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The Chameleon Effect: The Perception–Behavior Link and Social Interaction

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The *chameleon effect* refers to nonconscious mimicry of the postures, mannerisms, facial expressions, and other behaviors of one's interaction partners, such that one's behavior passively and unintentionally changes to match that of others in one's current social environment. The authors suggest that the mechanism involved is the *perception–behavior link,* the recently documented finding (e.g., J. A. Bargh, M. Chen, & L. Burrows, 1996) that the mere perception of another's behavior automatically increases the likelihood of engaging in that behavior oneself. Experiment 1 showed that the motor behavior of participants unintentionally matched that of strangers with whom they worked on a task. Experiment 2 had confederates mimic the posture and movements of participants and showed that mimicry facilitates the smoothness of interactions and increases liking between interaction partners. Experiment 3 showed that dispositionally empathic individuals exhibit the chameleon effect to a greater extent than do other people.

> He looked about his surroundings. They had become so familiar to him that, without realizing it, he was beginning to take on some of the mannerisms of the people who lived there.
>
> —Georges Simenon, *Maigret and the Toy Village*

As the saying goes, "Monkey see, monkey do." Primates, including humans, are quite good at imitation. Such imitation, in all primates, has generally been considered to be an intentional, goal-directed activity—for instance, mimicry helps one to learn vicariously from the experience of conspecifics or to ingratiate oneself to the other person (see Bandura, 1977; Galef, 1988; Heyes, 1993; Piaget, 1946; Tomasello, Savage-Rumbaugh, & Kruger, 1993). Recently, however, several studies have documented a passive, direct effect of social perception on social behavior, an effect that is unintended and not in the service of any discernible purpose (Bargh, Chen, & Burrows, 1996; Chen & Bargh, 1997; Dijksterhuis, Spears, et al., 1998; Dijksterhuis & van Knippenberg, 1998; Macrae et al., 1998; Mussweiler & Foerster, 1998). These findings suggest that imitation and mimicry effects in humans might often be unintentional (Chen, Chartrand, Lee Chai, & Bargh, 1998). As the popular meaning of the phrase "to ape" is "to intentionally imitate," perhaps the monkey metaphor may not be the most appropriate animal metaphor for the phenomenon.

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We believe that the chameleon is a better one. In the motion picture *Zelig,* Woody Allen plays a human chameleon who cannot help but take on the behavior, personality, and values of whomever he is with. Like a chameleon changing its color to match its current surroundings, Zelig's behavior changes to match the norms and values of the group with which he is currently involved. Although Allen's film took this phenomenon to laughable extremes, it is nevertheless a common experience to discover, after the fact, that one has taken on the accent, speech patterns, and even behavioral mannerisms of one's interaction partners. The naturalness and nonconsciousness of this process was frequently commented on by the author Georges Simenon, whose fictional Inspector Maigret (the subject of the opening epigraph) routinely immersed himself in the lives of murder victims as a favorite method for solving the crimes.

Such a "chameleon effect" may manifest itself in different ways. One may notice using the idiosyncratic verbal expressions or speech inflections of a friend. Or one may notice crossing one's arms while talking with someone else who has his or her arms crossed. Common to all such cases is that one typically does not notice doing these things—if at all—until after the fact.

Perceiving Is for Doing

The Perception–Behavior Link

Throughout the history of psychology, many have argued that the act of perceiving another person's behavior creates a tendency to behave similarly oneself. To begin with, William James's principle of *ideomotor action* held that merely thinking about a behavior increases the tendency to engage in that behavior (James, 1890). This principle is in harmony with the proposed existence of a perception–action link, if one assumes perceptual activity to be one source of behavior-relevant ideation. Making just this assumption, Berkowitz (1984) invoked the principle of ideomotor action in his revised theory of how violence portrayed in the mass media increases the probability of aggression in the viewer. He argued

that activation spread automatically in memory from representations of the perceived violent acts to other aggressive ideas of the viewer. This spreading activation to aggressive behavioral representations, he asserted, automatically led the viewer to behave in a more aggressive manner.

Carver, Ganellen, Froming, and Chambers (1983) tested Berkowitz's ideomotor account of modeling effects. They posited that individuals use *interpretive schemas* for perceiving and interpreting behaviors and *behavioral schemas* for producing behaviors. Because these two schemas are assumed to have substantial overlap in their semantic features, they should tend to become active at the same times. Carver et al. predicted that perceiving a hostile behavior in the environment would activate not only one's hostile interpretive schema, but one's hostile behavioral schema as well, so that the mere act of interpreting the behavior as hostile would make the perceiver more likely to behave in a hostile manner. Participants first were primed (or not) with hostile-related stimuli and then, in an ostensibly unrelated study, were to give shocks to another participant each time the latter made an error in a learning task. Results supported the hypothesis: Relative to the control group, participants who had been previously exposed to hostility-related priming stimuli gave longer shocks to the "learner."

Researchers in the area of language acquisition have also posited a "common-coding" principle to account for rapid language acquisition in young children. In a seminal paper, Lashley (1951) asserted that "the processes of language comprehension and language production have too much in common to depend on wholly different mechanisms" (p. 120). Following Lashley, Prinz (1990) hypothesized a common, or shared, representational system for language comprehension and action codes. He further suggested that the coding system for perceiving behaviors in others is the same as for performing those behaviors—and if so, he argued, that code cannot be used simultaneously in the service of perception and of behavior.

In an experimental demonstration of Prinz's (1990) thesis, Muesseler and Hommel (1997) instructed participants to reproduce certain sequences of four left and right arrow key presses as quickly as they could on each trial (the keys were labeled "<" and ">" respectively; thus, on one trial the sequence might be "< < > <" and on another trial "> < > <"). Participants practiced the sequence until they were ready to perform it rapidly. As soon as they made the first keypress of the sequence, however, the computer display briefly presented an additional left or right arrow key that they had been instructed to append to the end of their practiced sequence. The timing of this presentation was such that it occurred precisely when the participant was pressing the second of the four keys in the sequence. Which of the two keys ("<" or ">") was to be pressed at the end of the practiced sequence was manipulated to be either the same or the opposite of the key actually being pressed at that moment. As hypothesized, participants made more errors (i.e., more often pressed the wrong extra key) if the presented symbol corresponded to the one they were pressing at that moment than when it was different. Apparently, the behavior of pressing the right (or left) arrow key interfered with the ability to perceive the right (or left) arrow key symbol, consistent with Prinz's position that the same representation is used for perceiving as for behaving, and cannot be used for both at the same moment in time.

Priming of Social Behavior

The existence of an automatic, unintended, and passive effect of perception on behavior has important ramifications for whether social behavior can occur nonconsciously and without intention. If the effect of perception on behavior is automatic, then direct environmental causation of social behavior could be produced in a two-step process. The first would involve automatic (i.e., not effortful or consciously guided) perceptual categorization and interpretation of social behavior (environment to perception), with this perceptual activation continuing on to activate corresponding behavioral representations (perception to behavior). In this way, the entire sequence from environment to behavior would occur automatically, without conscious choice or guidance playing a role (see Bargh & Chartrand, 1999).

Regarding the first stage of this hypothetical sequence, it is now widely accepted that much of social perceptual activity is automated (i.e., immediate, efficient, and not consciously guided). Many years of research have demonstrated the variety of ways in which (a) behaviors are encoded spontaneously and without intention in terms of relevant trait concepts (e.g., Bargh & Thein, 1985; Carlston & Skowronski, 1994; Uleman, Newman, & Moskowitz, 1996; Winter & Uleman, 1984), (b) contextual priming of trait concepts changes the perceiver's interpretation of an identical behavior through temporarily increasing their accessibility or readiness to be used (see Bargh, 1989; Higgins, 1989, 1996; Wyer & Srull, 1989, for reviews), and (c) stereotypes of social groups become activated automatically upon the mere perception of the distinguishing features of a group member (e.g., Bargh, 1994, 1999; Brewer, 1988; Devine, 1989).

Thus, if the automatic activation of perceptual representations continuously activates behavioral representations, the same priming manipulations that have been shown to influence social perception should also influence social behavior. In support of this prediction, Bargh, Chen, et al. (1996) found that when stereotypes or trait constructs were "primed," or nonconsciously activated in the course of an unrelated task, the participant subsequently was more likely to act in line with the content of the primed trait construct or stereotype. In Experiment 1, in what was ostensibly a language test, participants were exposed to words related to either rudeness (e.g., "rude," "impolite," and "obnoxious"), politeness (e.g., "respect," "considerate," and "polite"), or neither (in the control condition); considerable previous work on impression formation using the same priming method (but with varying trait content; e.g., Banaji, Hardin, & Rothman, 1993; Srull & Wyer, 1979, 1980) had shown it to activate the corresponding perceptual trait constructs. On the basis of the hypothesized perception–behavior link, this activation was expected to continuously activate the behavioral constructs of rudeness or politeness, increasing the likelihood of such behavior.

After completing this priming task, participants encountered a situation in which they could either behave in a rude fashion and interrupt an ongoing conversation or behave in a polite fashion and wait for the conversation to end on its own—without the participant's intervention, the conversation would continue on for 10 min. Results showed that significantly more participants in the rude priming condition (67%) interrupted the conversation than did those in the control condition (38%), whereas only 16% of those primed with the polite condition interrupted it—in other

words, fully 84% of participants in the politeness priming condition waited the entire 10 min without interrupting.

