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Automatic sources of aggression

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Abstract

In this paper, we review research on automaticity with particular relevance to aggression. Once triggered by environmental features, preconscious automatic processes run to completion without any conscious monitoring. The basic experimental technique for studying automatic processes is priming. We review studies showing that priming, including subliminal priming, of mental constructs related to aggression leads to reliable effects on perceptions, judgments, and behavior. Specifically, after such priming, people perceive ambiguous behaviors as more aggressive and tend to act more aggressively themselves as well. We also review studies showing that: (a) prolonged exposure to violence can result in the development of chronic accessibility of aggressive constructs affecting how the social environment is interpreted, and (b) even goal-directed behavior can be automatically triggered by situational features if this behavior is consistently and frequently enacted in the same situation. © 2001 Elsevier Science Ltd. All rights reserved.

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Social psychology has always been about the role of the situation as a powerful determinant of behavior (e.g., Ross & Nisbett, 1991). The discrepancy between the objective causal role of the situation and its subjective perception as a causal factor has been a source of much fascinating research (Mischel, 1973; Nisbett & Wilson, 1977; Wilson & Brekke, 1994). For instance, in the seminal Milgram (1974) study on obedience to authority, more than 60% of participants administered deadly doses of electric shocks to another participant (actually a confederate). Psychiatrists' predictions of the percentage of people who would go beyond the reasonable limit of shocks, on the other hand, was about 1%. This experiment demonstrated

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how situational causes (e.g., having an authority figure who orders you to continue administering electric shocks) can have very large and powerful effects on behavior.

If one is asked in what way social psychology research has changed over the past two decades, it is fair to say that there is a much greater concern and focus on unconscious or implicit determinants of social behavior (Bargh, 1989, 1994, 1997; Bargh & Chartland, 1999; Bargh & Ferguson, in press; Chaiken & Trope, 1999; Greenwald & Banaji, 1995; Uleman & Bargh, 1989; Wegner & Bargh, 1998). As one of us recently argued (Bargh, 1997), research on these determinants is an extension of the social psychology tradition of discovering the situational causes of behavior. For instance, research on automatic social cognition tries to specify how situational features can directly trigger cognitions, emotions, motivations, and behaviors, without a role played by personal choice or intention.

In this paper, we describe studies drawn from research on automaticity and on the implicit determinants of social behavior that has particular relevance to aggression. First, we describe the main assumptions of research on automaticity. Second, we describe studies showing that subtle experimental manipulations have reliable effects on perception and judgments related to aggression. Specifically, we show that increasing the cognitive accessibility of concepts related to aggression leads to biased perceptions and judgments. Third, we describe studies showing that repeated use of aggression-related mental concepts, either actively or passively (as through exposure to aggression-related events) can result in stable individual differences in perception and judgments of the relevant behaviors of others. Fourth, we describe studies showing that increased accessibility of concepts affects not only perception and judgment but also one's own behavior. Finally, we present studies demonstrating that even motivations can be activated directly by the environment, such that goal-directed behavior can be driven by automatic situational influences.

1. Automaticity research and the logic of priming experiments

The most general characteristic of automatic processes is that once started, they run to completion without conscious guidance. These processes are fast and efficient, requiring few (if any) attentional resources. Automatic processes develop by consistent and frequent mapping of stimuli to responses (Shiffrin & Schneider, 1977). In other words, automatic processes come to reflect the regularities of one's life.

Automatic processes vary with respect to their triggering conditions. Some of these processes require the person's conscious intention to initiate the process (e.g., in the case of well-practiced skills) and can be considered as *goal-dependent* automatic processes. Other automatic processes require only the presence of the stimuli linked to the behavioral response, and thus are termed *preconscious* automatic processes (Bargh, 1989).

Research on automaticity in social psychology focuses on specifying the relationships between features of social situations and one's cognitive and behavioral responses to these situations. This research tries to establish lawlike *if . . . then* relationships between situations and behaviors not requiring any conscious mediation between the perception of the situational features on the one hand, and the cognitive and behavioral responses on the other. It is important to note that automaticity research does not exclude complex cognitive processes

and activities as mediators of responses to situations. On the contrary, the claim is instead that such cognitive activities can be triggered automatically by the situation. Once triggered, they can run to completion without any conscious monitoring or awareness of these processes (Bargh & Ferguson, in press).

