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Genuine eye contact elicits self-referential processing

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ABSTRACT

The effect of eye contact on self-awareness was investigated with implicit measures based on the use of first-person singular pronouns in sentences. The measures were proposed to tap into self-referential processing, that is, information processing associated with self-awareness. In addition, participants filled in a questionnaire measuring explicit self-awareness. In Experiment 1, the stimulus was a video clip showing another person and, in Experiment 2, the stimulus was a live person. In both experiments, participants were divided into two groups and presented with the stimulus person either making eye contact or gazing downward, depending on the group assignment. During the task, the gaze stimulus was presented before each trial of the pronoun-selection task. Eye contact was found to increase the use of first-person pronouns, but only when participants were facing a real person, not when they were looking at a video of a person. No difference in self-reported self-awareness was found between the two gaze direction groups in either experiment. The results indicate that eye contact elicits self-referential processing, but the effect may be stronger, or possibly limited to, live interaction.

1. Introduction

In face-to-face contact, the gaze is mostly directed to another individual's eye region (Itier, Villate, & Ryan, 2007). The orientation of another's eyes communicates the direction of their attention and potential targets for intentions (Itier & Batty, 2009). Another individual's averted gaze informs the observer that there is something conceivably interesting and important in the environment, and, indeed, an extensive line of research has indicated that seeing another's averted gaze triggers and automatic shift of the observer's visual attention in the same direction (e.g., Driver et al., 1999; Friesen & Kingstone, 1998; Hietanen, 1999; Langton & Bruce, 1999). But what about if the perceived gaze is directed at the self? In mutual gaze (eye contact), the self is the object of another's attention. Another's direct gaze has been shown to attract (Conty, Tijus, Hugueville, Coelho, & George, 2006; Senju, Hasegawa, & Tojo, 2005; von Grünau & Anston, 1995) and capture (Palanica & Itier, 2012; Senju & Hasegawa, 2005) the perceiver's attention, but is it possible that just as observing another's averted gaze at an object shifts the observer's attention to the same target, a gaze directed at an observer should turn the observer's attention upon themselves? It has been proposed that conscious attention is a bidirectional phenomenon, focused either inward toward the self or outward toward the external world, and when attention is directed to the self, it brings about self-awareness (Duval & Wicklund, 1972). Furthermore, it has long been theorized that eye contact turns the attention on the self, thereby increasing self-awareness (Argyle, 1975). Reddy (2003) has proposed that when engaged in eye contact,

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even infants as young as two months old are aware of others focusing attention on them and show reactions of self-awareness as a result. More recently, Conty, George, and Hietanen (2016) proposed that eye contact elicits self-referential processing – an information processing mode relating external information to the self, thus, facilitating and integrating perception and memory (Sui & Humphreys, 2015). They suggested that self-referential processing can, in fact, explain many of the effects of eye contact on cognition, one of them being the hypothesized enhancement of self-awareness. However, regardless of a lot of speculation, the effect of eye contact on self-referential processing and self-awareness has been little investigated.

Self-awareness entails more than just self-focused attention (Hull & Levy, 1979), though many other researchers have used these two terms interchangeably. Hull and Levy (1979) proposed a defining feature of self-awareness to be an enhanced sensitivity to self-relevant information in the immediate situation that serves to increase the understanding of the contingencies of the situation related to one's present activities. Self-awareness also involves the activation of self-knowledge, a process which further guides subsequent perception of the situation (Hull, Van Treuren, Ashford, Propsom, & Andrus, 1988). They referred to this phenomenon as self-relevant encoding, but today the terms self-referential encoding and self-referential processing are more used in the literature. We propose that self-awareness can be conceptualized as comprising of an explicit and implicit component, the former corresponding largely to self-focused attention, and the latter to self-referential processing.

