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Priming in Interpersonal Contexts: Implications for Affect and Behavior

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Abstract

Priming stereotypes can lead to a variety of behavioral outcomes, including assimilation, contrast, and response behaviors. However, the conditions that give rise to each of these outcomes are unspecified. Furthermore, theoretical accounts posit that prime-to-behavior effects are either direct (i.e., unmediated) or mediated by cognitive processes, whereas the role of affective processes has been largely unexplored. The present research directly investigated both of these issues. Three experiments demonstrated that priming a threatening social group (“hoodies”) influences both affect and behavior in an interpersonal context. Hoodie priming produced both behavioral avoidance and several affective changes (including social apprehension, threat sensitivity, and self-reported anxiety and hostility). Importantly, avoidance following hoodie priming was mediated by anxiety and occurred only under conditions of other- (but not self-) focus. These results highlight multiple routes through which primes influence affect and behavior, and suggest that attention to self or others determine the nature of priming effects.

Keywords

priming, affect, avoidance behavior

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Prime-to-behavior effects are among the most studied phenomena in contemporary social psychology. Literally hundreds of experiments have been reported in which priming a social concept (i.e., a trait or stereotype) has observable consequences for behavior related to that concept (see Smeesters, Wheeler, & Kay, 2010; Wyer, 2010). Yet, considerable uncertainty remains about the conditions that foster different *types* of outcome (e.g., assimilation, contrast, or response preparation) as well as the mechanisms responsible for each. In this article, we argue that a single prime can influence behavior via multiple routes. A prime can affect behavior through its direct (see Dijksterhuis & Bargh, 2001) or indirect (see Smeesters et al., 2010) operation on cognitive processes. More importantly—as reported here—a prime can also influence behavior through its effects on affective responses, which can similarly be direct or can occur in interaction with other mediating processes. In making this argument, we wish to highlight the complex role of affect in the emergence of prime-to-behavior effects. Moreover, we aim to establish that the intrapersonal versus interpersonal context—whether one acts in isolation or in interaction with others—is a key factor in determining how priming affects behavior. This distinction has been largely ignored in work on prime-to-behavior effects.

One Stereotype: Many Responses

Most societies include social groups that are perceived as dangerous or threatening—in the United Kingdom, perhaps the best example of such a group is “hoodies.” The term *hoodie* is used to refer to “a young person who wears a hoodie and is typically regarded as socially disruptive . . . a hooligan, a thug” (Oxford English Dictionary). Young men described as hoodies are typically regarded with at least a modicum of trepidation and, in some contexts, outright fear. In short, hoodies represent a group about which the majority of British people hold similarly negative attitudes and stereotypes, and one that is likely to trigger similar emotional responses and behavioral tendencies among most individuals.

Indeed, hoodies (like many other social groups) are associated not only with knowledge about stereotypic attributes but also with strong affective and behavioral reactions

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(e.g., Mackie, Devos, & Smith, 2000; Mackie, Smith, & Ray, 2008). Upon meeting a hoodie, one is likely to experience fear, threat, and the urge to move away. These reactions may occur as the result of stereotypes about hoodies (which depict them as dangerous and intimidating) being activated. However, in the context of a face-to-face encounter, activation of emotional and/or behavioral responses may be even stronger than activation of stereotypic knowledge. Thus, we suggest that such responses may also occur directly as the result of their history of repeated association with the sight of a hoodie. In recognition of the fact that many social groups are associated with more than simply knowledge of a stereotype, recent research has focused significant attention on the behavioral consequences of exposure to outgroups. This focus has resulted in a substantial evidence base on what have become known as prime-to-behavior effects and the development of competing theories about the cognitive mechanisms responsible for these effects. Similar investigations into the affective consequences of outgroup priming have been comparatively rare. Thus, the aims of this article are twofold. First, we explore the affective concomitants of exposure to the outgroup “hoodies.” Second, we focus on affective responses to priming as a way of differentiating between competing accounts of prime-to-behavior effects.

Affective Consequences of Stereotype Priming

The principal goal of the present research is to explore the affective consequences of priming social stereotypes. Research on stereotype priming has largely disregarded the possibility that affect plays a role in producing behavioral consequences. In large part, this tendency has resulted from early findings reported by Bargh, Chen, and Burrows (1996) that activating stereotypes of the elderly produced behavior consistent with the stereotype (i.e., walking slowly) but did not appear to influence participants' mood. Based on these results, Bargh et al. concluded that, consistent with the ideomotor account, affective processes do not play any role in prime-to-behavior effects. However, it is important to note that Bargh et al. measured behavioral and affective consequences of priming in separate experiments, making it difficult to draw firm conclusions about mediation. Furthermore, recent evidence suggests that the move to disregard the potential role of affect may have been premature. For example, Winkielman, Berridge, and Wilbarger (2005; see also Chartrand, van Baaren, & Bargh, 2006) have reported that automatically activated emotions have a direct influence on affect-relevant behavior. In addition, researchers such as DeMarree, Wheeler, and Petty (2005) have found that priming race stereotypes produces changes in participants' experience of emotions related to those stereotypes. Finally, Ruys and Stapel (2008) reported that subliminally priming disgust- and fear-inducing pictures led participants to report consciously feeling those emotions and to behave in ways consistent with those emotional experiences. Taken together, such findings

suggest that affect may be more likely to be involved in prime-to-behavior effects than has been acknowledged.

Importantly, affective processes may influence different aspects of the prime-to-behavior pathway. First, activation of a social group may result in affective reactions that are stereotypic of that group (e.g., DeMarree et al., 2005). Such an effect would be consistent with research showing that stereotype activation has “assimilation” effects (i.e., perceivers for whom a stereotype is primed take on the characteristics of the stereotyped group; e.g., Bargh et al., 1996; Dijksterhuis & van Knippenberg, 1998). Thus, priming a group that is stereotypically hostile or aggressive might result in perceivers feeling more hostile or aggressive themselves. A second possibility is that activating a social group may produce affective responses typically associated with interacting with that group. Such an effect would be consistent with recent research demonstrating a “response preparation” effect of priming (e.g., Cesario, Plaks, & Higgins, 2006; Jonas & Sassenberg, 2006; Smeesters, Wheeler, & Kay, 2009; described later). In that case, priming a stereotypically hostile or aggressive group might produce feelings of fear or anxiety. Such emotional responses might, in turn, influence perceivers' social interactions in at least two ways. First, others with whom the perceiver interacts might be viewed as more threatening (i.e., the affective response biases perceptions of others; e.g., Smeesters et al., 2009). If so, anxiety produced by priming should result in a tendency to avoid others. Second, the interaction context itself might be viewed as more threatening (i.e., the affective response biases perceptions of the environment; e.g., Kay, Wheeler, Bargh, & Ross, 2004). In that case, priming-induced anxiety might be expected to result in affiliation behavior (as others may be viewed as a source of support; e.g., Schachter, 1959).