Experiment 2 of Bargh, Chen, et al. (1996) extended these findings to the case of stereotype (collections of group-related traits, as opposed to single-trait concepts) activation. Participants were first primed either with words related to the stereotype of the elderly (e.g., "Florida," "sentimental," "wrinkle") or with words unrelated to the stereotype. Importantly, none of the primes was semantically related to slowness or weakness, though these concepts are components of the stereotype. As predicted, priming the stereotype caused participants to subsequently behave in line with the stereotype content; specifically, they walked more slowly down the hallway after leaving the experiment. Experiment 3 conceptually replicated this effect by subliminally presenting faces of young male African Americans to some participants, who then reacted to a provocation with greater hostility (a component of the African American stereotype; see, e.g., Devine, 1989) than did control participants. This latter effect was replicated and extended by Chen and Bargh (1997).

Dijksterhuis and van Knippenberg (1998) have conceptually replicated these findings by demonstrating that priming a stereotype or trait can affect subsequent performance on an intellectual task. In several studies, these researchers primed participants with a positive stereotype ("professor"), a negative stereotype ("soccer hooligans"), a positive trait ("intelligent"), or a negative trait ("stupid"). Those participants primed with either the professor stereotype or the "intelligent" trait showed enhanced performance on a general knowledge scale (similar to Trivial Pursuit), whereas those primed with the hooligan stereotype or the "stupid" trait showed decreased performance.

Mediational Evidence

The Bargh, Chen, et al. (1996) and Dijksterhuis and van Knippenberg (1998) studies showed that priming techniques produce changes in behavior based on the hypothesis of an automatic perception–behavior link. However, these studies (as well as that of Carver et al., 1983) did not provide evidence that perceptual activity mediated the effect of priming on behavior, because perception itself was never manipulated (or measured). It remains possible that environmental events (which priming manipulations simulate) directly activate perception and separately directly activate behavioral tendencies.

One way to show that passive perceptual activity automatically causes behavior would be to show that manipulations known to cause changes in perception and judgment produce corresponding changes in behavior. Dijksterhuis and his colleagues (Dijksterhuis, Aarts, Bargh, & van Knippenberg, 1998; Dijksterhuis, Spears, et al., 1998) have conducted a series of such studies.

Assimilation and contrast effects in automatic behavior. Research in social perception has documented two main forms of representation that moderate social judgments: trait categories (e.g., honesty) and exemplars (representations of specific people who exemplify the trait, such as Einstein for intelligence). In general, the evidence shows that activated trait categories usually produce assimilation effects; ambiguously relevant behavior is assimilated into the category rather than contrasted against it. A person whose trait category of honesty is in a heightened state of accessibility or activation is more likely than the average person to consider someone generous when he or she gives money to a charity following his or her boss's request to do so (e.g., Higgins, Rholes, & Jones, 1977; Srull & Wyer, 1979). But if a person is thinking about exemplars of a given trait, such as Einstein for the "intelligent" trait, then ambiguously relevant behaviors (getting a B on a test) are seen as less, not more representative of that trait (Herr, Sherman, & Fazio, 1984; Smith & Zarate, 1992; Stapel, Koomen, & van der Pligt, 1997). The exemplar sets a high standard against which mundane trait-consistent behaviors pale in comparison.

If perception mediates the ideomotor effects of the environment on behavior, then one should find assimilation effects on behavior with category priming and contrast effects on behavior with exemplar priming—the same effects one obtains on perceptual and judgmental dependent measures. Confirming this prediction, Dijksterhuis, Spears, et al. (1998) showed that priming (without specific examples) the stereotype of professors versus that of supermodels (the latter group being stereotypically viewed as unintelligent by the participant population) produced assimilation effects on behavior. Those participants primed with the professor stereotype gave more correct answers on a subsequent knowledge test than did those primed with the supermodel stereotype. But when specific exemplars of the two categories served as the priming stimuli (e.g., Albert Einstein and Claudia Schiffer), the opposite pattern was obtained; that is, contrast effects on behavior were observed.

Amount of experience mediates perception–behavior effects. Another approach to gaining positive evidence of mediation by perceptual activity is to assess individual differences regarding how much contact the individual has had with that group. The more contact, the stronger and more automatic the perceptual representation, and thus the stronger and more likely the behavioral effect. Dijksterhuis, Aarts, et al. (1998) assessed how much contact college-age experimental participants had per week with the elderly. It was assumed that greater amounts of contact with the elderly would correspond to stronger perceptual associations between being elderly and having relatively poor memory. In the course of a lexical decision task, it was shown that the greater the participant's amount of contact with the elderly, the stronger the association between the concepts of the elderly and of forgetfulness. Moreover, a subsequent memory test for all of the target stimuli in the lexical decision task showed that greater amounts of contact with the elderly were related to poorer memory performance. Most importantly, however, the effect of contact on memory was entirely mediated by the strength of the perceptual association between the concepts *elderly* and *forgetful.* There was no direct effect of amount of contact on behavior that was not mediated by the strength of the perceptual representation.

Research on Behavioral Coordination

Observations of and theories about nonconscious mimicry have a long history (see Bandura, 1977; Bavelas, Black, Lemery, & Mullett, 1987; Koffka, 1925; Piaget, 1946). Interestingly, most of the early writers on the topic conceptualized mimicry in terms of empathy. Adam Smith (1759/1966), for example, posited that

reflexive imitation occurs after one takes the perspective of the other and realizes what he or she must feel, and Charles Darwin (1872/1965) used the term *sympathy* to refer to imitation based on reflex or habit. In fact, according to Gordon Allport (1968), the original meaning of the term *empathy* was "objective motor mimicry"; it was only in the latter half of the 20th century that it came to be used as a global term encompassing vicarious emotion, role taking, and the ability to understand others.

Research on nonconscious mimicry began after a seminal paper by Scheflen in 1964. He observed that postural configurations were a source of information about an ongoing social interaction, as they communicated messages about liking and understanding. Moreover, individuals were said to utilize this postural information unconsciously to orient themselves within a group. Three basic lines of research on behavioral coordination developed thereafter (see Bernieri & Rosenthal, 1991). Research on *rhythmic synchrony* has included work on the precise synchronization between the speech and body movements of the two interaction partners (Bernieri, 1988; Condon & Ogston, 1966; Condon & Sander, 1974; Dittmann & Llewellyn, 1968, 1969; Kendon, 1970; cf. McDowall, 1978). *Facial mimicry* research has focused on neonates' mimicry of adult facial expressions (Meltzoff & Moore, 1977, 1979, 1983; cf. Kaitz, Meschulach-Sarfaty, Auerbach, & Eidelman, 1988). However, no consensus developed from this research as to the mechanisms responsible for the effect (Anisfeld, 1979; Jacobson & Kagan, 1979; Masters, 1979).

Facial mimicry has also been found in adults (Dimberg, 1982; Vaughan & Lanzetta, 1980; Zajonc, Adelmann, Murphy, & Niedenthal, 1987), although it is not clear from these studies whether the observers actually experience the same emotions as the other person or simply mimic his or her facial expressions. The Zajonc et al. finding that couples grow to resemble each other the longer they are together is especially intriguing given the present hypothesis of a perception–behavior link, because one reason for the increased resemblance could be the similar facial lines left by many years of unconsciously mimicking the perceived facial expressions of the partner.

The third type of behavioral coordination research, and the one that most closely resembles the chameleon effect, is that on *behavior matching,* which occurs when people mimic behavior patterns by adopting similar postures or showing similar body configurations (La France, 1979, 1982; La France & Broadbent, 1976). The main focus of this research has been to link posture similarity in naturalistic settings to rapport, which (though rarely operationalized the same way twice) often includes measures of involvedness, togetherness, being "in step," and compatibility (see also Bavelas, Black, Chovil, Lemery, & Mullett, 1988; Bavelas, Black, Lemery, & Mullett, 1986, 1987).

Despite the considerable amount of research on mimicry and behavioral coordination, there has been relatively little attention given to the mechanism responsible for it. The consensus position appears to be that behavioral coordination is in some way related to empathy, rapport, and liking, although some see mimicry as the cause and others see it as the effect of empathic understanding. That mimicry and behavioral coordination are said to serve the adaptive function of facilitating social interaction and interpersonal bonding does not, however, answer the question of how these effects are produced.

Four critical elements are missing from these observational studies. First, although moderate posture sharing has been reported, there has been no baseline or control group with which to compare the amount of mimicry observed; without this, one cannot determine whether it occurs more often than chance would predict. In fact, La France (1982) has stated that "posture mirroring is not constant nor ubiquitous" (p. 290), and the results of one statistical test of its existence suggested that it did not occur more often than would be predicted by chance (Bernieri, 1988). Although there is wide agreement that posture and body movement mimicking do occur, it nonetheless remains an experimentally unproven observation.

Second, there has been no test of the minimal conditions under which behavior matching occurs. As noted before, research has shown that there is greater posture similarity when the interactants like each other and feel more rapport (Charney, 1966; La France, 1979; La France & Broadbent, 1976; Scheflen, 1964). However, there has been no compelling test of whether there is significant mimicry among unacquainted interaction partners. If the perception–behavior link is the mechanism underlying behavior matching, then it should occur even among strangers. Furthermore, the chameleon effect is hypothesized to be an entirely passive and preconsciously automatic process (i.e., it does not depend on the concurrent operation of an intentional goal, such as ingratiation, during the interaction; see Bargh, 1989). Thus, not only should it occur among strangers, but it should occur even without an active goal to get along with and be liked by the interaction partner. To date, there have been no tests of whether posture and behavior mimicry occur under such minimal conditions.

