



FlashReport

Imagined sensory experiences can shape person perception: It's a matter of visual perspective

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HIGHLIGHT

- ▶ Person evaluation is impacted by imaginary sensory experiences.
- ▶ Spatial visual perspective serves as a boundary condition of embodied cognition.
- ▶ Embodied simulation is primarily grounded in a first-person processing orientation.

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ABSTRACT

Psychological warmth serves as a fundamental dimension of human social cognition. From impressions of strangers to appraisals of groups, assessments of warmth (vs. coldness) comprise an elemental building block of social perception. Using embodiment as a guiding framework, research has demonstrated that perceptions of others along the warm-cold dimension can be elicited by sensory experiences (e.g., physical warmth). Here we show that effects of this kind can also be triggered by mentally simulating physical temperature, but only under certain theoretically important imagery conditions. Specifically, impressions of a target were impacted by imagined warmth or coldness (i.e., thinking about holding a cup of hot/iced coffee) only when an event was simulated from an egocentric (i.e., first-person) perspective. No such effect emerged when an allocentric (i.e., third-person) orientation was adopted. This finding underscores the functional nature of mental simulation and identifies spatial visual perspective as a critical boundary condition of embodied cognition.

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Introduction

Psychological warmth serves as a fundamental dimension of human social cognition. From impressions of immediate strangers to appraisals of distant groups, assessments of warmth (vs. coldness) comprise an elemental building block of the person perception process (e.g., Asch, 1946; Fiske, Cuddy, & Glick, 2007). The benefits of this evaluative tactic are many. Having established that a person is warm or cold, one can quickly surmise whether they are also likely to be friendly or antagonistic, trustworthy or duplicitous and to be approached or avoided (Asch, 1946, 1958). Put simply, estimates of warmth underpin the behavioral products (e.g., impressions, feelings, actions) that shape the course and character of everyday social interaction. Moreover, this pivotal social-cognitive inference requires neither awareness nor consent, intuiting a person's psychological warmth is as straightforward as establishing they are female, middle aged and Asian (Fiske et al., 2007).

The application of warm and cold as universal person descriptors is believed to originate in the mind's propensity to ground abstract concepts (including psychological warmth) in concrete perceptual

experiences (i.e., embodiment, see Barsalou, 1999; Lakoff & Johnson, 1980; Niedenthal, Barsalou, Winkielman, Krauth-Gruber, & Ric, 2005). Throughout early development, caregivers provide infants with repeated instances of bodily (e.g., cuddling, holding, caressing) and psychological intimacy (e.g., love, trust, support), prompting powerful associative links to be forged between physical and social warmth (Lakoff & Johnson, 1980; Williams, Huang, & Bargh, 2009). The consequences of this affective coupling are compelling. Physical and social warmth become functionally interchangeable (i.e., physical warmth = social warmth), such that experiences of physical warmth (or coldness) trigger the same subjective states (e.g., feelings) as those associated with psychological warmth (or coldness), and vice versa (e.g., Bargh & Shalev, 2012; Ijzerman & Semin, 2009, 2010; Williams & Bargh, 2008; Zhong & Leonardelli, 2008). Thus, just as a hot shower can attenuate feelings of loneliness, so too social isolation can amplify the degree to which one feels physically cold. Similarly, and of relevance to the current investigation, briefly holding a cup of hot rather than iced coffee can elevate the apparent warmth of a target's personality (Williams & Bargh, 2008).

Notwithstanding widespread endorsement of embodied accounts of psychological warmth (Williams et al., 2009), important theoretical questions remain. In particular, what are the critical boundary conditions for the emergence of "warm-cold" effects and embodied social

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cognition more generally (Landau, Meier, & Keefer, 2010; Meier, Schnall, Schwarz, & Bargh, 2012)? To date, work exploring the substitutability of physical and social warmth has focused exclusively on online embodiment (Niedenthal et al., 2005; Wilson, 2002), the extent to which perceptual experiences (e.g., holding a hot coffee cup) trigger concomitant subjective feelings (i.e., psychological warmth) when people interact with the environment (Bargh & Shalev, 2012; Ijzerman & Semin, 2009; Williams & Bargh, 2008). Of comparable theoretical significance, however, is the related question of what happens during offline embodiment when cognitive activity is decoupled from the external world (Wilson, 2002; Zhong, Strejcek, & Sivanathan, 2010), as is the case during mind wandering? For example, are internally generated experiences of physical temperature (e.g., imaginary events) sufficient to influence impressions of a target's personality (cf. Williams & Bargh, 2008)?

Our intuition is that imagined physical warmth (or coldness) can indeed impact person evaluation, but only under quite specific triggering conditions. A central tenet of embodiment is that when cognition is offline (e.g., during mental simulation), activity continues in modality-specific systems (Barsalou, 1999; Wilson, 2002). As Niedenthal et al. (2005) report, "just thinking about an object produces embodied states as if the object were actually there" (p. 187). But is this really the case for all mental simulations? Are embodied states (e.g., modality-specific re-enactments) an inevitable accompaniment to offline cognition? We suspect not. When imagining an event (e.g., holding a cup of coffee), it is possible to adopt one of two viewpoints: an egocentric (i.e., first-person) or allocentric (i.e., third-person) spatial visual perspective (Avraamides & Kelly, 2008). From an egocentric (i.e., actor) perspective, people experience events through their own eyes, as if they were looking outward on the world. In contrast, from an allocentric (i.e., observer) perspective they see themselves through the eyes of others, as actors embedded in an event (Libby & Eibach, 2011). Critically, these contrasting visual perspectives serve distinct roles in perception and action. While egocentric frames of reference are body-centered (i.e., self-to-object spatial relations) and guide action (e.g., reaching, grasping) in near space, allocentric representations code the spatial relations among objects (i.e., object-to-object spatial relations) and impact action planning at a distance (Kosslyn, 1994; Milner & Goodale, 1995).