As implied previously, all of these affective changes may be particularly likely to emerge when one is exposed to a social group that is strongly associated with creating a positive or negative emotional state. Such is likely to be the case with groups perceived as threatening (e.g., hoodies). Perceivers may learn to associate such groups with affectively laden characteristics (e.g., hostility) or with a negative affective response (e.g., fear or anxiety). As a result, such responses may be automatically elicited when one encounters group-relevant cues. Thus, in the present research, we investigate the affective consequences of priming the stereotype of such a group. In general, we expect that priming hoodies may produce three distinct affective reactions: feelings of hostility, feelings of anxiety relating to interactions with strangers, or feelings of threat attributed to the environment. Each of these is likely to have different consequences for behavior—an issue to which we turn in the following section.

Varieties of Prime-to-Behavior Effects

A second important goal of the current studies is to distinguish among different varieties of prime-to-behavior effects. Previous

investigations have established at least three behavioral outcomes of priming a social group. Early reports focused on *assimilation* effects, wherein a person primed with a group stereotype becomes more likely to behave in ways consistent with that stereotype (e.g., Bargh et al., 1996; Dijksterhuis & van Knippenberg, 1998; see Dijksterhuis & Bargh, 2001, for a review). The traditional “ideomotor” account for such effects is that exposure to a concept (e.g., a trait or stereotype) activates behavioral representations associated with that concept (e.g., exposure to the concept “elderly” might activate the associated representation of “walking slowly”; e.g., Bargh et al., 1996). Although the ideomotor account suggests that prime-to-behavior effects are direct and unmediated by additional processing, alternative accounts (e.g., Mussweiler, 2007; Wheeler, DeMarree, & Petty, 2007) posit that changes in behavior are mediated by prime-congruent shifts in the self-concept.

Subsequent explorations of priming and behavior uncovered a second potential class of effects. Dijksterhuis et al. (1998) reported that individuals primed with individual group members showed behavioral *contrast* rather than assimilation. Such contrast effects are typically attributed to an implicit comparison process that is triggered when one encounters a social target. This comparison process results in the self being assimilated to similar targets but contrasted from dissimilar targets (see Dijksterhuis et al., 1998; Mussweiler, 2007). In support of this view, Schubert and Hafner (2003) found that a perceiver’s membership in a group (and consequently their level of similarity) determined whether priming the group led to behavioral assimilation or contrast.

More recently, a third class of prime-to-behavior effects has been reported. Rather than producing either assimilation or contrast effects on behavior, priming a social group may produce behavior consistent with interacting with the group. Such *response preparation* effects have been reported by Cesario et al. (2006), who proposed that priming a social target (a person or group) can automatically trigger behaviors associated with interacting with the group. That is, when exposed to a target (e.g., a gay man), one automatically activates behaviors compatible with how one wishes to interact with the target (e.g., affiliation behaviors if one has positive attitudes toward gay men, or avoidant-antagonistic behaviors if one has negative attitudes). In their research, Cesario et al. demonstrated that perceivers’ personal attitudes toward the primed target—and hence their personal interaction goals—predicted behavioral responses to the prime.

In a conceptually similar program of work, Jonas and Sassenberg (2006) forwarded the concept of “automatic response priming.” In other words, priming a social target activates relevant situation models containing typical interaction sequences. Consequently, when the target is encountered, response behaviors associated with related situation models are activated. Thus, rather than producing behavior characteristic of the target, priming evokes behavior compatible with

responding to the target. Finally, Smeesters et al. (2009) have recently reported that trait priming, under conditions of other-focus, produces behavioral effects consistent with attributing the primed trait to an interaction partner (rather than assimilating the trait to oneself). Thus, response preparation effects have been variously attributed to activation of an interaction goal (Cesario et al., 2006), activation of a situation model (Jonas & Sassenberg, 2006), or biased perception of others (Smeesters et al., 2009).

Predicting the Nature of Prime-to-Behavior Effects in Interpersonal Contexts

In evaluating the current state of play when it comes to prime-to-behavior effects, a number of issues preclude clear conclusions about the conditions under which priming results in assimilation, contrast, or response preparation effects. Furthermore, there remains substantial ambiguity regarding the process(es) through which prime-to-behavior effects occur, with distinct mechanisms proposed to underlie each effect. One factor that is likely to be important in determining how a prime affects behavior is the extent to which the primed concept may be applied to the context in which behavior is measured. Interpersonal contexts, in particular, may present various opportunities for primes to influence behavior. As noted by Smeesters et al. (2009), most theoretical accounts of prime-to-behavior effects focus on *intrapersonal* processes. Yet behavior in *interpersonal* interactions may have more profound consequences in the long run than behavior outside of a social context, and researchers often discuss the implications of their findings to such contexts.

Interpersonal contexts incorporate at least three targets to which a primed concept might be potentially applied: the self, the other person or people with whom one interacts, and the social situation in which the interaction takes place. Aside from the ideomotor model, which argues for a direct and unmediated effect of primes on behavior, theoretical accounts of assimilation and contrast effects tend to focus on the extent to which priming influences construal of the self. For example, the active-self account (Wheeler et al., 2007) posits that the active self-concept assimilates to or contrasts away from a primed concept, depending on the extent to which the prime is similar to or distinct from the self (see also Mussweiler’s, 2007, selective accessibility model).

Although priming traits and stereotypes may well produce changes in self-construal, there is clear evidence that it also produces changes in how other aspects of the social environment are perceived. Priming a trait or stereotype has most commonly been shown to bias perceptions of others in the direction of the prime (see DeCoster & Claypool, 2004, for a review). For example, early research on concept priming showed that activating traits such as “hostile” led participants to judge a target who behaved in ambiguous ways as more hostile (e.g., Srull & Wyer, 1979). More recently, Smeesters

et al. (2009) found that participants primed with “unkind” perceived their partner in an ultimatum or dictator game as less kind. Furthermore, priming may bias perceptions of the social context (e.g., Kay et al., 2004; Kay, Wheeler, & Smeesters, 2008) such that situations are construed in a manner consistent with a primed concept. For example, Kay et al. (2004) demonstrated that participants exposed to business-related objects perceived a game-playing situation as less cooperative than did those who were not exposed to such objects. In summary, priming may influence interpersonal behavior by biasing how the self and others in a social interaction are perceived, as well as how the social situation is construed.

Although few would likely dispute the effects of priming on person perception and situation construal, investigations of prime-to-behavior effects have largely taken place outside of interpersonal contexts. Indeed, a recent review of prime-to-behavior effects (Wyer, 2010) has found that a sizable majority (more than 70%) of experiments demonstrating such effects involved nonsocial behavior (e.g., cognitive performance, choice, motor responses), and even more (approximately 80%) examined behavior outside of interpersonal interactions. Moreover, when experiments have taken place in an interpersonal context, the results have often been interpretable in terms of either an ideomotor mechanism or a perception-biasing mechanism. For example, in the original work by Bargh et al. (1996), participants primed with the traits “rude” versus “polite” may have interrupted more or less quickly either because they themselves became more rude or more polite or because they perceived the experimenter’s ambiguous behavior (i.e., carrying on another conversation while the participant waited to speak to them) as relatively rude or polite. Likewise, participants primed with African American faces may have perceived the experimenter who told them that they would need to start the experiment over again as more unintelligent or incompetent than those primed with White faces, resulting in a more hostile reaction.