Third, the previous studies were correlational and did not manipulate the postures and mannerisms of either interactant.[1] This lack of experimental control over which mannerisms are done and how long they are engaged in precludes one from inferring causation. That is, one cannot conclude from these studies that Person X was mimicking Person Y; rather, one can only say that Persons X and Y were displaying the same mannerisms or postures at a given time. For one thing, there could be other, third factors that could spuriously lead to these shared behaviors (e.g., a hot room causing all present to fan their face). For a valid demonstration of the chameleon effect, one would need to show that Person X first engages in a particular behavior, and then Person Y mimics that behavior, without intending or having any reason to do so.

Finally, just as chameleons change their coloring to blend in with their current environment, an experimental demonstration of a behavioral chameleon effect should incorporate, as a within-subjects factor, variability in the behavior of interaction partners, to show that the participant's behavior changes accordingly.

[1] Although motor-mimicry researchers have manipulated confederates' behaviors, they were not interested in (and therefore did not manipulate) general postures or behavioral mannerisms. Instead, the experimenters created situations in which participants observed a confederate experiencing a specific event and emotion and then tested whether participants reacted as if the experience were happening to them (e.g., Bavelas et al., 1988; Bavelas, Black, Lemery, & Mullett, 1987).

Again, to date, there has been no demonstration of such passive behavior adaptations to multiple interaction partners.

The Chameleon Effect as Cause of Interpersonal Rapport and Empathy

We propose that the chameleon effect is the mechanism behind mimicry and behavioral coordination and thereby is the source of the observed smoother social interaction and interpersonal bonding produced by the (nonconscious) mimicry. In relating these formerly disparate areas of research, we hypothesize that the perception of another's behavior (be it facial expression, body posture, mannerism, etc.) increases the tendency for the perceiver to behave in a similar manner, and that this is an entirely passive and nonconscious phenomenon. Thus, we argue that the perception of another's behavior does not require or depend on the perceiver having any interpersonal goal, such as ingratiation, toward the person being perceived, nor does perception require the two interaction partners to have an already established relationship (i.e., a preexisting state of rapport). Unlike the prior correlational accounts of mimicry and rapport, we posit a directional causal sequence: Perception causes similar behavior, and the perception of the similar behavior on the part of the other creates shared feelings of empathy and rapport. In short, the widely documented automatic link between perception and behavior exists, at least in part, as a kind of natural "social glue" that produces empathic understanding and even greater liking between people, without their having to intend or try to have this happen.

As noted above, the studies that showed that the same priming manipulations that influence social perception also influence social behavior are suggestive, but not conclusive, evidence for automatic effects of perception on behavior. What is needed is a demonstration, within a social interaction context, that the perceiver's behavior changes as a function of the behavior of the interaction partner, and that these changes occur without conscious choice or guidance.

Thus, our first goal (Experiment 1) was to provide an experimental test of the existence of nonconscious mimicry of behavioral mannerisms in a way that (a) determines whether it occurs at greater-than-chance levels, (b) tests whether it occurs among strangers when no affiliation goal is operating, (c) manipulates mannerisms and behaviors of interaction partners (confederates of the experimenter) to determine the direction of causality of the effect, and (d) tests for a chameleon-type change in behavior as a function of the behavior of the current interaction partner. Unlike previous researchers, we did not observe individuals who were already engaged in an interaction; rather, we created dyadic interactions between participants and confederates during which confederates varied their facial expressions and behavioral mannerisms. In Experiments 2 and 3, we sought to verify that these automatic effects of social perception on social interaction produce greater empathy and liking between the interaction partners; in Experiment 3, we examined this issue by testing whether individual differences in empathy covary with individual differences in the chameleon tendency.

Experiment 1: A Test of Unintentional Mimicry Between Strangers

Method

Overview. Students participated in two consecutive dyadic sessions. Session 1 consisted of a 10-min interaction with 1 other "participant" (Confederate 1; C1), during which they took turns describing various photographs. Participants then repeated this photograph description task in Session 2 with a 2nd "participant" (Confederate 2; C2).

Confederates varied their mannerisms throughout the interactions. During Session 1, C1 either rubbed his or her face or shook his or her foot. During Session 2, C2 did whichever behavior C1 did not do. Facial expressions varied as well; C1 either smiled or had a neutral expression (i.e., did not smile) throughout Session 1. During Session 2, C2 smiled if C1 had not smiled, and did not smile if C1 had smiled. The order of mannerisms and facial expressions was counterbalanced, and C2 always did the mannerism and facial expression that C1 did not do. A video camera recorded participants during both sessions so that coders could later judge the extent to which participants mimicked the mannerisms and facial expressions of the 2 confederates.

Participants. Thirty-nine male and female students enrolled in an introductory psychology course at New York University participated in the experiment in partial fulfillment of a course requirement. Data from 4 of these participants were excluded from subsequent analyses for the following reasons: (a) 3 participants chose to not sign the consent form giving us permission to code and analyze their videotape, and (b) during debriefing, 1 participant expressed suspicion that the other participant was in fact a confederate. However, neither she nor any of the other participants accurately guessed our hypothesis.

Thus, we computed all analyses on responses from a final sample of 35 participants. For 14 participants, C1 smiled and shook his or her foot and C2 did not smile and rubbed his or her face. Because the possibility existed that encountering the smiling confederate first would affect participants' interactions with the nonsmiling C2, it was important to counterbalance the order of facial expressions by having the nonsmiling confederate interact first with some of the participants. Thus, C1 did not smile with 21 participants (of these, C1 rubbed his or her face with 8 and shook his or her foot with 13).

Apparatus and materials. Two male and two female assistants served as experimenters and confederates, rotating in the roles of experimenter or confederate. The experiment room had one chair for the experimenter at the front of the room, behind a desk in which the materials and stimuli for the experiment were kept. The room also contained two chairs for the participant and confederate that were placed approximately 1.2 m apart. These two chairs were half-facing each other and half-facing the experimenter's desk. With this arrangement, the participants could see the confederates' mannerisms during the interaction but could not see the experimenter's, whose body was effectively hidden by the desk.

Participants were videotaped throughout both sessions by means of a video camera on a shelf in the corner of the room. The camera was focused on the participant's chair, resulting in a clear view of the participant's entire seated body. To ensure that coders of the videos were blind to condition, we did not videotape the confederates. Thus, when judging a particular participant's responses, the raters did not know the corresponding mannerisms or facial expressions of the 2 confederates.

Color photographs for the experiment were chosen from magazines such as *Newsweek, Time,* and *Life.* The photos were cut out of the magazines and mounted on heavy black cardboard. Twelve photos were chosen that ranged somewhat in emotional content, amount of action involved, and

ambiguity of what was being portrayed in the photo.[2] These variables were not manipulated systematically, but the photographs were rotated so that participants did not always describe the same type of photo when with the smiling or nonsmiling confederate (e.g., only describing somewhat "happy" photos when with the smiling confederate). Thus, although 6 of the 12 photos were reserved for the confederates (so they could memorize a prepared script for each) and the other 6 were reserved for the participant, the order of the photos within each set varied.

Procedure. Each participant completed the experiment individually. Prior to each session, the experimenter turned on the video camera that would record the participant throughout the session. The experimenter then brought the participant into the laboratory room and seated him or her in the participant's chair. The experimenter then left the participant alone in the room for 1 min (ostensibly to retrieve copies of a needed form from another room), during which time the participant was videotaped to obtain a baseline measure. This baseline period was later coded to determine the extent to which the participant was already rubbing his or her face, shaking his or her foot, or smiling before interacting with any confederate.

The experimenter reentered the room and delivered the cover story. It was explained that the purpose of the study was to test a new projective measure being created by some psychologists in the department. (The assumptions underlying the use of projective measures were briefly explained to those participants unfamiliar with them.) The participant was informed that some researchers were trying to develop a revised version of one of the more common measures (the Thematic Apperception Test) that (a) could be administered to more than one person at a time and (b) would use photographs instead of picture drawings.

The participant was told that the researchers were in the initial stage of creating working sets of photographs to serve as the stimuli for the projective test. Toward this end, they were first testing various sets of photos on a "normal" (i.e., nonpatient) population. Specifically, college students were being recruited to describe what they saw in the various photographs. Participants could discuss the visual aspects of the photo, or free associate and say whatever came to mind (including what the people in the photos were thinking or feeling), or both. Importantly, the experimenter emphasized to the participant that responses would not be analyzed by any of the psychologists (or anyone else), so there was no need to be concerned about the content of his or her responses. Instead, the ease with which the students described and generated responses to the photos would ostensibly be taken as the indicator of the usefulness of those particular photos. Accordingly, the participant was told that at the conclusion of the experiment, he or she would be asked about the experience of describing the photographs (e.g., how easy it was to generate responses for them).

The participant was further informed that several sets of photographs had already been gathered and tested on students 1 at a time in individual sessions. The photos were now being tested in group settings, beginning with groups of 2 students at a time. The participant was then given a consent form to sign and told that he or she would be involved in two separate group sessions, each with 1 other participant. It was explained that another session was being conducted concurrently in another room, and that 1 of the participants from a previous session there would be the 1st partner. The experimenter then brought in the 1st other participant (C1) and seated him or her in the confederate's chair. The participant and C1 were each given a set of three photos facing down. The experimenter explained that the two sets of photos were different and reminded them that their task was to take turns describing what they saw in each photograph. They were told to describe each photo in any way they wished for approximately 1 min.

