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Research Article

Shopping to and fro: Ideomotor compatibility of arm posture and product choice

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Abstract

Consumption often requires flexing arms toward the body and merely inducing such activities has been shown to influence consumption. In three studies we show that the consumption effects from lateral arm movements arise from the fit between cognitions and motor activity. When a shopping situation conceptualizes product acquisition as movement away from the body the effects from priming arm flexion and extension are reversed. The findings prefer an ideomotor compatibility account rather than suggesting hardwired and unmalleable association between arm posture and consumption. The implications of these results for ideomotor research and management practice are discussed.

Keywords: Consumer behavior; Purchase quantities; Approach and avoidance motivation; Embodiment; Persuasion; Shopping

Body posture influences many behaviors, including consumption. Perhaps the most widely studied and easily manipulated body posture is arm extension or flexion. *Arm extension* occurs when the hand is extended away from the body (elbow ≈ 180°), whereas *arm flexion* occurs when the hand is retracted toward the body (elbow ≈ 90°). To illustrate, arm extension tends to facilitate responding to negative stimuli, whereas arm flexion facilitates responding to positive stimuli (for review see Eder & Hommel, 2013). Analogously, based on the association between arm flexion and positive evaluation, participants consume more when an arm is flexed than when it is extended (Förster, 2003). However, we will argue that posture effects on consumption are modulated by their compatibility with cognitions (Barsalou, Niedenthal, Barbey, & Ruppert, 2003; Körner, Topolinski, & Strack, 2015). In addition to providing a critical theoretical test of three models described below, this research also contributes practically by clarifying how shopping environments can be managed to optimize consumers' experiences.

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Theoretical framework

Arm postures both reveal and influence attitudes. Arm extension is typically faster when judging negative stimuli, whereas arm flexion is faster with positive stimuli (Chen & Bargh, 1999; Solarz, 1960). Rather than measuring arm flexion and extension, Cacioppo, Priester, and Berntson (1993) manipulated it. They had participants press their palms either downward on the topside of a table (arm extension) or upward against the bottom side of the table (arm flexion) while viewing a series of neutral Chinese ideographs. The ideographs were evaluated more positively when paired with arm flexion than with extension. Förster (2003) first applied this phenomenon to consumer behavior by manipulating arm flexion or extension (as in Cacioppo et al., 1993) while participants watched a TV program. Critically, while they watched the program, a bowl of cookies was placed nearby. Participants with flexed arms ate more cookies than those with extended arms. Researchers initially explained these posture-attitude associations via *evaluative conditioning*. That is, because negative stimuli are often pushed away from the body, and positive stimuli are typically pulled

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toward the body, arm extension and flexion respectively became associated with negative and positive evaluations of stimuli. And eventually, due to a lifetime's experience, those arm movements themselves come to signify negativity and positivity. Thus, arm extension induces a negative affective state, which elicits systematic processing that decreases consumption by critically highlighting negative attributes of products. In contrast, arm flexion induces positive affect and heuristic processing, which increases consumption by focusing on the positive attributes of products (i.e., feelings-as-information; Schwarz, 2002).

Although there is much evidence for evaluative conditioning as a general behavioral mechanism (Hofmann, De Houwer, Perugini, Baeyens, & Crombez, 2010), more recent evidence suggests that evaluative conditioning may not explain the effect of arm posture on attitudes. In particular, the effect appears to be moderated by the desirability of the product. For example, Förster (2003) had participants watch a documentary film with their arm in a flexion, extension, or neutral position, and with a glass of either orange juice or mineral water to drink. Importantly, the orange juice was shown in pre-testing to be extremely tasty, whereas the mineral water was judged to be of neutral taste. Participants drank more orange juice with flexed arms and less orange juice with extended arms, relative to the neutral posture. However, arm posture did not affect consumption of the neutral product, mineral water. Similarly, Förster (2004) showed a series of desirable foods and drinks (e.g., Snickers) and undesirable foods and drinks (e.g., beef lung) to participants whose arms were either flexed, extended, or relaxed in a neutral position. Participants judged the desirable products more favorably with flexed arms, and judged the undesirable products less favorably with extended arms. Van den Bergh, Schmitt, and Warlop (2011) also showed that product-type (i.e., vice or virtue) moderates the influence of arm posture on product choice. In a field study, they examined purchases by shoppers who carried a basket (which may involve arm flexion) or pushed a cart (which typically entails arm extension). They found that basket shoppers purchased more chocolate bars, candy, and chewing gum than cart shoppers. In a follow-up lab study, they had participants either extend or flex their arms while choosing between a vice or virtue product (i.e., forced choice between a fruit and a chocolate bar). Participants in the flexion group chose more vice products than participants in the extension group. Thus, arm flexion selectively increased the choice of vice over virtue products.

