Article

Situated Embodiment: When Physical Weight Does and Does Not Inform Judgments of Importance

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Abstract

Bodily sensations impact metaphorically related judgments. Are such effects obligatory or do they follow the logic of knowledge accessibility? If the latter, the impact of sensory information should be moderated by the accessibility of the related metaphor at the time of sensory experience. We manipulated whether "importance" was on participants' minds when they held a physically heavy versus light book. Participants held the book while making an importance judgment versus returned it before making the judgment (Study 1) or learned prior to holding the book that the study was about "importance evaluations" versus "graphics evaluations" (Study 2). In both studies, the same book was judged more important when its heft was increased but only when importance was on participants' minds at the time of sensory experience. We conclude that sensory experiences only impact metaphorically related judgments when the applicable metaphor is highly accessible at the time of experience.

Keywords

embodied cognition, situated cognition, weight, importance, context

Experimental research has documented strong effects of concurrent sensory experiences on metaphorically related judgments (for reviews, see Landau, 2017; Landau et al., 2014; Schwarz & Lee, 2019). For example, incidental fishy smells can undermine interpersonal trust (Lee & Schwarz, 2012), physical warmth can foster the perception of social warmth (Williams & Bargh, 2008), and physical weight can influence judgments of importance (Jostmann et al., 2009). Such observations reflect that thought about abstract concepts is grounded in more concrete sensory experiences. This grounding is apparent in familiar metaphorical expressions, for example, when we note that something "smells fishy," talk about a "warm welcome," or characterize a discussion as dealing with "heavy issues."

Several theories conceptualize how such associations between sensory experiences and abstract concepts may be formed, including conceptual metaphor theory (CMT; Lakoff & Johnson, 1980, 1999), perceptual symbol systems (PSS; Barsalou, 1999, 2008), scaffolding (Williams et al., 2009), and simulated sensorimotor metaphor (SSM; Slepian & Ambady, 2014). PSS (Barsalou, 1999) and the scaffolding model (Williams et al., 2009) propose that perception and cognition share neural structures. They assume that humans first perceive the world, then build abstract knowledge representation on top of these perceptual pathways. Abstract concepts therefore share neural pathways with the sensorimotor states with which they are co-experienced. Because heaviness is co-experienced with importance, the concept of importance is built upon the same sensorimotor pathways that encode heaviness. By this logic, sensing heaviness activates the same neural pathways as thinking of importance, rendering thoughts of importance more accessible and more likely to be used in a later judgment.

CMT (Lakoff & Johnson, 1980, 1999) and SSM (Slepian & Ambady, 2014) propose that embodiment effects arise because of learned associations between perceptual experiences and abstract concepts. CMT suggests that abstract concepts are difficult to comprehend, so we represent them by drawing on more concrete experiences. This is reflected in metaphors that link sensory source domains with abstract target domains. Thus, sensing heaviness renders the abstracted concepts and their metaphorically related attributes more accessible. SSM additionally suggests that learning an embodied metaphor incorporates sensorimotor neural pathways into representations.

While the details of these theories differ, they share the assumption that experiencing a sensorimotor state will activate the associated abstract concept. They similarly forgo discussion

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of the conditions under which sensorimotor cues are unlikely to affect judgment. They entail the presumption that the activation of associated abstract representations is obligatory whenever the respective sensory state is experienced. From this perspective, the sensory experience by itself should be sufficient to bring the abstract concept to mind. Hence, holding a physically heavy (rather than light) book should make the book appear more important, reflecting how importance is "embodied" in heaviness (Ackerman et al., 2010; Jostmann et al., 2009).

Alternatively, sometimes a heavy book may just be a heavy book, with no implications for its importance. This would conflict with the presumption of the discussed embodiment theories that importance is obligatorily activated when heaviness is experienced. It would suggest a far weaker version of social embodiment than was originally laid out in the 2000s when social psychologists were documenting a dizzying array of main effects of embodied cues (see Niedenthal et al., 2005). And it would suggest that abstract social knowledge is not entirely embodied in sensory states but that it is merely associated with them. Sometimes, heavy books may just be heavy, hot coffee may just be hot, and fishy smells may just smell bad.