A powerful technique for studying implicit and automatic influences on behavior is "priming" (Bargh & Chartrand, 2000). In priming experiments in social cognition, participants are exposed to stimuli related to the mental concept under study (e.g., aggressiveness), in a subtle and unobtrusive manner. Next, in the context of an ostensibly unrelated study, participants are asked to make a judgment or perform a behavior related to the primed dimension. For instance, in a classic study participants were asked to rehearse words while performing a perception task (Higgins, Rholes, & Jones, 1977). Some of the words were trait concepts such as adventurous or reckless. Then in the context of a reading comprehension study, participants were presented with a description of a target person's behavior that was ambiguous with regard to the primed dimension. For example, the person was said to enjoy taking risks. After reading this description the participants were asked how well they liked the person. Participants who were exposed to positive traits related to the behaviors (such as adventurous) liked the target person significantly more than did those participants previously exposed to negative-related traits such as reckless. Importantly, previous exposure to positive or negative traits unrelated to the target's behavior had no effect on subsequent liking, demonstrating that the priming effect was on the interpretation of the target's behaviors.

The underlying logic of these experiments is that the environmental priming stimuli activate mental concepts relevant to them, with this activation persisting for a time thereafter, as a result increasing the likelihood of its use in a subsequent situation (Higgins, 1996; Sedikides & Skowronski, 1991). Preactivated or primed concepts require less in the way of environmental stimulation to become active (see Bruner, 1957; Kelley, 1955). Moreover, these accessibility processes are automatic and independent of one's intention and awareness (Neely, 1977).

We hasten to note that priming is used as a proxy for natural influences of context in social situations. For example, imagine that a person just watched a violent movie and several minutes later witnessed a person pushing another person on the street. How would this pushing behavior be interpreted?

In fact, Carver, Ganellen, Froming, and Chambers (1983, Experiment 1) examined exactly this situation. They demonstrated that watching a videotape depicting a hostile interaction for few minutes affects how people subsequently interpret the behavior of a different person in an ostensibly unrelated situation. In this experiment, participants who had watched the violent interaction perceived an ambiguous hostile behavior as being more aggressive than did participants who had previously watched a nonviolent interaction. If the movie colored the perception of the person's behavior as aggressive, were the participants aware of this influence? In Carver et al.'s experiment, all but one of the participants failed to discern the connection between the priming task (watching the tape) and the later judgment task. This finding is consistent with many others in social perception showing that people attribute the meanings ascribed to other people's behavior as inherent in the behavior itself, and do not realize or experience their own role in interpreting it (e.g., Jones & Nisbett, 1972; Trope, 1986).

2. Automatic effects on perception and judgment of aggression: temporary accessibility

In this section, we focus on studies demonstrating automatic effects on perception and judgments of stimuli linked to aggression and hostility. Soon after the Higgins et al. (1977) study described above, researchers introduced new priming procedures to test the generality of accessibility effects on perception and judgment.

In one such priming procedure, Srull and Wyer (1979, 1980) asked participants to form sentences out of scrambled words. Some of the stimulus words were selected so that the possible sentences described a violent behavior (e.g., leg break arm his). Then in an allegedly unrelated experiment, in a different room and with a different experimenter, participants read a description of a target person whose behavior could be interpreted either as aggressive or as nonaggressive. For instance, the target person was described as ''refusing to pay his rent until the landlord repaints his apartment.'' Although the two tasks were presented as completely unrelated, participants who had been exposed to aggressive primes rated the target person as being more aggressive. Moreover, the effect was stronger for participants who had been exposed to a greater number of behavioral sentences implying hostility.

As with the original studies on the ''weapons effect'' (Berkowitz & LePage, 1967), one alternative interpretation of the priming findings was that they reflected experimental demands (Page & Scheidt, 1971). In other words, participants notice that hostile-related words were presented in the priming task and realize the connection between them and the subsequent hostile-related-behavior description. As with the weapons effect research (Carlson, Marcus-Newhall, & Miller, 1990), this interpretation was ruled out.

