

Over the Hills and Far Away: The Link Between Physical Distance and Abstraction

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Abstract

Construal level theory posits a bidirectional relationship between physical (geographical) distance and levels of mental representation, whereby larger magnitudes of distance trigger higher levels of mental representation and higher levels of mental representation increase perceptions of distance. In the current article, we review research that supports a construal level theory approach to physical distance. After briefly describing the basic tenets of construal level theory, we review factors that influence perceptions of distance in physical space as well as effects of physical distance on mental representation, judgment, and behavior that are consistent with this framework. We close by discussing future directions to be explored.

Keywords

construal level, abstraction, space, psychological distance

Interactions across physical distance are a part of our everyday experience: We work as members of distributed teams, instant message friends across the globe, and follow breaking news occurring in faraway countries. Many assume that larger magnitudes of distance from objects and events reduce their impact or relevance (e.g., Latané, Liu, Nowak, Bonevento, & Zheng, 1995). Conversely, others have argued that technology has essentially “flattened” the world or, more bluntly, that distance is “dead” (Cairncross, 1997). Indeed, with e-mail and instant messaging being primary modes of communication even for those located in close proximity, perhaps geographical distance is not the influential factor it once was.

In this article, we review research that has used construal level theory (Trope & Liberman, 2010) as a framework to suggest that, far from being dead, distance can fundamentally change the way we think about and behave toward the world. Indeed, that we interact with increasing regularity across distance makes it particularly important to explore ways in which high and low degrees of distance might elicit different ways of processing information. In what follows, we briefly describe the central tenets of construal level theory and then describe how this approach has expanded our understanding of both the antecedents of distance estimates and the consequences of distance for mental representation, judgment, and behavior. Throughout, we limit our focus to the issue of physical distance (not reviewing extant construal research on other topics) so as to provide a current, comprehensive review of this area of research.

Physical Distance and Representation

Level of representation

According to construal level theory, distance from things (objects, events) is associated with how abstractly those things are construed or represented. Abstract, higher-level representations consist of schematic summaries that capture the essence or gist of something, whereas concrete, lower-level representations incorporate more contextual, readily observable features (Trope & Liberman, 2010). Further, higher-level representations involve broad and global processing, whereas lower-level representations involve narrow and individuating processing (Liberman & Förster, 2009). To exemplify, consider the act of voting. A higher-level representation of voting might emphasize its overall purpose (e.g., partaking in democracy) or the traits it conveys (e.g., responsibility). Alternatively, a lower-level representation would emphasize voting’s concrete aspects, such as how it is implemented (e.g., pressing a lever) or the context in which it will be performed (e.g., a public school).

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Increases in distance are associated with higher-level representations, a link that presumably stems from an association between distance and knowledge. Usually, people have less knowledge or certainty regarding things in distant locations, particularly about their concrete aspects. It is often useful, therefore, to rely on more general, abstract representations (e.g., schemas, prototypes) when thinking about faraway things, because such information is less likely to change and more likely to be reliable across different degrees of distance. In this way, construal level theory assumes that people develop a bidirectional association between distance and representation whereby more distant things trigger higher-level representations and higher-level representations confer a sense of greater distance. Presumably, this association is overgeneralized such that even when individuals have reliable concrete information about distant things they will still represent them more abstractly.

Antecedents of physical-distance judgments

Given an association between distance and representation, abstract representations should magnify perceptions of distance. Consistent with this assertion, Liberman and Förster (2009) presented participants with hierarchical letters (larger letters made of smaller letters). On a subsequent distance-estimation task, participants assigned to identify the larger letters (i.e., to focus on the global elements, associated with abstract representations) estimated greater distances than those who identified the smaller constituent letters (i.e., who focused on local elements, associated with concrete representations). Interestingly, although Liberman and Förster found that effects on distance estimates only occurred for self-anchored judgments (i.e., distance estimates from where participants were currently located), other research (e.g., Wakslak & Trope, 2009) has found conceptually similar effects on distance estimates between objects not involving the self, suggesting that more research is needed to explore the conditions under which construal will influence only self-anchored distance estimates versus distance estimates more broadly.

Another influence on distance estimates derives from construal level theory's conceptualization of physical distance as one of a number of distance dimensions (physical, social, temporal, and probabilistic distance) that each relates similarly to representation. The theory uses the term *psychological distance* to encompass these disparate dimensions, thereby highlighting the commonality between them. Evidence that physical distance shares a common meaning with these other dimensions emerges in studies using a modified Stroop paradigm (see Trope & Liberman, 2010, for a review). For example, participants viewed landscape photographs with arrows pointing at either a proximal or distal point in the landscape; these arrows contained a word denoting either psychological proximity (e.g., tomorrow, we, sure) or distance (e.g., year, others, maybe). When asked to quickly identify the words as belonging to one or the other category, participants responded more quickly when the physical distance cue was congruent rather than incongruent with the word's distance connotation (e.g., a

physically distant arrow containing a word denoting temporal distance; a physically proximal arrow containing a word denoting temporal proximity).

