FlashReport

Reconstruction of things past: Why do some memories feel so close and others so far away?

Ellie J. Kyung [a,*], Geeta Menon [b], Yaacov Trope [c]

[a] New York University, Stern School of Business, Tisch Hall 825, 40 West Fourth Street, New York, NY 10012, USA
[b] University of Pennsylvania, The Wharton School, 700 Jon M. Huntsman Hall, 3730 Walnut Street, Philadelphia, PA 19104, USA
[c] New York University, Department of Psychology, 6 Washington Place, Room 782, New York, NY 10003, USA

ABSTRACT

The vast majority of work in construal level theory focuses prospectively on the future. Through a series of studies controlling for knowledge about an event, we look retrospectively at the past and demonstrate that construal mindsets can materially influence how a past event is reconstructed in memory. Specifically, an event recalled in a more concrete mindset feels subjectively closer than when recalled in an abstract mindset (Studies 1–3). We present evidence suggesting this is because a concrete mindset actually makes people feel as though they know more, even if they were initially exposed to the same set of information—perceived information accessibility mediates the effect of construal level on temporal distance (Study 2). The effect of construal level on memory reconstruction extends to judgments of blame, where judgments of greater temporal distance drive a greater propensity to blame parties for negative events and temporal distance mediates these judgments (Study 3). Together, these studies are the first to demonstrate that the mindset employed when recalling an event shapes its remembrance.

© 2009 Elsevier Inc. All rights reserved.

"When to the sessions of sweet thought, I summon up remembrance of things past..." – Shakespeare

In his 30th sonnet, William Shakespeare sorrowfully laments the long-ago death of a friend. He writes of transcending the past and feeling the pain of the loss anew. Tulving (2002) noted that human beings are unique in their capacity to engage in mental time travel to the past although time ticks continuously towards the future. Yet on these excursions through time, the same event can sometimes feel close and at others quite distant, and these subjective temporal judgments can in turn influence other judgments such as those of culpability and blame (Frank & Gilovich, 1989; Wilson & Ross, 2003).

Past research on memory for time has a focused on how inferences about the age of a memory (distance-based theories), its placement in general temporal patterns (location-based theories) or relative to other events (order-based theories) can influence temporal judgments (Friedman, 1993; Friedman & Lyon, 2005). We investigate how underlying mindsets—specifically, concrete versus abstract construal mindsets—can influence how close to or far from we feel from past events.

Work in fuzzy-trace theory (Brainerd & Reyna, 1995) demonstrates that information can be encoded along a "gist" to "verbatim" continuum. Thus abstract versus concrete mindsets might influence temporal judgments by making different types of information more accessible in memory. Previous work illustrates that when thinking about the *future*, relative to temporally proximal events, distant ones are represented more abstractly, with a greater propensity to make moral, dispositional attributions and underweight situational constraints (Eyal, Liberman, & Trope, 2008; Nussbaum, Trope, & Liberman, 2003). Conversely, people believe that events described by more superordinate "whys" were more likely to take place in the distant future than those described by more superordinate "hows" (Liberman, Trope, McCrea, & Sherman, 2007).

In contrast, our work focuses on the *past* and is the first to demonstrate that construal mindset can influence subjective temporal distance from an event in memory and, in turn, judgments of blame. Through three studies, controlling for knowledge about events and objective temporal distance, we demonstrate that people feel subjectively closer to an event when recalling it in a concrete mindset versus an abstract one (Studies 1–3). Furthermore, we find evidence that the relationship between construal level and temporal distance is mediated by differential knowledge made accessible by different mindsets: when recalling an event in a concrete mindset, people actually felt they knew more about it and believed it occurred more recently (Study 2). Finally, we illustrate that subjective temporal distance mediates the effect of construal level on the extent to which people blame responsible parties in

* Corresponding author. Address: Marketing Department, Leonard N. Stern School of Business, 40 West Fourth Street, New York, NY 10012, USA.
E-mail address: ekyung@stern.nyu.edu (E.J. Kyung).

a negative event—when recalling an event in an abstract mindset, people not only felt further from it, but also placed more blame on culpable parties (Study 3). Together, these studies demonstrate that construal mindsets can materially influence the nature of remembrance.

Study 1

First, we test whether an event feels subjectively closer when recalled in a concrete versus abstract mindset.

Method

Forty-six students participated in a one-hour session encompassing several studies. As the penultimate study (about 55 min into the session), participants completed the Freitas, Gollwitzer, and Trope (2004) priming procedure; in the context of the goal "improve and maintain good heath," participants responded to three "why?" questions in the abstract condition, promoting increasingly high-level thinking, and three "how?" questions in the concrete condition, promoting increasingly low-level thinking. In the final study, participants responded to the main dependent measure, "How long ago do you feel this experiment session began" (1 = feels like it just started, 7 = feels like it started a while ago). The actual minutes between participants' session start time and this study were used as a covariate to control for objective time duration.