How then can sensorimotor cues activate associated abstract concepts sometimes but not all the time? Quite simply, situations matter. The principals of situated social cognition (Smith & Semin, 2007) and knowledge accessibility (Higgins, 1996; Wyer & Srull, 1989) apply. We propose that embodied cues affect judgment to the extent that the situation renders the metaphorically linked domain active. Thus, weight may only inform judgments of importance when importance is already on the perceiver's mind at the time of the sensory experience.

This conjecture is compatible with the observation that the meaning of sensorimotor experiences is often ambiguous. The same sensory attribute can ground different judgment dimensions. For example, verticality has been shown to ground valence (good things are "up"; Meier & Robinson, 2004), power (the powerful are "at the top"; Schubert, 2005), and rationality ("high level" intellectual discussions sometimes "sink" to an emotional level; Cian et al., 2015). Similarly, heaviness grounds concepts beyond importance, including guilt (Kouchaki et al., 2014), secrets (Slepian et al., 2012), and forgiveness (Zheng et al., 2015). Cases where the same sensory experience grounds several judgment dimensions present the problem of one-to-many mapping and raise the question how perceivers decide which mapping to apply. The available evidence suggests that the mapping that is most likely to be used is the one that is most accessible at the moment and most applicable to the target (for discussions, see Landau, 2017; Schwarz & Lee, 2019; Xu et al., in press). Hence, verticality is interpreted as bearing on valence when participants are asked valence-related questions (e.g., Meier & Robinson, 2004) but as bearing on power (Schubert, 2005) or rationality (Cian et al., 2015) when participants are asked power- or rationality-related questions.

This suggests that metaphor-consistent effects of a given sensory experience may be most likely when task or context variables increase the cognitive accessibility of a judgment dimension on which the sensory experience can be brought to bear. This possibility stands in contrast to the assumption that the association is obligatory as discussed above. We test this possibility by drawing on the weight-importance metaphor. Of interest is whether the sensory experience of a heavy versus light physical weight only influences judgments of importance when this judgment dimension is already on the perceiver's mind at the time of the sensory experience.

The available literature is silent on this issue because all published studies either exposed participants to the sensory experience while rendering a judgment of importance or introduced the judgment task as concerning importance evaluations prior to the sensory experience. In either case, the procedures ensured that importance was on perceivers' minds at the time of the sensory input (e.g., Ackerman et al., 2010; Chandler et al., 2012; Hauser & Schwarz, 2015; Jostmann et al., 2009; Zestcott et al., 2017; Zhang & Li, 2012). We therefore cannot tell whether weight spontaneously influences impressions of importance or only does so when participants are already mulling over the importance of the target stimulus when they experience its weight. The answer to this question has important conceptual and methodological implications pertaining to the role of sensory experience in judgment and the conditions under which embodiment effects are most likely to replicate.

Study 1

Overview

Following the procedures of Chandler et al. (2012) and Hauser and Schwarz (2015), participants were presented with an unknown book of normal or heavy heft (due to insertion of a concealed weight). All participants were asked questions about the book's importance as well as demographic questions. For some participants, the importance questions were asked first, while they held the book, followed by the demographic questions after they returned the book. For other participants, the demographic questions were administered while they held the book and the importance questions after they returned the book. If metaphorically relevant sensory cues have an obligatory effect, the book's weight should influence its perceived importance under both conditions, resulting in a main effect of weight on judgments of importance. If sensory cues need to be interpreted in the context of the judgment task to exert an influence, the weight of the book should only affect its perceived importance under concurrent exposure conditions, where the weight is experienced while the judgment is made, resulting in an interaction of weight and the timing of the importance questions.

Method

Participants ($N = 157$; 92 female; age range 18–25) evaluated the importance of a book and answered demographic questions. Sensitivity power analysis suggests this sample size gives us adequate power to detect an effect size as small as $f = .225$ for the interaction (Faul et al., 2007). Data were collected over two

semesters and analyzed only once at the conclusion of data collection. All materials, data, and analysis code are available at https://osf.io/cka4d/.