The experimenter suggested that C1 turn over the first photo and begin. C1 described the photograph, following a memorized script to ensure that responses were standardized across different confederates and different experimental sessions. It should be noted that the confederates were trained to deliver the responses with natural hesitation, including pauses, *umms*, and *hmms*. One example of a scripted response refers to a photo of a man holding in his arms a small dog with a leg cast:

> This is a picture of a man holding a small dog—maybe a chihuahua but I'm not sure. The dog's leg is in a cast, so I guess it's broken. I don't know how dogs' legs get broken, but maybe it got stuck somewhere, like in those gutters outside or something. So then it was probably crying or making a lot of noise and this man heard it. The man looks like a pretty nice guy, so he probably felt sorry for the dog and wanted to help it. This picture looks like it's taken at a vet's office, so the man probably brought the dog to the vet and then they put the cast on the leg. And then this picture was taken right after that. The man didn't know who the dog belonged to, so he's having people take pictures of the dog so that the owner can come pick him up.

The experimenter then asked the participant to turn over his or her first photo and begin describing it. After the participant finished, C1 and the participant continued alternating turns until both completed their sets of three photographs. During the interaction, C1 made minimal eye contact with the participant to minimize the possibility that any personal relationship between the two would be established. C1 was either smiling or not smiling and either rubbing his or her face or shaking his or her foot. Behaviors were always performed throughout the interactions.

After all photographs had been described, the experimenter told participants that they would now be switching partners. One of the participants would be brought to the other laboratory room to join another participant, and the other would stay in the current room to meet a new partner. The experimenter escorted C1 out of the laboratory room and approximately 1 min later brought in C2 to join the participant. The experimenter gave the participant and C2 a different set of three photographs each, and once again they alternated taking turns describing them. This time, however, C2 was displaying the mannerism (rubbing his or her face or shaking his or her foot) and facial expression (smiling or not smiling) that C1 had not.

Following the session with C2, the experimenter said that the debriefing would take place individually, and that C2 would be taken to the other laboratory room where he or she would be debriefed by the other experimenter. The experimenter escorted C2 out of the room and returned alone approximately 30 s later. The experimenter then queried the participant in a "funneled" question sequence (i.e., from general to increasingly specific questions about awareness of hypotheses; see Bargh & Chartrand, in press) to determine if he or she (a) was suspicious that the other participants were in fact confederates, (b) noticed that the confederates each displayed certain mannerisms throughout the session, or (c) thought that the purpose of the experiment was anything other than what the cover story indicated. Finally, the hypotheses and purpose of the study were explained to the participant. The participant was asked to sign a video release form allowing the researchers to examine the data and was thanked for his or her participation in the study.

Results

Interjudge reliability. Videotapes were coded by two independent judges blind to the condition of participants. Three time periods were coded for each participant: 1 min of baseline before interacting with confederates (BL), the time spent with C1 (T1), and the time spent with C2 (T2). The coding procedure yielded the following dependent variables: (a) the number of times the partic-

[2] Although an effort was made to avoid photographs with strong emotional content, at the same time we needed to choose photos that would (a) be convincing as stimuli for a projective measure and (b) be able to stimulate 1–2 min of description as well as conjecture as to what was being thought or felt by the people in the photographs.

ipant smiled, (b) the number of times the participant rubbed his or her face, and (c) the number of times the participant shook his or her foot.[3]

The following are the interjudge reliabilities: For the number of times smiling, the reliability for the three ratings (BL, TI, and T2) ranged from $r = .79$ to 1.00, with mean $r = .89$. For number of times participants shook their foot, the three ratings ranged from $r = .53$ to .79, with mean $r = .68$. For number of times participants rubbed their face, the interjudge reliabilities ranged from $r = .33$ to .60, mean $r = .50$.[4] All reliabilities were significant at $p < .001$.

The mean of the two judges' ratings was taken to form a single rating for each behavior. Ratings for T1 and T2 were then divided by the number of minutes (to the nearest second) that the interaction lasted to arrive at a rate per minute. (This method had the further advantages of equating T1 and T2 with BL so that the numbers would all be in the same metric and ensuring that any differences would not be artifactually due to somewhat longer or shorter interactions in T1 vs. T2.)

For both the smiling and behavioral measures, a repeated measures analysis of variance (ANOVA) was conducted on the number of times each action occurred per minute. For each analysis, we included the baseline rating as a covariate to adjust for individual differences in performing the key behaviors in the absence of another person. Neither the participant's gender nor the order in which the confederates enacted the various behaviors affected the results, so neither of these variables is discussed further.

Facial expression. As predicted, there was a significant effect of confederate expression, $F(1, 34) = 20.31$, $p < .0001$. Participants smiled more times per minute when with the smiling confederate ($M = 1.03$) than with the neutral confederate ($M = 0.36$). This result suggests that participants did indeed mimic the facial expression of the confederates.

Behavioral measures. We next conducted a repeated measures ANOVA on the number of times participants engaged in the mannerisms per minute. Confederate behavior (foot shaking vs. face rubbing) and participant behavior (foot shaking vs. face rubbing) were the two within-subject variables. Whereas there were no main effects for confederate behavior ($F < 1$) or participant behavior ($p > .25$), the predicted interaction between the two was, in fact, reliable, $F(1, 34) = 9.36$, $p = .004$ (see Figure 1). Our hypothesized chameleon effect specifically predicts that participants should engage in face rubbing (or foot shaking) more in the presence of the confederate engaging in that behavior than in the presence of the confederate not engaging in that behavior. Consistent with this prediction are our findings that participants rubbed their face more times in the presence of the face-rubbing confederate than when with the foot-shaking confederate, $F(1, 34) = 5.71$, $p < .025$, and shook their foot more times when with the foot-shaking confederate than with the face-rubbing confederate, $F(1, 34) = 3.76$, $p = .06$. These results, in conjunction with the facial expression findings, support our hypothesis that individuals passively take on the mannerisms and facial expressions of those around them without the intention or reason to do so.

Liking as potential mediator. If the perception–behavior link is, as we argue, a completely nonconscious, non-goal-dependent mechanism that produces the chameleon effect, mimicry of others should occur even in the absence of a reason to do so, such as pursuing an affiliation goal. In the present study, with one smiling and one nonsmiling confederate, it is reasonable to suppose that participants would be more likely to have an affiliation goal—if they had one at all, which the design of the experiment attempted to minimize—with the smiling than with the nonsmiling confederate. Thus, one could conceptualize the smiling and nonsmiling confederates as a likability manipulation. The question becomes, did the participants mimic the foot-shaking and face-rubbing behaviors of the nonsmiling confederate or only those of the smiling confederate?

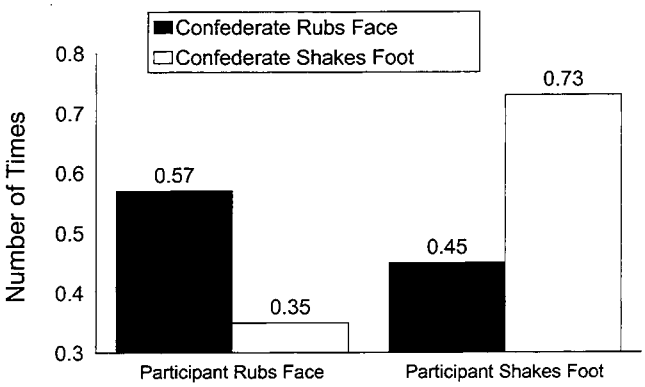


Figure 1. Number of times participants rubbed their face and shook their foot per minute when with a confederate who was rubbing his or her face and a confederate who was shaking his or her foot.

In the following analysis, whichever of the two behaviors the nonsmiling confederate performed was the key behavior for a given participant. We compared how much participants engaged in the key behavior with the nonsmiling confederate with how much they engaged in that same behavior with the smiling confederate (who was doing the other behavior). A repeated measures ANOVA was conducted on the number of times the action occurred per minute. A significant effect of confederate behavior was obtained, $F(1, 34) = 4.16$, $p = .05$. Participants performed the key action more times with the nonsmiling confederate doing that key behavior ($M = .56$) than with the smiling, likable confederate doing the other behavior ($M = .40$). It was not the case that participants only mimicked the behavior of the smiling, apparently friendly confederate and not the nonsmiling, apparently less friendly confederate.

Were the mimicry effects greater in the presence of the smiling confederate? We next compared the extent to which participants mimicked the behavior (either foot shaking or face rubbing) of the

[3] We also coded number of seconds participants spent smiling, rubbing their face, and shaking their foot. The correlations between these seconds measures and the number of times measures was high (for smiling, r = .92; for face rubbing, r = .88; for foot shaking, r = .94). Because of this redundancy, we report only the number of times analyses in the text. However, we computed all analyses on the number of seconds as well, and the results showed the identical pattern and significance level as the number of times analyses.