Because studies of prime-to-behavior effects rarely assess perceptions of others or of the situation, such alternative explanations cannot be ruled out. Importantly, in those cases where such perceptions are assessed (e.g., Chen & Bargh, 1997; Kay et al., 2004; Smeesters et al., 2009), the results are consistent with a biased perception mechanism. In a direct test of the possibility that priming influences interpersonal behavior by changing the way interaction partners are perceived, Smeesters et al. (2009) recently reported that participants who were primed with competition versus cooperation behaved in a more competitive or cooperative way during an ultimatum game (consistent with an ideomotor effect). Importantly, however, under conditions of other-focus, their competitive or cooperative behavior was mediated by perceptions that their *opponent* was competitive or cooperative.

Most investigations of prime-to-behavior effects have similarly neglected to assess how priming affects situational

construal. However, recent research by Kay and colleagues (Kay et al., 2004; Kay et al., 2008) has tested the possibility that changes in situational construal mediate the effects of priming on behavior. In that research, participants who were primed with concepts related to competition construed a subsequent task (a social dilemma game) as more competitive than did those who were primed with cooperation. Furthermore, construing the situation as more or less competitive had downstream consequences for how participants behaved during an ultimatum game (Kay et al., 2004). Thus, such findings introduce an additional route through which primes may influence behavior. The way in which a situation is construed creates demands for how one behaves in that situation. Thus, priming a concept may also influence interpersonal behavior indirectly by biasing one’s construal of an interaction context.

Overview of Experiments

The current research integrates and extends research on prime-to-behavior effects by exploring the effects of priming a social stereotype (that of hoodies) on both affect and behavior in an interpersonal context. Importantly, to distinguish between assimilation, contrast, and response preparation effects, we measure several outcomes. First and foremost, in each of three experiments, we measure avoidance, which is not a behavior associated with the stereotype of hoodies but *is* a strongly associated response to hoodies. However, as discussed here, we also expect that exposure to hoodies will produce affective responses associated with the group.

The experimental paradigm we employ is likely to invoke a focus on others because participants expect to work on a joint task with another participant. Following Smeesters et al.’s (2009) finding that perceptions of others are assimilated to primed concepts under conditions of other-focus, we expect that participants in our experiments who have been primed with hoodies will perceive an expected interaction partner as more threatening (in line with the hoodie stereotype). As a result, we expect that they will feel more anxiety about interpersonal encounters and will tend to avoid others in such encounters. We test these hypotheses in Experiment 1.

Whereas the focus of Experiment 1 is on determining whether priming a threatening outgroup produces behavioral and emotional responses to a specific individual (i.e., participants’ anticipated interaction partner), Experiments 2 and 3 address the possibility that those affective responses may be influenced in multiple ways. For example, participants for whom a sense of threat has been activated may view the environment at large (and not only their anticipated interaction partner) to be more threatening. Thus, in addition to replicating the effects of priming hoodies on avoidance behavior in Experiments 2 and 3, we examine a wider range of affective consequences that may result from priming a threatening outgroup and examine the relation between such affective responses and avoidance behavior.

Experiment 1

The aim of Experiment 1 was to provide a preliminary test of the hypothesis that exposure to a threatening outgroup (hoodies) would lead to greater avoidance behavior, as well as to general wariness of unknown others. To accomplish this, we adapted the priming manipulation described by Bargh et al. (1996, Study 3). In the current study, participants were briefly exposed to pictures of either a young man dressed as a hoodie, the same person dressed in neutral attire, or no pictures. After the priming manipulations, participants were asked to sit in another room to work on a group task with another (actually nonexistent) participant, who had momentarily stepped out of the room. The distance between the participant's chosen seat and that of the supposed "other" participant was measured. In addition, we assessed participants' disposition toward interacting with strangers through a questionnaire they filled out while waiting for the "other participant" to return. Based on the notion that even nonconscious exposure to an outgroup that is strongly linked to emotional (fear) and behavioral (avoidance) responses should produce those responses, we predicted that participants exposed to the hoodie primes would both sit farther away from the other participant and express more discomfort interacting with strangers. This pattern of results should not emerge if priming produces a simple ideomotor response; however, because of the interpersonal nature of the experimental situation, we expect that priming will influence perceptions of others and thus elicit emotional behavioral responses associated with perceiving others in prime-consistent ways.

Pilot Study

To verify that participants in the main experiments were likely to associate avoidance behavior with *responding* to hoodies but not with the *stereotype* of how hoodies themselves would behave, we carried out a pilot study in which we assessed (a) stereotypes of hoodies, including their expected behavior, and (b) typical responses to encountering a hoodie. An independent sample of 40 participants was asked to list five behaviors they expected members of 12 groups (including hoodies) to engage in. None of the 40 participants listed a behavior associated with avoiding others. The same sample of participants was also asked to list five behaviors they themselves typically produced in response to hoodies. Responses consistent with avoidance (e.g., looking away, crossing the street) were listed by 37 of the 40 participants. No participant listed a response associated with approaching or affiliating with hoodies. Thus, avoidance appears to be an unequivocally typical response to hoodies but is not considered a type of behavior normally displayed by hoodies. To the extent that avoidance behavior follows activation of the hoodie stereotype, we can therefore be confident in inferring a *response preparation* effect rather than an *assimilation* effect.

Method

Participants and design. Forty-two undergraduate students (32 female, $M_{age} = 22$ years) were randomly assigned to one of three conditions: no prime, neutral prime, or hoodie prime.¹ Participants were tested individually.

Procedure. Participants took part in a two-phase experiment. The priming phase was adapted from Bargh et al. (1996, Study 3). Participants were seated in a computer laboratory and were introduced to a "spatial perception" study, which was in fact the priming task. The task consisted of 100 trials, each of which began with a series of 10 asterisks for 1,000 ms, followed by a priming stimulus for 11 ms (in the neutral and hoodie prime conditions), then a pattern mask consisting of gray ovals for 21 ms, and finally a display of colored dots for up to 2,000 ms. Participants were instructed to try to judge whether the number of colored dots was odd or even and to respond by pressing one of two response keys on the keyboard.

The prime-mask sequence varied depending on condition. Participants in the *hoodie prime* condition were presented with a grayscale photograph 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. In both of these conditions, the photograph was immediately replaced by a grayscale pattern mask. Participants in the *no prime* condition were presented only with masks.

After completing the priming task, participants were informed that the next part of the experiment consisted of a group task in which they would work with another student. The experimenter explained that this task would take place in an adjacent room and led the participant into a room containing a table and chairs. The room was set up such that there was one chair placed at the table, on which was a (nonhooded) jacket and backpack. A stack of other chairs was placed against the wall. The experimenter informed the participant that the other student had left to make a phone call but would return momentarily. The experimenter went on to explain that while he or she was waiting, the participant could begin by filling out a brief questionnaire, and so he or she should take another chair from the stack and have a seat at the table while the experimenter left to get the questionnaire. After the participant had taken a seat, the experimenter returned with the questionnaire 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 purported to belong to the other participant was measured and recorded at the end of the experiment.

