantly differ from extended events on directive function, $F(1, 51)=0.67$, $p = 1.00$. Also, recurring event and extended event narratives were not found to contain significantly different levels of directive function, $F(1, 51)=3.33$, $p = .21$.

We observed that each event type served multiple functions and therefore conducted several ANOVAs to examine differences in self, social, and directive function scores within each event type. Analyses on the single-event narratives revealed that self function was significantly more prevalent than either social or directive functions, $F(1, 51)=45.98$, $p < 0.001$; $F(1, 51)=62.72$, $p < 0.001$, and that social and directive functions did not significantly differ within single events, $F(1, 51)=0.03$, $p = 1.00$. Within recurring-event narratives, we found significantly higher scores for the social function than the directive function, $F(1, 51)=66.07$, $p < .001$, but not the self function, $F(1, 51)=4.23$, $p = .13$; the result was significant prior to correction, and scores for the self function were significantly higher than those for the directive function, $F(1, 51)=45.16$, $p < .001$. Finally, we found that extended events served significantly more self function compared with the directive function, but not the social function, $F(1, 51)=82.38$, $p < .001$; $F(1, 51)=4.07$, $p = .15$, with the social function score falling between self and directive functions, being significantly greater than the directive function, $F(1, 51)=22.94$, $p < .001$.

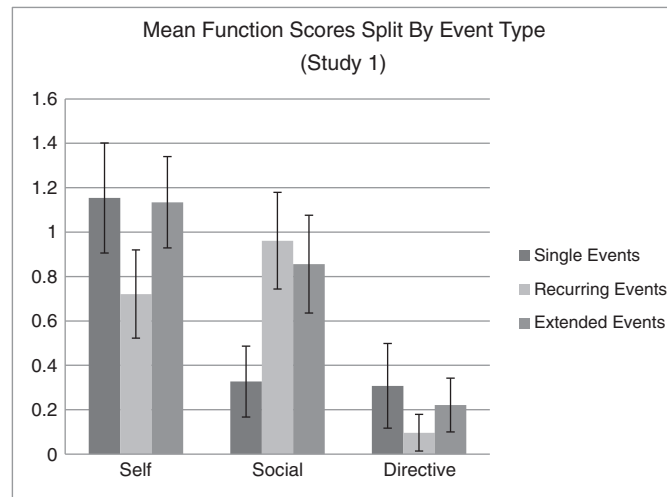


Figure 1. *M* function scores based on narrative coding across event types. Error bars represent 2 *SEM*

Discussion

In this study, we extended the literature on the functions of autobiographical memory for different event narratives. Our results suggest the following: (i) single, recurring, and extended event narratives differ in the extent to which they express different functions; and (ii) all three event types serve multiple functions simultaneously. More broadly, our findings suggest that what we know from autobiographical memory research on single/unique events may not be true of other types of event memories. The analyses by function revealed that single and extended events expressed more self function than did recurring events, but extended and recurring events expressed more social function than did single events. Single and extended events also expressed more directive function than recurring events but did not differ from each other. The within-event-type analyses suggested that extended events contain high levels of self and social functions, whereas single events contain comparatively high levels of self and directive functions and recurring events contain high levels of social function. Interestingly, extended events were comparatively high on all three functions. This finding fits well with the Conway and Pleydell-Pearce (2000) hierarchical model of autobiographical memory, which proposes that extended events are an amalgam of single and recurring events. As a result, because they are essentially the sum of multiple single and recurring events, extended events seem to represent the features of both single and recurring events and serve high levels of each function.

Study 1 provided the first examination of the functions served by autobiographical memories of different event types. The results were promising. However, several issues remained. Study 1 employed only a narrative measure of the functions. Although the results clearly indicate that individuals express the different functions of autobiographical memory in their personal narratives, the inclusion of a questionnaire measure of the functions served could provide evidence of convergent validity and provide an important replication and extension of Study 1. Furthermore, replication in a larger sample would provide critical validation of the results and conclusions of Study 1.

