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Emotions and language about motion: Differentiating affective dominance with syntax from valence with semantics ☆

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ABSTRACT

Motion as encoded in linguistic cues is used to differentiate affective valence and dominance. Participants were invited to rate their affective responses to different words along valence and dominance scales. The words were nouns describing static cues and verbs describing motion, connected to *DOWN*/*UP* and *Avoidance*/*Approach* cues. The results of three studies showed that valence and dominance could be differentiated through syntax and semantics of motion. On one hand, dominance feelings, compared to valence ones, are particularly influenced by motion encoded in syntactic classes (verbs *vs.* nouns). On the other hand, valence feelings, compared to dominance ones, are influenced by a semantics of motion through *DOWN*/*UP* and *Avoidance*/*Approach* cues, considered as polarities. A polarity correspondence effect is proposed to explain these results.

1. Introduction

In everyday life, the cognitive mind is intimately connected to the physical, emotional and social worlds, and concepts both lead to and are influenced by expressions, bodily signals and behavior. Language might play a role in cementing this connection by simulating those contexts and behavior. In this article, we explore how facets of language such as syntax and semantics and their encoding of motion might help differentiate emotional responses such as valence and dominance, heretofore considered to be similar if not identical constructs.

We suggest that language is not only grounded in concrete perceptual and motor experiences, but also in the way individuals simulate these experiences in grammatical constructions. When speaking about motion, for example, without moving or actively interacting with the spatial world, individuals mentally reactivate previously learned motor and perceptual experiences. In this way, theories of embodied language postulate that processing of linguistic stimuli involves the processing of correspondent modal events, thus connecting conceptual language to various perceptual and motor experiences (Kaschak et al., 2005; Meteyard, Bahrami, & Vigliocco, 2007).

When considering language about motion, it would make sense that mental simulation might be related to either syntactic/grammatical forms or semantics or both. Bergen and Wheeler (2010) recently studied the role of grammatical cues on the content of mental simulation and showed that progressive sentences, compared to perfect ones (a syntactic distinction) about hand motion facilitated related manual action (see also Arunachalam & Waxman, 2010, for the influence of tran-

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sitive *vs*. intransitive sentences on the meaning of verbs for children; Kaschak & Glenberg, 2000, for examining affordances and grammatical cues for the construction of meaning). The recent cognitive linguistic literature suggests that syntactic and semantic explanations about words and sentences interact with each other (McKoon & Ratcliff, 2003; especially for verbs, McKoon & Macfarland, 2002; McKoon & Ratcliff, 2008). With regards to semantics specifically, Sidhu, Kwan, Pexman, and Siakaluk (2014) showed that word recognition involves activation of multiple dimensions of meaning and that bodily experiences were particularly relevant when processing verbs. The embodiment of bodily experiences would include a semantics of motion. As such, we propose that motion might not be simulated only by different syntactic classes of words, but also by particular semantics associated with words such as spatial cues like *DOWN*/*UP* or Away/Toward the body (*Avoidance*/*Approach*). Syntactics and semantics clearly interact, however, we aim to show that distinguishing between the two can be beneficial, leading to a better understanding of how dimensions of emotional affect, specifically valence and dominance, differ from one another.

1.1. Preliminary evidence for valence and dominance being differently related to bodily cues

While several studies have shown that the world of emotion is two-dimensional (Yik, Russell, & Feldman-Barrett, 1999), other studies have proposed that the world of meaning and affect (Fontaine, Scherer, Roesch, & Ellsworth, 2007; Osgood, Suci, & Tannenbaum, 1957) may best be measured through three dimensions – evaluation or valence, activity or arousal and potency or dominance. In the latter studies, however, dominance and valence have been highly correlated and it has been difficult to differentiate between them when computing their correlations within IAPS (International Affective Picture System, Lang, Bradley, & Cuthbert, 2008), ANET (Affective Norms for English Text, Bradley & Lang, 2007), and ANEW materials (Affective Norms for English Words, Bradley & Lang, 1999, respectively .83, .90, .83; see also Warriner, Kuperman, & Brysbaert, 2013). These high correlations suggest that valence and dominance are close emotional concepts (see also Scherer, Dan, & Flykt, 2006). However, several methodological and theoretical considerations might suggest another explanation.

Although valence and dominance are highly correlated, some recent research shows that these emotional dimensions could act differently in relation to bodily information. For example, on a methodological level, a precise look at the Self Assessment Manikin scales used in previous studies (SAM, Bradley & Lang, 1994) reveals the importance of bodily cues in distinguishing these two dimensions. Valence, as the experience of an unpleasant state as opposed to a pleasant one is measured with a 9-point scale, each point being represented by an identically sized manikin. Conversely, dominance, as a feeling of being controlled opposed to being in control, is measured by a 9-point scale in which each point is represented by a manikin that is increasing in size (the feeling of control or dominance is associated with a, large imposing manikin, whereas a state of being controlled is associated with a very small manikin). Thus, the rating scale assessing dominance conveys bodily information (small *vs*. imposing manikin), whereas the rating scale for valence does not.

On a theoretical level, Fontaine et al. (2007) claimed recently that four dimensions are needed to represent the space of emotions (valence, control-dominance, arousal and unpredictability) with the help of various components (Action, Appraisal, Body, Face, Feelings, Gesture, Regulation, Voice). It was observed that dominance is strongly associated with bodily cues (73% of the items were around action, body, face, gesture, and voice), whereas valence is associated with every emotional component (including bodily cues). This observed pattern suggested that valence and dominance could be differentiated (while usually highly correlated) from one another with the help of bodily information.

1.2. Dominance is associated with motion contrasted to inhibition: Verbs compared to nouns as syntactic cues

Dominance might be closely related to social cognitions, such as power, which has been connected to action, as well as emotional and motivational dimensions. Keltner, Gruenfeld, and Anderson (2003; see also Anderson & Berdahl, 2002) proposed that a powerful orientation (with a feeling of control) is associated with the motivational system of approach, whereas a powerless one (a feeling of being controlled) is related to threats, punishments and inhibited social behaviors. Keltner et al. (2003) thus suggested that an approach/inhibition theory of power was the best hypothesis for an understanding of these social behaviors. They contrasted power, dominance and an approach tendency, with reduced power and an absence of action (e.g., inhibition). This rationale proposes that dominance (power) is highly related to bodily action and motion cues (see also Galinsky, Gruenfeld, & Magee, 2003, for linking power to action).

However, inhibition of action is different from an opposing action such as avoidance. Smith and Bargh (2008; see also Maner, Kaschak, & Jones, 2010) discussed this question and examined whether power, dominance, approach, and action would contrast with reduced power, low dominance and the motivational avoidance system, instead of an inhibition orientation. They hypothesized that reduced power and dominance were also related to action and motion cues on the negative side. However, they strongly demonstrated that power facilitated approach behaviors, but did not affect avoidance ones. These results would suggest that power and dominance might be particularly connected to action in contrast to inhibition or inaction. Action as manifested in avoidance behaviors did not facilitate the processing of weak power or submissive cues, as opposed to power ones.

Additionally, language and its grammatical structure, such as different syntactic classes, offer some interesting distinctions for simulating an action or a motion. Vigliocco, Vinson, Druks, Barber, and Cappa (2011) recently suggested that processing nouns and verbs leads to neural separability. For example, Rueschemeyer, Brass, and Friederici (2007) found that