This association between physical and other distances suggests that changing the magnitude of other distance dimensions should influence physical distance estimates. Consistent with this idea, Stephan, Liberman, and Trope (2010) found that participants who observed a speaker address another person using socially close language (colloquial phrases) rather than socially distant language (formal phrases) estimated less physical distance between the communicators. Moreover, participants who addressed a stranger using language that was socially closer actually chose to maintain less physical distance from the addressee.

Another cue for distance recently examined in relevance to construal level theory is fluency. Alter and Oppenheimer (2008) argue that fluency is an ecologically valid distance cue, as distant objects are typically difficult to see and less frequently encountered and thus more perceptually and conceptually disfluent; accordingly, they found that object disfluency (i.e., the degree to which an object is difficult to process) was associated with higher-level representations. Moreover, items were judged as closer when fluently (vs. disfluently) processed: Participants estimating their distance from several cities on a difficult-to-read questionnaire (disfluent stimulus) estimated greater distances than those completing an easy-to-read version (fluent stimulus). Similarly, when reporting their distance from previously primed cities as well as novel cities, participants judged the primed (and presumably more fluently processed) cities as closer than the novel cities.

Consequences of physical distance

An association between physical distance and representation further suggests an effect of distance on representation, as well as downstream effects on judgment and behavior.

Representation. Using a variety of indicators, research supports the prediction that distant events are represented in more abstract, higher-level terms, even when concrete information about them is available and reliable. Fujita, Henderson, Eng, Trope, and Liberman (2006), for example, found that participants who imagined behavior occurring in a distant (vs. near) location increasingly thought about the general motives driving behavior rather than particular means one might use to implement behavior. Furthermore, participants who viewed a video purportedly taped in a distant (vs. near) location used more abstract language to describe the video's content. Similarly, Rim, Uleman, and Trope (2009) found that participants were more likely to spontaneously infer abstract traits from the same behavioral information about others who were purportedly far rather than close.

Distance effects on representation have been found using measures of "chunking" as well. For example, using a behavior-segmentation technique in which participants viewed a film containing a sequence of actions and were instructed to

push a button each time a meaningful unit of behavior occurred, Henderson, Fujita, Trope, and Liberman (2006) found that participants created larger segments of actions that were framed as faraway (vs. nearby), suggesting they approached the distant sequence through a more abstract, broader lens. Moreover, getting even more directly at representation by focusing on representational mode, Amit, Algom, and Trope (2009) examined the effect of distance on identification of pictures, a concrete way of representing things, versus words, a more abstract mode of representation. Using pictures with depth cues to manipulate the perceived distance from target stimuli, the researchers found that participants more quickly classified pictures located in a near (vs. distant) position but more quickly classified words located in a distant (vs. near) position.

While most research on physical distance focuses on horizontal distance, Meyers-Levy and Zhu (2007) examined the effects of increased vertical distance, finding that people exhibit higher levels of abstractness of ideation when larger vertical spaces (i.e., ceiling heights) are salient. Higher ceilings led participants to use broader categories and more abstract language to classify objects. Thus, both horizontal and vertical distances appear to similarly lead to higher-level representations.

Judgments. If representation of something changes as a function of distance, judgments should change accordingly. For example, more distant, abstractly represented behavior should be increasingly attributed to traits over contextual factors, resulting in greater correspondence bias. Henderson et al. (2006) supported this prediction: Participants expected the future behavior of a distant (but not near) person to be consistent with a described behavior, regardless of whether this behavior was caused by situational constraints (e.g., the person was forced to adopt a viewpoint for an essay).

Another implication of a distance shift in level of representation is that individuals should expect events in distant locations to more strongly resemble prototypical events, which are relatively schematic and abstract. So, for example, when thinking of the weather in a distant location one should think of that location's prototypical weather (e.g., rain in London in January) rather than a less prototypical occurrence (a sunny, cloudless day in London in January). Indeed, participants expected a greater likelihood for typical events (and lesser likelihood for atypical ones) when making judgments related to a distant (rather than near) location (Henderson et al., 2006). This tendency to expect a general case to emerge when considering events in a distal location was also evident in predictions participants made when shown data reflecting a general trend accompanied by a recent local deviation from the trend. When asked to predict outcomes for distant (vs. near) locations, participants were more likely to extrapolate from general trends (vs. local deviations). Moreover, consistent with such a focus on general information, people preferred seeing data relevant to a distant (vs. near) location (e.g., stock traded on a distant vs. near exchange) aggregated across larger time intervals (Wakslak, 2010).

Distance effects on representation also have implications for the degree of individuation of social targets. With decreasing physical distance from objects, people should exhibit narrower breadths of categorization due to the increased focus of lower-level representations on individuating object features. Indeed, participants who perceived less physical distance from members of a task group increasingly thought about those members as unique individuals rather than interchangeable constituents of a group, resulting in reduced confidence that members possessed prototypical group features (i.e., that they had common goals; Henderson, 2009).

