

# Emotion

## **Don't Sit So Close to Me: Unconsciously Elicited Affect Automatically Provokes Social Avoidance**

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## BRIEF REPORT

## Don't Sit So Close to Me: Unconsciously Elicited Affect Automatically Provokes Social Avoidance

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Behavior may be automatically prompted by cues in our social environment. Previous research has focused on cognitive explanations for such effects. Here we hypothesize that affective processes are susceptible to similar automatic influences. We propose that exposure to groups stereotyped as dangerous or violent may provoke an anxiety response and, thus, a tendency to move away. In the present experiment, we subliminally exposed participants to images of such a group, and found that they displayed greater avoidance in a subsequent interaction. Critically, this effect was explained by their increased sensitivity to threat-related information. These findings demonstrate an affective mechanism responsible for nonconscious priming effects on interpersonal behavior.

*Keywords:* subliminal priming, affect, behavior

Upon encountering an individual who (by virtue of physical appearance or membership in a negatively stereotyped group) is associated with hostility or aggression, one's spontaneous response is likely to be to move away (e.g., by crossing the street or taking a seat on the other side of the room). Such responses may be elicited even in the absence of conscious consideration of the actual threat posed by the individual. Notably, research into what have become known as "prime-to-behavior" effects has established exactly how little conscious reflection is needed in order for exposure to a stereotyped out-group to result in significant behavioral changes (see Dijksterhuis & Bargh, 2001, for a review).

Although there have been numerous demonstrations of how priming representations of a stereotyped group can influence both cognitive and behavioral responses, relatively little attention has been directed at the potential for stereotype priming to give rise to affective responses. This is somewhat surprising, as, in many cases, one's representation of an out-group involves not only what one *knows* but also how one *feels* about the group. Indeed, there may be many situations in which one's predominant response is affective in nature. This may be particularly true when a social out-group is strongly associated with negative emotions such as fear or disgust—in such cases, one's affective response to encoun-

ters with the out-group may be a significant predictor of one's behavioral responses to the group. Yet this possibility has so far been discounted in research on stereotype priming and its automatic effects on behavior.

In large part, this tendency has resulted from findings reported by Bargh, Chen, and Burrows (1996) indicating that activating elderly stereotypes produced stereotype-consistent behavior (walking more slowly) but did *not* appear to influence participants' mood. Based on these results, Bargh and colleagues concluded that affective processes are unlikely to play any role in prime-to-behavior effects. According to this view, behavior results from the activation of behavioral representations associated with a primed group. Thus, exposure to an out-group automatically activates its mental representation, which includes the group's prototypical behaviors. The congruent motor programs are then elicited and the following behavior automatically conforms to the out-group. However, with respect to Bargh et al. (1996), it is noteworthy that behavioral and affective consequences of priming were measured in separate experiments, making it difficult to draw firm conclusions about the extent to which affect did or did not mediate behavior. Furthermore, unlike group stereotypes that include danger or threat, the affective responses triggered by elderly people may be subtler and may not be strongly associated with a dominant behavioral reaction.

While we do not refute the possibility that prime-to-behavior effects may sometimes be the direct and unmediated consequence of the activation of a group representation alone, recent evidence suggests that such effects can also be mediated by changes in how the self, others, or the situation are perceived. For example, Smeesters, Wheeler, and Kay (2010) propose that "indirect" prime-to-behavior effects emerge when a prime alters self-construal, biases perceptions of others, or changes one's interpretation of the present situational context. In each case, priming effects on behavior are underpinned by cognitive mechanisms that produce prime-congruent changes in perception.

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Of greater importance for the present work, research on emotion activation would suggest that the move to completely disregard the role of *affect* may have been premature. Unconsciously elicited emotions have a direct effect on affect-relevant behavior (Ruys & Stapel, 2008), and unconscious perception of affectively laden social stimuli elicits congruent behavioral and affective responses (Winkielman, Berridge, & Wilbarger, 2005). Therefore, it becomes critical to investigate whether such affective reactions also contribute to automatic effects of stereotypes on behavior. Indeed, we suggest that one's behavioral reaction to individuals perceived as threatening may have more to do with one's affective or emotional response than with the thoughts that spring to mind when one sees such individuals. In previous work by Plant and Devine (2003), overt anxiety was a significant predictor of avoidance of intergroup contact. Anxiety or feelings of threat that are induced by nonconscious priming may similarly encourage avoidance. Unlike intergroup anxiety, however, anxiety stemming from unconscious exposure to a threatening group is likely to produce avoidance in the absence of a specific (consciously perceived) target—thus, generalized avoidance behavior (rather than avoidance of a specific group or group member) may emerge.

