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Self and team prioritisation effects in perceptual matching: Evidence for a shared representation

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ABSTRACT

Previous research has demonstrated that in-group favouritism occurs not only in higher-level judgments such as reward allocation, but also in low-level perceptual and attentional tasks. Recently, Moradi, Sui, Hewstone, and Humphreys (2015) found a novel effect of in-group bias on a simple perceptual matching task in which football fans responded more efficiently to stimuli newly associated with their own football team than stimuli associated with rival or neutral teams. This result is consistent with a robust self-bias effect in which individuals show a large performance advantage in responding to stimuli associated with the self over stimuli associated with a close friend or a stranger (Sui, He, & Humphreys, 2012). The present research utilised a perceptual matching paradigm to investigate the relations between self and in-group prioritisation amongst a sample of college rowers. Across two experiments, we demonstrated a reliable performance advantage for self and team stimuli. We also found a relationship between the self and team advantage in RT, and demonstrated an overlap in the perception of self- and team-associated shapes that was stronger in participants who reported a greater sense of group identity with their team. Further, we found no relation between the team bias and positive valence implicitly associated with the team, showing that the team bias effects are unlikely to be driven by emotional significance. The results are consistent with an overlap between self and in-group representation, which may provide evidence for a common process driving both self and in-group perceptual advantage effects.

1. Introduction

A great deal of evidence suggests that socially relevant information is given high priority in cognitive processing. Research has found that personally significant distractors are harder to ignore than neutral ones (e.g., Welford & Morrison, 1980; Wood & Cowan, 1995) and encoding information in relation to the self has repeatedly been shown to enhance memory performance (Cassidy & Gutchess, 2012; Conway & Pleydell-Pearce, 2000; Cunningham, Turk, Macdonald, & Macrae, 2008; Turk, Cunningham, & Macrae, 2008). A bias for the self is also observed in perceptual judgments such as facial recognition, with recognition faster (Keyes & Brady, 2010; Sui, Zhu, & Han, 2006) and orientation judgments enhanced (Sui, Liu, & Han, 2009) for own faces than faces belonging to others.

While this research has consistently shown that self-relevance modulates many forms of attentional and perceptual processes, the experiments have typically used highly familiar stimuli such as faces and names and so it has been difficult to isolate the effects of social relevance from effects of familiarity on performance. However, a series of recent studies demonstrated that newly made associations of the self and personally familiar people to neutral stimuli enhances their perceptual processing (Sui et al., 2012; Sui, Rotshtein, & Humphreys, 2013; Sui, Sun, Peng, & Humphreys, 2014). In a novel paradigm, participants learned to associate geometric shapes (e.g., square, circle and triangle) with social labels ('self', 'friend' and 'stranger') by being told, for example, 'you are the triangle, your best friend is the square and a stranger is the circle'. Following this short learning phase, participants then had to judge whether shape-label pairs subsequently presented very quickly on the computer screen conformed to the original pairings or not by responding with keys for yes and no. There was a large self-prioritisation effect, whereby shapes that were initially matched to the self were responded to faster and more accurately than shapes that were associated with others. Self-associated stimuli also showed weaker effects of stimulus degradation, consistent with perceptual processing being enhanced (Sui et al., 2012). Follow-up research using fMRI found that the self-matched shapes were associated with enhanced activity in

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brain regions linked to self-representation and social attention (the vmPFC and LpSTS), while other-matched shapes recruited a dorsal frontoparietal control network (Sui et al., 2013). The research demonstrated that tagging novel stimuli with self-relevance can rapidly direct attention and enhance perception and, most importantly, that these effects are not rooted in stimulus familiarity.

As well as giving high priority to information relating to the self, human cognition is also largely biased to material relating to social in-groups. Like self-associated information, preference for the in-group affects a wide range of psychological processes, with greater empathetic responses (Johnson et al., 2002; Xu, Zuo, Wang, & Han, 2009), more favourable reward allocation (Tajfel, 1970; Tajfel, Billig, Bundy, & Flament, 1971) and a higher likelihood of ascribing complex emotions (Leyens et al., 2000) to in-group than to out-group members. Furthermore, similar to biases for the self, biases for the in-group also extend to lower level perceptual tasks such as facial recognition (Brigham, Bennett, Meissner, & Mitchell, 2007; Cassidy & Gutchess, 2012; Michel, Corneille, & Rossion, 2007). A recent research study that utilised the matching paradigm described above (from Sui et al., 2012) explored whether in-group associations modulated perceptual matching for neutral stimuli in the same way as associations with the self did (Moradi et al., 2015). Football fans learned to pair the badges of the team that they supported, a rival team and a non-rival (neutral) team with newly associated geometric shapes (e.g. 'your team is the circle, the rival team is the square and the neutral team is the triangle'). Following this stage, they then responded to random shape-badge pairs presented on screen very quickly as being correct or incorrect according to the previously learned associations. As for self-associated stimuli, a large advantage for reaction time and accuracy was found for shapes that were matched to participants' own team badges compared with shapes matched to rival and non-rival badges. Control experiments verified that these effects were not based on increased familiarity for stimuli associated with participants' own team badges, showing that the enhanced performance truly reflected social value. This conclusion was further supported by a positive correlation between the in-group advantage in perceptual performance and satisfaction with the team ratings on Leach et al.'s (2008) multi-component group identification scale. That there was no difference in responses to neutral and rival out-groups suggested the effects were rooted in in-group favouritism rather than out-group derogation.