Results

As predicted, participants recalling the start of the session in a concrete mindset felt closer to it ($M = 5.20$) than those in an abstract mindset ($M = 6.05$, $F(1,44) = 4.06$, $p < .05$). The effect of construal level is independent of any prior knowledge since all participants had the same knowledge about the experiment session.

Study 2

Next, we replicate the effect of construal mindsets on temporal judgments for memories consolidated over time, employing a two-part study with a fabricated news event to control for prior knowledge. We also examine the effect of construal level on *perceived* information accessibility.

Method

Study part 1
Thirty-nine students read an article for 2 min describing a company in a foreign country that produced infant formula lacking B1, resulting in infant hospitalizations and deaths. The articled stated that party names had been disguised and that the event had *just* occurred. To control for knowledge, only males who had never fed an infant participated in this study. Participants confirmed they had never heard of the event.

Study part 2
Two weeks later, participants completed the construal mindset manipulation—a 30-word variation of the task used by Fujita, Trope, Liberman, and Levin-Sagi (2006). They were presented with 30 words (e.g., *pasta*). For each, those in the abstract condition were asked "_____ is an example of what," generating superordinate categories, and those in the concrete condition were asked "an example of _____ is what," generating subordinate exemplars.

In an "unrelated" study, participants indicated when they felt the incident occurred (1 = very recently, 10 = not very recently). As a measure of information accessibility, participants answered "true," "false" or "don't know" to four quiz statements (e.g., *primary problem with the formula was that it caused stomach problems*). "True" and "false" answers were scored as 1 and "don't know" as 0 and summed as an aggregate measure of knowledge participants felt they accessible in memory—not its accuracy. Finally, they rated how vivid and emotional they found the event in memory (1 = not at all, 9 = very much).

Results

Participants that recalled the event in a concrete mindset felt it occurred more recently ($M = 5.72$ versus $M = 7.38$, $F(1,37) = 4.17$, $p < .05$) and scored more highly on the perceived information accessibility quiz ($M = 3.67$ versus $M = 2.95$, $F(1,37) = 4.53$, $p < .05$) than those in an abstract mindset.

Using the bootstrapping approach, we have evidence that information accessibility mediates the effect of construal level on temporal judgments[1] (mediation effect parameter $p < .05$, two-tailed). Construal level predicts temporal judgments ($\beta = .82$, $t(1,36) = 2.04$, $p < .05$) and the mediator, information accessibility ($\beta = -.36$, $t(1,36) = -2.17$, $p < .05$). Information accessibility predicts temporal judgments, controlling for construal level ($\beta = -.91$, $t(1,36) = -2.37$, $p < .05$). Construal level does not predict temporal distance when including information accessibility as a mediator ($\beta = .51$, $t(1,36) = 1.24$, $p > .20$). When recalling the event in a concrete mindset, participants actually felt they knew more information about it, and this perceived information accessibility drives subjective temporal judgments. The experience of recall did not differ in terms of vividness or emotionality by construal level and does account for the differential temporal judgments (Table 1, (4 and 5)).

Study 3

Greater temporal distance is associated with greater propensity to make dispositional attributions more and take situational factors into account less (Frank & Gilovich, 1989; Nussbaum et al., 2003). Concrete mindsets might also promote a more complex, verbatim representation (Reyna & Brainerd, 1995) that includes both dispositional and situational factors. Thus, an abstract mindset might drive both judgments of greater temporal distance and a gist-driven representation of the event less-likely to include situational factors not already included in the general schema for the event. Both factors can lead to a greater propensity to blame responsible parties. We next test this relationship between construal mindsets and attribution-related judgments in addition to temporal ones.

Method

Study part 1
Forty-three students read an article for 3 min that described a company (WaterCo.) that produced bottled water contaminated with benzene. The contamination was from solvents used to clean the plant, and did not result in any illnesses or hospitalizations, but did lead to a product recall that cost the company millions of dollars. The article was again described as an event that had just occurred in a foreign country with disguised party names. Participants confirmed they had never heard of this event.

---

[1] Using Preacher and Hayes' (2004) SPSS macro (5000 iterations, 95% confidence interval).

Table 1
Effect of construal mindset on judgments in memory.