Here, we tested the hypothesis that priming a social group stereotyped to be hostile (“hoodies” in the United Kingdom, defined in the Oxford English Dictionary as “a young person who wears a hoodie and is typically regarded as socially disruptive . . . a hooligan, a thug”) provokes a state of tension marked by increased sensitivity to signs of danger or threat. We expect that this affective response will, in turn, produce avoidance in an interpersonal context. Specifically, we propose that exposure to the group “hoodies” will elicit affective responses that are typically associated with encountering a hoodie (i.e., anxiety or fear), which will encourage behavior tailored to coping with that affective state (i.e., avoiding potential threats).

We subliminally primed participants with images of a young man who appeared to be a hoodie or who was neutral in appearance. Participants then completed a selective attention task designed to assess their level of anxiety by measuring their sensitivity to threat-related stimuli. Finally, participants were led to believe that they would be meeting another participant, and the distance they placed between themselves and the person they expected to meet was measured as an indication of avoidance behavior. Because situations involving unfamiliar others may be construed as potentially threatening, we hypothesized that participants who were primed with images of a hoodie would tend to avoid unfamiliar others, and their avoidance would be mediated by sensitivity to threat.

## Method

### Participants

Participants were 52 undergraduate students at the University of Plymouth (38 female,  $M_{age} = 22.15$ ) who completed the study to fulfill a course requirement.<sup>1</sup>

### Design and Procedure

Participants were randomly assigned to a hoodie prime or neutral prime condition. The priming phase was adapted from Bargh

et al. (1996; Study 3). Participants were introduced to a “spatial perception” study, which was in fact the priming task. The computerized task consisted of 100 trials, each beginning with a row of asterisks in the center of the screen (1000 ms), followed by the priming stimulus (11 ms), a series of hash marks covering the same area as the prime (11 ms), a pattern mask of gray ovals (21 ms), and a display of colored dots (up to 2000 ms). Participants were asked to judge whether the number of dots was odd or even and respond by pressing one of two keys. The prime-mask sequence varied depending on condition. Participants in the *hoodie prime* condition were presented with a grayscale photograph ( $247 \times 269$  pixels on a  $640 \times 480$  screen) of a young man in a hooded shirt (in the fashion of a hoodie). Participants in the *neutral prime* condition were presented with a grayscale photograph of the same young man dressed in casual, but nonhooded, attire.

Second, participants completed a digit matching task designed to assess whether the priming stimuli had elicited a heightened state of anxiety or threat. Previous studies confirm that chronically anxious individuals typically show increased interference from threat-related words in selective attention tasks (e.g., Williams, Mathews, & MacLeod, 1996; cf. Rothermund, Voss, & Wentura, 2008). Similarly, emotionally salient or personally significant words capture nonanxious participants' attention during selective attention tasks (Anderson & Phelps, 2001; Wolford & Morrison, 1980). Because the hoodie prime was expected to elicit an affective state of heightened anxiety or threat, the attention of participants exposed to that prime should be automatically captured by threat-related words in a selective attention task. The digit matching task was modeled on a digit parity task, which has shown increased processing interference from threat-related words compared to neutral words (Aquino & Arnell, 2007).

Half of the 48 trials consisted of threat-related words (e.g., agony, coffin, disease; MacLeod, Mathews, & Tata, 1986) and half of neutral words (e.g., potato, umbrella, locker). Each word was presented in the center of the screen, flanked on both sides by a number. On half of the trials, the numbers were the same (e.g., a “7” appeared on each side of the word), whereas, on the other half, the numbers differed (e.g., a “7” appeared on the left, and a “5” appeared on the right). Words and numbers were both presented in Arial 14-point font. Participants' task was to judge whether the two numbers were the same and respond by pressing one of two keys. The time required to respond to each trial was recorded. To the extent that participants' attention was drawn to threatening information, they should be slower to make the digit matching judgment on trials involving threat-related words because of the increase in attentional processing elicited by those words.