Participants then completed a 24-item questionnaire that was described as an assessment of their attitudes toward working in a group. Participants rated their agreement with statements about various aspects of group work on a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*). Embedded among

the 24 items were two questions designed to assess participants' discomfort relating to interacting with strangers ("I find it difficult to relate to individuals who are unlike me" and "I feel intimidated around individuals I don't know"; $\alpha = .51$).

Finally, the experimenter concluded the experiment and debriefed the participant regarding the priming task and the nonexistence of the other participant. No participant expressed awareness of the priming stimuli or of the relation between the priming phase (i.e., the dot estimation task) and the subsequent measures. Importantly, no participant reported suspicion about the existence of the other participant.²

Results and Discussion

The distance that participants placed themselves relative to the other participant was measured in centimeters. A one-way ANOVA was carried out to compare seating distance in the no prime, neutral prime, and hoodie prime conditions. A significant priming effect was obtained, $F(2, 39) = 7.06, p < .01, \eta_p^2 = .26$ (see Figure 1). Two orthogonal planned contrasts were computed to directly test the hypothesis that participants in the hoodie prime condition would sit farther away from the other participant than would participants in the no prime or neutral prime conditions, which were not expected to differ. Contrast 1 compared the hoodie prime condition ($M = 119.21, SD = 26.36$) with the other two conditions combined and was significant, $t(39) = 3.51, p < .01, d = 1.12$. Contrast 2 compared the no prime ($M = 96.64, SD = 27.03$) and neutral prime ($M = 84.00, SD = 21.63$) conditions and was not significant, $t(39) = 1.33, p = .19, d = .43$.

The two questionnaire items that were designed to assess participants' discomfort with strangers were averaged. Average scores were analyzed using the same procedure as described previously. First, a one-way ANOVA in which prime condition was the independent variable revealed a marginally significant effect, $F(2, 39) = 2.45, p < .10, \eta_p^2 = .11$. Next, two orthogonal planned contrasts were computed. Contrast 1, which compared the hoodie prime condition ($M = 4.11, SD = 0.88$) to the control and neutral prime conditions, was significant, $t(39) = 2.14, p < .04, d = .69$. Contrast 2, which compared the control condition ($M = 3.29, SD = 1.22$) to the neutral prime condition ($M = 3.50, SD = 0.92$), was not significant, $t(39) = .56, p > .50, d = .18$.

Finally, measures of seating distance and of discomfort with strangers were uncorrelated, $r = -.04, ns$. Tests of mediation (entering discomfort with strangers as a mediator in the effect of prime on seating distance) likewise produced no evidence of mediation, Sobel $z = 0.94, p = .35$.

Thus, nonconscious exposure to a hoodie provoked affective and behavioral reactions in response to another person who was not a hoodie. Participants exposed to "hoodies" in the first part of the experiment professed greater discomfort with interacting with a stranger and in fact chose to distance themselves to a greater extent from a stranger with whom they

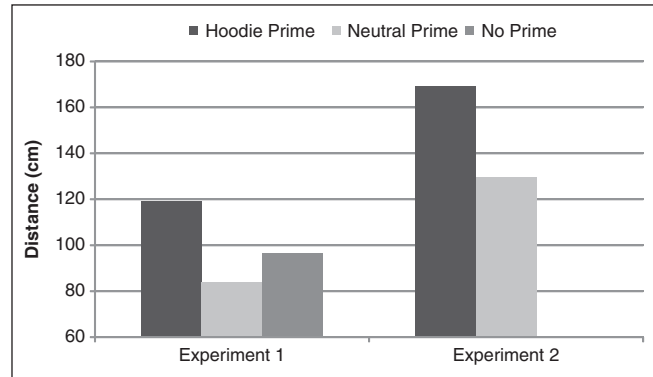


Figure 1. Average seating distance (cm) following hoodie versus neutral priming: Experiments 1 and 2

expected to interact. These findings are consistent with the hypothesis that affective responses that result from stereotype activation may bias perceptions of others in an interpersonal context. It is interesting to note that the questionnaire measure did not correlate with seating distance. We return to this issue in the introduction to Experiment 3.

These results are consistent with previous research demonstrating that priming produces response preparation (rather than assimilation or contrast; e.g., Cesario et al., 2006; Jonas & Sassenberg, 2006; Smeesters et al., 2009). Indeed, the results of Experiment 1 are not easily explained by a simple ideomotor mechanism (e.g., Dijksterhuis & Bargh, 2001). According to the ideomotor account, individuals primed with hoodies should be more likely to behave in a manner typical of hoodies; for example, they might be expected to behave more aggressively. Our pilot testing indicated that avoidance behavior is not seen as characteristic of hoodies, and thus greater avoidance after hoodie priming would not seem to fall under the realm of ideomotor behavior. Of course, this does not rule out the possibility that in some circumstances, hoodie priming might also produce ideomotor responses (e.g., aggressive behavior). However, findings such as the one reported in Experiment 1 and those reported by others (Cesario et al., 2006; Jonas & Sassenberg, 2006; Smeesters et al., 2009) suggest that prime-to-behavior effects are not limited to ideomotor responses.

Experiment 2

The results of our first experiment were consistent with the hypothesis that priming social groups with strong affective associations (e.g., threatening groups such as hoodies) produces the associated affective response. In Experiment 1, participants responded to being primed with a hoodie by becoming more uncomfortable about interacting with a stranger, suggesting that affect associated with a particular group (in this case, hoodies) may influence one's reactions to others who do not belong to the group. This finding is akin to

prior research on priming that indicates that traits and stereotypes that are activated in one context may be applied to others in an unrelated context (e.g., Devine, 1989; Smeesters et al., 2009; Srull & Wyer, 1979).

Recent research by Kay and colleagues (Kay et al., 2004; Kay et al., 2008) suggests that concept priming also influences other types of judgments, such as how a situation is construed. In that research, participants for whom the concept of competition had been primed viewed a social situation as more competitive than did those for whom competition had not been primed. Such findings suggest that affective responses that are activated via priming may also influence how subsequent situations are construed. In Experiment 2, we explore the possibility that priming hoodies leads perceivers not only to view others in a social interaction as more threatening but to view the environment itself as more threatening as well.

To test this, we employ an affective Stroop task (e.g., Miller & Patrick, 2000), which has been shown to assess the extent to which individuals are sensitive to threat cues. Like the standard Stroop task (Stroop, 1935), the affective Stroop requires participants to name the ink colors in which a series of stimuli are printed. However, unlike the standard Stroop (in which color labels are presented in compatible or conflicting ink colors), the affective Stroop includes threat-related words (e.g., *knife*, *blood*, *danger*). The rationale for the task is that to the extent an individual is highly sensitive to threatening information, he or she will find it more difficult to ignore the semantic meaning of threat-related words. Because processing the meaning of the word is incompatible with optimal performance on the color-naming task, performance should be slower. In the present study, if priming participants with hoodies increases their feelings of threat, they should also become more sensitive to threatening information in the environment. In the context of completing an affective Stroop task, threat-related words may have the same effect as threatening cues in the environment at large. Thus, hoodie-primed participants should find it more difficult to ignore threatening stimuli during the affective Stroop task.