STUDY 2

The major objective of this study was to test for replication and extend Study 1 by including both narrative and questionnaire measures of function and recruiting a larger sample. We aimed to do the following: (1) verify the findings from Study 1; (2) examine potential differences in the patterns of results produced by narrative and questionnaire measures; and (3) examine relations between questionnaire and narrative measures of the same constructs (convergent validity). A secondary objective of this research was to further develop and validate narrative and questionnaire measures of function to provide useful and reliable tools for future research. We included only single and recurring events for three reasons. First, theoretically, extended events do not seem to be at the same organizational level within hierarchically organized autobiographical memories (Conway & Pleydell-Pearce, 2000), and thus, it seems that a more in-depth investigation of the hierarchical relationships among these memory types is critical before we continue to compare across them. Second, empirically, from the results of Study 1, extended events do not seem to differ categorically in the way that single and recurring events do but rather seem to represent elements of both single and recurring events, again bolstering the theoretical claims of hierarchical organization. Finally, for pragmatic reasons, because we added questionnaires about each memory in addition to the narrative recall, the time that each participant spent in the study increased, and we did not want fatigue effects.

Participants

We recruited 103 undergraduate students (56 women) from four introductory-level social science courses at a mid-sized private university and given extra credit by their instructor for their participation. Forty-one participants self-identified as Caucasian, 32 as Asian, 16 as African-American, four as South Asian, and two as Hispanic, and eight did not provide ethnicity information or described themselves as multiracial. Participants' ages ranged from 18 to 28 years ($M=18.87$, $SD=1.41$). All participants gave written informed consent as approved by the Institutional Review Board.

Procedure

The data were collected as part of a larger study during the regularly scheduled meeting time of four undergraduate classes with the instructor's permission. Only those students who signed informed consent participated. Of the 109 students who received extra credit for attending the data collection sessions, six asked that their data not be used for research. These workbooks were destroyed following data collection.

Each group consisted of roughly 25 participants and was seated in a 45-person university lecture hall. As each participant arrived, they were given a narrative workbook and instructed to write narratives about four different personally significant events from their lives: two single events and two recurring events, as described later. Participants were given 60–90 minutes to complete the tasks from the larger study, including the workbook. All participants completed the task in this time. The order of the events was counter-balanced. Following each narrative elicitation, participants were asked to complete questions explicitly regarding the self, social, and directive functions (in that order) of the memory they just narrated.

Narrative elicitation

The instructions given to participants prior to writing their single and recurring event narratives were identical to those from Study 1.

Functions questionnaires

The questionnaires used in this study were informed by previous literature examining the functions of autobiographical memory more generally (e.g., Berntsen & Rubin, 2006; TALE, Bluck & Alea, 2011).

Immediately following each narrative elicitation, participants completed three questionnaires to assess the function that memory serves (self, social, and directive). The self function was assessed with the centrality of events scale (Berntsen & Rubin, 2006), a brief seven-item scale designed to assess how central an event is to a person's sense of self or identity. Although not developed from the functional perspective, the centrality of events scale assesses the extent to which a memory has become central to one's understanding of self/identity. Beyond its overlap with our operationalization of the self function, the centrality of events scale has been widely used and is well validated. Reliability for the centrality of event scale was calculated on our sample and Cronbach's α ranged from .88 to .91 for the four memories provided by the participants. Items were rated on a Likert-type scale from 1 (*totally disagree*) to 7 (*totally agree*); examples include 'I feel that this event has become part of my identity' and 'This event was a turning point in my life'. Scores obtained ranged from 7 to 35.

The social function was assessed using a six-item scale developed for this study to assess the extent to which each memory served a social function by facilitating, or enhancing the appreciation of, personal relationships. Reliability for the social function scale was calculated on our sample, and Cronbach's α ranged from .80 to .91 for the four memories. Items were rated on a Likert-type scale from 1 (*totally disagree*) to 7 (*totally agree*); examples include 'When I

think about this event I feel closer to my friends, family, or community', 'Thinking about this event reminds me of how important my relationships are', and 'When I share this memory I feel closer to the person(s) I am sharing with'. Scores obtained ranged from 6 to 30.

