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Losing oneself upon placement in another's position: The influence of perspective on self-referential processing

Tianyang Zhang [a], Ying Zhu [a], Yanhong Wu [a,b,*]

[a] Department of Psychology, Peking University, Beijing, China
[b] Key Laboratory of Machine Perception (Ministry of Education), Peking University, Beijing, China

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ABSTRACT

Self-referential processing is considered to be an essential index for exploring self-consciousness. However, whether perspective is the determining factor of the self-reference effect (SRE), which is accompanied by self-referential processing, has not been established. The present study aims to address this issue by using a self-reference paradigm, in which the participants perform a self-reference task while adopting different perspectives. Our results showed that trait words presented with the self in the first-person perspective (1PP) were better remembered compared to trait words presented with others. Interestingly, these SREs were decreased and even reversed in the third-person perspective. When the participants viewed themselves based on their friend's perspective, no significant difference was found between the recognition performances of self- and friend-trait words. Moreover, an improved "remember" recognition performance of friend-trait words was found. These findings support the assumption that the 1PP is a necessary factor for self-advantage in self-referential processing.

1. Introduction

Humans are social animals. To maximize the likelihood of survival in the social environment, one needs the abilities to distinguish and reflect the "self" from the context of its environment or from others (Decety & Sommerville, 2003; Gallagher, 2000; Vogeley & Fink, 2003). Self-referential processing is arguably the most important cognitive processing of self-other representations in human interactions. Numerous behavioral studies on self-referential processing have employed the self-reference paradigm, which requires the participants to evaluate trait words in relation to self or to others and recall the words subsequently in an unexpected memory test (Klein & Loftus, 1988; Klein, Rozendal, & Cosmides, 2002; Rogers, Kuiper, & Kirker, 1977). These studies found that relative to the others-trait words, words associated with oneself elicit a memory advantage. This memory advantage is currently known as the self-reference effect (SRE), and it has been demonstrated in a wide range of materials (Kesebir & Oishi, 2010; Kim & Johnson, 2012; Sui, He, & Humphreys, 2012; Turk et al., 2011; Turk, Cunningham, & Macrae, 2008). Consistent with the behavioral findings, several neuroimaging studies have found that hemodynamic responses in the ventral medial prefrontal cortex (vMPFC) and posterior cingulate cortex increase trait judgments of the self relative to others (Han et al., 2008; Heatherton et al., 2006; Jenkins & Mitchell, 2011;

* Corresponding author. Address: Department of Psychology and Key Laboratory of Machine Perception (Ministry of Education), Peking University, 5 Yiheyuan Road, Beijing 100871, China. Fax: + 86 10 6275 5508.
E-mail address: wuyh@pku.edu.cn (Y. Wu).

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Kelley et al., 2002; Lombardo et al., 2010; Moran, Heatherton, & Kelley, 2009; Wu, Wang, He, Mao, & Zhang, 2010; Zhu, Zhang, Fan, & Han, 2007).

A central question in self-referential processing concerns the account and critical influence factor of self-advantage (Klein & Loftus, 1988; Ma & Han, 2010; Symons & Johnson, 1997; Wang, Zhang, & Sui, 2011). Many investigators have noted that human adults not only can assess or remember information related to themselves in their own perspective but also can assess or remember information by adopting the perspective of another person, seeing themselves "from the outside" (Nigro & Neisser, 1983; Robinson & Swanson, 1993; Ruby & Decety, 2004; Ruby et al., 2009; Vogeley et al., 2004). Several investigators have suggested that the perspective may be responsible for self-advantage (Vogeley & Fink, 2003; Vogeley et al., 2004; Wang et al., 2011). For instance, Vogeley and Fink (2003) proposed that the first-person perspective (1PP) is insufficient but necessary for human self-consciousness because the 1PP refers to the centeredness of one's own multimodal experiential space upon one's own body. Consistent with this notion, Wang et al. (2011) used a face orientation identification task to assess the function of the third-person perspective (3PP) in the self-advantage effect by manipulating the perspective. In this study, self-face or friend-face was randomly presented in different orientations on a computer screen; the participants had to judge the orientations of faces from their own position or from another person's position as quickly and accurately as possible within 1000 ms. Wang et al. found that the advantage effect was decreased in the 3PP. They also suggested that the self-advantage in face processing is evident among the participants who adopted the 1PP.

