Short Report

Taking Another Person's Perspective Increases Self-Referential Neural Processing

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The ability to adopt the perspective of another person has been identified as a critical component of social functioning that predicts level of empathic concern for other individuals (Davis, 1983) and level of category-based responding toward out-groups (Galinsky & Moskowitz, 2000). One explanation for these effects holds that in taking another person's perspective, one comes to treat that person as more "selflike"; indeed, the extent to which perceivers describe another person as sharing their own personality attributes increases after they imagine an event from that person's perspective (Davis, Conklin, Smith, & Luce, 1996). An alternative explanation, however, is that perspective taking might lead only to a shift in non-self-based social-cognitive processes deployed when considering the minds of others (Mitchell, Heatherton, & Macrae, 2002). How exactly does taking another person's perspective lead to greater overlap between self and other?

Recent neuroimaging findings suggest a novel way to test the proposal that perspective taking increases self-based processing of others. Studies have shown that a region of human ventromedial prefrontal cortex (vMPFC) is preferentially engaged by self-referential mentation, such as introspecting about one's own personality characteristics (Kelley et al., 2002) or one's attitudes and preferences (Mitchell, Macrae, & Banaji, 2006). Accordingly, to the extent that perspective taking does lead to greater overlap in the cognitive processes engaged by consideration of self and other, activity in vMPFC should differentiate less between self and a person whose perspective has recently been adopted than between self and a person considered from a more distal vantage.

EXPERIMENT

We tested this hypothesis by scanning 14 participants (10 females, 4 males) while they judged the preferences of two individuals: one whom they had considered earlier from a first-person perspective (P1) and one whom they had considered earlier from a third-person perspective (P3). For the P1 condition, participants viewed the face of an unfamiliar individual and were instructed to "imagine for a moment that you are this person, walking through the world in their shoes and seeing the world through their eyes. Think about how you, as this person, would experience this event." For the P3 condition, participants again viewed the face of an unfamiliar individual, but in this case they were simply instructed "to gather as many clues as you can about what this person might be like and to think about how they might experience the given event." In both conditions, participants were given 5 min to compose a brief narrative essay—using the appropriate perspective—about the target's experience of a common event, such as "meeting a friend for lunch." The order of the P1 and P3 conditions was counterbalanced across participants. The overall length of P1 and P3 essays did not differ significantly (mean number of words = 115.7 vs. 108.9, respectively), $p_{rep} < .759$. To determine the effectiveness of the manipulation, we calculated the percentages of first-person and third-person pronouns in the essays. As expected, P1 essays contained a significantly higher percentage of first-person than third-person pronouns (10.4% vs. 1.9% of words, respectively), whereas P3 essays showed the opposite pattern (0.5% vs. 10.5% of words, respectively).

Participants then underwent functional magnetic resonance imaging (26 axial slices, 5 mm thick; 1-mm skip; repetition time = 2 s; echo time = 35 ms; 3.75 × 3.75 in-plane resolution) while completing an opinion-judging task. On half of the trials, participants considered the opinions and preferences of the target persons about whom they had just written (Mitchell, Macrae, & Banaji, 2006). On these trials, participants were cued with a photograph of either the P1 or the P3 target, which was displayed above a question about the target's opinion about a specific issue. Questions referred to a range of everyday attitudes, such as "enjoys playing video games" and "prefers