Prior research thus shows that social significance, such as relevance to the self or an in-group, plays an important role in directing attention and enhancing perceptual processing. Perhaps then, the shared effects of self and in-group relevance on low-level cognition are driven by a common process that stems from a shared representation. This would imply that prioritisation for the self predicts prioritisation for the in-group, and vice versa. Alternatively, in-group prioritisation in this context may be driven by a component distinct from the self, such as emotional or motivational significance inherent in the concept of the group. Many social psychological theories are rooted in the premise that the psychological self extends to include other people and social in-groups such that group memberships form a vital part of self-representation. This forms the basis of social identity theory (Tajfel, 1982) and theories that have followed, such as self-categorisation theory (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987) and optimal distinctiveness theory (Brewer, 1991). In addition to social identity theory and its successors, the theory of identity fusion has more recently been proposed as a unique form of alignment with a group such that in certain individuals or under specific circumstances, the personal self and the social self become completely at one (Swann, Jetten, Gomez, Whitehouse, & Bastian, 2012). In cases of identity fusion, boundaries between the personal and the social self are highly blurred and individuals are likely to care as much about group outcomes as self outcomes, which can lead to extreme forms of pro-group behaviour (Gómez & Vázquez, 2015).

Further, there is experimental evidence to support the notion that the in-group is cognitively represented as a part of the self. For example, Smith and Henry (1996) asked participants to complete questionnaires relating to traits about themselves, an in-group and an out-group and then had them make yes/no self-descriptive judgments on a computer on the same traits. They found that traits on which the self matched the in-group were responded to faster and more accurately than traits on which the self and in-group mismatched, showing a cognitive overlap between self and group representation. There was no effect of matches or mismatches to the out-group. The reverse effect was also demonstrated, with judgments about in-group characteristics facilitated when they matched the self (Smith, Coats, & Walling, 1999). The effect was further demonstrated for attitude as well as trait judgments and was positively correlated with explicit measures of group identification, such that participants who showed a large reaction time facilitation effect tended to report high levels of social identity, a greater desire for closeness with the in-group and higher perceived in-group similarity (Coats, Smith, Claypool, & Banner, 2000). This evidence led to the proposal of a connectionist model for self and in-group representation. Using the basic architecture of an Interactive Activation and Competition model (McClelland & Rumelhart, 1981), Smith et al. (1999) conducted a small-scale simulation such that self and in-group (or partner) nodes were connected by bidirectional positive links which were also connected to certain traits via positive or negative links. The process of answering a question about whether a certain trait described the in-group (or partner) was then modelled. When a trait was positively connected to both in-group and self, there was a much greater activation level (which corresponds to a faster behavioural response time) than when the trait was connected to the in-group alone. Furthermore, when the self-group link was strengthened (or weakened) to reflect perceived closeness with (or distance from) the group, the effect increased (or decreased) accordingly. Thus, the connectionist model predicted the observed behavioural results and strengthened the conclusion that representations of self and others are not stored as isolated and independent structures but are linked by direct connections indicating the strength of relationship and also by indirect connections through commonly shared traits. These experiments provide evidence for a shared cognitive representation of the personal and social self. In this case, we might then expect this overlap to manifest itself at the perceptual level too, with attentional prioritisation for the self (within the perceptual matching paradigm described above), predicting attentional prioritisation for the social in-group.

The present research explores whether the self and in-group biases in visual perception, measured by perceptual matching (Moradi et al., 2015; Sui et al., 2012), are driven by overlapping representations of self and in-group information. Evidence for an overlap between self and group in higher-level processes such as trait judgments has been demonstrated (Coats et al., 2000), but is this also relevant to effects on lower-level, perceptual and attentional processes? If so, we would expect to see a positive correlation between the self and in-group advantages in performance on the perceptual matching task. We might also expect more difficulty in discriminating between newly-learned self and in-group stimuli than, for example, self and rival group stimuli. The two experiments reported here utilised the perceptual matching paradigm described above (Sui et al., 2012) to explore the relationship between the self- and team-oriented advantages in visual perception in a sample of college rowers. In Experiment 1, participants performed two separate matching tasks: one in which they learned to associate self, friend and stranger labels with three separate geometric shapes, and the other in which they learned to associate team, rival and neutral labels with three different geometric shapes. In both tasks, participants had to respond to randomly presented shape-label pairs as correctly or incorrectly matched according to the previously learned associations (learned earlier, at the beginning of the experiment). Performance advantages were taken as the differences in reaction time and in accuracy between self/team shapes and 'non-self' (the average of friend and stranger) and 'non-team' (the average of neutral and rival) shapes, and