Although these findings support the assumption that self-face advantage benefits from the 1PP, whether the advantage effect is concealed under the difficult 3PP task has not been established (Zacks, Rypma, Gabrieli, Tversky, & Glover, 1999). From the previous results, the participants might sacrifice reaction time to ensure accuracy in the 3PP condition. Moreover, the studies mentioned above specifically concerned perspective in space or action; whether these results could generalize to a perspective on a more abstract level (e.g., perspective in language, nonverbal memory, social interaction or self-reflection) has not been defined. Meanwhile, previous studies have likewise found that self-related information can be categorized to that related to the physical self (e.g., self-face recognition, body recognition or agency) and the psychological self (e.g., personal traits judgment, autobiographical memory). Although some research has reported that making judgments about one's own personality traits, current mental states, and physical attributes share the same neural response modality (Jenkins & Mitchell, 2011), self-face recognition and personal traits judgment manifest in different behavioral and neural response modalities (Devue & Brédart, 2011; Gillihan & Farah, 2005; Van der Meer, Costafreda, Aleman, & David, 2010). Therefore, whether a perspective is responsible for self-advantage and whether the SRE based on self-referential processing is also involved in a perspective have not been established. Additionally, reasons that explain why the 1PP is necessary for self-advantage and why the 3PP can eliminate self-advantage have not been identified.

Compared with completing a face orientation identification task in the other person's position, a simpler task for participants is to reflect on their or others' personal traits in the other person's perspective, given that human adults need to use this social interaction skill to "read other's minds" in everyday life (Baron-Cohen, 1997). In fact, several earlier studies have explored the neural activity of self-referential processing in different perspectives using the self-reference paradigm (D'Argembeau et al., 2007; Ochsner et al., 2005; Ruby et al., 2009). However, these studies have primarily focused on distinct neural regions associated with self-referential processing and perspective and not on whether the perspective is responsible for self-advantage. From the behavioral data, we could not find direct evidence for the perspective that is responsible for self-advantage: Ochsner et al. (2005) found that response times for judgments involving direct appraisals or reflected appraisals (self in the other person's perspective) were made with similar speed; D'Argembeau et al. (2007) found that the primary effect of response times for judgment target and the interaction between judgment target and perspective was not significant. D'Argembeau et al. (2007) noted that different regions of the MPFC are related to self-referential processing and perspective and that the adopted 3PP can decrease self-referential neural processing in the left dorsal MPFC using MRI data. This finding implied that adopting different perspectives might affect self-advantage in self-referential processing.

In the present study, we used a self-reference task in conjunction with different instructions; we measured memory performances to examine whether adopting 3PP during self-referential processing would impair SRE. We used a mixed design with between-subject measures concerning a perspective factor, in which a participant only needs to adopt one kind of perspective (i.e., 1PP or 3PP). This design reduces the difficulty of 3PP, given that the participants do not need to repeatedly change their perspectives within the experimental task (Turk et al., 2012). Before the experiment, the participants were asked to choose a close friend. For the 3PP condition, the participants were instructed to imagine for a minute that they are placed in their friend's position; i.e., they need to represent their friend's knowledge or experience instead of their own knowledge or experience. Moreover, we carefully manipulated the cues of personal traits judgment task in the 3PP condition (see Method). Specifically, we unified the perspectives of the two pronouns in the cue sentence. For example, we used the following: "According to Tianyang Zhang (a close friend's name), is Zhijun Cao (participant's own name) optimistic?", instead of "According to Tianyang Zhang (a close friend's name), are you optimistic?" Using this type of manipulation, we avoid the possible confounding factor of perspective waving triggered by the change of pronouns within the trial. Furthermore, the purer effect caused by the 3PP is observed because pronouns, such as I or you, may promote a 1PP processing (Brunyé, Ditman, Mahoney, Augustyn, & Taylor, 2009). If the 1PP is an essential factor for self-advantage, SRE should be decreased or reversed when the participants adopt the 3PP. Alternatively, if the 1PP does not involve self-advantage, SRE should be unaffected by the perspective change.