First of all, these and subsequent priming studies carefully debriefed participants and inquired as to their potential awareness of a relation between the priming task and the subsequent social perception task; participants overwhelmingly have no inkling of such an influence. But to further, and experimentally, rule out the demand-effect explanation, Bargh and Pietromonaco (1982) introduced a subliminal priming procedure. In the context of a first, vigilance task, participants were asked to detect flashes appearing on the computer screen by pressing a button as quickly as possible. The flashes were words presented very briefly and immediately pattern-masked. They were presented outside of the participants' foveal visual field (that is, in the visual periphery) and their position and timing was randomly determined. Following the vigilance task, in an ostensibly unrelated study on impression formation, participants were given the behavioral description used in Srull and Wyer (1979) and asked to rate the target person on a number of traits. Participants who were *subliminally* exposed to aggressive words (e.g., hostile, hurt, rude) rated the target person as more aggressive than participants who were exposed to control words (e.g., water, long, number).

Bargh and Pietromonaco (1982) was the first social cognition study demonstrating effects of information presented outside of one's awareness on social judgments. In subsequent studies, Bargh, Bond, Lombardi, and Tota (1986) and Erdley and D'Agostino (1988) conceptually replicated the experiment by using different primes and different behavioral descriptions. Bargh et al. (1986) primed the concepts of kindness for some participants and shyness for the others, after which they read a story in which the target behaved ambiguously kind or shy (corresponding to the participant's priming condition). Compared to participants not presented with any trait-related primes, primed participants considered the target person to

possess more of the focal trait. In the Erdley and D'Agostino study, the target person was described as performing both mean and honest behaviors. Participants who were primed with words related to mean rated the target as more mean than did participants primed with words related to honest; those primed with honesty considered the target as more honest than did the other participants.

Research on stereotyping has also provided relevant evidence. Devine (1989) used the Bargh and Pietromonaco (1982) subliminal priming procedure to study the effect of stereotype activation on perception and judgments. Whereas in Bargh and Pietromonaco, the traits of interest were directly primed, Devine used a more subtle procedure. In her Experiment 2, participants were subliminally exposed to words that were part of the African-American stereotype (e.g., ghetto, jazz, lazy, minority) but *not* to words related to aggression and hostility. The underlying logic was that activating a set of features that are part of a stereotype is sufficient to cause the entire stereotype to become active in an all or none fashion (see Hayes-Roth, 1977). Because "aggressive" is part of the African-American stereotype, even though this concept was not primed directly, participants primed with stereotype-related stimuli should judge a person who performed a number of ambiguously aggressive behaviors as more aggressive, compared to nonprimed participants. Devine obtained exactly this pattern of findings.

Why is research using subliminal priming procedures important? The main reason is that this research rules out explanations of priming effects as artifacts of procedures, such as experimental demands, instead of as theoretically important unintended effects of situational context and recent social events. Such research illuminates the nature of accessibility effects on cognition in its clearest form. In fact, most of the classical findings on situational cues facilitating aggression have been subsequently reinterpreted in terms of such priming or accessibility mechanisms (Anderson, Benjamin, & Bartholow, 1998; Berkowitz, 1984, 1997).

Critically, we emphasize here that research using subliminal manipulations is not meant to show that one is bombarded by subliminal stimuli in one's environment. The importance of these findings is not in their demonstration of subliminal influences so much as their ruling out mundane demand interpretations of priming studies. In this regard, it is important to note that subliminal priming effects are of the same quality as supraliminal priming effects, such as in the Srull and Wyer (1979) scrambled sentence test. Indeed, people seem to overestimate the influence of such subliminal stimuli, but to greatly underestimate the influence of more potent and far more prevalent supraliminal stimuli (Wilson & Brekke, 1994). What is key is not the participant's lack of awareness of the priming stimuli, but his or her lack of awareness of the potential effect and influence of those priming stimuli (Bargh, 1992).