[4] Reliability between judges was higher for the foot-shaking than for the face-rubbing measures. Because there are many physical gestures that can be made in the facial area (e.g., scratching an itch, playing with an earring, fixing hair), a detailed coding key was created and used by both raters. However, judgment calls had to be made, which reduced reliability. It should be noted that in Experiment 2 the reliability for this measure was substantially higher.

smiling confederate more than the behavior of the nonsmiling confederate. Behavior mimicked (face rubbing or foot shaking) when the participant was with the smiling confederate was the between-subjects variable, and confederate expression (smiling versus nonsmiling) was the within-subjects variable. There was no significant main effect for confederate expression across the two behaviors being mimicked, nor was the interaction significant ($Fs < 1$). Thus, there was no evidence in our study that the obtained effects were goal dependent.

Participants' awareness of having engaged in behavioral mimicry. For the chameleon effect to be considered passive and automatic, it must be demonstrated that participants were not aware of having mimicked the confederates. Although intuitively it seems unlikely that participants would want to purposefully mimic the confederates' mannerisms, it is possible that participants believed that shaking their foot or rubbing their face simultaneously with the confederate would be beneficial for the interaction in some way, and they mimicked for these conscious, motivated reasons. However, we have evidence that this was not the case. Participants were asked during the funneled debriefing at the conclusion of the experiment whether anything about either of the confederates stood out to them. Participants were then asked whether either of the confederates had any particular mannerisms or ways of speaking that they noticed or that seemed distinctive. One participant (out of 35) mentioned that 1 of the confederates made hand motions while speaking, and 2 others commented on the slouching posture of 1 confederate. However, none of the participants mentioned noticing that the confederates were shaking their foot or rubbing their face. (When asked, most reported that they "hadn't noticed" the mannerisms of the confederate.) Thus, it seems that not only were participants not consciously trying to imitate the mannerisms of the confederates, but they did not even pay attention to these mannerisms in the first place.

Discussion

Researchers have long been interested in nonconscious mimicry, yet there has been little attention given to identifying the mechanism underlying the phenomenon. We have argued that the perception–behavior link can provide such a mechanism. The perception–behavior link posits the existence of a natural and nonconscious connection between the act of perceiving and the act of behaving, such that perceiving an action being done by another makes one more likely to engage in that same behavior. This mechanism can account for the chameleon effect, the tendency of people to take on the postures and mannerisms of those around them.

In Experiment 1, we sought to provide an experimental test of the chameleon effect in which the mannerisms and facial expressions of interaction partners were manipulated and standardized across participants. Analyses revealed that behavioral mimicry did in fact occur at significantly greater than chance levels. Significant mimicry was found for facial expressions and for two different behavioral mannerisms, after controlling for BL measures of each behavior. Furthermore, the design of the experiment, in which the confederates' behavior was predetermined and standardized and so it was clear who was mimicking whom, enables conclusions to be drawn for the first time about the causal direction of the effect. Unlike previous studies, this one showed that the similarity in mannerisms between participants and confederates could not have been due to any third factor.

Moreover, because participants interacted with 2 different partners, each of whom engaged in different facial expressions and behavioral mannerisms, the results demonstrated the true chameleon-like nature of the perception–behavior effect, as the participants' behavior changed as a function of the behavior of their current interaction partner. Thus, they rubbed their face when interacting with the face-rubbing confederate but then reduced face rubbing and increased foot shaking during their interaction with the foot-shaking confederate. No previous study had demonstrated how an individual's behavior naturally adapts to changes in social environmental settings by blending in to each of them successively.

Because the perception–behavior link is preconscious and not goal dependent, for it to be the cause of the chameleon effect, the effect should occur among strangers when no affiliation goal is present. This was found to be the case; participants mimicked the behavior of strangers, even nonsmiling ones who never made eye contact with them. In designing the experiment, we sought to minimize the possibility that participants would choose to pursue an affiliation or other social goal toward the confederates that would cause them, in pursuit of that goal, to engage in behavioral mimicry (even at a nonconscious, goal-dependent, automatic level). Thus, confederates were instructed to not make eye contact with the participants, and when serving as the smiling confederate, to never smile at the participants. Finally, that the obtained behavioral mimicry occurred just as much in the presence of the nonsmiling as the smiling confederate is further evidence against the goal-dependent alternative account.

Experiment 2: The Adaptive Function of the Chameleon Effect

What is the adaptive function served by the chameleon effect, the nonconscious tendency to behave with others as those others are behaving? As reviewed above, there is consensus among researchers that behavior matching is related to greater liking and rapport between the interactants. Our second goal for the present research was to test whether behavior matching does in fact increase liking and create a sense of smoother interactions. Our hypothesis that automatic effects of perception on behavior serve adaptive functions is part of a larger research effort that traces the "downstream" consequences of a variety of immediate, preconscious reactions to the social environment. For example, recent research on the downstream effect of the tendency to automatically evaluate perceived stimuli as either good or bad (e.g., Bargh, Chaiken, Govender, & Pratto, 1992; Bargh, Chaiken, Raymond, & Hymes, 1996; Fazio, Sanbonmatsu, Powell, & Kardes, 1986) has demonstrated direct effects on behavioral predispositions toward those stimuli (Chen & Bargh, 1999), as well as mood effects that reflect the average valence of automatic evaluations made over time in a given environment (Chartrand & Bargh, 1999). The chameleon effect, as another variety of a preconscious automatic process, also likely exists for a useful, adaptive reason.

It is plausible that the chameleon effect serves the basic human need to belong. In a recent review, Baumeister and Leary (1995) argued that according to the existing evidence, the human need to belong is a powerful, fundamental, and extremely pervasive mo-

tivation.[5] We desire frequent, nonaversive interactions with others and want to form and maintain strong, stable interpersonal relationships. We try to orient toward fellow human beings in a way that is relatively free from conflict and negative affect. To the extent that two interactants are similar to each other and have things in common (even at the level of behavioral mannerisms), such a smooth, conflict-free interaction will be more likely to occur. Moreover, automatically behaving in a manner similar to other group members—including having similar facial reactions to events—helps prevent an individual member from standing out as different, and so it would help to prevent ostracism and social distance from other group members (see Brewer, 1991).

Researchers of elementary motor mimicry have posited a very specific function served by motor mimicry that is consistent with this analysis. Recall that motor mimicry is a subset of behavior matching that refers to an individual reacting to another person going through a specific, emotion-laden incident (e.g., wincing at the other's pain). The individual reacts as if he or she were experiencing and feeling the same thing as the other person. Bavelas and her colleagues (Bavelas et al., 1988; Bavelas, Black, Lemery, & Mullett, 1986, 1987) take a strong stand that motor mimicry is not an overt manifestation of an intrapersonal process, such as vicarious emotion or cognitive role taking, but rather is an important communication tool that relays the message "I am like you" or "I feel as you do" to the other person.

Over 20 years earlier, Scheflen (1964) similarly suggested that mimicry might serve a communicative function without a person's awareness or intent: "Human behavior can be communicative whether or not it is *intended* to communicate . . . . *The intent of an interactant and the function that a behavior actually has in a group process must be conceptually distinguished* (italics in original; p. 318). We suggest that behavior matching serves this same function, and individuals use behavior mimicry as a communication tool on a completely nonconscious level.

Although behavior-matching researchers have not discussed its use as a communication tool per se, the notion is consistent with the proposed link between behavior matching and rapport. Scheflen (1964) originally posited that people in a group often mirror one another's posture and that this reflects a shared viewpoint. Bernieri and Rosenthal (1991) pointed out that people seem to get along better when their behaviors are well coordinated: "Interpersonal coordination and synchrony may eventually explain how it is that we 'hit it off' immediately with some people and never 'get it together' with others" (p. 429). Tickle-Degnen and Rosenthal (1987) also reviewed the evidence for a link between interpersonal coordination and rapport and suggested that it is quite strong.

Empirical evidence supporting the link between social rapport and interpersonal coordination comes primarily from the work on posture mirroring. In a typical study, La France (1982) found that students frequently displayed the same postural configuration as that of the teacher, and the extent of posture similarity was positively correlated with the students' ratings of rapport, involvement, and togetherness. Interestingly, La France has discovered that posture mirroring (e.g., one person lifting his or her right arm and another person lifting his or her left arm in a "mirror image") is related to rapport, although posture mimicking (e.g., both individuals lifting their right arm) is not (La France & Broadbent, 1976). Additional studies have found a relationship between behavior matching and self-reported rapport and involvement (Charney, 1966; La France, 1979; Trout & Rosenfeld, 1980). Hatfield, Cacioppo, and Rapson (1994) also argued that behavioral mimicry leads to emotional convergence between interaction partners.

Thus, there is consensus among researchers that behavior matching is related to greater liking and rapport. However, there has been disagreement over the causal direction. Some researchers have conceptualized various types of behavioral coordination as by-products or outgrowths of preexisting emotional rapport or liking (Levenson & Ruef, 1997; Scheflen, 1964). However, others have argued for the reverse causal direction. La France (1982), for instance, suggested that posture mirroring may not only reflect shared viewpoints and harmony but may actually be instrumental to achieving them.