Beyond biasing perception of other people and of the social environment, another possible outcome of priming hoodies is that perceivers may adopt the affectively relevant attributes that are included in their stereotype. Research by DeMarree et al. (2005) suggests that affective states associated with a group stereotype may be induced by priming the group. In DeMarree et al.'s research, participants primed with the stereotype of African Americans later reported feeling more aggressive, an affective state associated with the African American stereotype. In Experiment 2, we also measure the extent to which participants consciously experience emotional states associated with the hoodie stereotype (e.g., hostile) after being primed with hoodies.

Thus, our second experiment had two aims. First, we wished to replicate the behavioral effect obtained in Experiment 1. More importantly, however, we endeavored to broaden our

investigation of how priming a social group with strong affective associations alters perceivers' own affective states. In addition to measuring avoidance behavior (defined as seating distance, as in Experiment 1), we also measure participants' sensitivity to threatening stimuli in their environment (using an affective Stroop task) and their own conscious emotional states (using a self-report measure). Based on previous research and the reasoning outlined previously, we expect that hoodie priming will not only increase avoidance behavior (suggesting that participants' interaction partners are viewed as more threatening) but will also increase threat sensitivity (suggesting that the situation is construed as more threatening) and consciously experienced hostile emotions (suggesting that emotional states associated with hoodies may also be attributed to the self).

Method

Participants and design. Thirty-six undergraduate students (26 female, $M_{\text{age}} = 19.3$ years) were randomly assigned to either a neutral prime or hoodie prime condition.³ Participants were tested individually.

Procedure. Participants took part in a three-phase experiment. The priming phase consisted of the same task as described in Experiment 1. After completing the priming task, participants next completed an affective Stroop task. In this task, participants identified the print color of 20 control words (circle, gesture, list, review, sweater, collecting, consider, hats, reside, towel, desks, paper, pen, percent, sheets, folder, invent, trend, trunk, wheel) and 20 threat-related words (assault, beat, destroy, harass, damage, molest, sinister, stab, chase, suspicious, wound, bruise, bully, hit, threat, torment, danger, injure, knife, stare).⁴ Both sets of words were drawn from Isenberg et al. (1999). The amount of time required to respond to each trial was recorded.

Finally, participants were instructed that they would complete the final part of the session in an adjacent room and that it would involve working on a task with another participant. Participants were led to the room where a table and chair (on which a jacket and backpack were placed) were situated in one corner. The experimenter explained that the other participant had stepped out to make a phone call and that they should take a chair from a stack and have a seat at the table where they would begin by filling out a questionnaire. The experimenter marked the location of the participant's chair as in Experiment 1.

Participants then completed a 20-item emotion checklist. Participants rated the extent to which they were currently feeling each of 10 positive (interested, excited, strong, enthusiastic, proud, alert, inspired, determined, attentive, active) and 10 negative (hostile, irritable, distressed, upset, guilty, scared, ashamed, nervous, jittery, afraid) emotions. Ratings were made on a 7-point scale (1 = *not at all*, 7 = *very much*). Embedded within the list were two negative emotions that are

typically associated with the hoodie stereotype (hostile and irritated, $\alpha = .61$).⁵

Results and Discussion

As in Experiment 1, the distance each participant sat from the other "participant" was recorded in centimeters and analyzed using a *t* test. Replicating the results obtained in Experiment 1, this analysis yielded a significant effect of prime on seating distance, $t(34) = 2.09$, $p < .05$, $d = .72$ (see Figure 1). As expected, participants who were primed with hoodies sat significantly farther away from the location where they expected the other participant to be seated ($M = 169.13$, $SD = 55.89$) than did those primed with neutral figures ($M = 129.46$, $SD = 58.28$).

Response times during the affective Stroop task were also analyzed for evidence that participants primed with a hoodie would have their attention drawn to threatening stimuli to a greater extent than those primed with a neutral figure. Response times corresponding to incorrect responses (2.03% of trials) were removed, as were response times greater than 3 *SD* above the mean (0.91% of trials). The average amount of time required by participants to name the color of control stimuli and threat-related words was then calculated, and the difference between them computed such that higher (more positive) scores reflected slower responses to threatening words than to control stimuli. These scores were then compared using an independent samples *t* test. The effect of priming condition was significant, $t(34) = 2.37$, $p = .02$, $d = .81$. As expected, participants primed with hoodies showed significantly more interference in responding to the threat-related words ($M = 21.55$, $SD = 49.72$) than did participants in the neutral prime condition ($M = -19.07$, $SD = 53.00$).

Lastly, participants' ratings of their current feelings of hostility and irritation were averaged and compared using an independent-samples *t* test. This comparison was significant, $t(34) = 2.51$, $p = .02$, $d = .86$, indicating that participants in the hoodie condition reported significantly greater levels of hostility and irritation ($M = 1.97$, $SD = 0.88$) than did those in the neutral prime condition ($M = 1.36$, $SD = 0.54$).

Relation Between Affect and Behavior

Across Experiments 1 and 2, priming hoodies has been shown to influence affective responses in three ways. First, we found (in Experiment 1) that perceivers' level of discomfort with strangers increased after hoodie priming, which is compatible with previous research on response preparation effects (e.g., Cesario et al., 2006; Jonas & Sassenberg, 2006; Smeesters et al., 2009). Second, the finding (in Experiment 2) that participants' sensitivity to threat in the environment has parallels with research by Kay and colleagues (Kay et al., 2004; Kay et al., 2008), showing that situational construal is influenced by primed concepts. Third, the finding that self-reported feelings of hostility increase when participants are primed with hoodies

replicates recent work by DeMarree et al. (2005), who reported that affective traits such as aggressiveness are assimilated to the self after priming with stereotypes that include those traits.

Thus, these findings suggest that activation of an affectively charged social group has wide-ranging implications for perceivers' own affective states as well as for their behavior. Moreover, each of these effects has an analogue in the literature on priming effects on judgment and behavior. However, to our knowledge, no research has examined multiple effects within the same experiment. Thus, in an exploratory analysis, we examined the extent to which the effects found in Experiment 2 tended to covary across participants. Results of correlation analyses indicated that seating distance was not significantly correlated with either hostility ($r = .01$, *ns*) or Stroop interference ($r = .14$, *ns*), nor were the two measures of affect correlated with each other ($r = .25$, $p > .10$). Partial correlations between each pair of variables, controlling for the third, were essentially identical. Consistent with these results, formal tests of mediation indicated that neither hostility (Sobel $z = .82$, $p = .41$) nor Stroop interference (Sobel $z = -.19$, $p = .85$) mediated the effect of hoodie priming on seating distance.

Summary

These results replicate those of the first experiment in that avoidance behavior (as measured by seating distance) was significantly increased by brief exposure to a hoodie. In contrast to the ideomotor perspective, which would not predict avoidance responses, these results support the response preparation hypothesis forwarded by Jonas and Sassenberg (2006; see also Cesario et al., 2006; Smeesters et al., 2009): Nonconscious activation of a group that provokes avoidance responses was sufficient to produce avoidance behavior in an unrelated context. More importantly, the results of Experiment 2 provide evidence that priming a group with strong affective associations has wide-ranging consequences for participants' affective states, producing heightened sensitivity to threat-related information as well as increases in conscious experience of emotions associated with the group stereotype.

