Is valence a unitary and amodal natural kind?

Valence is commonly understood as the positive or negative character of emotions, affective states, and, according to some accounts, even perceptual experiences. Although it is considered to be one of the central concepts in affective sciences and philosophy of emotion, there is widespread disagreement about its underlying nature (Colombetti, 2005). Philosophers debate whether differences in valence stem from differences in mental states' contents (Martínez, 2011; Bain, 2013; Klein, 2015; Carruthers, 2018), the attitudes directed at those contents (Jacobson, 2021; De Vignemont, 2023), or the functional roles they play in the wider cognitive economy (Aydede & Fulkerson, 2018).

Despite these disagreements, two assumptions are widely shared in the literature. First, valence is taken to be *unitary*, i.e. it is identified with a single psychological kind common across affective states. Second, it is assumed to be *amodal*, i.e. "nonsensory, or not specific to any perceptual modality" (Carruthers, 2018 p. 668). Even theorists who allow that perceptual experiences can be valenced typically endorse this second assumption, since "Valence does not look like anything, or it looks like too many things" (De Vignemont 2023, p. 10).

This paper challenges both assumptions by drawing on empirical studies from neuroscience and psychology. First, I argue that the processes underpinning valence are not exclusively amodal but rely on both *modality-specific* and *modality-general* neural encodings. Evidence for modality-specific valence processing comes from multiple sensory domains (Miskovic & Anderson, 2018). For instance, neurons in the *olfactory epithelium* exhibit a patchy organization with a valenced tuning profile (Lapid et al., 2011), while the majority of neural responses associated with gustatory valence is not shared with those correlated with visual valence (Chikazoe et al., 2014). Recent work further suggests that even within vision, valence processing depends on stimulus type: although it is possible to find differential responses to valence of negative and positive stimuli in early visual cortices, these neural signatures are highly dependent on the nature of the stimulus itself (Ballotta et al., 2023). This picture is reinforced by behavioral evidence showing Garner interference between color and valence (Jacobson et al., 2024), indicating that perceptual valence is not processed independently of modality-specific features.

I then argue that modality-specific and modality-general valence processing correspond to *distinct* natural kinds. In particular, I suggest that the widespread belief in the unitary nature of valence results from conflating two different phenomena: the valenced character of affect-laden experiences and domain-general evaluative processes involved in decision-making. Support for this hypothesis comes from the fact that neural evidence for modality-general "valence" substantially overlaps with evidence for abstract value representations used to compare and trade off disparate kinds of options (De Martino & Cortese, 2023). Crucially, both kinds of processes reliably recruit overlapping brain regions, most notably the ventromedial prefrontal cortex, orbitofrontal cortex, and the ventral striatum (Bartra, McGuire, & Kable, 2013; Sescousse et al., 2014). I argue

that what has been described as amodal valence is better understood as *value*: an abstract representational format functioning as a neural "common currency" that enables comparison between otherwise incommensurable options (Levy & Glimcher, 2012). Valence and value, on this view, are not different realizations of a single kind, but two distinct psychological kinds that have been systematically conflated. I conclude by addressing several objections to this hypothesis.

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