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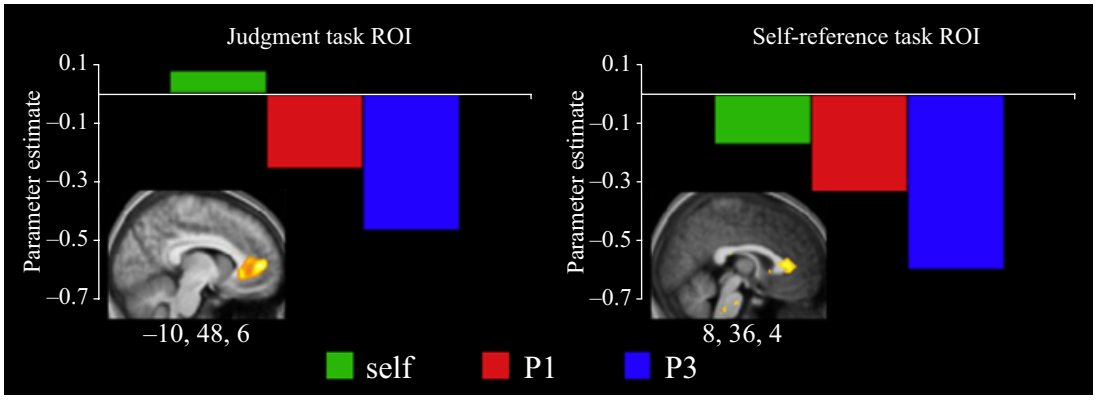

Fig. 1. Blood-oxygenation-level-dependent (BOLD) responses in regions of interest (ROIs) identified by the contrast analyses (greater activation on self trials than on *other* trials). The ROIs are shown overlaid on a sagittal slice of subjects' mean normalized brain and are identified by Montreal Neurological Institute coordinates. Results are shown separately for the opinion-judging task (left panel) and the explicit self-reference task (right panel). The *other* trials included both trials on which the targets had been considered earlier from the first-person perspective (P1) and trials on which the targets had been considered earlier from the third-person perspective (P3).

autumn to spring," and participants used a 4-point scale to judge the target's likely response to each question. On the other half of the trials, participants were prompted to report their own preferences regarding the same issues (self trials), rather than those of the two targets. The opinion-judging task comprised 60 P1, 60 P3, and 120 self trials divided among three functional runs (210 volume acquisitions each).

Whole-brain, random-effects analysis (SPM2; $p < 10^{-4}$, $k = 25$ voxels) revealed a region of vMPFC in which activity was higher for self trials than for *other* trials (i.e., P1 and P3 trials combined). Critically, although this region was preferentially engaged by self-referential thought, its response to another person was nevertheless sensitive to whether that person had been considered from the first- or third-person perspective during the essay task. As the left panel of Figure 1 suggests, vMPFC activity was significantly greater for P1 targets than for P3 targets, $t(13) = 2.39$, $p_{rep} = .901$, $d = 0.64$. Consistent with the typical results from this region, modulation of vMPFC activity was primarily in the form of negative-going deactivations against resting baseline.

Finally, participants were also scanned (two runs of 130 acquisitions) while completing an explicit self-reference task (Kelley et al., 2002) that has been used frequently to identify brain regions that respond preferentially during judgments of the self. During this task, participants alternately reported how well a trait adjective (e.g., *curious*, *intelligent*, *neurotic*) described either themselves or another person who was familiar, but not personally known, to them. A whole-brain, random-effects contrast again identified a region of vMPFC that showed greater activation on self trials than on *other* trials. As was the case for the region of interest (ROI) identified from the opinion-judging task, activity in this vMPFC ROI was significantly greater for P1 than for P3 targets, $t(13) = 2.49$, $p_{rep} = .913$, $d = 0.66$ (see Fig. 1, right panel). The dissociation between P1 and P3 targets in this alternate vMPFC ROI is particularly compelling because this region was defined independently on the basis of a well-characterized self-reference task conducted within separate functional runs.

CONCLUSIONS

Given the complexity of human social behavior, a central goal of psychology has been not only to characterize the constituent mental processes from which social cognition arises, but also to describe the conditions under which these various processes are deployed. We suggest that conscious attempts to adopt another person's perspective may prompt perceivers to consider that person via cognitive processes typically reserved for introspection about the self. Consistent with earlier proposals regarding the mechanisms underlying perspective taking (Davis, 1983; Davis et al., 1996; Galinsky & Moskowitz, 2000), our results suggest that the prosocial effects of perspective taking, such as increased empathy and reduced prejudice, may result from a blurring of the distinction between self and other.

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