Measures		Concrete mindset		Abstract mindset	
		M	SD	M	SD
Study 1					
(1)	Temporal judgments (1–7; 1 = feels like it just started, 7 = feels like it started a while ago)	5.29	1.46	6.05	1.13
Study 2					
(2)	Temporal judgments (0–10; 0 = very recently, 10 = not very recently)	5.72	2.68	7.38	2.39
(3)	Perceived information accessibility quiz scores (0–4; 4 = most knowledge)	3.67	0.49	2.95	1.32
(4)	Vividness of event in memory (1–7; 1 = not at all, 7 = very much)	2.33	0.35	2.29	0.32
(5)	Emotionality of event (1–7; 1 = not at all, 7 = very much)	2.06	0.35	1.95	0.33
Study 3					
(6)	Temporal judgments (0–100, 0 = now)	58.78	5.40	74.61	4.77
(7)	Attributions (Points of blame to company−consideration of other circumstances)	5.22	6.36	22.26	5.63
(8)	Liking of company	5.33	.33	4.09	.29
(9)	Purchase intent	5.22	.451	3.91	.40
(10)	Vividness of event in memory (1 = not at all, 9 = very much)	3.44	.42	3.74	.37
(11)	Emotionality of event (1 = not at all, 9 = very much)	3.06	.44	2.35	.39

Study part 2

Ten days later, participants completed the same construal manipulation as in Study 2. In an "unrelated" study, participants indicated how far they felt from the event using a slider scale where one side was anchored at "right now." The participants dragged the knob representing the event from "right now" to the point that represented how near or far they felt from the event, allowing for a more finely graded scale of subjective temporal distance. Values on the slider were converted to a 100-point scale where higher numbers indicate greater temporal distance.

As a measure of taking dispositional factors versus situational circumstances into account, participants were asked to allocate a total of 100 points towards "factors that account for the events related to the recall:" WaterCo. management, the employee that cleaned the plant, and circumstances beyond anyone's control. They also indicated how much they liked the WaterCo. brand (1 = not at all, 9 = very much) and their intent to purchase bottled water from WaterCo., should they reside in the same country (1 = not at all likely, 9 = highly likely). Participants then rated the recall experience according to its vividness, and emotionality (1 = not at all, 9 = very much). Finally, they were asked whether they had looked up any information about the event after part 1 and demographic questions.

Results

Two participants were eliminated from the study because they suspected the event was fabricated. As with the previous studies, participants that recalled the event in a concrete mindset felt closer to it ($M = 58.78$) than those who recalled it in an abstract mindset ($M = 74.61$, $F(1,39) = 4.83$, $p < .05$).

As a measure of the extent to which participants blamed WaterCo. for the bottled water recall versus considered situational circumstances, we subtracted the number of points allocated to "circumstances beyond anyone's control" from the number of points allocated to WaterCo. management. (Points allocated to the employee that cleaned the plant did not differ by condition.) Participants in a concrete mindset blamed the company less and took situational circumstances into account more ($M = 5.22$) than those in an abstract mindset ($M = 22.26$, $F(1,39) = 4.02$, $p < .05$), mirroring subjective temporal judgments. Furthermore, using the bootstrapping approach, [1] subjective temporal distance mediates the effect of construal mindset on propensity to blame. Construal level predicts blame ($\beta = 17.04$, $t(38) = 2.01$, $p < .05$) and the mediator, temporal distance ($\beta = 15.83$, $t(38) = 2.20$, $p < .05$). Temporal distance predicts blame ($\beta = .40$, $t(38) = 2.24$, $p < .05$), but construal

level does not predict blame when including temporal distance as a mediator ($\beta = 10.68$, $t(38) = 1.25$, $p > .20$). Thus judgments of blame are driven by those of subjective temporal distance. (The effects are also robust to examining only blame for WaterCo. management.)

In a concrete mindset, versus an abstract one, participants also indicated that they liked the company more ($M = 5.33$ versus $M = 4.09$, $F(1,39) = 8.07$, $p < .01$) and were more likely to purchase from it in the future ($M = 5.22$ versus $M = 3.91$, $F(1,39) = 4.722$, $p < .05$). Again, the experience of recall itself did not differ in vividness or emotionality by construal level (Table 1, (10 and 11)).

General discussion

While previous work on temporal judgments in memory illustrates how different types of information influence these judgments, we illustrate how an underlying mindset can influence what information comes to mind at all. In our studies, participants were given the same information about an event, but construal materially influenced how that event was reconstructed from memory. Whether an event occurred in the past hour (Study 1), few days (Study 3), or few weeks (Study 2), people felt closer to it when recalling it in a concrete mindset versus an abstract one. Mediation analysis suggests that a concrete mindset makes details of an event more accessible, leading to more recent temporal judgments. People tend to believe an event occurred more recently when they can recall more information about it (Brown, Rips, & Shevell, 1985).