Like Experiment 1, the affective measures collected in Experiment 2 did not significantly correlate with seating distance. Thus, the evidence so far appears to suggest that affective and behavioral consequences of priming are independent of each other. However, as suggested in the earlier review of prime-to-behavior effects, a number of factors may influence how an affective response (once elicited by priming) is applied. To the extent that affect is applied to the self, one may experience stereotypic emotions (i.e., hostility, as shown in this experiment). If, on the other hand, it is applied to others in an upcoming interaction, one may experience apprehension or anxiety (as suggested by Experiment 1). Finally, if affect is applied to the situation itself, one may experience a heightened sensitivity to cues conveying the potential for threat or danger (as reflected by the results from the Stroop task in Experiment 2).

Each of these affective reactions may result from priming, and each is likely to have a different influence on behavior. The accumulated results from Experiments 1 and 2 provide compelling evidence that affective reactions do occur (see also Wyer & Calvini, 2010). However, the vital question of when and if they are responsible for producing the avoidance behavior observed in those experiments remains unanswered.

Experiment 3

Thus, the results of Experiments 1 and 2 suggest that priming can have multiple consequences for affect and behavior. However, these consequences appear so far to be independent of each other. Thus, these findings raise questions about the conditions that are likely to produce each type of response. In both of the experiments reported thus far, threat following hoodie priming could bias perceptions of the self, the situation, or the interaction partner—the experimental context itself did not impose any constraints.

There are, however, factors that do encourage activated concepts to be applied to one target versus another. Recent research by Smeesters et al. (2009) may be instructive. In that work, the extent to which trait priming influenced behavior was moderated by attentional focus. Under conditions of other-focus, participants' behavior was predicted by their construal of their interaction partners (which was in turn influenced by the prime). The same effects were not found under control conditions. Similarly, DeMarree and Loersch (2009) have recently reported that self-focus versus other-focus moderates the effects of priming on judgment and behavior. When attention is focused on others, people are more likely to use the primed concept in forming an impression of those others (as in Smeesters et al., 2009). In contrast, when attention is focused on the self, people appear to assimilate primed concepts to the self-concept and behave accordingly. We have argued here that the nature of the expected interaction (working on a joint task) is likely to invoke other-focus for most participants. However, it is likely that some participants remain self-focused (DeMarree et al., 2005). If so, hoodie-priming may be more likely to produce assimilation effects on affect (leading them to feel more angry or hostile, as in Experiment 2) rather than response effects (feeling anxious or threatened).

In Experiment 3, we directly test this possibility. Participants were again primed with either hoodies or neutral figures, and their subsequent seating distance was measured as an indicator of avoidance. However, in this study, participants were induced to adopt either a self-focus or other-focus after the prime (but before the seating distance measure was obtained). In addition, once participants were seated, they reported their current emotional state on both anger-related and anxiety-related dimensions. We expect that priming hoodies should again lead to greater seating distance, but only among participants in the other-focus condition. Moreover, we expect that participants' self-reported emotions should

reflect assimilation (i.e., greater anger) under self-focus conditions but response effects (i.e., greater anxiety) under other-focus conditions.

Method

Participants. Forty-eight members of the university community (31 female, $M_{\text{age}} = 23.3$ years) took part in the study in exchange for £3.

Design and procedure. Participants were randomly assigned to conditions of a 2×2 design in which prime (hoodie vs. neutral) and focus of attention (self-focus vs. other-focus) were manipulated between participants. The experiment consisted of three phases. The priming phase was identical to that described in Experiment 2. After completing the priming task, participants were introduced to a study on "social reflection," which served as our attentional focus manipulation. Participants in the self-focus condition were asked to sit quietly and think about themselves for 3 min. Participants in the other-focus condition were asked to think about people they knew for the same amount of time. Once the time for that task was up, participants were led to an adjacent room where they expected to meet another participant. The seating distance measure was obtained in the same manner as in the previous experiments. Once seated at the table, participants completed an emotion questionnaire in which they were asked to rate their current emotional state on dimensions related to anxiety (tense, relaxed, anxious, calm, worried, confident; $\alpha = .87$) and anger (irritable, friendly, angry, affectionate, pleasant, aggressive; $\alpha = .78$). Ratings were made on a 1 (*not at all*) to 9 (*very much*) scale.

Results

Seating distance was analyzed using a two-way ANOVA in which prime and focus of attention were entered as between-participants variables. The analysis yielded significant main effects of both prime, $F(1, 44) = 4.08, p = .04, \eta_p^2 = .09$, and focus of attention, $F(1, 44) = 7.05, p = .01, \eta_p^2 = .14$. However, both were qualified by a significant two-way interaction, $F(1, 44) = 4.57, p = .04, \eta_p^2 = .09$ (see Figure 2, top panel). Simple effects analyses were then carried out within each focus of attention condition. Among other-focused participants, those primed with the hoodie sat significantly farther away ($M = 159.0$ cm, $SD = 94.7$ cm) than did those primed with the neutral figure ($M = 94.2$ cm, $SD = 41.7$ cm), $F(1, 44) = 8.63, p = .005, d = 0.89$. In contrast, among self-focused participants, there was no difference in seating distance between those primed with the hoodie ($M = 84.25, SD = 17.63$) and those primed with the neutral figure ($M = 86.08, SD = 84.92$), $F(1, 44) < 1, d = .03$.

Next, participants' emotion ratings were analyzed. With respect to anger ratings, there was a significant two-way interaction, $F(1, 44) = 10.75, p = .002, \eta_p^2 = .20$ (see Figure 2, bottom panel). Simple effects analyses indicated that among other-focused participants, hoodie-primed participants