Similar to Chandler et al. (2012) and Hauser and Schwarz (2015), experimenters handed participants a copy of the hardcover book *Dogboy* (by Eva Hornung) as part of a public opinion survey. The book was either a control weight (420 g) or a heavy copy containing concealed weights (645 g). Prior studies have shown that weight only affects impressions of the book's importance when participants view the back cover of the book, which contains ample information about the book in the form of review snippets and a short synopsis (Chandler et al., 2012; Hauser & Schwarz, 2015). Thus, in order to investigate the boundary conditions for this effect, experimenters handed participants the book with the back cover facing up and told participants to look at only the back cover while answering questions.

Participants were asked eight questions in total, four concerning demographics and four concerning the book. However, after the initial block of four questions (during which participants held the book), experimenters feigned confusion and asked for the book back, saying "Emmm . . . I'm sorry, but would you mind handing me the book back? The rest of the questions are in there and I keep forgetting them." After participants returned the book, experimenters administered the remainder of the questions.

Question block order was randomized such that either the four book questions came first (followed by the demographic questions) or the four demographic questions came first (followed by the book questions). This established that participants either considered the importance of the book while feeling its heft (*importance during book holding* condition) or considered its importance after feeling its heft *(importance after book holding* condition). The four questions concerning demographics asked about participants' age, major, year at university, and political orientation. The four concerning the book asked participants how interested they were in reading the book (1 = *not at all interested*, 10 = *very interested*), how much they'd be willing to pay for the book (free response), how likely it was that the book would appear on *The New York Times*' list of most influential and important books of the year (1 = *not at all likely*, 10 = *extremely likely*), and whether they'd read the book before (all said no). These items exactly replicate those used in previous research with this paradigm (Chandler et al., 2012; Hauser & Schwarz, 2015), maintaining consistency with the prior literature on sensory state effects on judgment.

Results and Discussion

We conducted a 2 (question order: importance questions during book holding vs. after book holding) × 2 (weight: control vs. heavy) × 3 (question: interest in reading, willingness to pay, likelihood of being on *The New York Times*' list) mixed analysis of variance on standardized responses to the questions. The results were similar for all questions ($ps > .29$ for all interactions involving the question variable), so we averaged responses to the items to form an index of importance ($\alpha = .77$). The remainder of the analyses focuses upon the effects of the between-subject manipulations.

Table 1. Mean (Standard Deviation) Book Importance by Book Weight and Importance Question Order.

	Book Weight	
Importance Question Order	Control	Heavy
During book holding	−.274 (.889)	.228 (.646)
After book holding	.134 (.894)	−.103 (.798)

Consistent with the hypothesized context-sensitive interpretation of sensory experience, the effect of the book's weight on importance depended on the order in which the questions were asked, $F(1, 153) = 8.14$, $p = .005$, $f = .23$, for the two-way interaction of weight and question order. Neither the main effect of book question order nor of weight reached significance, $ps > .308$.

We examined this two-way interaction with simple effect analyses of weight under each question order condition. Recall that Chandler et al. (2012) observed a main effect of weight when participants (viewing the back of the book) considered its importance while holding it. We replicated this effect, as shown in the top panel of Table 1. When the book questions were asked first while the participants held the book, a heavier book was thought to be more important than the control book, $F(1, 153) = 7.65$, $p = .006$, $d = 0.64$, 95% CI [0.19, 1.09], for the simple effect of weight. As shown in the bottom panel of Table 1, weight did not exert a significant influence when the book questions came second, immediately after the participants had answered demographic questions and returned the book to the experimenter, $F(1, 153) = 1.64$, $p = .202$, $d = -0.28$, 95% CI [−0.73, 0.17], for the simple effect of weight.

In sum, the physical weight of a book only influenced its perceived importance under concurrent conditions. When the weight was experienced while the judgment was made, the familiar metaphor-congruent effect replicated. But when participants returned the book right before making the importance judgment, weight exerted no influence. These results are difficult to reconcile with the assumption that the sensory experience alone is sufficient to spontaneously affect impressions of importance.