Self-awareness is a transient state and it can be directed to different sides of the self (Fenigstein, Scheier, & Buss, 1975; Govern & Marsch, 2001). Public self-awareness refers to the concern of how one presents oneself and how one is perceived by others. It often emerges in situations such as giving a presentation or being photographed, and it is associated with evaluation apprehension (Alden, Teschuk, & Tee, 1992). By contrast, private self-awareness is an introspective state, characterized by examination and reflection on one's thoughts, feelings, and life (Govern & Marsch, 2001). Introspective self-awareness has been proposed to refine the perception of one's experience and facilitate self-knowledge (for a review, see Silvia & Gendolla, 2001). Enhanced self-awareness is associated, for example, with more accurate self-reports of sociability and dominance behavior (Pryor, Gibbons, Wicklund, Fazio, & Hood, 1977; Turner, 1978). Interoceptive awareness is yet another aspect of self-awareness characterized by awareness of afferent interoceptive signals from one's own body. Interoceptive self-awareness has been proposed to sharpen the perception of internal states, such as arousal and emotions (Silvia & Gendolla, 2001), and it has been found to enhance the perception of one's own heartbeat (Ainley, Maister, Brokfeld, Farmer, & Tsakiris, 2013; Ainley, Tajadura-Jimenez, Fotopoulou, & Tsakiris, 2012). Previous research has manipulated the level of self-awareness in a variety of ways. Efficient manipulations have included listening to recordings of one's own voice (Wicklund & Duval, 1971), being in front of cameras (Davis & Brock, 1975), writing about oneself (Silvia & Eichstaedt, 2004), running in place in an embarrassing way (Wegner & Giuliano, 1983), seeing one's reflection in a mirror (Wicklund & Duval, 1971), and being observed by an audience (Carver & Scheier, 1978).

Considering the relatively large amount of research on self-awareness and the well-established notion that self-awareness can be efficiently induced by exposing one to other individual's observation, it is, perhaps, surprising that the effect of eye contact, the most intimate form of direct observation, on self-awareness has received so little attention. Only relatively recently Hietanen, Leppänen, Peltola, Linna-aho and Ruuhiala (2008), Myllyneva, Ranta and Hietanen (2015) and Pönkänen, Peltola and Hietanen (2011) demonstrated the effect of eye contact on self-reported evaluations of self-awareness. They measured self-awareness with the Situational Self-Awareness Scale, which is probably the most widely used tool for the purpose (SSAS; Govern & Marsch, 2001). SSAS is a self-report questionnaire that includes two subscales of self-awareness, awareness of the public and of the private side of the self, and a control scale of awareness of immediate surroundings to measure attention focused on other targets than the self. In the studies by Hietanen et al., SSAS ratings were measured while the participants were looking at another person who either made eye contact or had an averted gaze. In all of the studies, higher levels of public self-awareness were measured in response to eye contact compared to averted gaze. The ratings of private self-awareness or awareness of immediate surroundings did not differ between the gaze conditions.

In another recent study, Baltazar et al. (2014) demonstrated the effect of eye contact on interoceptive self-awareness. Participants were presented with pictures of either a face with direct gaze or averted gaze, or a picture of a fixation cross on the screen. The picture of a face or a cross was followed by an emotional picture after which the participants evaluated their arousal response to the emotional picture. Skin conductance responses to the emotional pictures were recorded, and the correlations between the subjective ratings and the physiological responses were calculated. The results showed that the participants rated their subjective arousal to the emotional pictures more consistently with the objective measures of their physiological arousal after having seen direct gaze than averted gaze pictures. The authors proposed that the results were best explained by an enhancement of interoceptive self-awareness induced by eye contact.

The studies of the effects of eye contact on self-awareness by Hietanen et al. (2008), Myllyneva et al. (2015) and Pönkänen et al. (2011) relied exclusively on explicit self-report measurements. Even though self-evaluations have the advantage of being able to reveal conscious attitudes and emotions they may also suffer from serious shortcomings. People may have conflicting motives affecting their reporting, and even when attempting to answer honestly and accurately, they can be limited in their capacity to accurately evaluate their own state (Paulhus & Vazire, 2007). Of specific limitation for self-awareness research are findings demonstrating that completing self-report questionnaires can, in fact, increase self-awareness (Osberg, 1985), presumably because of the introspection it requires (Eichstaedt & Silvia, 2003). In this regard, the above cited study by Baltazar et al. (2014) reporting enhanced accuracy of interoceptive evaluations in the context of direct gaze is an