The directive function was assessed using a six-item scale developed for this study to assess the extent to which each memory served a directive function by changing behavior or influencing decision making. Reliability of the directive function scale was calculated on our sample, and Cronbach's α ranged from .85 to .89 for the four memories. Items were rated on a Likert-type scale from 1 (*totally disagree*) to 7 (*totally agree*); examples include 'Thinking about this event informed my decision making on several occasions' and 'Thinking about this event has helped me to better understand a problem at hand'. Scores obtained ranged from 6 to 30.

Narrative coding of functions

All narratives were transcribed verbatim from the written workbooks into word documents, and word documents were spot checked for accuracy of transcription before coding. Each narrative was coded on the same four-point scales developed to assess the expression of self, social, and directive functions developed for Study 1. Reliability was established between two independent coders on a subset of 69 narratives (17%). Reliability analyses on the narrative measures of self, social, and directive functions produced intraclass correlation of 0.76, 0.82, and 0.76, respectively. In cases of disagreement, scores were taken from the expert coder (i.e., the developer of the coding system). Following reliability, the remaining narratives were divided between the two coders and coded independently. The range of scores obtained during coding on each scale was 0–3, and 83% of narratives received at least one nonzero score for the functions.

Results

Analyses focused on comparing the extent to which autobiographical memories of single and recurring events served self, social, and directive functions through narrative coding and questionnaire measures. Preliminary analyses indicated no significant relations between function and number of words per narrative (single: $M = 200.40$, $SD = 109.73$; recurring: $M = 170.47$, $SD = 82.60$), gender of participant, or booklet order, so these variables were not considered further.

Function and event type

Narratives. An initial 2 (event type) \times 3 (function) repeated-measures ANOVA was conducted to determine if there were any significant differences in the self, social, and directive functions for personally significant single and recurring autobiographical memories served. The ANOVA produced a significant effect of event type, $F(1, 96) = 8.22$, $p = .005$, function, $F(2, 192) = 92.09$, $p < .001$, and an event type \times function interaction, $F(2, 192) = 39.17$, $p < .001$. Follow-up analyses examined each function across event types and within event types (Bonferroni correction applied). Results for these follow-up analyses are summarized in Figure 2. Comparisons of event type by function reveal that

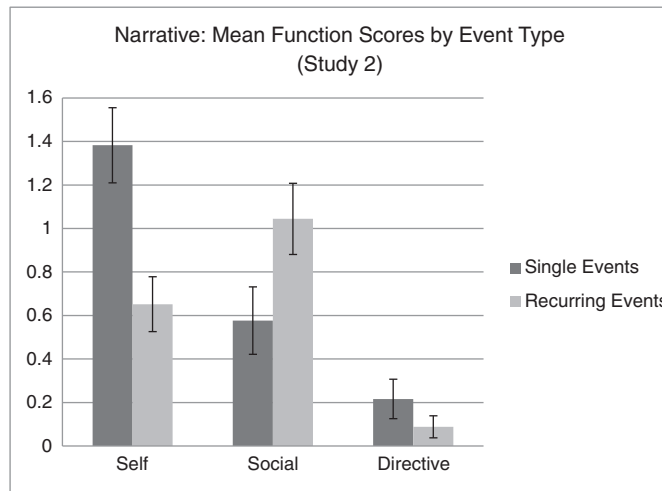


Figure 2. *M* function scores based on narrative coding across event types. Error bars represent 2 *SEM*

the self and directive functions were significantly higher for single events compared with recurring events, $t(96)=7.44, p < .001$; $t(96)=2.49, p = .045$, whereas the social function was significantly higher in recurring events, $t(96) = -4.08, p < .001$. When we look within event type, results indicate that single events serve significantly more self function compared with social or directive function, $t(96)=7.59, p < .001$; $t(96)=12.90, p < .001$, and more social function compared with directive function, $t(96)=2.79, p < .001$. Recurring events, however, serve more of a social function compared with a self or directive function, $t(96) = -4.00, p < .001$; $t(96)=10.99, p < .001$, and more of a self function than a directive function, $t(96)=9.39, p < .001$. These analyses suggest that single events serve more of a self function than any other function and more of a self function than recurring events. Recurring events, meanwhile, serve more of a social function than any other function and more of a social function than single events. The directive function appeared very minimally in the narratives and was significantly lower than the other functions regardless of event type, but single events did serve more of a directive function than recurring events.

