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Do social utility judgments influence attentional processing?

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ABSTRACT

Research shows that social judgments influence decision-making in social environments. For example, judgments about an interaction partners' trustworthiness affect a variety of social behaviors and decisions. One mechanism by which social judgments may influence social decisions is by biasing the automatic allocation of attention toward certain social partners, thereby shaping the information people acquire. Using an attentional blink paradigm, we investigate how trustworthiness judgments alter the allocation of attention to social stimuli in a set of two experiments. The first experiment investigates trustworthiness judgments based solely on a social partner's facial appearance. The second experiment examines the effect of trustworthiness judgments based on experienced behavior. In the first, strong appearance-based judgments (positive and negative) enhanced stimulus recognizability but did not alter the size of the attentional blink, suggesting that appearance-based social judgments enhance face memory but do not affect pre-attentive processing. However, in the second experiment, in which judgments were based on behavioral experience rather than appearance, positive judgments enhanced pre-attentive processing of trustworthy faces. This suggests that a stimulus's potential benefits, rather than its disadvantages, shape the automatic distribution of attentional resources. These results have implications for understanding how appearance- and behavior-based social cues shape attention distribution in social environments.

1. Introduction

Humans make hundreds of decisions every day. Often, these choices depend heavily on the signals people receive from their interaction partners (Behrens, Hunt, Woolrich, & Rushworth, 2008). For example, facial expressions contribute important information to appearance-based social decision-making. Research shows that faces displaying negative emotions, such as fear and anger, are pre-attentively processed (Eastwood, Smilek, & Merikle, 2003; Fox et al., 2000; Öhman, Lunqvist, & Esteves, 2001). This attentional negativity-bias is explained by an adaptive evolutionary drive to avoid threat (Cosmides & Tooby, 2000). However, recent research showing that valuable stimuli are also pre-attentively processed has begun to suggest that reward-related information may bias attention in a similar fashion (Anderson, Laurent, & Yantis, 2011; Dux & Marois, 2009; Roelfsema, van Ooyen, & Watanabe, 2010) and that positive emotional expressions facilitate target detection (Hodsall, Viding, & Lavie, 2011). While threat detection may be important in many contexts, it may be less influential in the everyday social environments people typically experience.

One factor that may shape decision-making in ordinary social contexts is people's judgments of those with whom they interact. These social judgments are important because they guide expectations about how a partner might behave (Cosmides, 1989; Cosmides & Tooby, 2000; Frith & Frith, 1999). Appearance-related social judgments are particularly influential (Willis & Todorov, 2006). For example, research shows that the degree to which an individual

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looks trustworthy influences a range of decisions including financial investments (van't Wout and Sanfey, 2008), the interpretation of verbal information (Hassin & Trope, 2000), wagering behavior (Schlicht, Shimojo, Camerer, Battaglia, & Nakayama, 2010), legal decisions (Porter, ten Brinke, & Gustaw, 2010), and voting (Olivola & Todorov, 2010).

Nonetheless, appearances are not always accurate (Porter, England, Juodis, van Brinke, & Wilson, 2008). Research has therefore begun to examine how behavioral experience alters social judgments. This work shows that people's behavior significantly influences others' judgments such that truthful, consistent, and prosocial behaviors lead to more positive interpersonal evaluations (Ames & Johar, 2009; Bayliss & Tipper, 2006; Heerey & Velani, 2010). Thus, these findings suggest that both appearance- and experience-based judgments influence social decisions.

Recently, research has begun to suggest that social judgments may be akin to economic value judgments (Chang, Doll, van't Wout, Frank & Sanfey, 2010) because they shape expectations about the utility or subjective desirability of interacting with a particular social partner. For example, the presence of social rewards such as genuine smiles increases stimulus utility and influences subsequent economic decisions (Shore & Heerey, 2011). Moreover, people assume that interaction partners who look attractive or trustworthy, or engage in prosocial behavior will provide positive outcomes and other social rewards (Delgado, Frank, & Phelps, 2005; Wilson & Eckel, 2006). This evidence therefore suggests that social cues lead to joint economic and social judgments of interaction partners, which subsequently influence decisions by biasing people's expectations about those partners.