Study 2

Overview

In Study 1, the book's weight only influenced participants' judgment when they held the book in their hands while evaluating its importance. This observation is compatible with two interpretations. On the one hand, it may reflect that the effect of sensory experience itself fades quickly and only influences judgment when concurrent with the judgment task. On the other hand, it may reflect that the meaning of the sensory

Table 2. Mean (Standard Deviation) Book Importance by Book Weight, Task Framing, and Importance Question Order.

	Book Weight	
Framing × Importance Question Order	Control	Heavy
Graphic design framing		
During book holding	−.360 (.696)	.369 (.498)
After book holding	−.048 (.772)	−.083 (.473)
Overall	−.204 (.739)	.143 (.525)
Importance framing		
During book holding	−.167 (.599)	.156 (.554)
After book holding	−.303 (.638)	.410 (.446)
Overall	−.235 (.604)	.283 (.601)

experience is ambiguous, and weight may only be interpreted in terms of importance when that concept is highly accessible. If the latter, an influence of weight should also be obtained when the situation renders importance accessible prior to the sensory experience, even when the explicit judgment of importance is not requested until after the book is returned. Study 2 tests this possibility and provides an extended replication of Study 1.

In Study 2, all participants evaluated the importance of a normal or heavy book either while holding it or after returning it. For some participants, the task was framed at the onset as a graphic design evaluation, a framing that does not provide an importance-related context. For other participants, the task was framed at the onset as an importance evaluation task, thus rendering importance accessible.

If the effect of the sensory experience fades quickly (i.e., weight effects require that the sensory experience is concurrent with the computation of the judgment), then weight effects should be obtained whenever participants hold the book in their hands at the time of judgment, independent of the initial framing. Alternatively, if the meaning of the sensory experience is ambiguous (i.e., weight effects require that the sensory experience is interpreted in terms of importance), weight effects should be obtained whenever the importance concept is highly accessible at the time of the sensory experience. Under graphic design framing, this would replicate the weight effects seen in Study 1. However, under importance evaluation framing, this would manifest in weight effects that are independent of whether the experience is concurrent with the computation of the judgment or not.

Method

Ninety participants (39 female; age range 18–28) evaluated the importance of an unknown book and answered demographic questions. Sensitivity power analysis suggests this sample size gives us adequate power to detect an effect size as small as $f = .298$ for the interaction (Faul et al., 2007). We had planned to collect data over two semesters, but data collection was terminated at the end of the first semester due to the relocation of the first author. We chose to end data collection at that point and analyze.

Procedures were identical to those of Study 1 but with the addition of a task framing manipulation (randomly assigned). When approaching participants, experimenters introduced the task in one of two ways. Some participants were told that the task was a project for a graphic design class and that researchers wanted people's impressions of the graphic design of the book, such as how much they liked the cover art and how easy it was to read the cover text. Other participants were told that the task was a book evaluation for a marketing class and that researchers wanted people's impressions of how important and valuable the book was.

Results and Discussion

We conducted a 2 (question order: importance questions during book holding vs. after book holding) × 2 (weight: control vs. heavy) × 2 (task framing: importance evaluation vs. graphic design evaluation) × 3 (question: interest in reading, willingness to pay, likelihood of being on *The New York Times*' list) mixed analysis of variance on standardized responses to the questions. The results were similar for all questions ($ps > .25$ for all interactions involving the question variable), so we averaged responses to the items to form an index of importance. Reliability for this index was low in this study ($\alpha = .29$); however, previous studies found acceptable reliability for this index, and this analysis strategy maintains consistency with prior research on this paradigm. The remainder of the analyses focuses on the effects of the between-subject manipulations.