3. Automatic effects on perception and judgment: chronic accessibility

The studies described above show that subtle experimental manipulations can increase the accessibility of aggressive concepts in memory, which in turn can affect people's perceptions and judgments. But can repeated exposure to aggressive concepts result in chronic individual accessibility of such concepts, so that they exert their influence continually and not just when primed? Kelley (1955) argued that people have individual or personal constructs through

which they perceive and understand the social environment. The research on temporary accessibility described above has shown that the more frequent the primes, the stronger are the priming effects (Srull & Wyer, 1979, 1980). By this logic, repeated exposure to specific constructs (e.g., aggression) may accrue in individual differences in the latent accessibility of these constructs.

Higgins, King, and Mavin (1982) measured individual or chronic accessibility of constructs by asking participants to list characteristics of different people (e.g., a male friend and a female friend). Personality traits that appeared frequently in different descriptions or were the first to be listed, were considered as chronically accessible — that is, they came to mind spontaneously and not because of their associational relations to another trait concept. These same participants were contacted for a different study 2 weeks later and presented with a description of a target person's behavior, which contained information related to, as well as unrelated to the participants' chronically accessible traits. Chronic accessibility had the same effect on person perception as had temporary accessibility in the earlier studies. Participants were later asked to re-create the descriptions and what they remembered about the person were mainly those behaviors that corresponded to their personal, chronically accessible constructs.

The distinction between temporary and chronic accessibility is important because these two types of accessibility are different with respect to their triggering conditions. Consider again the studies on temporary accessibility described above. In these studies, there are two conditions necessary to trigger an implicit effect on perception and judgment: the temporary accessibility of the construct (e.g., aggression) and the stimulus input or the description of the target person. In the case of chronic accessibility, the only necessary condition is the presence of stimulus input related to the chronically accessible constructs. That is, one does not need extra, preceding stimulation from the environment to act on perceptual input related to one's chronic constructs. In fact, stimuli related to chronically accessible constructs immediately capture one's attention (Bargh & Pratto, 1986) and are processed even under conditions of information overload (Bargh & Thein, 1985).

Implications of research on chronic accessibility are straightforward for the study of aggression. People who are repeatedly exposed to stimuli related to aggression can develop chronically accessible knowledge structures, which would automatically affect the interpretation of new aggression-related events. Dodge's research (Dodge, 1980; Dodge & Crick, 1990; Dodge, Price, Bachorowski, & Newman, 1990; Dodge & Tomlin, 1987) is particularly relevant to this theme. In a series of studies, Dodge has shown that highly aggressive children tend to perceive aggressive intentions in others' behaviors when these behaviors are ambiguous. For example, in one study (Dodge, 1980), aggressive and nonaggressive children were presented with descriptions of peer-provocative situations such as "a peer spilling a lunch tray on your back while you are not looking." Aggressive children were 50% more likely to infer hostile intentions than nonaggressive children.

Other studies are also relevant to research on chronic accessibility of aggressive constructs. Zelli, Huesmann, and Cervone (1995) (see also Zelli, Cervone, & Huesmann, 1996) used a paradigm introduced by Winter and Uleman (1984). Winter and Uleman have shown that people spontaneously make trait inferences when presented with behavioral information (see for a general review Uleman, Newman, & Moskowitz, 1996). One paradigm to test these

effects is based on cued recall. Participants are presented with behavioral sentences, told to memorize them, and after a delay, are given a cue word for each sentence and asked to recall the sentences. If participants made a trait inference, then a trait cue should facilitate the recall of the corresponding behavioral sentence, because the trait concept had been spontaneously generated at the time of reading the behavioral sentence and so encoded, along with the behavioral sentence, in memory (see Tulving & Thompson, 1973).