In further research, we (Henderson & Wakslak, 2010) extended this logic to the domain of priming, reasoning that when individuals form judgments of a close target (e.g., someone skydiving in a nearby location), they process the target in a more localized manner, judging the target as an individual about which they have no a priori opinion rather than as a member of a category (e.g., "skydivers") about which they already have a general impression. Consistent with this, we found that available semantic primes had an influence on evaluations of nearby (but not faraway) targets. Furthermore, we reasoned that individuals hold general attitudes about social categories (e.g., people who skydive) and that general information is favored for distant judgments, and we found that, indeed, participants' general attitudes about a target's category were a better predictor of their evaluations of a distant rather than close target.

Behavior. Shifts in representation also have behavioral consequences. Henderson (in press), for example, examined negotiations across small or large degrees of physical distance, arguing that because higher-level representations entail a focus on primary over secondary information, distant negotiators should more successfully focus on their primary negotiation motives. Indeed, participants who negotiated via instant text exchange with someone purportedly faraway (vs. nearby) were more likely to make concessions on low-priority issues in exchange for concessions on high-priority issues, consequently achieving more mutually beneficial agreements.

Distance cues also influence task behavior. Jia, Hirt, and Karpen (2009) reasoned that more abstract, higher-level representations should facilitate creativity; they demonstrated that portraying a task as originating from a far (vs. close) location increased creative responses and led to better performance on a problem-solving task requiring abstract creative insight. Shani, Igou, and Zeelenberg (2009) examined distance's role during information search. They argued that unpleasant potential facts (e.g., being overcharged by a photographer) represent relatively unimportant, lower-level features of events (e.g., a wedding day) and posited that people who adopt higher-level representations should give less attention to such facts and consequently be less motivated to seek confirming information. Supporting this, participants were less affected by and less likely to seek information about a potential unpleasant fact (e.g., missing an opportunity on the stock market) when it

concerned a distant rather than near situation (i.e., foreign vs. local company).

Future directions

Physical distance often covaries with several variables (e.g., familiarity, similarity). The studies we have reviewed held these variables constant (e.g., Henderson, in press; Jia et al., 2009) and/or included measures to verify that the effects still emerged when statistically controlling such variables (e.g., Fujita et al., 2006; Henderson, 2009). Future research should continue to examine unique effects of physical distance, especially in consequential domains like education and financial decision making; this should be complemented by research on how distance might interact with other variables that may covary with it. Moreover, research should examine interactive effects of physical and other distances. Intriguingly, given that some work (e.g., Casasanto & Boroditsky, 2008) suggests that physical distance is a fundamental dimension upon which other key variables (e.g., time) are anchored, physical distance may exert more influence than other distances. More broadly, such research would begin to explore boundary conditions for some of the findings we reviewed, another general area not given sufficient attention to date.

Another intriguing issue pertains to mapping the constructs of objective physical distance, psychological distance, and level of representation onto one another. For example, research has primarily manipulated distance at two levels (near vs. distant). While this work has established that greater distance elicits higher-level thinking, it leaves unanswered how increasing amounts of distance relate to level of representation (e.g., is the relationship linear?). Moreover, construal-level theory's use of the phrase "psychological distance" to encompass different distance dimensions under a unifying umbrella concept raises the possibility that it is subjective distance, rather than objective distance (which has largely been the focus of extant research), that is critical. Future research should explore how events that are subjectively (but not objectively) close versus far from people might be construed differently.

Coda

The research we reviewed here supports a broad association between physical distance and mental representation. Of course, construal-level theory recognizes that other factors beyond level of representation (e.g., physiological resources, motivation) can affect perceptions of distance (e.g., Proffitt, Stefanucci, Banton, & Epstein, 2003) and that physical distance exerts effects that are dependent as well as independent of level of representation (see Henderson, in press, which separates such effects within the context of a single study). Our review, however, points to the variety of previously untapped findings that emerge from construal level theory, highlighting how changes in mental representation are one way through which physical distance influences judgment and behaviors.

Recommended Reading

- Bar-Anan, Y., Liberman, N., & Trope, Y. (2006). The association between psychological distance and construal level: Evidence from an implicit association test. *Journal of Experimental Psychology: General*, *135*, 609–622. Demonstrates that people have an implicit association between more psychological distance (e.g., increased physical distance from events) and abstract thinking.
- Fujita, K., Henderson, M.D, Eng, J., Trope, Y., & Liberman, N. (2006). (See References). Demonstrates that events that are geographically far away are thought about in more abstract, higher-level terms.
- Henderson, M.D, Fujita, K., Trope, Y., & Liberman, N. (2006). (See References). Demonstrates that people's judgments and predictions reflect a more general way of thinking when dealing with events and people that are physically far away from them.
- Liberman, N., & Förster, J. (2009). (See References). Demonstrates that making people focus on general patterns rather than specific details increases how psychologically far away (e.g., physical distance) events seem from them.
- Trope, Y., & Liberman, N. (2010). (See References). Reviews research in support of construal level theory, specifically highlighting how people's level of abstract thinking is related to the extent that they think about the future, the past, remote locations, another person's perspective, and counterfactual alternatives.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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