Questionnaires. An initial 2 (event type) × 3 (function) repeated-measures ANOVA was conducted to determine if there were any significant differences in the self-reported

functions that personally significant single and recurring autobiographical memories served. The ANOVA produced a significant main effect for function, $F(1, 99)=58.70, p < .001$, and an event type × function interaction, $F(1, 99)=48.30, p < .001$, but no significant effect of event type, $F(1, 99)=82, p = .368$. Follow-up analyses examined each function across event types and within event types. Results for these follow-up analyses are summarized in Figure 3. Comparisons of event type by function reveal that single events served significantly more self function, $t(99)=2.51, p = .042$, and directive function, $t(99)=4.61, p < .001$, compared with recurring events, whereas the social function was significantly higher for recurring events, $t(99) = -4.08, p < .001$. Looking within event type, results suggest that single events were reported to serve equal levels of self and social function, $t(99) = -0.10, p = .93$, with the directive function significantly lower than both self (marginally) and social functions, $t(99)=2.22, p = .06$; $t(99)=2.53, p = .39$. Recurring events, however, served more of a social function compared with self or directive functions, $t(99) = -9.64, p < .001$; $t(99)=12.41, p < .001$, and more of a self function than directive function, $t(99)=5.84, p < .001$.

The analyses examining event type and function in the questionnaire data yielded similar results to the analyses conducted on the narrative data. Just like with the narrative

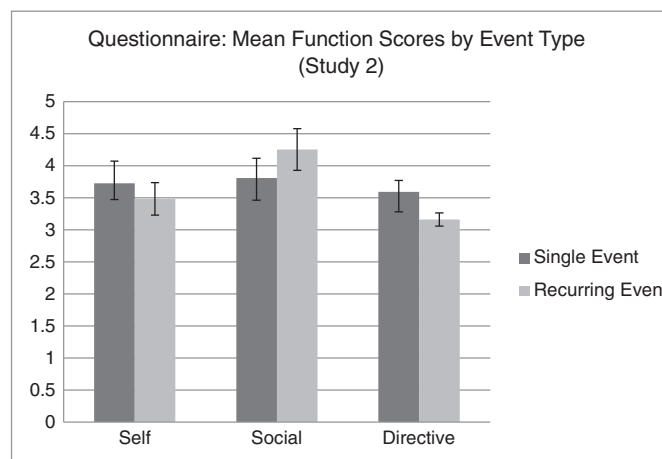


Figure 3. *M* function scores based on self-report questionnaires across event types. Error bars represent 2 *SEM*

data, the self and directive functions were higher in the single events, and the social function was higher in the recurring events. Interestingly, the within-event analyses differed slightly in the questionnaire data. Specifically, single events did not differ in the level of self and social functions they served. However, the questionnaire results within the recurring events were identical to the narrative results. Recurring events served significantly higher levels of social function, followed by self function, and finally directive function.

Given the similarity in narrative expression and self-report of the three functions of autobiographical memories, we examined whether functions expressed were related across tasks. Table 2 displays correlations between questionnaire and narrative measures of self, social, and directive functions. Notably, questionnaire and narrative measures of the self and social functions were significantly correlated for both event types, and the directive function measures were significantly correlated only for recurring events. Finally, we examined the possibility that the differences in self and social function scores by event type resulted simply from more, or fewer, people being included in the events recalled. Essentially, we questioned whether recurring events were merely more socially oriented (generally included more people) or were actually serving more of a social function compared with single events. We counted the number of people mentioned in each narrative and found that single and recurring events did not differ in the number of people mentioned, $t(90) = 0.88$, $p = .384$.