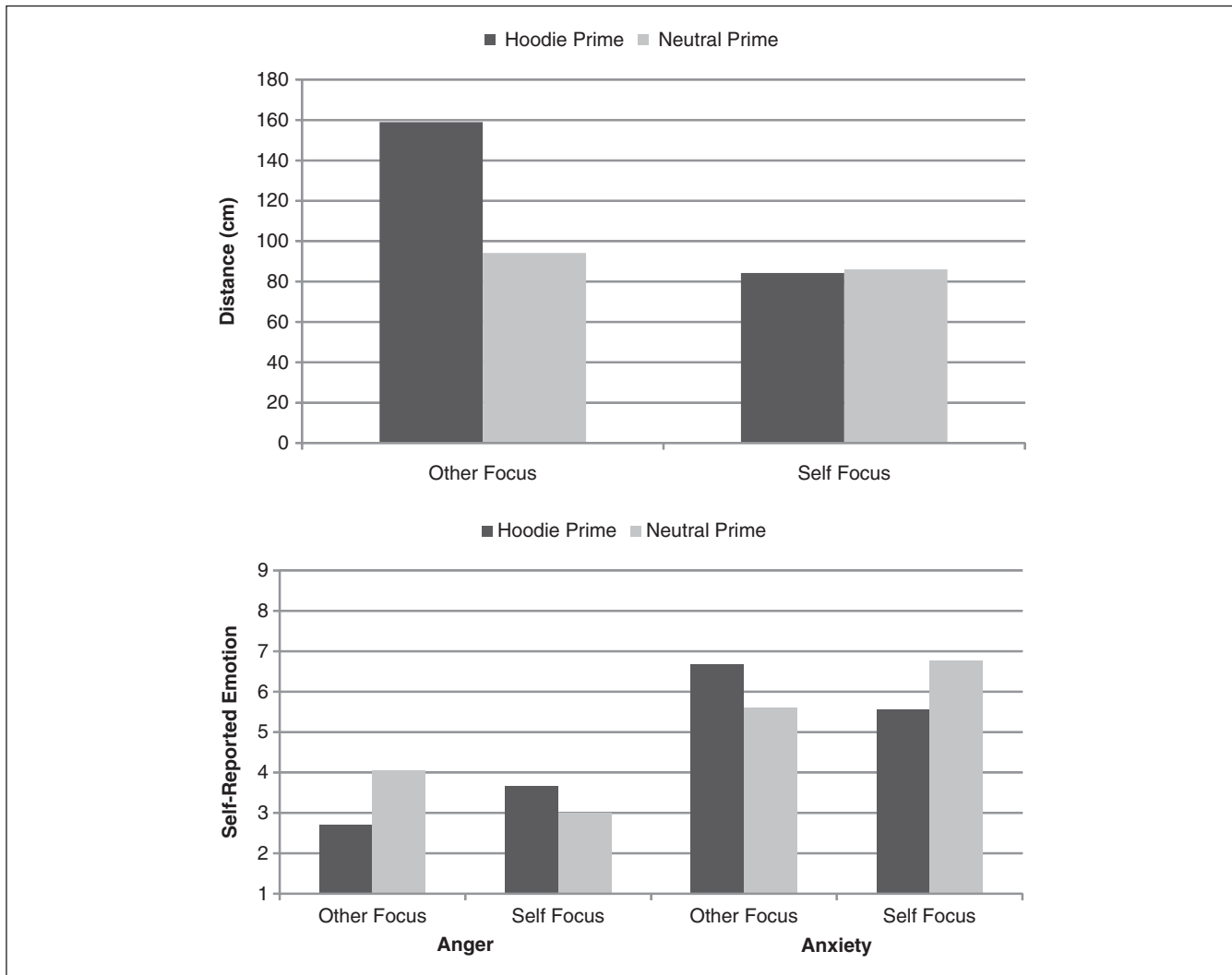


Figure 2. Average seating distance (cm) following hoodie versus neutral priming under self-focus versus other-focus (top), and average ratings of anxiety and anger as a function of priming and focus of attention (bottom): Experiment 3

expressed less anger ($M = 2.71$, $SD = 0.77$) than did neutral-primed participants ($M = 4.06$, $SD = 1.25$), $F(1, 44) = 9.74$, $p = .003$, $d = 1.30$. In contrast, among self-focused participants, there was a nonsignificant trend in the opposite direction such that hoodie-primed participants expressed greater anger ($M = 3.65$, $SD = 1.16$) than neutral-primed participants ($M = 2.99$, $SD = 1.01$), $F(1, 44) = 2.29$, $p = .14$, $d = 0.61$.

With respect to anxiety, there was also a significant two-way interaction between prime and focus of attention, $F(1, 44) = 11.43$, $p = .002$, $\eta_p^2 = .206$ (see Figure 2, bottom panel). Simple effects analyses revealed that among other-focused participants, hoodie-primed participants reported significantly greater levels of anxiety ($M = 6.68$, $SD = 1.16$) than did neutral-primed participants ($M = 5.61$, $SD = 1.23$), $F(1, 44) = 5.04$, $p = .03$, $d = 0.90$. Among self-focused participants, the reverse was true, as hoodie-primed participants expressed less

anxiety ($M = 5.56$, $SD = 1.11$) than did neutral-primed participants ($M = 6.76$, $SD = 1.16$), $F(1, 44) = 6.43$, $p = .02$, $d = 1.06$.

Finally, tests of moderated mediation were carried out using bootstrapping procedure recommended by Preacher, Rucker, and Hayes (2007). First testing the mediating role of anger, a model was tested in which prime was designated as the independent variable, anger as the mediator, seating distance as the dependent variable, and focus of attention as a moderator of the path from anger to seating distance. No evidence was found for a conditional indirect effect, 95% CI $[-79.24, 41.68]$. In contrast, a parallel test carried out on a model in which anxiety was the proposed mediator did indicate a significant conditional indirect effect, 95% CI $[16.10, 152.81]$ (see Figure 3). To decompose the interaction, Sobel tests were conducted within each focus of attention condition, entering anxiety as a potential mediator. Under self-focus, anxiety did not mediate the

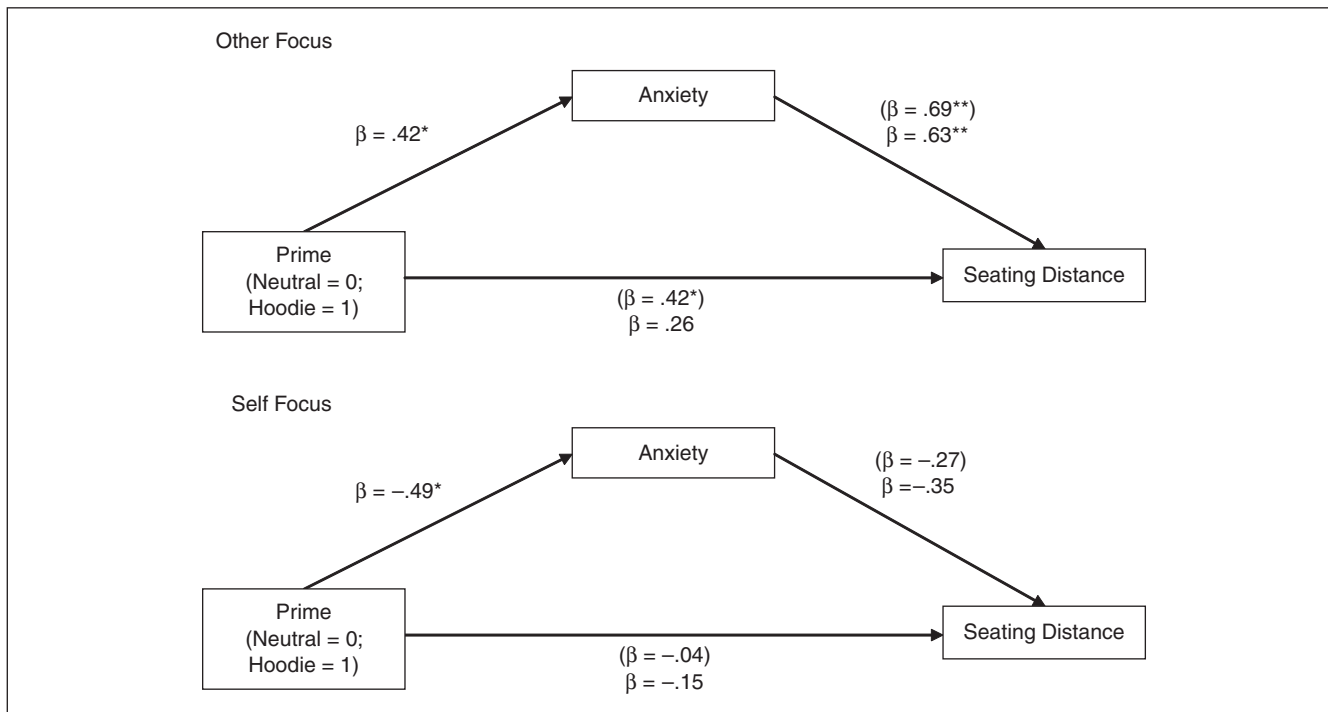


Figure 3. Moderated mediation model of the effect of hoodie priming on seating distance, with anxiety as mediator and focus of attention as moderator

* $p < .05$. ** $p < .01$.

effect of priming on seating distance ($z = .94$), and bootstrapping likewise yielded no evidence of mediation, 95% CI $[-0.87, 21.99]$. In contrast, under other-focus, the Sobel test was marginally significant ($z = 1.88, p = .06$), and bootstrapping indicated a reliable mediated effect, 95% CI $[5.21, 99.66]$.