Zelli et al. (1995, 1996) worked with participants having either high self-reported aggression (e.g., they had reported punching, beating, or choking someone in the past year) or low self-reported aggression. Participants were presented with behavioral sentences established through pretesting as having two alternative interpretations. For example, "The policeman pushes Dave out of the way" can be interpreted either as a sentence implying physical aggression or as a sentence implying alertness and concern for Dave's safety. After a short delay, participants were given either trait cues or semantic cues and asked to recall the behavioral sentences. Relative to nonaggressive participants, participants high on self-reported aggression showed a distinctive recall advantage for sentences for which the cues were aggressive traits. That is, participants with presumably chronic accessibility of aggressive constructs had spontaneously interpreted and encoded the behaviors as aggressive in nature and intent.

Moreover, when participants were asked to think about the motives of the actor performing the behavior or to make deliberate inferences about the behaviors, the differences between participants who are high and those who are low on aggression disappeared. This finding has important implications for research on aggression because it suggests that measures of deliberate or controlled inferences may not be sufficient to reveal underlying differences between aggressive and nonaggressive individuals.

Bargh et al. (1986) showed that temporary and chronic accessibility have independent and additive effects on social perception. In their experiment, participants were reliably influenced by subliminal trait priming in a subsequent judgment task independent of the chronic accessibility of the trait constructs for the participants. However, chronic accessibility had a separate, additive effect on the interpretation of the target's behaviors. Those for whom kindness (or shyness, in a replication experiment) was a chronically accessible construct and who were also primed with kind (shy)-related stimuli gave the most extreme ratings of the target's kindness (shyness); nonprimed chronics and primed nonchronics gave intermediate ratings of the target on the relevant trait, and nonprimed nonchronics saw the least of that trait in the target person. These findings suggest that the same mechanism underlies both temporary and chronic accessibility effects — that one can simulate the effects of individual differences in chronic trait construct accessibility with priming manipulations of randomly selected participants.

4. Automatic effects on behavior

All of the above studies demonstrated construct accessibility effects on perception and judgments. But one might still argue that these effects are limited in their implications for aggressive behavior. For example, priming can make aggressive thoughts more accessible but

that does not mean that one will act on these thoughts. A stronger case for the role of automaticity can be made if one shows priming effects on actual behavior.

There are precedents for the hypothesis that trait concepts activated in the course of social perception should carry on to have a direct and automatic effect on behavior (see review in Bargh & Chartland, 1999). William James described the notion of *ideomotor action* in which merely thinking about doing something makes you more likely to actually do it. Many theorists of observational learning, as well as of imitative behavior in humans, as well as other primates (and also fish and birds) have argued that there is a close connection between perceptual and behavioral representations of the same form of behavior, which makes such learning or imitation possible. Berkowitz (1984) relied heavily on this position in his theoretical analysis of modeling and of media effects on social behavior.

In a test of Berkowitz's hypothesis, Carver et al. (1983, Experiment 2) used the same priming procedure of scrambled sentences that was introduced and used by Srull and Wyer (1979), but instead of measuring judgments, they measured actual behaviors. Participants were recruited for a concept learning study and told that they would be teaching another participant (actually a confederate) by administering rewards for correct answers and punishments for incorrect answers. Importantly, the punishment was administration of electric shocks of varying intensity. Just before the end of the instructions, another experimenter came in and explained that she was nearly finished with master's thesis project but that some of her participants did not show up. She asked the participants to fill out the form for her study. All participants agreed and filled out the form, which was actually the priming manipulation. Next, participants engaged in the learning experiment in which they purportedly gave shocks to a "learner" participant. Those who had been exposed to aggressive concepts in the priming tasks administered stronger shocks than did control participants.

In the Carver et al. (1983) experiment, participants behaved more aggressively as measured by the administered shocks, but notice that they were already placed in an aggression-evoking situation of punishing another person, and given explicit instructions to deliver shocks. Thus, one may argue that priming alone was not sufficient to trigger aggressive behavior in this experiment. A stronger case for automatic triggering of aggression would be to find evidence for spontaneous aggressive reactions in the absence of explicit instructions or conscious intention.