Evidence for the mimicry-to-rapport causal direction has been mixed. In a correlational study, La France (1979) used a cross-lag technique to assess causality and found that posture similarity seems to lead to rapport slightly more than vice versa, although there was some evidence that the effect was bidirectional. In a study of the impact of gesture similarity on persuasion and interpersonal influence, Dabbs (1969) manipulated movement similarity by having a confederate "interviewee" mimic the gestures and mannerisms of 1 of 2 participant "interviewers" in the room. Results were equivocal; whereas the participant who was mimicked did not report liking the confederate more than did the participant who was not mimicked, mimicry did cause the confederate to be evaluated more favorably on other dimensions (e.g., he was considered to be well informed and to have sound ideas). In a second experiment, some participants were trained to be confederates 10 min before the start of the experiment and were told to either mimic a 2nd participant or to "antimimic" him (i.e., do the opposite of what he did). Results were again unclear as to the effect of mimicry, but they did suggest that antimimicry could have a negative effect in certain circumstances. Finally, Maurer and Tindall (1983) focused on whether perceptions of a counselor's empathy partially depend on nonverbal cues such as having similar behavioral mannerisms. They found that when counselors mimicked the body positions of their clients, the clients perceived a greater level of expressed empathy on the part of the counselor.

In Experiment 2, we sought to test whether manipulated variations in posture similarity produce variations in liking between interaction partners. We especially wanted to test the extent to which posture similarity affects liking when there is no overarching interpersonal goal held by the interactants toward each other. In both the Dabbs (1969, Experiment 1) and Maurer and Tindall (1983) experiments, there was a role–power differential between the confederate and participant, and so interpersonal goals (e.g., ingratiation) may have affected their results. Our hypothesis, however, is that the chameleon effect operates in a passive, non-goal-dependent manner to create greater liking and ease of interaction. Hence, mimicry of one interaction partner by the other should cause the former to like the partner more and to experience greater

[5] Brewer's (1991) model of optimal distinctiveness is consistent with this argument and puts it in a larger framework by bringing in a second, opposing need. In this model, social identity is viewed as a reconciliation between the two needs: On the one hand, we have a need for validation, similarity to others, and a sense of belonging, and on the other, we have a need for uniqueness, individuation, and a sense of distinctiveness.

ease of interacting, even when the two are strangers or new acquaintances who are not seeking to establish a relationship.

Method

Overview. Participants had one 15-min session with another "participant" (a confederate). During this session, the participant and confederate took turns describing what they saw in various photographs. Confederates either mirrored the behavioral mannerisms of the participant throughout the interaction (the experimental condition) or engaged in neutral, nondescript mannerisms (the control condition). When the interaction was over, participants completed a questionnaire on which they were asked to report (a) how much they liked the confederate and (b) how smoothly the interaction had gone.

Participants. Seventy-eight male and female students enrolled in an introductory psychology course participated in the experiment in partial fulfillment of a course requirement. Data from 6 of these participants were excluded from analyses for the following reasons: 2 participants in the control condition sat in the same neutral position as the confederates, making it equivalent to the experimental condition in which body language and mannerisms are in synchrony. Four participants suspected that the other participant was in fact a confederate. It should be noted, however, that none of these participants were able to guess our hypothesis. Thus, we computed all analyses on responses from a final sample of 72 participants, with 37 in the mimicking (mirroring) condition and 35 in the control condition.

Apparatus and materials. The experiment room was the same as used in Experiment 1. The same color photographs from Experiment 1 were also used for Experiment 2. There were 4 female assistants who served as confederate and experimenter, and they alternated roles. All assistants were trained to mirror the body language and mannerisms of the participants.

Although the confederates were kept blind to the specific hypothesis of the experiment, they were necessarily aware of the manipulation involved and of the participant's assigned experimental condition. It is therefore possible that they could have, intentionally or unintentionally, behaved differently toward the participants who were in the experimental condition (e.g., acted more friendly or likable toward them). To address this possibility, 22 of the sessions (11 of the control condition and 11 of the experimental condition) were videotaped in their entirety to later assess, through the ratings of outside judges, whether the confederates were behaving differently (other than in the mimicry itself) toward participants in the mimicry versus no-mimicry conditions. Both the participant and confederate were visible through the lens of the camera so that judges would be able to see and code the confederate's behavior toward the participant.

The dependent measures were ratings from participants on liking for the confederate and smoothness of the interaction. The key items read, "How likable was the other participant?" and "How smoothly would you say your interaction went with the other participant?" To help camouflage the hypothesis of the study, we embedded these two items among eight other questions that asked about the task itself and the group format (e.g., how easy or difficult it was for them to generate responses to the photos, and whether they thought the various photographs went well together as a single "set"). All items were rated on 9-point scales (for the smoothness item, 1 = *extremely awkward,* 9 = *extremely smooth;* for the likability item, 1 = *extremely dislikable,* 9 = *extremely likable*).

Procedure. The procedure was the same as for Experiment 1, with participants working with confederates to ostensibly help develop the projective measure involving sets of photographs, except that the confederates no longer smiled (or not), shook their foot, or rubbed their face. Instead, during the interaction, the confederate avoided eye contact with the participant and maintained a neutral facial expression. Furthermore, in the mimicry condition, the confederate mirrored the posture, movements, and mannerisms displayed by the participant. In the control condition, the confederate sat in a neutral relaxed position, with both feet on the floor and both hands holding the photos (or resting in the lap).[6]

When the participant and confederate had completed the photograph descriptions, the experimenter explained that they would next complete the questionnaire about the task. Because it was necessary to complete it independently and privately, they would be separated and seated in different rooms. The experimenter asked the confederate to complete the survey in an adjoining room and escorted her there. Then, the experimenter returned to the laboratory room, gave the participant the questionnaire to complete, and told him or her to come to the hallway outside when finished. At this point, the experimenter queried the participant to determine whether he or she was suspicious that (a) the other participant was in fact a confederate, (b) the confederate was mirroring his or her own behaviors, or (c) the purpose of the experiment was anything other than what the cover story indicated. Finally, the purpose and hypotheses of the study were explained to the participant. (Those who were videotaped were asked to sign a video consent form.) The participant was thanked for his or her participation.

Results

Liking and smoothness as a function of being mimicked. We predicted that relative to those in the control condition, participants in the experimental condition would report (a) finding the confederate more likable and (b) having smoother interactions with her. To test these hypotheses, a multivariate analysis of variance (MANOVA) was conducted on the liking and smoothness variables, with mimicking of participants by confederates (yes vs. no) as the between-subjects variable. Gender was also included as a between-subjects variable in this and all subsequent analyses, but no reliable main effect for gender or interaction between gender and mimicking emerged, and so the gender variable is not discussed further. In addition, we initially included as an additional between-subjects variable in the MANOVA whether the experimental session had been videotaped, but this variable also did not interact with any of the effects, Fs < 1. Therefore, the sessions that were videotaped were representative of the larger sample; the liking and smoothness ratings of the participants in these sessions did not differ from the ratings of the participants who were not videotaped.

As predicted, there was an overall effect of mimicking across the two dependent measures, $F(2, 69) = 3.47, p = .04$. This effect was not moderated by type of dependent measure, interaction $F < 1$. We also conducted separate univariate tests on the liking and smoothness ratings. Participants in the experimental condition reported liking the confederate more ($M = 6.62$) than did those in the control condition ($M = 5.91$), $F(1, 70) = 5.55, p = .02$. Furthermore, they reported that the interaction went more

[6] It was important that the confederates in the nonmimicking condition not come across as stiff and awkward, while the mimicking confederates came across as relaxed, mobile, and animated. This potential confounded difference in behavior might provide an alternative explanation for our results: The participants liked the confederate in the mimicking condition more not because they were being mimicked by her, but rather because she seemed more relaxed, at ease, animated, and interesting than the confederate in the neutral condition. Consequently, we instructed all confederates to sit in a relaxed (i.e., not stiff and upright) position in both the mimicking and nonmimicking conditions; the only difference was that in the mimicking condition the relaxed position happened to mirror the participant's position, whereas in the nonmimicking condition it did not.

smoothly (M = 6.76) than did those in the control condition (M = 6.02), $F(1, 70) = 4.08$, $p = .05$. Thus, the results support the hypothesis that mimicry increases liking and fosters smooth, harmonious interactions. Although previous, correlational research showed liking and rapport to be related to posture similarity, this is the first demonstration that mimicry causes greater liking and smoother interactions.

Confederates' behavior toward participants. It is important to consider an alternative explanation for these findings. Although we believe that mimicry by the confederate produced the greater liking and smoothness ratings by participants in that condition, relative to the no-mimicry condition, it is possible that some associated difference in the behavior of the confederates in the two conditions produced the effects. For obvious reasons, it was not possible to keep the confederates blind to the participant's assigned condition (mimicry vs. no-mimicry). Although confederates were kept blind to the specific hypothesis in the study, it remains possible that they unwittingly behaved differently toward the participants in the mimicry versus no-mimicry conditions; for example, they may have behaved in a more friendly manner toward those they mimicked or, more subtly, engaged in greater smiling or made more eye contact with them. If so, this would provide an alternative reason for the participants liking the confederates more in this condition—one having nothing to do with mimicry. Hence, we sought to determine whether there were any such differences in confederate behavior in the two conditions.

As described in the *Method* section, we videotaped a sample (n = 22) of the experimental sessions for precisely this reason—to collect evidence germane to this alternative explanation. These videotapes were then independently coded by two judges blind to the experimental hypothesis. For each interaction, the following behaviors were coded: (a) how much eye contact the confederate made with the participant, (b) how much the confederate smiled at the participant, (c) how friendly the confederate acted toward the participant, and (d) how much the confederate appeared to like the participant. All items were rated on a 6-point scale (1 = *low*, 6 = *high*). The reliability between the two judges for the four items combined was quite high, $r = .96$. (The interjudge correlations for each of the individual scale items ranged from $r = .72$ to $r = .91$.) Accordingly, ratings from the two coders were averaged to form a single index for each measure.