After the digit matching task, participants were informed that the next part of the experiment required them to work on a task with another participant in an adjacent room. The experimenter led the participant into a room (approximately 20 m<sup>2</sup>) where a table was placed in the corner opposite from the door. One chair was placed at the far end of the table, upon which was a (nonhooded) jacket and backpack (neutral with respect to gender), with a stack of similar chairs placed near the door. The experimenter informed

<sup>1</sup> Participant gender did not moderate affective or behavioral responses to the prime, as no significant main or interaction effects involving gender were found.

the participant that the other student had left to make a phone call but would return momentarily. The experimenter explained that while s/he was waiting, the participant could begin by filling out a questionnaire, and so s/he should take another chair from the stack and have a seat at the table while the experimenter retrieved the questionnaire. After the participant was seated, the experimenter returned with a questionnaire (unrelated to the current experiment) and, on the pretext of explaining what to do, knelt down to place a marker on the floor at the corner of the participant's chair. The distance between this marker and the chair purportedly belonging to the other participant was measured and recorded at the end of the experiment.

After completing the questionnaire, participants were thoroughly debriefed and excused. An extensive funnel debriefing procedure (Bargh & Chartrand, 2000) was used to confirm that participants were unaware of the priming stimuli. No participant reported awareness either of the priming stimuli or of any connection among the three phases of the experiment.

## Results

### Seating Distance

An independent-samples *t*-test comparing participants' seating distance revealed that those in the hoodie prime condition sat significantly farther away ( $M = 147.38$  cm,  $SD = 75.24$ ) than did those in the neutral prime condition ( $M = 106.81$  cm,  $SD = 42.49$ ),  $t(50) = 2.39$ ,  $p = .02$ ,  $d = .68$ .<sup>2</sup> Avoidance is a response typical of individuals who encounter hoodies (see Discussion). Here, avoidance emerged among participants for whom images of hoodies were primed, as a response to someone who was not themselves believed to be a hoodie.

### Attention to Threat

Participants' response times (RTs) on the digit matching task were examined to determine whether participants' attention was automatically drawn to threat-related stimuli. After removing trials where response times deviated more than 3 standard deviations from the mean (1.2% of all responses), average RTs on trials involving threat-related versus neutral words were computed separately and subjected to a two-way mixed-model Analysis of Variance (ANOVA), where trial type (threat-related vs. neutral) was entered as a repeated-measures variable and prime (hoodie vs. neutral) was a between-participants variable. This analysis yielded only a significant two-way interaction,  $F(1, 50) = 4.51$ ,  $p = .04$ ,  $\eta_p^2 = .08$  (see Figure 1). Analyses of simple main effects revealed that hoodie-primed participants were slower than neutral-primed participants on trials involving threat-related words,  $F(1, 50) = 3.05$ ,  $p = .08$ ,  $d = 0.48$ , whereas there was no difference between the two groups on neutral trials,  $F < 1$ ,  $d = 0.20$ . Furthermore, hoodie-primed participants were slower to respond to threat-related than neutral trials,  $t(25) = 1.93$ ,  $p = .065$ ,  $d = 0.40$ , whereas neutral-primed participants were not,  $t(25) = 1.12$ ,  $p > .27$ ,  $d = 0.23$ . Thus, exposure to hoodies produced a heightened sensitivity to threat-related stimuli.

### Mediation

Threat-sensitivity scores were computed for each participant as the average RT to threat-related trials minus the average RT to

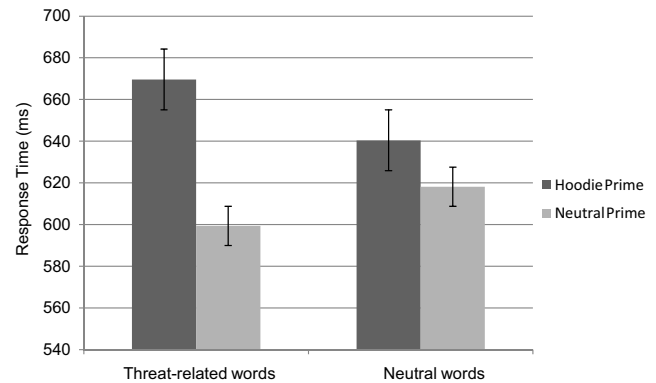


Figure 1. Mean response time (with standard errors) on digit matching task, as a function of word type (threat-related vs. neutral) and prime condition (hoodie vs. neutral).