Accordingly, in Experiment 1 of Bargh, Chen, and Burrows (1996), participants were primed either with the concept of rudeness or the concept of politeness (or with trait-neutral primes, in a control condition), using the scrambled sentences procedure. Participants were informed that the experimental session consisted of two unrelated studies. They were told that after they had completed the first task (the priming manipulation) they should come down the hall to find the experimenter, who would be waiting in another room. The experimenter was waiting down the hall and was engaged in a conversation with a confederate. The dependent measure of the study was whether the participant would interrupt the experimenter and this conversation in order to receive instructions. The conversation continued for up to 10 min or until the participant interrupted. Results showed that whereas 67% of those primed with rudeness interrupted the conversation to get the next part of the experiment to work on, only 16% of participants primed with politeness interrupted during the 10-min period.

Experiment 3 of Bargh, Chen, et al. (1996) provided even stronger evidence for automatic triggering of aggressive behavioral reactions. In this experiment, participants were subliminally exposed either to African-American faces or to Caucasian faces. As discussed above, presentation of selected features of a group stereotype should result in the activation of the entire stereotype. Because aggressiveness is part of the African-American stereotype, participants exposed to African-American faces should react more aggressively than participants exposed to Caucasian faces. All faces were presented for less than 26 ms and immediately masked. What participants saw on each trial were different pictures composed of colored circles. The target pictures were presented for 3 s, and the task of the participant was to make an even/odd judgment for the number of circles. This task was deliberately chosen because pretesting showed that participant found the task boring and tedious.

On the 130th trial of the task, the computer program unexpectedly displayed an error message and a subsequent message that the program should be started over again. In fact, the experimenter who was blind to the participant's experimental condition announced that the participant had to do the task over again. The reaction of the participant to this news was videotaped by a hidden camera. As predicted, participants exposed subliminally to African-American faces reacted more aggressively than participants exposed to Caucasian faces. The same pattern was revealed in the experimenter's ratings of participants' hostility.

Chen and Bargh (1997) took this research one step further by showing how it leads to self-fulfilling prophecy or behavioral confirmation effects — a phenomenon that has been of considerable interest in social psychology for many years. Presumably, when a person interacts with a member of a stereotyped group, the person acts based on his or her stereotypic expectancies. The member of the stereotyped group reciprocates the stereotype-congruent behavior, providing stereotype-confirming evidence to the person. The usual conceptualization of these processes is in terms of conscious expectancies guiding behavior. For example, expecting low intelligence, the teacher asks only simple questions and behaves in a condescending or paternalistic fashion to the stereotyped group member, who by his or her simple answers (and lack of answering more difficult questions) validates the initial expectancy of low intelligence.

Based on the idea of a direct and automatic link between perception and behavior, Chen and Bargh (1997) proposed that these processes can occur completely unconsciously. To test this proposal, they used the same subliminal priming procedure with African-American or Caucasian faces described in the previous experiment. Participants came for a study that ostensibly looked at the effect of working alone vs. working with another person on a task. Participants worked in pairs. All participants started with the same priming task as before; however, faces were subliminally presented for only one of the participants in the pair (the "perceiver"). The other participant (the "target") did the same computer task but faces were not presented. After the priming task, the pair of participants was given a verbal task to work on together consisting of guessing words from incomplete cues — one of them would give clues to the other who would try to guess what the word was. Participants' speech was audiotaped on separate channels and then rated by coders blind to the hypothesis and the experimental conditions for the degree of hostility manifested during the game.

Conceptually replicating Bargh, Chen, et al. (1996, Experiment 3), Chen and Bargh (1997) found that perceivers who were subliminally exposed to African-American faces expressed

more verbal hostility than participants who were exposed to Caucasian faces. More importantly, this was also the case for the targets — those participants who had not been primed. That is, participants who were not primed but interacted with a participant primed with the African-American stereotype expressed more hostility than participants who interacted with a participant not primed with the stereotype. Mediation analyses showed that the effect on the target's behavior was mediated by the perceiver's own hostility, which had been communicated to the target during the game. At the end of the experiment, all participants rated the person they interacted with on a number of trait scales. Perceivers who had been primed with the African-American stereotype had come to believe, by the end of the experiment, that their interaction partners were more dispositionally hostile, whereas nonprimed perceivers considered their partners as less hostile. This experiment provides clear evidence that processes as complicated as behavioral confirmation effects can be triggered automatically by situational features and can run to completion completely outside of one's awareness.

