Beyond the Distinction Between Word-Cued Versus Important Autobiographical Memories: A Reply

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Abstract

In this reply to the three commentaries on our target article, we follow up and elaborate upon several points raised by the commentary writers. In particular, we highlight their comments on issues concerning (1) the reminiscence bump in word-cued versus important memories, (2) the reminiscence bump outside of autobiographical memory, and (3) other effects of cueing on the temporal location of the bump in autobiographical memory. We conclude that our demonstration, in the target article, of two different bumps at two different locations, – one bump for word-cued memories and another bump for important memories – appears to be just the tip of the iceberg, as there is good reason to suspect that the location of the bump is sensitive to a wide range of manipulations of cueing procedure. We suggest that researchers should take this apparent flexibility of the bump into account in future studies on the phenomenon.

Beyond the Distinction Between Word-Cued Versus Important Autobiographical Memories: A Reply

We thank Habermas, Hatiboğlu, and Köber (2015), Janssen (2015), Rubin (2015) and for their thoughtful commentaries on our target article (Koppel & Berntsen, 2015). We would like to use this reply to follow up and elaborate upon a few of the points they raise, concerning, specifically, (1) the reminiscence bump in word-cued versus important memories, (2) the reminiscence bump outside of autobiographical memory, and (3) other effects of cueing on the temporal location of the bump in autobiographical memory.

The Reminiscence Bump in Word-Cued Versus Important Memories

In our target article, we argue that the mechanisms underlying the reminiscence bump in word-cued memories are poorly understood. We reason that, among other considerations, (1) the identity formation, life script, and life story accounts are more consistent with the later bump in important memories than the earlier bump in word-cued memories, (2) none of the existing accounts accounts say anything about the retrieval strategy (or strategies) used in generating word-cued memories, and (3) nor can any of the existing accounts explain the basic finding that the location of the bump differs for word-cued versus important memories, though the life script account may provide the best explanation for the bump in important memories.

Habermas et al. (2015) specifically focus on our claims about the bump for important memories. They argue that this bump is best understood in terms of their account based on the life story schema, which shares many features with the life story account (Glück & Bluck, 2007)

discussed in our article. Let us be explicit. We find that their account provides an insightful and valuable description of the development of the life story and its relation to personal identity. However, it suffers from many shortcomings when evaluated specifically as an explanation of the bump. First, as we point out in the target article in relation to the life story account, their account is unable to explain the differential locations of the bump for word-cued versus important memories.

Second, it has difficulties explaining other cue-dependent variations in characteristics of the bump (some of which we do not discuss in our article), such as the absence of a bump when memories are retrieved in response to a request for negative events (Berntsen & Rubin, 2002; Rubin & Berntsen, 2003), and the apparently earlier bumps for odor-cued and vivid memories, which we return to later. Thus, like the life story account (Glück & Bluck, 2007), Habermas et al.'s (2015) account is ill-suited for explaining how the bump can be moved (or removed) by varying the nature of the cues.

Third, although we do not make this point in our target article, any account that emphasizes highly individualistic meaning-making processes as underlying the bump has difficulties explaining the finding that the lifespan distribution of important and emotional memories of middle-aged and older people can generally be reproduced by young people, when they are asked to generate imaginary memories of a fictitious older person in response to the same cues (Berntsen & Rubin, 2002, 2004; Rubin & Berntsen, 2003). A strength of the life script account is that it can account for such findings, as well as for variations in characteristics of the bump when memories are sampled in response to requests for emotional events (Berntsen & Rubin, 2002, 2004; Rubin & Berntsen, 2003). In spite of these strengths, as we note in the target article, the life script account, like all other existing accounts (including the account

advocated by Habermas et al., 2015, and the cognitive account abilities account, advocated by Janssen, 2015), fails to directly explain the differential locations of the bump for word-cued versus important memories.

Another respect in which Habermas et al. (2015) pick up on our discussion about the individual bumps for word-cued and important memories, and wherein they focus more on our contentions regarding the weaknesses of current accounts in explaining the bump in word-cued memories, is by putting forth a goal-based account of each bump. They suggest that, whereas conscious life goals are formed in adolescence and help structure the intentional recollection of important memories, implicit motives are formed in childhood and play a role in the more automatic process of which past events come to mind in association to external stimuli, such as word cues (Woike, 2008). Although this dual-process account of the bumps in word-cued and important memories represents a novel and intriguing suggestion, it requires direct testing.