These differences in spatial visual perspective may exert an important influence on the emergence of embodied behavior. Elsewhere, neuroimaging investigations have revealed greater activity in motor and sensorimotor regions when people imagine actions (and body parts) from an egocentric than allocentric viewpoint (e.g., Lorey et al., 2009; Ruby & Decety, 2001). In addition, the contents of mental simulations comprise more information about bodily sensations, affective reactions and psychological states when events are imagined from a first- than third-person perspective (Libby & Eibach, 2011; McIsaac & Eich, 2002). Given therefore the contention that offline cognition (i.e., mental simulation) is body-centered and action oriented (Gallese, 2005; Jeannerod, 1994; Wilson, 2002), these imaging and self-report data suggest that the visual perspective from which an event is imagined may also impact the emergence of embodied behavior. Specifically, effects should be more pronounced when an egocentric than allocentric perspective has been adopted during mental simulation. As Lorey et al. (2009) contend, "...imagining oneself from a first-person perspective is more embodied than from a third-person perspective" (p. 233). We explored this prediction in an experiment in which participants furnished impressions of a target after imagining holding a cup of coffee (hot or iced) from either an egocentric (i.e., first-person) or allocentric (i.e., third-person) viewpoint.

Method

Participants and design

Forty-eight undergraduates (24 females) completed the experiment. The study had a 2 (Visual Perspective: egocentric or allocentric) ×

2 (Coffee Cup: hot or cold) between-subjects design and was reviewed and approved by the School of Psychology, University of Aberdeen ethics committee.

Stimulus materials and procedure

Participants arrived at the laboratory individually and were greeted by a female experimenter who explained that the study comprised the performance of two unrelated tasks. The first task consisted of a guided mental imagery exercise whereby participants were instructed to imagine holding a cup of hot or iced coffee from either an egocentric or allocentric visual perspective. Prior to the imagery, participants were instructed about the visual perspective they were required to adopt. Those in the egocentric condition were told: "When you imagine the event, please picture it from a first-person perspective. Visualize the event from your own viewpoint—that is, you see the event through your own eyes." Alternatively, participants in the allocentric condition were instructed: "When you imagine the event, please picture it from a third-person visual perspective. Visualize the event from the viewpoint of an observer—that is, you see yourself and the surroundings." The experimenter then checked that the participant understood the instructions and clarified any misunderstandings. Next, participants were blindfolded to enhance the vividness of their imagery and asked to imagine (from the instructed perspective): "Standing outside a lecture theater with a friend who asks you to hold their cup of hot (iced) coffee while they go to the bathroom." Participants were given 30 seconds to visualize this event.

The second task comprised a personality questionnaire modeled on Asch (1946) and Williams and Bargh (2008). Participants were given a brief description of a hypothetical Person A (i.e., "Person A is intelligent, skillful and industrious. Person A is also determined, practical and cautious") and then rated this individual on ten traits using 7-point Likert scales. Five of the traits were related to the "warm-cold" dimension (i.e., generous/ungenerous; happy/unhappy, good-natured/irritable, sociable/anti-social and caring/selfish) while the others were unrelated to psychological warmth (i.e., attractive/unattractive, carefree/serious, talkative/quiet, strong/weak, honest/dishonest). Following Williams and Bargh (2008), scores for each trait set were averaged into a single index that was either relevant or irrelevant with respect to psychological warmth.

On completion of the tasks, participants were funnel debriefed to probe for any suspicions they had regarding the purpose of the research. Crucially, no participant indicated awareness of the experimental hypothesis or the possibility that the imagery task could influence ratings of the target. Finally, participants were fully debriefed and dismissed.

Results

Relevant traits

A 2 (Visual Perspective: actor or observer) × 2 (Coffee Cup: hot or cold) between-subjects analysis of variance (ANOVA) was performed on the data. This yielded a main effect of Coffee Cup, $F(1,44) = 5.96$, $p = .02$, $\eta_p^2 = .12$, that was qualified by a Visual Perspective × Coffee Cup interaction, $F(1,44) = 4.29$, $p = .04$; $\eta_p^2 = .09$, (see Fig. 1). Simple effects analysis revealed that only from an egocentric (i.e., first-person) perspective did the temperature of the coffee cup impact ratings, such that perceptions of the target were colder when participants previously imagined holding an iced rather than hot beverage, $F(1,44) = 10.18$, $p = .003$. No such effect emerged from an allocentric (i.e., third-person) perspective, $F < 1$. To establish the directionality of the effect observed in the egocentric condition, twelve additional participants (6 females) were given the personality questionnaire absent the imaginary warm/cold experience. This baseline condition enabled us to ascertain if it was the hot or cold (or both) mental simulation that was driving the effect. Interestingly, only ratings in the cold condition differed

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