Discussion

Our findings with multiple measures of the self, social, and directive functions replicated Study 1. Across measures, we found that single events served more of a self function compared with the social or directive function. This supports previous literature that has focused on single events as critical for identity. Recurring events, regardless of measure, served more of a social function. Recurring events can often be more representative of longer periods, which may make them better suited to serve a social function as they can better capture the significant impact of ongoing personal relationships. Also, recalling and reminiscing such experiences may better facilitate closeness because their frequency/scope make them more representative of social relationships and likely contain more to reminisce about. Interestingly, the directive function was minimally served by both event types for both measures (see Hyman & Faries, 1992, for a similar finding). That said, single events did score significantly higher on the directive function, supporting Pillemer's

(2003) arguments for the directive power of single episodes. These results should, however, be viewed in the context of the other functions. Although single events may serve a greater directive function compared with recurring events, in general, the directive function of autobiographical memory seems to be less common overall. This suggests, at least for emerging adults, that autobiographical memory may be more of a social system used for self and relationships (see Fivush, 2010, for elaboration of this argument). Regarding the examination of convergent validity of the narrative and questionnaire measures of the functions utilized here, results were modest.

GENERAL DISCUSSION

In this study, we extended the literature on the functions of autobiographical memory by examining the functions served by memories of multiple event types using both narrative and questionnaire measures. Our examination of autobiographical memory functions with narrative coding, consistent with suggestions from previous literature, found that single events scored higher on self and directive functions compared with recurring events, whereas recurring events scored higher for social function. Within event types, single event narratives scored highest on the self function followed by social function and directive function scores. Recurring events scored highest on the social function, followed by the self function, with the directive function scoring the lowest. Extended events (Study 1 only) were found to be high on all functions compared across event types. Questionnaire assessments of the functions of autobiographical memory produced similar results (Study 2).

The studies presented here clearly demonstrate the value in examining multiple event types in autobiographical memory. Individuals use these different event types to varying degrees in the construction and representation of self and social relationships. Furthermore, the event types examined here serve to guide behavior to varying degrees. These results suggest that what we know about autobiographical memory from single events cannot be assumed to be generalizable to autobiographical memories from other event categories.

Previous research on self and identity suggests that single events serve a strong self function. Yet as our results suggest, extended events also play an important role in self-definition. This finding may result because of the broader scope and greater temporal extent of these experiences. Because extended events represent substantial periods of one's life, and their boundaries may be determined by significant

Table 2. Correlations between narrative and questionnaire assessments of memory function within event type

Questionnaire	Narrative coding					
	Single events			Recurring events		
	Self	Social	Directive	Self	Social	Directive
Self	.343**	.271*	.082	Self	.343**	.348**
Social	.145	.380**	-.121	Social	.096	.424**
Directive	.341**	.196	.145	Directive	.259**	.258**

* $p < .05$, ** $p < .01$.

events in life or history (Brown & Lee, 2010), they may be more representative of an individual's life or environment and thus make them excellent fodder for the construction of a self. Similarly, we would argue that the scope that recurring events represent (frequently repeated activities) imbues them with the traditions and rituals that are representative of particular social relationships. In this sense, recurring events are more about the 'we', and what 'we' do compared with single events. Perhaps because of this, recurring events were found to serve a higher social function compared with the self or directive function. Importantly, the differences in social function between single and recurring events are not attributable to the mere inclusion of more people (Study 2). Something about the feeling of a shared experience may instead underlie the differences observed here.

For both event types, self and social function measures were significantly correlated, whereas measures of the directive function were only correlated for recurring events. There were also several other correlations across functions (within and across measurement method). This suggests that individuals who use their memories for one function are more likely to use it for the others. This may imply that the propensity to use autobiographical memories to serve self, social, and directive functions is a meaningful individual difference. Although further research is necessary, this finding may represent a link between the functional approach to autobiographical memory and personality theories that emphasize autobiographical narrative as a central construct of individual differences. Individual differences in participants' propensity to use their autobiographical memories to serve self, social, and/or directive functions may be firmly rooted in development and socially/culturally mediated (Fivush, 2008; Fivush & Nelson, 2006; Fivush & Waters, *in press*).