Social interactions, especially with multiple partners, contain more information than people can process (Foulsham, Cheng, Tracy, Henrich, & Kingstone, 2010). Therefore, biases based on social judgments may shape decision-making in more subtle ways as well. For example, research has shown that non-social reward cues change stimulus utility, and that this influences the pre-attentive processing of rewarded stimuli (Anderson et al., 2011; De Martino, Kalisch, Rees, & Dolan, 2009; Dux & Marois, 2009). If social utility judgments influence neural processing in a similar fashion, we predict that social stimuli eliciting strong judgments should likewise capture attention, suggesting one mechanism by which those stimuli shape social decisions and behavior. Specifically, the ability of an interaction partner to capture attention, even for a short while, may bias the information one gains during an interaction involving that partner. Therefore, social judgments may bias decision-making by guiding attention toward or away from particular partners, thereby determining the information people acquire and use in subsequent decisions.

Here, we ask how appearance – (Experiment 1) and behavior-based (Experiment 2) social utility judgments affect the allocation of attention to social stimuli. Understanding how such judgments shape the perception and attentional processing of stimuli provides an important clue about how social judgments influence decision-making processes. To measure differences between stimuli in terms of attention capture, we utilized an attentional blink (AB) paradigm (Raymond & O'Brien, 2009; Raymond, Shapiro, & Arnell, 1992). The AB is an elegant way of measuring the degree to which different stimuli automatically capture attention. In AB tasks, participants must detect two visual stimuli presented at varying time points in a rapid stream of images. If the second stimulus occurs within 500 ms of the first, it is often undetected (Chun & Potter, 1995), causing an impairment in perceptual encoding known as the attentional blink (Raymond et al., 1992). Interestingly, participants are less likely to miss a target presented within 500 ms of another when the target is emotionally salient (Keil & Ihssen, 2004). If social judgments increase the motivational or emotional salience of social stimuli this should cause those stimuli to capture attention, even when they are presented within the window of the attentional blink (i.e., within 500 ms following another target).

2. Experiment 1

Here, we investigate whether appearance-based social utility judgments affect the recognition of faces when they appear within versus after the window of the attentional blink. In this experiment, we use judgments of trustworthiness, as this trait is judged quickly, reliably and automatically from physical appearance (Berry & Brownlow, 1989; Engell, Haxby, & Todorov, 2007; Olsen & Marshuetz, 2005; Todorov, Pakrashi, & Oosterhof, 2009; Todorov, Said, Engell, & Oosterhof, 2008; Willis & Todorov, 2006). We predict that when stimuli appear outside the window of the attentional blink, recognition will be better for faces judged to be high or low in trustworthiness compared to average (medium) rated faces, because faces with more extreme ratings are thought to be more salient than average faces (Singer, Kiebel, Winston, Dolan, & Frith, 2004; Winston, Strange, O'Doherty & Dolan, 2002).

For stimuli presented within the window of the attentional blink, however, the literature suggests two opposing predictions. If valuable or positive stimuli reduce the attentional blink (e.g., Anderson et al., 2011; Raymond & O'Brien, 2009), one might predict trustworthy, but not untrustworthy or neutral faces to be preferentially processed and therefore to attenuate the attentional blink. Alternatively, based on research showing that less trustworthy faces are more likely to be remembered (e.g., Yamagashi, Tanida, Mashima, Shimoma, & Kanazawa, 2003), one might anticipate a reduced attentional blink for faces that are low, rather than average or high in trustworthiness.

2.1. Method

2.1.1. Participants

Fifty-five undergraduate psychology students (17 male, mean age = 21.07 SD = 3.97) participated in the study for partial course credit. All participants gave written informed consent and the University's Ethics Committee approved the study (likewise for Experiment 2 below).