Evaluative conditioning does not explain this selective effect of arm posture on product choice, because if arm flexion simply induced positive attitudes, then it should increase choices of vice and virtue products equally, as well as desirable, neutral, and undesirable products. Instead, Van den Bergh et al. (2011) supported a *motivation* theory, whereby arm flexion induces a drive for immediate gratification (i.e., reward-seeking behavior) due to the association between arm flexion and approach motivation (Van den Bergh, Dewitte, & Warlop, 2008). Stated alternatively, arm flexion induces positive affect and heuristic processing, which increases choice of vice products by focusing on their short-term benefits. And arm extension induces negative affect and systematic processing, which increases choice of virtues by focusing on their long-term benefits (i.e., cognitive tuning; Schwarz, 2002). So in the choice between an apple (which has the delayed gratification of long-term health) and a chocolate (which has the immediate gratification of short-term satisfaction), arm flexion motivates choice of the immediately gratifying chocolate. And similarly in Förster's (2003) study, arm flexion increased consumption of immediately rewarding products (e.g., orange juice, cookies) but not of neutral products (e.g., mineral water). Thus, at present, this motivation account provides the most complete and viable explanation of the effect of arm posture on consumer choice.

Both of these accounts of arm posture effects assume that consumer behavior is *embodied*, in the broad sense that cognition and behavior are constrained by one's body (Barsalou, 2008; Casasanto, 2011; Krishna, 2012; Krishna & Schwarz, 2014). In this case, consumers' preferences, choices, and actual consumption are influenced by the posture of the arm. An equally important – but less studied – assumption of embodiment is that cognition is also *situated*, in the broad sense that cognitions occur in various situations that may impose different constraints and hence elicit different behaviors (Barsalou, 2009; Robbins & Aydede, 2009). For instance, people prefer products when the handle is oriented toward their dominant hand, so that they could easily imagine grasping it (Elder & Krishna, 2012). But if the dominant hand is occupied (e.g., by holding something else), then people prefer the product when the handle is oriented toward the nondominant hand, again presumably because it facilitates the mental simulation of grasping the product (Eelen, Dewitte, & Warlop, 2013). Thus, when the situation constrained the available bodily response, the embodied effect was reversed. Situation effects such as these demonstrate that the *ideomotor compatibility* between a mental simulation of an action (e.g., imagining grasping a cup with handle pointed leftwards) and the enactment of a compatible motion (i.e., pressing a button with the left hand) affects preferences and behaviors (Barsalou et al., 2003; Eelen et al., 2013; Ping, Dhillon, & Beilock, 2009).

We propose that arm posture affects shopping behavior via the ideomotor compatibility between the arm posture and the simulated movement required by the shopping situation. Given that arm flexion enacts movement toward the body, whereas arm extension enacts movement away from the body, arm flexion and extension are naturally compatible with mental simulations of moving objects toward and away from the body, respectively (cf. Glenberg & Kaschak, 2002). And critically, product choice and consumption are typically enacted by motion toward the body: Shopping typically entails moving products from shelves into one's basket, and ingestion entails bringing food or liquid toward the mouth. Consequently, consumption typically is mentally simulated by movement toward the body. So by default, arm flexion is compatible with mental simulations of consumption, and hence arm flexion should increase consumption and choice, especially of desirable products (Förster, 2003, 2004; Van den Bergh et al., 2011).

This account attributes the standard arm posture effect to a different mechanism than either evaluative conditioning or motivation. By both of those accounts, it is the long-term behavioral association between arm flexion and positive affect or