The means of each of the four ratings are presented in Table 1. No significant differences in eye contact, smiling, friendliness, or liking were observed between the experimental and control conditions (all $ps > .20$). In fact, three of the four measures were actually (but nonsignificantly) lower in the mimicking than the no-mimicking condition. It does not appear that confederates behaved differently toward the participants in the mimicry versus no-mimicry conditions, other than in the mimicry manipulation itself, and so we can more confidently attribute the observed differences in liking for the confederate and for the rated level of smoothness of the interaction to the effects of mimicry.[7]

Participants' awareness of having been mimicked. Participants were asked during the funneled debriefing whether they noticed anything in particular about the confederate's behavior or mannerisms and whether anything about the confederate's behavior made them feel awkward or uncomfortable. One participant reported that the confederate kept her head down and did not make eye contact with her. A 2nd participant reported that the confederate was crossing her legs (as was the participant), but she remarked that it "seemed normal and did not make me feel uncomfortable." Thus, only 1 out of 37 participants in the mimicking condition noticed that the confederate had a similar mannerism, but it was not interpreted by that participant as mimicry.

Table 1
Outside Judges' Ratings (1 = Low, 6 = High) of Confederate's Openness and Friendliness to Participant as a Function of Experimental Condition (Experiment 2)

	No mimicking		Mimicking	
Measure	*M*	*SD*	*M*	*SD*
Eye contact	1.63	0.52	1.41	0.49
Smiling	1.75	0.53	1.45	0.52
Friendliness	2.94	0.18	3.00	0.00
Liking participant	3.25	0.46	3.23	0.41

Discussion

After it was demonstrated in Experiment 1 that the perception–behavior link produced chameleon-like passive behavioral mimicry of interaction partners, we sought in Experiment 2 to assess the possible adaptive value of this effect. On the basis of past research linking mimicry to rapport, we hypothesized that the chameleon effect serves the adaptive function of fostering liking between people and creating smooth, harmonious interactions. It follows that if an individual's movements and postures are purposefully mirrored by an interaction partner, that individual should report that the interaction went more smoothly and that the partner was more likable compared with individuals whose movements were not mirrored. The results of Experiment 2 confirmed that, compared with control condition participants, those participants whose movements were mirrored by the confederate both experienced the interaction as having gone more smoothly and liked the confederate significantly more.

It should be noted that this link between mimicking and liking contradicts some previous findings. For instance, La France found that posture similarity and rapport were positively correlated when the interactants were acquainted with each other and involved in an ongoing interaction (La France, 1979, 1982; La France & Broadbent, 1976) but negatively correlated when the interactants were unacquainted (La France & Ickes, 1981; see Bernieri, 1988, for a similar finding). This latter finding implies that the relation between mimicry and rapport should hold only for people involved in

[7] Ideally, one would obtain the judges' blind ratings of the likeability of the confederates per se—that is, how likeable a person who is not being mimicked considers the confederate to be. Such a rating would correspond more directly to the liking ratings made by the participants. However, the same confederate interacted with many different participants—sometimes mimicking them and sometimes not. Thus, an overall likeability rating for a given confederate would necessarily include both mimicking and nonmimicking sessions. To avoid this problem and to obtain separate ratings for the mimicking versus nonmimicking conditions, we opted instead to have judges rate the confederates' likeableness toward each individual participant.

an ongoing interaction. The most crucial difference between the La France and Ickes study and ours is that in the former, participants were not interacting at all; rather, they were simply sitting in the same waiting room at the same time. Thus, the positive effects of chameleon-like mimicry for ease of interaction and liking may only accrue within the context of a social interaction and not between strangers who do not interact at all. To us, however, this is an inconsequential constraint that would not diminish the adaptive value of the chameleon effect as a kind of social glue that helps to bind interaction partners together.

Experiment 3: Individual Differences in Nonconscious Mimicry

Although we believe nonconscious behavior mimicry to be a pervasive and ubiquitous phenomenon, we also expect there to be individual differences in the extent to which an individual engages in such behavioral and posture mimicry. Certainly not everyone engages in the chameleon effect to the same degree as did Woody Allen's Zelig. What might determine whether one is more or less likely to nonconsciously mimic others? Surprisingly, no one has thus far posited any personality or individual difference variables as moderators of the chameleon effect, to our knowledge. In Experiment 3, we focused on one such potential moderator.

On the basis of the relation established in Experiment 2 between behavior mimicry on the one hand and liking and interaction smoothness on the other, one individual difference likely to be related to the chameleon effect is empathy. Theoretical distinctions have been made between various components of the empathic response, but research has distilled two major forms. The first is based on cognitive, intellectual reactions, such as the ability to take and understand the other person's perspective. The second is based on visceral, emotional reactions to the others' situation (see Davis, 1983).

We suggest that the cognitive facet of empathy (i.e., perspective taking) is more relevant to the chameleon effect, because, as was demonstrated in Experiment 1, the mechanism that produces the effect is the perception–behavior link. The cause of the chameleon effect is therefore a purely passive, cognitive mechanism that is not associated with or dependent on any particular affective or emotional state. Thus, the most likely candidate for an individual-difference moderator of the chameleon effect would be one concerned with differences in how much attention and thought are paid to one's interaction partners. In other words, a person will be more susceptible to the effects of perception on behavior if he or she engages in greater perceptual activity directed at the other person. Taking the perspective of others is a perceptual, cognitive process that is likely to lead to greater perception of an interaction partner, which in turn leads to more mimicking. Moreover, if it is, as we argue, the passive perception–behavior link that produces the chameleon effect and its consequent benefits for social interaction, then individual differences in the emotional or affective-based form of empathy should not be related to differences in the chameleon effect.

In harmony with this argument is Davis's (1983) finding that perspective taking but not empathic concern (the affective component of empathy) was consistently related to various measures of interpersonal functioning: "Perspective-taking ability should allow an individual to anticipate the behavior and reactions of others, therefore facilitating *smoother* [italics added] and more rewarding interpersonal relationships" (p. 115). Given that (a) we believe social functioning to be one of the adaptive consequences of the chameleon effect, and (b) in Experiment 2 it was demonstrated that mimicry led to smoother interactions, individual differences in perspective taking should be related to individual differences in the extent of the chameleon effect.

We note that many theorists, Mead (1934) and Piaget (1932) among them, have argued that possessing and using an ability to take another's perspective is responsible for much of human social capacity. Among other benefits, well-developed perspective-taking abilities help an individual gain more satisfying interpersonal relations. In a similar vein, Cialdini, Brown, Lewis, Luce, and Neuberg (1997) asserted that the merging of self with other is influenced by perspective taking. It is likely no coincidence that these consequences of frequent perspective taking parallel the consequences of behavioral mimicry we found in Experiment 2. That is, both behavioral mirroring and perspective taking lead to smoother interactions and greater liking. Perhaps, then, one of the reasons why those with a greater tendency to take the perspective of others have greater social functioning and compassion for others is because they engage in more behavioral mimicry; that was our prediction in Experiment 3.

Method

Participants. Fifty-five students in an introductory psychology course participated in this study in partial fulfillment of a course requirement. Three of these participants suspected that the confederate was part of the experimental setup, 1 had general suspicions regarding the study, and 1 was not videotaped because of equipment malfunction (again, none of the participants accurately guessed our hypothesis). Data from these 5 participants were excluded from further analysis. Thus, data from 50 participants remained in final analyses.

Apparatus and materials. The experiment room was the same as that used in Experiments 1 and 2. Four female assistants alternated serving as confederate and experimenter. Assistants were trained to continually shake their foot and rub their face throughout each interaction as the confederate.

The same color photographs from Experiments 1 and 2 were used. The same video camera setup was used as in Experiment 1, such that only the participants (and not the confederates) were visible through the camera lens.

To measure perspective taking, we used the perspective-taking subscale of Davis's (1980) Interpersonal Reactivity Index (IRI). The IRI also conveniently includes a subscale for empathic concern, which represents the emotional concern-for-others facet of empathy. Thus, administering the IRI allowed us to test our hypothesis that it is the cognitive, perspective-taking component of empathy and not the emotional, empathic-concern facet that moderates the perception–behavior link.

The perspective-taking subscale assesses the tendency to spontaneously adopt the psychological point of view of others. Sample items include "When I'm upset at someone, I usually try to 'put myself in his/her shoes' for a while," "I believe that there are two sides to every question and try to look at them both," and "I sometimes try to understand my friends better by imagining how things look from their perspective." The empathic concern subscale assesses "other-oriented" feelings of sympathy and concern for unfortunate others, and sample items include "I often have tender, concerned feeling for people less fortunate than me"; "I am often quite touched by things that I see happen"; and "Other people's misfortunes do not usually disturb me a great deal." All items are rated on a 5-point scale (A = *does not describe me well;* E = *describes me very well*). There are seven items on each subscale, some of which are reverse-coded. The alpha

coefficient for perspective taking is .71 for men and .75 for women; for empathic concern, the alpha is .68 for men and .73 for women.

Procedure. Each participant completed the experiment individually. The confederate was always sitting in the waiting area before the participant arrived. The experimenter brought them both into the laboratory room, seating them in the two chairs reserved for them.