The Reminiscence Bump Outside of Autobiographical Memory

As Janssen (2015) notes, the reminiscence bump is not unique to autobiographical memory: Reminiscence bumps are also found in memory for public events (for a review, see Koppel, 2013), in the distributions of favorite books, movies, and records, and in judgements of the best football players of all time (see Schuman & Corning, 2014, for an overview of the bump as attained across each of these domains). We would like to echo Janssen's contention that, just as future accounts of the bump should address whether they apply to the bump in word-cued or important memories (or both), future accounts of the bump should also address whether they can be applied to the bump in these other domains as well.

Indeed, given the broadly privileged status the period of adolescence and young adulthood has in human memory, one step towards understanding what makes this period of life special would be to gain an understanding of whether similar processes are responsible for these various manifestations of the bump. The most parsimonious explanation, of course, is that there is at least some common thread underlying the bump as attained across different domains. However, it remains to be established what this common thread is, and whether the most parsimonious explanation is also the correct one.

Other Effects of Cueing on the Temporal Location of the Reminiscence Bump in Autobiographical Memory

In our target article, we distinguish between the two dominant cueing methods used in looking at the reminiscence bump in autobiographical memory, namely, the cue word method and the important memory method. However, these are not the only cueing methods that have been employed towards probing for the distribution of autobiographical memories over the lifespan. For instance, Rubin (2015) notes that several of the papers we used in calculating the average range and midpoint of the bump in word-cued memories also included a condition wherein participants generated autobiographical memories in association to odor cues (e.g., the scent of tobacco; Chu & Downes, 2000; Willander & Larsson, 2006, 2007) or imagined odor cues (i.e., participants were given a cue word and asked to imagine the corresponding odor; Willander & Larsson, 2008). In each case, an earlier bump was attained for odor-cued or imagined odor-cued memories than for word-cued memories.

Rubin (2015) suggests that for odor-cued memories proper, as opposed to memories in association to imagined odor cues, this early bump can be attributed to the different neural

structures invoked through olfaction than through word cues, as well as the direct, preconscious link between odors and emotions. However, in the case of imagined odor cues, Rubin hypothesizes that such cues elicit an earlier bump because, whereas word cues initiate a search process that involves looking for a language-based context for the event, some of the memories triggered through imagined odors may have less of a narrative context.

Moreover, there remain any number of cueing methods that have not been applied in looking at the distribution of autobiographical memories, but which could be fruitfully put towards this purpose. As Rubin (2015) notes, few other sensory cues have been used in eliciting autobiographical memories. However, future researchers could look at the distribution of autobiographical memories in association, for instance, to taste cues or sound cues. The search processes triggered through such sensory cueing methods would not only presumably differ from the search processes triggered through non-sensory cueing methods, but may differ from each other as well. Different sensory cueing methods may, in that case, yield bumps at different locations.

Furthermore, though it was outside the scope of our article to discuss differences in the location of the bump *within* studies using the cue word and important memory methods, respectively, it is far from clear that all types of cue words, or all variations on requests for important memories, yield bumps at similar locations. In the case of cue words, as Rubin (2015) notes, words that are easier to image produce earlier memories (Rubin, 1980; Rubin & Shulkind, 1997b). Therefore, a comparison of the bump as attained in association to highly imageable words versus non-imageable words would likely yield an earlier bump for imageable words.