Discussion

Experiment 3 replicated and extended our first two experiments by showing automatic affect activation after hoodie priming and clarifying the role of affective responses in mediating the effects of priming on behavior. Following research by DeMarree and Loersch (2009) and Smeesters et al. (2009), we found that attentional focus is an important factor in determining the manner in which priming influences subsequent responses. Extending earlier research, we established that hoodie priming influences both affect and behavior in distinct ways, depending on participants' focus of attention. Specifically in this study, we replicated the effect of hoodie priming on avoidance behavior, but only under conditions of other-focused attention. Under self-focus conditions, the priming effect disappeared.

Attentional focus also moderated the effects of priming on affective responses. Self-focused participants were more likely to assume emotional states associated with hoodies (reporting marginally greater anger than neutral-primed participants). In contrast, other-focused participants were more likely to

experience anxiety before a social interaction if they had been exposed to images of a hoodie. More importantly, anxiety (but not anger) mediated the effect of hoodie priming on avoidance behavior under conditions of other-focused (but not self-focused) attention. These findings provide strong support for the contention that exposure to threatening outgroups can induce several distinct affective responses that, under the appropriate circumstances, influence interpersonal behavior.

General Discussion

The research reported here highlights the important role of affect in moderating the nature of prime-to-behavior effects. Across three experiments, priming hoodies had several distinct effects on participants' affective states, variously producing discomfort with strangers (Experiment 1); feelings of hostility, irritation, and anger (Experiments 2 and 3); anxiety (Experiment 3); and heightened sensitivity to threatening information (Experiment 2). The diversity of affective responses reported across these three studies mimics, in many ways, the diversity of behavioral responses to priming that have been reported in recent years. For both affect and behavior, the variety of response observed will likely depend on the target to which the prime is applied. Primes applied to the self are likely to result in stereotype-related affective states (DeMarree et al., 2005) and stereotype-consistent behavior (DeMarree &

Loersch, 2009). Primes applied to others are likely to induce affective reactions associated with encountering the primed group (as observed in Experiment 3) and to behavior consistent with such encounters. Finally, primes applied to the situation may influence one's construal of the situation and thus promote corresponding affective and behavioral reactions (Kay et al., 2004; Kay et al., 2008).

Thus, the behavioral consequences of priming will critically depend on the specific target to which that bias is applied. To the extent that one is thinking and acting in isolation (as is typically the case in experiments testing prime-to-behavior effects), an activated concept may be most likely used to shape the active self-concept. In such cases, assimilation may be the most likely result. However, in interpersonal contexts in which other features (other individuals, the social situation itself) are more likely to be salient, the same concept may be used in interpreting those features instead. The results of Experiment 3 were consistent with this proposal and demonstrated how affective and behavioral responses to priming diverge when the target to which a prime is applied is directly manipulated.

Thus, the present research also underscores the importance of considering the intrapersonal versus interpersonal context in which a target behavior is observed. Whereas previous research on prime-to-behavior effects has typically demonstrated assimilation or contrast effects, such studies have primarily examined behavior *outside* of social interactions. The current studies suggest that the intrapersonal versus interpersonal nature of the behavior under examination is a vital determinant of what behavior is observed. Rather than provoking assimilation or contrast effects on behavior, priming a social group before an interpersonal interaction resulted in behavior tailored to an encounter with that group. Thus, our findings further demonstrate that the nature of prime-to-behavior effects may critically depend on the nature of the behavior under examination. Indeed, consistent with a growing collection of findings (Cesario et al., 2006; Jonas & Sassenberg, 2006; Smeesters et al., 2009), these studies indicate that prime-to-behavior effects may include the production of interaction-appropriate behaviors as well. The present studies do not contradict findings that priming a group can lead to ideomotor responses, but they do add to the growing body of evidence showing that priming effects are not limited to those that can be characterized as ideomotor.

In summary, the three experiments reported here advance current research and theory on prime-to-behavior effects by demonstrating that the same unconscious prime can have multiple effects—the specific nature of the effect observed in a given situation will likely depend on a number of factors. In addition, this research reinforces the point made elsewhere (DeMarree & Loersch, 2009; Smeesters et al., 2009) that focus of attention (toward the self or others) is likely to determine whether the prime is applied to the self (resulting in assimilation or contrast effects) or to others (resulting in response effects). Finally, perhaps the most important contribution of the current work is to provide the first evidence that affective

processes contribute to prime-to-behavior effects. The role of affect was dismissed early on in the development of research into such effects, and it has seldom, if ever, been revisited. We hope the present research will serve as an impetus for further investigations into this neglected question.

Declaration of Conflicting Interests

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Notes

1. Participants' race/ethnicity was not recorded in any of the experiments reported here; however, the population from which participants were recruited is composed of approximately 94% White, 5% South Asian, and 1% Black British.
2. The same debriefing procedure was used (with the same result) in all experiments reported here.
3. Because the neutral and control prime conditions did not differ in Experiment 1, only the neutral prime condition was used in this experiment.
4. The affective Stroop is an established measure of threat sensitivity (see MacLeod, Mathews, & Tata, 1986). However, the reader may note that the threat-related words reflect physical threats and as such may be related to the stereotype of hoodies. Importantly, we believe it would be inappropriate to view the Stroop task as a measure of stereotype activation. There are two reasons for this. First, the established validity of the Stroop as a measure of stereotype activation is limited to paradigms in which the stereotype prime immediately precedes the target word (as in Kawakami, Dion, & Dovidio, 1999). The present study employed the Stroop in a substantially different manner, where the prime was presented in an entirely separate task from the Stroop. Second, if the Stroop task used here was tapping into stereotype accessibility, we would expect it to correlate significantly and positively with other measures such as expressed feelings of hostility. This relation did not emerge. Indeed, among hoodie-primed participants—those for whom we would expect to observe such a relation—the correlation between hostility and Stroop interference was effectively zero ($r = -.04, ns$).
5. We also examined ratings on emotions related to anxiety (afraid, scared, nervous) and found these were unaffected by the priming manipulation. It is possible that participants linked these words to the stimuli that appeared in the Stroop task and thus consciously corrected their responses or that the emotion terms used were too extreme to pick up differences in anxiety. We return to the assessment of anxiety in Experiment 3.

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