5. Automatic evaluation of environmental stimuli

Automatic effects are not limited to perception, judgment, and behavior. Such effects also occur in evaluation of objects and even in goal-directed behavior. Research on attitude evaluation has shown that people automatically evaluate all attitude objects (Bargh, Chaiken, Raymond, & Hymes, 1996; Fazio, Sanbonmatsu, Powell, & Kardes, 1986). In the attitude evaluation paradigm, participants are presented on each trial with a word referring to an attitude object (e.g., apple, dentist) immediately followed (after 250 ms) by either a positive (e.g., wonderful) or a negative adjective (e.g., dreadful). The task of the participant is to respond with "good" or "bad" for each adjective, as quickly as possible. Participants are faster to respond when the attitude object and the adjective match on evaluative valence and slower when they mismatch, demonstrating that the attitude object has been evaluated as good or as bad within just a quarter of a second. The automatic evaluation effect is obtained even when participants do not engage in an explicit evaluation task but are asked simply to pronounce the adjectives as quickly as possible (Bargh, Chaiken, et al., 1996). Chen and Bargh (1999) have shown that these automatic evaluations are directly linked to approach/avoidance behavior, wherein participants are faster to respond to positive targets when pulling a lever toward them compared to pushing it away from them, and are faster to respond to negative targets when pushing rather than pulling the lever.

To the best of our knowledge, no automatic evaluation studies have specifically used stimuli related to aggression. Such a line of research seems pertinent. For instance, people who enjoy watching violent movies or highly aggressive people may have default positive evaluations of weapons and may be more likely to approach and use such weapons if available.

6. Automatic goal pursuit

In mainstream psychological science, goal-directed behavior has always been the reserved domain of conscious processes (with the prominent exception, of course, of the

psychoanalytic tradition). People are considered to set goals consciously and then implement them in a series of deliberately monitored steps (see Locke & Latham, 1990; Mischel, Cantor, & Feldman, 1996). However, if people consistently and frequently pursue the same goal in the same situation, according to the automaticity logic described above, it should be possible that relevant situational features can eventually come to trigger goal-directed behavior. This is the main thesis of the auto-motive model of self-regulation (Bargh, 1990; Bargh & Barndollar, 1996). Subsequently, several studies have provided evidence in favor of this proposal.

For instance, Chartrand and Bargh (1996) primed information-processing goals (either to form an impression or to memorize) in participants, both supraliminally and subliminally, and then gave them a series of behavior sentences to read but with no explicit instructions except that they would be asked questions about the sentences later. Yet the results replicated the findings of previous studies, which had explicitly instructed participants to pursue the goal either of impression formation or of memorization.

Other such studies have focused on the problem of sexual harassment. A repeated theme in research on sexual harassment is that the perpetrators often do not perceive their actions as inappropriate or abusing (Fitzgerald, 1993). Further, men who sexually harass often have power, institutional or otherwise, over the victims. How can automaticity help account for sexual harassment behavior? One first needs to posit an automatic link between power and sex for men who are likely to sexually harass. Hence, being in a power situation can automatically trigger a sexuality goal. Once triggered by the situation, this goal may guide behavior outside of the perpetrator's awareness. Correspondingly, the person who harasses will not be aware that his behavior was affected by the situation and may misattribute this behavior to other salient situational features (e.g., the attractiveness of the victim or her own "flirtatious" behavior).

Bargh, Raymond, Pryor, and Strack (1995) set out to test these hypotheses. Experiment 1 tested the hypothesis that there is an automatic association between power and sex for participants who report inclinations to sexually harass. The task of participants was to pronounce words as quickly as possible. Unknown to participants, the target words were preceded subliminally by words referring to power (e.g., authority, strong, macho, etc.). To avoid embarrassment in the task, the sex-related words were selected to be ambiguous (e.g., bed, date, wet, etc.). As predicted, participants with high scores on scales measuring the likelihood to sexually harass and attractiveness of sexual aggression pronounced sex-related words more quickly when these words were preceded by subliminally presented power words compared to neutral control words. Thus, this experiment provided evidence that for people who are inclined to sexually harass, the accessibility of power-related concepts automatically leads to increased accessibility of sex-related concepts.