As to the important memories method, as we discuss in the article, we grouped several related cueing methods under this umbrella term. Methods that were part of this category

included simple requests for important memories (e.g., Cuervo-Lombard et al., 2007; Glück & Bluck, 2007; Rubin & Schulkind, 1997a), requests for vivid or clear memories (Benson et al., 1992; Cohen & Faulkner, 1988; Fitzgerald, 1988; Robinson & Taylor, 1998), and free-recall procedures, in which participants were asked to freely recall autobiographical memories without any explicit instruction that the memories should be important (e.g., Conway & Holmes, 2004; Demiray, Gülgöz, & Bluck, 2009; Rabbit & Winthorpe, 1988). This grouping made sense conceptually and was necessary in making the first step in establishing that the location of the bump varies according to the method used to cue memories. However, the location of the bump may vary across the different methods we included within this category as well. The one potential indication of this we see in our article is that, of the four articles we included in which participants were asked to report vivid or clear memories (Benson et al., 1992; Cohen & Faulkner, 1988; Fitzgerald, 1988; Robinson & Taylor, 1998), two of them attained an unusually early bump by the standards of studies looking at important memories: Robinson and Taylor (1998) found a bump from 5 to 11 years of age, and Cohen and Faulkner (1988) found a bump from 0 to 10.

If we were to speculate as to why vivid memories may produce an earlier bump than other types of important memories, we would begin with our contention in the article (as initially fully elaborated in Berntsen & Rubin, 2004) that the search process for important memories is structured by the cultural life script. Thus, the search process for vivid memories may draw less upon the life script than the search process for other types of important memories, or it may simply yield different types of life script events. For instance, Rubin's (2015) hypothesis regarding the earlier bump for memories in association to imagined odor cues than for word-cued memories may apply here as well: The search process for vivid memories may place less of a

priority on finding memories with a strong narrative context than the search process for other types of important memories, and therefore may be more likely to yield relatively non-contextualized memories. That said, more research needs to be done before it could be confidently said that the bump in vivid memories is in fact located earlier than the bump in other types of important memories, and, if so, why this is the case.

Nonetheless, all of these considerations point to the question that Rubin (2015) alludes to in the title of his commentary: Just how many reminiscence bumps are there? Our demonstration of two bumps at two different locations – one bump for word-cued memories and another bump for important memories – appears to be just the tip of the iceberg; we imagine that the location of the bump is sensitive to a wide range of manipulations of cueing procedure. This, in turn, underscores one of the central points of our article. Namely, researchers would do well to move away from the heretofore common characterization of the bump as a unitary construct. Rather, researchers should make a point not only of acknowledging the bump for the flexible phenomenon it appears to be, but of designing studies intended to investigate this flexibility.

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References

- Benson, K. A., Jarvi, S. D., Arai, Y., Thielbar, P. R. S., Frye, K. J., & McDonald, B. L. G. (1992). Socio-historical context and autobiographical memories: Variations in the r reminiscence phenomenon. In M. A. Conway, D. C. Rubin, H. Spinnler, & W. W. W Wagenaar (Eds.), *Theoretical perspectives on autobiographical memory* (pp. 313-322). Dordrecht, NL: Kluwer Academic.
- Berntsen, D., & Rubin, D. C. (2002). Emotionally charged autobiographical memories across the lifespan: The retention of happy, sad, traumatic, and involuntary memories. *Psychology and Aging*, 17, 636-652. doi:1037/0882-7974.17.4.636
- Berntsen, D., & Rubin, D. C. (2004). Cultural life scripts structure recall from autobiographical memory. *Memory & Cognition*, 32, 427-442. doi:10.3758/BF03195836
- Chu, S., & Downes, J. J. (2000). Long live Proust: The odour-cued autobiographical memory bump. *Cognition*, 75, B41-B50. doi:10.1016/S0010-0277(00)00065-2
- Cohen, G., & Faulkner, D. (1988). Life span changes in autobiographical memory. In M. M. Gruenberg, P. E. Morris, & R. N. Sykes (Eds.), *Practical aspects of memory: Current research and issues: Vol. 1. Memory in everyday life* (pp. 277-282). New York, NY: Wiley.
- Conway, M. A., & Holmes, A. (2004). Psychosocial stages and the accessibility of autobiographical memories across the life cycle. *Journal of Personality*, 72, 461-480. doi:10.1111/j.0022-3506.2004.00269.x