Did the results of Study 1 replicate with a comparable framing in Study 2? Yes—when the task was introduced as a graphic design evaluation, the influence of weight on perceived importance depended on the timing of the importance questions. As shown in the upper half of Table 2, when participants answered the importance questions first, while holding the book, they judged a heavier book as more important than a light book, $t(82) = 2.83$, $p = .006$, $d = 1.12$, 95% CI [0.22, 2.02], for the simple effect of weight. However, when participants answered the importance questions after having returned the book, they judged heavy and control books as similarly important, $t(82) = 0.14$, $p = .892$, $d = -0.05$, 95% CI [−0.89, 0.79], for the simple effect of weight. This is reflected in a significant simple two-way interaction of weight and question order, $F(1, 82) = 4.37$, $p = .040$, which replicates Study 1.

On the other hand, when the task was introduced as an importance evaluation, the influence of weight on perceived importance no longer depended upon question order, $F(1, 82) = 1.11$, $p = .296$, for the simple two-way interaction of weight and question order. As shown in the bottom half of Table 2, participants in this framing condition judged heavy books as more important than light books regardless of question order, $F(1, 40) = 9.37$, $p = .004$, $d = .93$, 95% CI [0.29, 1.56], for the simple main effect of weight.

These diverging patterns are reflected in a significant three-way interaction of weight, question order, and task

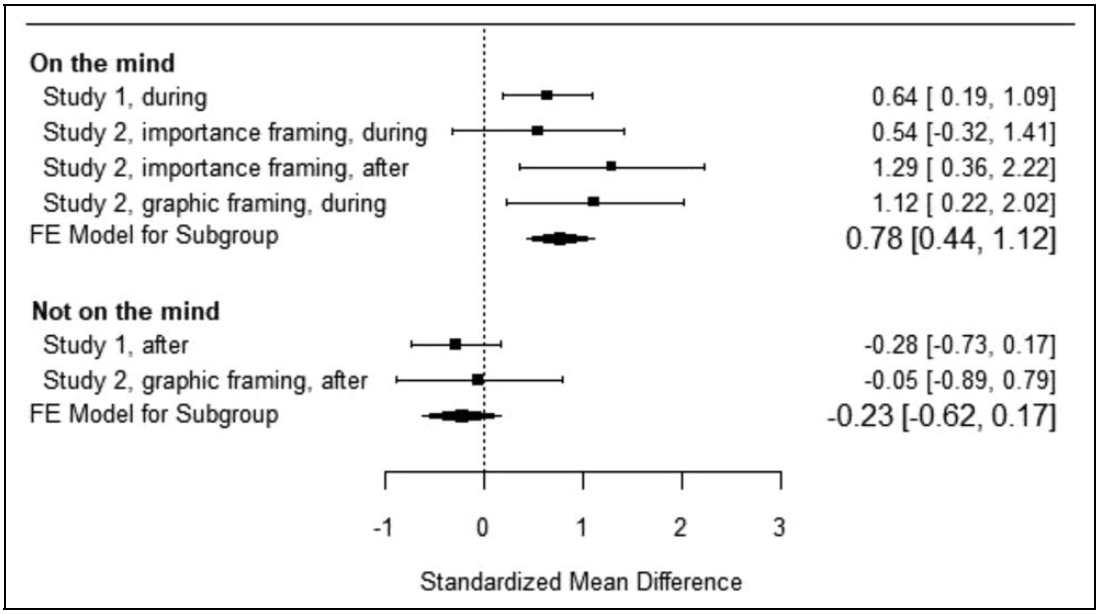

Figure 1. Forest plot of the standardized mean effect of weight for conditions when importance was "on the mind" versus "not on the mind" when weight was felt. *Note*. Subgroups are fixed effects (FE) model estimates of the meta-analytic effect size for each condition. Dots represent effect sizes and bars represent 95% confidence intervals.

framing, $F(1, 82) = 4.91$, $p = .029$, $f = .25$. There was also a significant main effect of weight, $F(1, 82) = 11.03$, $p = .001$, $d = .72$, 95% CI [0.30, 1.15]; however, this was qualified by the previously described three-way interaction. All other main effects ($ps > .68$) and interactions ($ps > .25$) were not significant. These results highlight that the mere experience of weight is insufficient to affect perceived importance. Instead, physical weight is only used as an input into judgments of importance when this judgment dimension is on the perceiver's mind at the time of the sensory experience.