Experiment 2 of Bargh et al. (1995) tested whether this automatic activation induced by power-related stimuli can have real consequences for interaction. In this study, participants worked individually on a word completion test (the priming manipulation), which contained either some power-related words or no power-related words (in the control condition). Next, each participant worked alongside another participant (female) who was actually a confederate, on a purported experiment on visual illusions. Finally, the experimenter told

participants that he or she was interested in the incidental impressions people form of each other and asked participants to fill in a questionnaire about the "other participant." The critical dependent measure was the rating of the confederate's attractiveness and of how much the participant would like to get to know her. On these measures, the power-priming procedure made no difference for participants low in sexual aggression tendencies, but it did make a difference for participants with high scores on this scale. The latter participants found the confederate much more attractive after priming with power-related words than after neutral priming.

Together, these studies show how the mental representations of power situations can be automatically associated with representations of sexually related goals. Once placed in a power situation, individuals prone to power abuse can sexually harass their colleagues without any awareness of the underlying causes of their behavior.

The research on the automatic triggering of goals, which in turn can guide one's actions without conscious choice or guidance, thus, has important implications for aggression. For example, if a person has repeatedly witnessed that a "normal" way of dealing with social problems is by using violence and has been repeatedly placed in such situations, or has pursued this goal repeatedly as a child in order to get his or her way, then this person can develop chronic motivations to harm people who are perceived as threatening or who are seen to stand in the way of the person's desired outcomes. Critically, because such automatic motivations do not require conscious choice or intention to be put into motion, repeated prior choice of the goal would eventually cause the goal to operate and guide behavior without the person realizing or having perhaps desired to behave in this way.

One of the features of automatic goal pursuit is that the person does not know that they are pursuing the goal. However, Chartland (1999) has shown that mood is affected by success or failure at goals one does know he is pursuing. Although frustration is not such a strong cause of aggression as initially thought (Dollard, Doob, Miller, Mowerer, & Sears, 1939), under certain circumstances, it can lead to aggression (Berkowitz, 1989). An interesting hypothesis to consider is whether or not negative affect from failure at a nonconsciously pursued goal can result in a subsequent aggressive behavior.

7. Conclusions

Automaticity in social behavior can appear in many different forms under different disguises. According to a recent model (Bargh, 1997), there are three distinctive systems that can operate outside of one's awareness to guide behavior. Environmental features trigger unconscious processing in the perceptual (or cognitive) system, in the evaluative (or affective) system, and in the motivational system. Although these systems are interactive and operate in parallel, they have distinctive mechanisms and operating characteristics. Importantly, the preconscious processing of stimuli by these systems determines the psychological situation of the individual as phenomenologically perceived by himself.

The unconscious processing of environmental features and the effects thus put into motion are generally adaptive and useful (Bargh & Chartland, 1999). Automatic processes

simply take over the regularities in one's life, leaving more of one's limited conscious cognitive resources for handling novel and complex situations. On the other hand, as we have outlined, automatic processes can have its downsides. Being unaware about the underlying motives of one's behavior naturally makes it difficult to control this behavior. In many situations, people fail to see that their perceptions, judgments, and behaviors can be biased and harmful to other people. In the absence of knowledge of the true (nonconscious) instigating cause, they tend to rationalize and attribute the behavior to socially desirable motives that fit their own lay theories about what causes that kind of behavior (Wilson & Brekke, 1994).

Specifically, regarding applications to aggression research, we reviewed studies documenting how environmental features can automatically affect one's perceptions, judgments, and behaviors related to aggression and hostility. We showed that (a) priming stimuli linked to aggression affects one's perceptions and judgments of other people; (b) repeated exposure to aggression-linked concepts can develop into stable individual differences expressed in the chronic accessibility of aggressive concepts; (c) priming can affect behavior directly; and (d) goal-directed behavior can be automatically triggered by relevant situational features.

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