Interestingly, although a concrete mindset led people to *believe* they knew more, they were not necessarily more accurate. Future work might more specifically explore why concrete mindsets, associated with more verbatim representations, can lead to identification of more false memories although gist-driven, abstract memories are typically associated with a higher degree of false memory (Brainerd & Reyna, 2002).

In the context of blame, a more complex representation of the event in a more concrete mindset led people to take mitigating circumstances into account more and blame culpable parties less. Furthermore, these judgments of blame were mediated by those of subjective temporal distance. Note that in our studies, we used fictional events where subjects felt low emotional connection and—in Studies 2 and 3—situations with both dispositional and mitigating circumstances. However, for events where people have encoded very emotional information, we predict there can be instances where a more complex, concrete representation—including these emotional factors—can lead to greater blame for events rather than less. These emotional aspects might evoke more vis-

ceral reactions and have a stronger effect on judgments of blame than any consideration for mitigating circumstances or the propensity to place less blame with decreased temporal distance. (Particularly in those situations where there are no discernable mitigating circumstances.) Exploring when and in what instances the effects of construal might be disassociated or different from those of distance is another interesting area for future research.

Previously, Semin and Smith (1999) found a link between the age of an event and the linguistic abstractness with which it is stored in memory—cuing recall with more abstract predicates led people to remember more temporal distance examples of a behavior than cuing recall with more concrete predicates. Our work is the first to illustrate that mindset can influence the reconstruction of events in memory, further underscoring the bi-directional relationship between construal level and distance and that the past is reconstructed through the present (Johnson & Sherman, 1990) Thus we see that how we reconstruct things past, and the factors which influence reconstruction, shape their remembrance.

References

Brainerd, C. J., & Reyna, V. F. (1995). Fuzzy-trace theory: An interim synthesis. *Learning and Individual Differences, 7*, 1–75.
Brainerd, C. J., & Reyna, V. F. (2002). Fuzzy-trace theory and false memory. *Current Directions in Psychological Science, 11*, 164–169.
Brown, N. R., Rips, L. J., & Shevell, S. K. (1985). Subjective dates of natural events in very long term memory. *Cognitive Psychology, 17*, 139–177.
Eyal, T., Liberman, N., & Trope, Y. (2008). Judging near and distant virtue and vice. *Journal of Experimental Social Psychology, 44*, 1204–1209.
Frank, M. G., & Gilovich, T. (1989). The effect of memory perspective on retrospective causal attributions. *Journal of Personality and Social Personality, 57*, 399–403.
Freitas, A. L., Gollwitzer, P., & Trope, Y. (2004). The influence of abstract and concrete mindsets on anticipating and guiding others' self-regulatory efforts. *Journal of Experimental Social Psychology, 40*, 739–752.
Friedman, W. J. (1993). Memory for the time of past events. *Psychological Bulletin, 113*, 44–66.
Friedman, W. J., & Lyon, T. D. (2005). The development of temporal-reconstructive abilities. *Child Development, 76*, 1202–1216.
Fujita, K., Trope, Y., Liberman, N., & Levin-Sagi, M. (2006). Construal levels and self-control. *Journal of Personality and Social Psychology, 90*(3), 351–367.
Johnson, M. K., & Sherman, S. J. (1990). Constructing and reconstructing the past and future in the present. In E. T. Higgins & R. M. Sorrentino (Eds.). *Handbook of motivation and cognition: Foundations of social behavior* (Vol. 2, pp. 22). New York, NY: Guilford Press.
Liberman, N., Trope, Y., McCrea, S. M., & Sherman, S. J. (2007). The effect of level of construal on the temporal distance of activity enactment. *Journal of Experimental Social Psychology, 43*, 143–149.
Nussbaum, S., Trope, Y., & Liberman, N. (2003). Creeping dispositionism: The temporal dynamics of behavior prediction. *Journal of Personality and Social Psychology, 84*, 485–497.
Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, and Computers, 36*, 717–731.
Reyna, V. F., & Brainerd, C. J. (1995). Fuzzy-trace theory: An interim synthesis. *Learning and Individual Differences, 7*, 1–75.
Semin, G. R., & Smith, E. R. (1999). Revisiting the past and back to the future: Memory systems and the linguistic representation of social events. *Journal of Personality and Social Psychology, 76*, 877–892.
Tulving, E. (2002). Episodic Memory: From Mind to Brain. *Annual Review of Psychology, 53*, 1–25.
Wilson, A. E., & Ross, M. (2003). The identity function of autobiographical memory: Time is on our side. *Memory, 11*, 137–149.