- Cuervo-Lombard, C., Jovenin, N., Hedelin, G., Rizzo-Peter, L., Conway, M. A., & Danion, J. M. (2007). Autobiographical memory of adolescence and early adulthood events: An investigation in schizophrenia. *Journal of the International Neuropsychology Society, 13*, 335–343. doi:10.1017/S135561770707035X
- Demiray, B., Gülgöz, S., & Bluck, S. (2009). Examining the life story account of the reminiscence bump: Why we remember more from young adulthood. *Memory, 7*, 708-723. doi:10.1080/09658210902939322
- Fitzgerald, J. M. (1988). Vivid memories and the reminiscence phenomenon: The role of a self narrative. *Human Development, 31*, 261-273. doi:10.1159/000275814
- Glück, J., & Bluck, S. (2007). Looking back across the life span: A life story account of the reminiscence bump. *Memory & Cognition, 35*, 1928-1939. doi:10.3758/BF03192926
- Habermas, T., Hatiboğlu, N., & Köber, C. (2015). Why does the adolescent bump differ from the emergent adulthood bump in autobiographical memories? *Journal of Applied Research in Memory and Cognition*. [details to be filled in by the journal].
- Janssen, S. M. J. (2015). Commentary on Koppel and Berntsen: How many reminiscence bumps are there? *Journal of Applied Research in Memory and Cognition*. [details to be filled in by the journal].
- Koppel, J. (2013). The reminiscence bump for public events: A review of its prevalence and taxonomy of alternative age distributions. *Applied Cognitive Psychology, 27*, 12-32. doi:10.1002/acp.2865
- Koppel, J., & Berntsen, D. (2015). The peaks of life: The differential temporal locations of the reminiscence bump across disparate cueing methods. *Journal of Applied Research in Memory and Cognition*. [details to be filled in by the journal].

- Rabbitt, P., & Winthorpe, C. (1988). What do old people remember? The Galton paradigm reconsidered. In M. M. Gruenberg, P. E. Morris, & R. N. Sykes (Eds.), *Practical aspects of memory: Current research and issues: Vol. 1. Memory in everyday life* (pp. 301-307). New York, NY: Wiley.
- Robinson, J. A., & Taylor, L. (1998). Autobiographical memory and self narratives: A tale of two stories. In C. P. Thompson, D. J. Herrmann, D. Bruce, J. D. Read, D. G. Payne, & M. P. Toglia (Eds.), *Autobiographical memory: Theoretical and applied perspectives* (pp. 125–143). Mahwah, NJ: Erlbaum.
- Rubin, D. C. (1980). 51 properties of 125 words: A unit analysis of verbal behavior. *Journal of Verbal Learning and Verbal Behavior*, 19, 736-755.
doi:10.1016/S0022-5371(80)90415-6
- Rubin, D. C. (2015). One bump, two bumps, three bumps, four? Using retrieval cues to divide one autobiographical memory bump into many. *Journal of Applied Research in Memory and Cognition*. [details to be filled in by the journal].
- Rubin, D. C., & Berntsen, D. (2003). Life scripts help to maintain autobiographical memories of highly positive, but not highly negative, events. *Memory & Cognition*, 31, 1-14.
doi:10.3758/BF03196077
- Rubin, D. C., & Schulkind, M. D. (1997a). The distribution of autobiographical memories across the lifespan. *Memory & Cognition*, 25, 859–866. doi:10.3758/BF03211330
- Rubin, D. C. & Schulkind, M. D. (1997b). Properties of word cues for autobiographical memory. *Psychological Reports*, 81, 47-50. doi:10.2466/pr0.1997.81.1.47
- Schuman, H., & Corning, A. (2014). Collective and autobiographical memory: Similar but not the same. *Memory Studies*, 7, 146-160. doi:10.1177/1750698013508196

Willander, J., & Larsson, M. (2006). Smell your way back to childhood: Autobiographical odor memory. *Psychonomic Bulletin & Review*, 13, 240–244.

doi:10.3758/BF03193837

Willander, J., & Larsson, M. (2007). Olfaction and emotion: The case of autobiographical memory. *Memory & Cognition*, 35, 1659–1663. doi:10.3758/BF03193499

Willander, J., & Larsson, M. (2008). The mind's nose and autobiographical odor memory. *Chemosensory Perception*, 1, 210–215. doi:10.1007/s12078-008-9026-0

Woike, B. A. (2008). A functional framework for the influence of implicit and explicit motives on autobiographical memory. *Personality and Social Psychology Review*, 12, 99-117.

doi:10.1177/1088868308315701