Beyond our examination of the functions of autobiographical memories for multiple event types, we presented data relevant to the validity and reliability of the narrative coding and questionnaire measures designed to assess the functions that specific autobiographical memories serve. Both domains of measurement have strengths and weaknesses and are likely best used in concert. For example, the directive function was largely undetected in the narrative data yet clearly present in the participants' questionnaire responses. It is possible that this kind of information may not be easily integrated into event narratives. Directive information may extend beyond the boundaries of the event (e.g., after I nearly drowned, I stopped swimming in the ocean); thus, participants may have felt that this information was not as relevant to the task of narration. Alternatively, the directive function may operate largely out of conscious awareness unless explicitly promoted to think about it (Kuwabara & Pillemer, 2010). However, narratives do allow for the integration of specific event details and implicit meaning, perspectives, and associations (Bruner, 1986) likely not tapped by explicit measures such as questionnaires.

Questionnaires can be tailored to assess specific dimensions of each function in ways a narrative cannot. To date, work on the functions of autobiographical memory has not focused on how specific memories come to serve any given function (but see Bluck & Alea, 2011; Rasmussen &

Berntsen, 2009). Instead, research has focused on questionnaire reports of how frequently people use their autobiographical memories to serve various functions (e.g., Bluck et al., 2005). This work has been important in validating the existence of discrete functions of autobiographical memory. Our aim was to extend this work to the level of individual memories. Our results suggest that we have succeeded in developing useful measures that have demonstrated several critical features of reliability and validity. Certainly, future research is needed to further validate these measures, yet initial results are promising. Providing evidence of predictive validity, Waters (2013) found that the questionnaire measures of the functions used here were significantly correlated with psychological well-being.

Perhaps not surprisingly, functions were not identified with one specific event type, but rather the event types often served multiple functions simultaneously. This trend/effect was observed in both the narrative and questionnaire measures. For example, 33% of the narratives in Study 1 indicated that the memories served multiple functions. The extent to which these functions change over developmental time is still unknown but represents a promising future direction for research. It may also be worthwhile to examine the effects of written versus oral narrative tasks on the expression of autobiographical memory functions.

Future research should also seek a better understanding of how the functions of autobiographical memory fluctuate across the life span, as these studies were limited to a one time point assessment of one age group. It is likely that the functions that a specific memory serves are not stable, short-term, or across the life span. For example, many of the recurring events described in this study involved family. It is possible that although they did not serve a directive function in late adolescence, in adulthood, these memories of recurring events from childhood may direct parenting behavior or the establishment and maintenance of family rituals (all directive functions). Similarly, a single event about graduating high school may serve a significant self function as a college freshman but will likely take a backseat to graduating from college later in life. Also, we readily acknowledge that our patterns of results for functions, within and across event type, may differ across cultures. This too will be an interesting area for future research. Research on less individual-focused cultures suggests that the self and social functions may not be equally prevalent across cultures (Wang, 2001). Our understanding of the functions autobiographical memory serves would be significantly deepened with more diverse samples, both within western cultures and outside of them.

In terms of application, a functional approach to autobiographical memory may help us better understand links between experiences and subsequent psychological outcomes. Waters (2013) has demonstrated that individuals who use their memories to serve the self, social, or directive function reported higher levels of psychological well-being. Furthermore, research suggests that relations between personal experiences and outcome measures can be influenced by the functions those experiences come to serve. For example, Boals and colleagues found that individuals who experienced a trauma reported higher levels of posttraumatic growth if they used that event to serve a self function

(assessed using the centrality of events scale; Boals, Steward, & Schuettler, 2010; Schuettler & Boals, 2011).

In conclusion, the results of this study show promise for the functional approach and the expansion of autobiographical memory research beyond discrete unique single events to other categories of experience. In general, recurring and extended events have been overlooked in the autobiographical memory literature. We have shown that examining event types other than single events can enrich our understanding of autobiographical memory and its functions.

ACKNOWLEDGEMENTS

The authors would like to thank Drs Lawrence Barsalou, Scott Lilienfeld, Joseph Manns, and Bradd Shore for their thoughtful comments during the conceptualization of this project. We would also like to thank Kelly Tracey, John Shallcross, Chanie Howard, Yaa Cheremateng, Lauren Albers, Sumarga Suanda, Widaad Zaman, and Jennifer McGee for their assistance with data collection, transcription, and coding.

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