Summary Analyses

To address issues of power, we conducted a meta-analysis of the current studies, which provides a more reliable index of the effect size while also incorporating error in estimates as a function of sample size (Braver et al., 2014; Cumming, 2012, 2014; McShane & Böckenholt, 2017). The meta-analysis assesses the strength of the evidence that the size of the weight effect depends on whether importance is on the perceiver's mind while feeling the heft of the book.

Conditions in which importance is assumed to be on the perceiver's mind are all conditions where participants held the book during the judgment task or where the whole experiment was framed in terms of importance evaluations (Figure 1). The weight effect was operationally defined as the difference in perceptions of importance for a control book versus one that contained concealed weights. In each study, the standardized mean difference for the weight effect was computed for each cell of the other between-subject conditions. Because each effect had similar designs, we used fixed effect models in the R package metafor (version 2.1-0; Viechtbauer, 2010) to estimate the average effect size of the weight effect for "on the mind" versus "not on the mind" conditions (Hedges & Vevea, 1998; Laird & Mosteller, 1990).

As shown in the top panel of Figure 1, the meta-analysis revealed a weight effect of $d = 0.78$ ($SE = 0.17$, $z = 4.51$, $p < .0001$, 95% CI [0.44, 1.12]) when the situation fostered importance being on the mind while the book's heft was felt. In these situations, the same book seemed more important when it contained a concealed weight than when it did not. This effect size is comparable to the $d = .79$ observed by Chandler et al. (2012; Study 1) when participants held the same book, back cover up, with the same concealed weight (vs. not) while judging its importance.

As shown in the bottom panel of Figure 1, the meta-analysis revealed a nonsignificant weight effect of $d = -0.23$ ($SE = 0.20$, $z = -1.12$, $p = .263$, 95% CI [−0.63, 0.17]) when the situation did not bring importance to mind. In these conditions, inserting a concealed weight failed to increase the perceived importance of the book relative to an unweighted copy.

Finally, we tested whether the weight effect is significantly moderated by whether the conditions do versus do not put importance on participants' minds. A meta-analytic test for moderation of the weight effect confirmed that this is the case, standardized mean difference estimate = 1.01, $SE = 0.27$, $z = 3.79$, $p = .0002$, 95% CI [0.49, 1.53].

General Discussion

In combination, these findings indicate that the sensory experience of heaviness does not create an obligatory impression of importance. Instead, physical weight only informs judgments of importance when importance is on the perceiver's mind

while experiencing weight. Replicating earlier weight effects on importance judgments (Ackerman et al., 2010; Chandler et al., 2012; Hauser & Schwarz, 2015; Jostmann et al., 2009; Zhang & Li, 2012), a heavy book seemed more important than a light book when participants held the book when making an importance judgment (Study 1 and graphic design framing conditions of Study 2) or were aware that they would later be asked to assess the book's importance (importance framing conditions of Study 2). In contrast, the book's heft did not influence judgments of importance when this evaluative dimension was not on perceivers' minds at the time they experienced the book's weight (Studies 1 and 2).

Theoretical Implications

Most theories of embodied cognition share the assumption that activating a sensory state activates the associated abstract concept. They assume that abstract knowledge is scaffolded upon (Williams et al., 2009), requires simulation of (Barsalou, 1999), or shares conceptual structure with (Lakoff & Johnson, 1980, 1999) concrete sensory domains. Hence, the sensory experience should be sufficient to elicit metaphor-congruent judgments. Our findings challenge this assumption. We only observed an influence of physical weight on judgments of importance when the judgment dimension was on perceivers' minds when at the time of sensory experience. Thus, our evidence is incompatible with these models of embodied cognition.