neutral trials on the attention task. These scores represent the additional attention captured by threat-related words, with higher scores indicating greater attentional bias toward threat-related information. To assess whether differences in threat sensitivity scores accounted for the effects of hoodie priming on seating distance, the steps outlined by Baron and Kenny (1986) were followed (see Figure 2). As formal tests of mediation (e.g., Sobel) are not appropriate for small samples, the procedure recommended by Preacher and Hayes (2004) was followed. The bootstrap estimate of the indirect effect was 16.11 ( $SE = 10.69$ ), with a 95% confidence interval ranging from 1.27 to 46.93. This suggests that threat sensitivity did, in fact, mediate the effect of hoodie priming on seating distance.

However, consistent with our hypotheses, additional analyses indicated that the mediation was driven by hoodie-primed participants, for whom threat sensitivity was a significant predictor of seating distance,  $b = .69$ ,  $t(25) = 4.65$ ,  $p < .001$ . Among neutral-primed participants, the relationship between threat sensitivity and seating distance was nonsignificant,  $b = .09$ ,  $t(25) = .46$ ,  $p = .65$ . Formal tests (Preacher, Rucker, & Hayes, 2007, moderated mediation Model 1) confirmed a significant conditional indirect effect,  $b = .31$ ,  $t(51) = 3.60$ ,  $p < .001$ .

## Discussion

The present experiment establishes, for the first time, that subliminal exposure to a threatening out-group produces not only cognitive and behavioral responses but also affective responses. Moreover, the data reported here establish that such affective responses determine prime-to-behavior effects under conditions in which the primed out-group is associated with strong affective reactions and in which the behavior in question is assessed in interpersonal contexts. It appears that unconsciously perceiving the

<sup>2</sup> The effect of hoodie priming on seating distance appears to be highly reliable, as it has been replicated in three additional experiments not reported here.

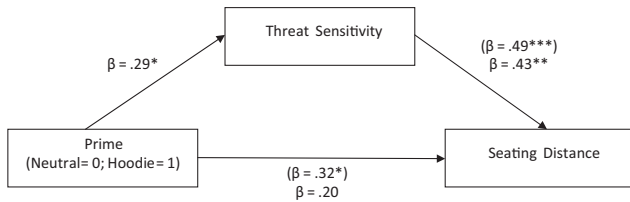


Figure 2. Threat sensitivity as a mediator of the effect of hoodie priming on seating distance. Betas in parentheses indicate simple or direct effects on seating distance; betas outside of parentheses indicate effects on seating distance when the other variable in the model is controlled for. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

presence of a social group produces an automatic affective response that alone influences subsequent social behavior.<sup>3</sup>

This research highlights the complexity of priming effects on behavior. Only recently have researchers begun to identify the conditions in which distinct varieties of prime-to-behavior effects occur (e.g., DeMarree & Loersch, 2009) and to explore the mechanisms responsible for producing them (e.g., Smeesters, Wheeler, & Kay, 2009). The overwhelming majority of this work has focused on cognitive factors that play an undeniable role in producing these effects. However, this singular focus has neglected the possibility that affective mechanisms may also be at work. The present research provides a first demonstration that priming drives attention to affectively relevant information, which, in turn, predicts the behavioral outcome.