However, our findings are consistent with theories of knowledge accessibility and situated social cognition. These theories assume that most inputs are somewhat ambiguous and require interpretation, guided by concepts that are rendered accessible by current goals and situational influences (for reviews, see Higgins, 1996; Smith & Semin, 2004, 2007). From this perspective, physical weight is an ambiguous input that could be interpreted in any number of ways or bearing upon any number of targets. Heaviness would only be perceived as bearing on importance when this evaluative dimension is accessible at the time of the sensory experience. Thus, the influence of sensory states follows the logic of knowledge accessibility (Higgins, 1996). Future research may fruitfully test to which extent this conclusion holds for other sensory experiences and judgment domains as well as how the current results bear upon sensorimotor versus enactive accounts of embodiment effects (Foglia & O'Regan, 2016; Palmiero et al., 2019).

A situated perspective also refines previous theories by providing a parsimonious solution for the problem of one-to-many mappings. Some sensory inputs have multiple metaphorical meanings, as already noted for the case of verticality—being "up" or "down" can connote valence (Meier & Robinson, 2004), godliness (Meier et al., 2007), power (Schubert, 2005), and rationality/emotionality (Cian et al., 2015). Additionally, these meanings can differ across cultures (see Xu et al., in press). Which interpretation is applied is presumably guided by the concept rendered most accessible by the current task, context, or culture. At present, the available data are compatible with this suggestion but suffer from the ambiguities associated with different experimental materials across different tasks (Schwarz & Lee, 2019).

Our findings pose a problem for the previously reviewed theories of embodied cognition. These theories embrace the idea that abstract knowledge is built upon concrete domains in such a way that the two are inextricably linked. However, if the two domains are so closely tied, how can embodiment effects be so dependent upon context as the current results suggest? Additionally, recent research has documented other boundary conditions that eliminate the effect, such as a lack of supporting information (Chandler et al., 2012), a lack of elaborative thinking (Hauser & Schwarz, 2015), and high salience of the sensory cue (Zestcott et al., 2017). Nonreplications have also been reported (e.g., Ebersole et al., 2016; Rabelo et al., 2015). How can the link between inextricable concepts be so feeble?

Barsalou (2016) refined these theories, proposing that situated conceptualization explains how embodied cues can have moderated effects. In his framework, the degree to which current situational inputs mirror the inputs of past situations where embodied associations are learned determines whether a current embodied cue will activate the associated concept. While this approach may explain some boundary conditions such as individual differences, it does not provide a clear explanation for others. For instance, it would suggest that most people have learning experiences that associate small (but not large) increases in heaviness with importance (Zestcott et al., 2017), associate heaviness with importance only in situations where they are thinking elaboratively (Hauser & Schwarz, 2015), and only associate heaviness with importance in situations where importance is already on the mind (the current results). These suggestions could be true, but they would prove difficult to test.

Instead, the assumption that sensory states and abstract knowledge are inextricably linked may need to be revisited. Situated embodiment attenuates this assumption by suggesting that the link between sensory states and abstract concepts is subject to contextual influences on knowledge accessibility. Sensations like warmth, heaviness, and fishy smells are ambiguous inputs, and their interpretation and impact depend on which applicable concept is rendered most accessible by the current context, goal, or culture. Future research may fruitfully test this assumption across a broader range of sensory experiences.

Finally, our findings reiterate a core insight of social psychology: Situations matter. Heaviness does not obligatorily imply importance, and (most likely) warmth does not obligatorily imply friendliness. There are indeed associations between these concepts, but, in line with the logic of situated cognition (Higgins, 1996; Smith & Semin, 2007), the situation plays a critical role in determining whether those associations manifest in tangible effects. While previous reviews of embodiment in social psychology laid out ample evidence of sensory experiences exacting strong main effects on judgments (see Niedenthal et al., 2005), these effects may be more fragile and sensitive to contextual minutiae than previously assumed.

Conclusion

The lessons learned from social psychological research into situated cognition (Smith & Semin, 2004, 2007) can provide a heuristically useful framework for understanding embodiment effects. While a book's heft would not affect its perceived importance without a conceptual grounding of importance in physical weight, its heft alone is not sufficient to make it important. Sometimes a heavy book is just a heavy book.

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