Much of the previous work has focused on behavioral measures that can be interpreted in terms of multiple processes (e.g., assimilation, contrast, or response), making their implications ambiguous (e.g., Chen & Bargh, 1997). In contrast, the results reported here are unequivocal in their implication: increased seating distance reflects a *response* (rather than assimilation or contrast) to hoodies. Unlike early reports of prime-to-behavior effects, which described behavioral assimilation or contrast to activated traits or stereotypes (e.g., Dijksterhuis, et al., 1998), response effects entail behavior that is suited to interacting with a member of a primed social group (e.g., Cesario, Plaks, & Higgins, 2006; Jonas & Sassenberg, 2006). We were careful in this study to identify a behavior that is unambiguously a response to hoodies and not a stereotypic association. In pretesting reported in Wyer, Calvini, Nash, and Miles (2010), avoidance was the most frequently listed response to encountering a “hoodie” but had no association with the hoodie stereotype. The same pretesting indicated that approach-related behavior (e.g., crowding, pushing, etc.) was unrelated to the hoodie stereotype. Thus, we are able to conclude that our measure of seating distance reflects a behavioral response to hoodies rather than either assimilation or contrast. This strongly suggests that our results are the outcome of an affective process rather than stereotype activation.

Response effects of priming have previously been attributed to direct activation of interaction behaviors via goal states (Cesario et al., 2006), situation models (Jonas & Sassenberg, 2006), or, most recently, action semantics (Cesario, Plaks, Hagiwara, Navarrete, & Higgins, 2010). In particular, Cesario et al. (2010) reported that participants primed with African American faces later increased their physical distance from another (unknown) person, if they were able to do so. Intriguingly, participants in the same study

displayed a different behavioral response (i.e., aggression) if their ability to distance themselves was constrained by the physical environment. While the authors attributed these effects to activation of fight-or-flight action semantics, their results are largely compatible with the conceptualization offered here. Threat-related affect is likely to trigger a “flight” response when social avoidance is possible; when it is not possible, other behavioral strategies are likely to be used.

The present work highlights a second, albeit related, route for prime-to-behavior effects. Our findings suggest that exposure to the feared group, “hoodies,” produced increased sensitivity to threat, which then led to greater avoidance behavior. Thus, the unconscious activation of an anxious response associated with a social group (such as the feeling experienced after exposure to a hoodie) may automatically trigger behaviors suitable to resolve the unconscious affect. In fact, social avoidance is likely to be the first and most direct response to cope with unpredictable conditions in the absence of further appraisal processes (see Kurzban & Leary, 2001).

Alternatively, an unconscious affective response might also influence people’s social behavior in a less direct way by mediating their conscious appraisal of the behavior’s social context. In the current experiment, participants may have construed their interaction partner as the actual source of their affective state, hence intentionally avoiding interaction with a threatening individual. This is not incompatible with Smeesters et al.’s (2009) findings that trait priming influences interpersonal behavior by influencing how one’s interaction partner is construed. Such construal processes may have contributed to participants’ avoidance behavior in the present experiment.

In this study, however, the construal appears likely to have been driven by affective processes rather than by straightforward (cognitive) assimilation of the other person to the prime. The relative contribution of affective and cognitive mechanisms in producing response effects will need to be clarified by further investigation. It is likely that some groups are more strongly associated with stereotypic beliefs while others have predominantly affective associations; thus, the extent to which affective processes play a role in producing prime-to-behavior effects may vary. We would contend, however, that the great majority of groups that one may encounter in daily life are characterized by both strong affective and cognitive associations. Thus, the unconscious influence of priming on (social) behavior will be the outcome of the interaction of both types of automatic responses to the prime.

In closing, the present experiment advances the current literature by demonstrating, for the first time, that affective processes contribute to prime-to-behavior effects. Of course, it is yet to be determined how the activation of affective responses may interact

<sup>3</sup> Readers may question whether exposure to threatening words in the attention task may have amplified the prime-induced affect, only thus determining the avoidance behavior of hoodie-primed participants (who processed them more extensively). This would imply that the link between affect and behavior is unlikely to emerge outside of limited experimental conditions. We discount this possibility on the basis of similar work (Wyer et al., 2010) in which no threatening words were presented (nor did any other intervening task occur between hoodie priming and the seating measure), and yet an even larger effect on seating distance was observed ( $d = 1.12$  vs.  $0.68$  in the current study).



with other prime-congruent cognitive representations (such as group stereotypes). The present findings suggest that, at least for highly affectively charged social groups, interpersonal behavior is unambiguously the consequence of the individual's affective states alone. However, the automatic activation of the group's cognitive representation (i.e., stereotype) may still occur and play a role in other behavioral conditions. Thus, this study should serve as an impetus for further research into affective routes through which prime-to-behavior effects may emerge.

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