The procedure was essentially the same photograph-description task used in Experiments 1 and 2. The major change was that the confederate engaged in two different mannerisms throughout the interaction: rubbing her face and shaking her foot. As in Experiment 2, the confederate avoided eye contact with the participant whenever possible and maintained a neutral facial expression.

As soon as the participant and confederate completed the photograph descriptions, the experimenter asked if they would mind completing a questionnaire that another psychologist in the department was planning to use in a future experiment. All participants agreed to fill out the questionnaire (the IRI). The experimenter explained that because it was necessary to complete the scale independently, they would be separated from each other at this time and seated in separate rooms. The experimenter chose the confederate to complete the survey in an adjoining room and escorted her there. Then the experimenter returned to the laboratory room, gave the participant the IRI scale, and told him or her to come to the hallway outside when the questionnaire was completed. At that point, the experimenter queried the participant as to any suspicions that (a) the other participant was in fact a confederate or (b) the purpose of the experiment was anything other than what the cover story indicated. Next, the purpose and hypotheses of the study were divulged to the participant. The participant was asked to sign a video consent form. Finally, the participant was thanked for his or her participation.

Results

Interjudge reliability. Videotapes were coded by a judge for the number of times participants rubbed their face and shook their foot. Approximately half (23) of the videotapes were then coded by a second judge. Reliability between the two judges was very high: for the number of times participants rubbed their face, $r = .97$, and for the number of times they shook their foot, $r = .82$, both significant at $p < .001$. Ratings between the two judges were averaged to form a single rating for face rubbing and foot shaking. Ratings were then divided by the time duration of the interaction (to the nearest second) to arrive at a rate for behavior per minute.

Perspective taking. To test the hypothesis that individuals who are high perspective-takers nonconsciously mimic others to a greater extent, we categorized participants into those who scored high and those who scored low on perspective taking. We computed the median on the perspective-taking subscale of the IRI (median = 19) and classified those participants above the median ($n = 28$) into the *high-perspective-taking* category and those below it ($n = 22$) into the *low-perspective-taking* category.

A repeated measures ANOVA was performed with number of times participants rubbed their face and number of times participants shook their foot as a within-subject variable and perspective taking (high vs. low) as a between-subjects variable. Gender was included as an additional between-subjects variable in this and all subsequent analyses, but no significant main effect for gender or interaction between gender and perspective taking was revealed. Thus, the gender variable is not discussed further. As predicted, however, there was a significant main effect of perspective taking across the two types of mimicking, $F(1, 48) = 3.85$, $p = .05$. This main effect was not moderated by an interaction with type of behavior (face rubbing vs. foot shaking), $p > .20$. Specifically, high-perspective takers rubbed their face ($M = 1.30$) and shook their foot ($M = 0.40$) more times per minute than did low-perspective takers (Ms = 0.85 and 0.29, respectively). These results support our hypothesis that those individuals who have a greater tendency to take the perspective of others also are more likely to engage in behavioral mimicry.

Empathic concern. To test our hypothesis that the emotional facet of empathy would not moderate the chameleon effect, we also performed a median split on the Empathic Concern subscale scores (median = 21). Participants with scores above the median ($n = 28$) were classified into the *high-empathic-concern* category, and those with scores below it ($n = 22$) were placed in the *low-empathic-concern* category.

A repeated measures ANOVA was performed with number of times participants rubbed their face and number of times participants shook their foot as a within-subject variable and empathic concern (high vs. low) as a between-subjects variable. As predicted, there was no main effect of empathic concern across the two types of mimicking, $F < 1$, nor was there an interaction between empathic concern and type of behavior (face rubbing vs. foot shaking), $F < 1$. In fact, the means showed a slight trend for there to be more mimicry of foot shaking and face rubbing among those low in empathic concern than those high on this subscale.

Discussion

Our third goal in this research was to test a personality variable that may moderate the extent to which one engages in behavior mimicry. Because of the link among perspective taking and social skills, empathy with others, and compassion for others, individuals who often take the perspective of others are more likely to have positive, smooth interactions. High-perspective takers may be the ones who are better at nonconsciously guiding social interactions and automatically doing the things that ensure smooth and easy interactions. Part of this may entail mimicking the behavioral mannerisms of interaction partners.

In Experiment 3, we tested whether those who take the perspective of others have more strongly developed this covert mechanism for attaining smooth, positive interactions. Specifically, we predicted that high-perspective takers would be more likely to mimic the mannerisms of another person. We also predicted that the emotional facet of empathy (operationalized as the Empathic Concern subscale of the IRI) would not similarly moderate the cognitive perception–behavior link. As predicted, high-perspective takers mimicked the mannerisms of a confederate more so than did low-perspective takers, and, also as predicted, participants who scored low and participants who scored high on empathic concern did not significantly differ in the extent to which they mimicked the confederate. This supports our prediction that chronic differences in perspective taking would be related to chronic differences in nonconscious mimicking tendencies.

General Discussion

We have argued that the perception–behavior link, through which merely perceiving an action performed by another can lead one to perform that action, is the mechanism behind the often observed behavior mimicry and consequent empathic understanding within social interactions. In Experiment 1, we tested the

existence of the chameleon effect in an experimental demonstration that supported the perception–behavior link as its proximal cause: Changes in a confederate's behavior caused changes in the participant's behavior, in the absence of the participant's awareness of this influence. Experiment 2 provided an explicit test of the commonly held belief that nonconscious mimicry serves the adaptive function of facilitating smooth interactions and fostering liking. In line with this prediction is the finding that individuals whose postures and movements were mirrored by a confederate liked that partner more and thought the interaction went more smoothly compared with those whose behaviors were not mirrored, again without being aware of the true source of this increased empathic understanding and liking. Finally, in Experiment 3, we tested perspective taking as a individual difference that moderates the extent to which one engages in behavior mimicry. As hypothesized, those who frequently take the perspective of interaction partners mimicked the mannerisms of a confederate to a greater extent than did those who less often take the perspective of others, as would be expected if social–perceptual activity mediated the effect.

The present experiments go beyond other recent perception–behavior studies in showing, for the first time, automatic behavioral effects mediated by actual, in-person perception of the partner's behavior (as opposed to priming manipulations that could have influenced behavior directly). They also represent an advance over existing mimicry–empathy research by providing an experimental instead of a correlational demonstration of the effect, by ruling out the need for a purposive interaction goal in order for the effect to occur, and by providing for the first time a mechanism for the effect (viz., the perception–behavior link). Finally, the present investigation shows that two formerly separate effects, previously studied in isolation from one another, are actually outcomes of the same underlying process.

Our conclusion that the effect of perception on behavior is an automatic process that does not depend on conscious choice is consistent with recent neuropsychological findings as well. One telling piece of evidence is the fact that the frequency of direct effects of perception on action is increased in pathological states in which strategic conscious control over behavior is impaired or nonexistent (Prinz, 1990, p. 176). Such "echo-reactions" as the unintentional repetition of the words used by another (*echolalia*) or unintentional imitation of another's actions (*echopraxia*) are commonly observed in patients with aphasia, apraxia, mental retardation, and brain damage whose ability to consciously and intentionally self-regulate is severely impaired. Thus, in the absence of intentional forms of action control, the perception–behavior link remains intact, arguing against the role of conscious choice as a mediator.

Our conclusion is also in harmony with Hilgard's (1965) account of hypnotic suggestion. According to Hilgard, the directives given by the hypnotist are first perceived by the person being hypnotized, and then, because of the suspension of the will that is characteristic of the hypnotic state, passive effects of perception on action are left free to operate. In other words, the suggestions made by the hypnotist have a direct automatic effect on behavior because of the abdication of conscious control by the hypnotized person; in other words, it is an instance of James's (1890) ideomotor action effect in which the ideation is externally induced by the hypnotist (see also Wegner & Wheatley, 1999).

Preconscious Automatic Processes as Adaptive and Beneficial

The perception–behavior link is one of several routes through which the environment can influence behavior without one's awareness, intent, or control. With this particular route, perceptual activity nonconsciously spreads to behavioral representations, increasing the likelihood of behaving similarly to others in the current environment. There has also been research on automatic routes from environment to behavior via the nonconscious activation of motivations and goals (see Bargh, 1990, 1997; Bargh & Gollwitzer, 1994; Chartrand & Bargh, 1996) and via nonconscious evaluation of environmental stimuli (see Bargh, Chaiken, et al., 1996; Chen & Bargh, 1999). Uncovering the adaptive purpose of the perception–behavior link is in harmony with a recent trend in social automaticity research of identifying the adaptive purposes of these various preconscious determinants of behavior; at the same time, it stands in contrast with those theorists who hold that such nonconscious effects are uniformly negative and maladaptive (e.g., Bandura, 1986; Langer, 1989, 1997; Locke & Latham, 1990; Mischel, Cantor, & Feldman, 1996).

For instance, a person's chronic goals within a situation become linked in memory to the representation of that situation, such that entering that environment automatically causes that goal to become active and to operate without the individual's awareness of its activation or guiding role in subsequent behavior (Bargh, 1990; Chartrand & Bargh, 1996). This nonconscious reaction has been conceptualized as an adaptive mechanism because it reflects the individual's history of goal choice within the situation and increases the probability of goal pursuit. It also eliminates the need to consciously choose the goal on each occasion, when attention and thought may be on other matters at the time. Positive, self-actualizing goals, such as achievement, and positive aspects of motivational states, such as persistence and overcoming obstacles to attain the desired goal, have all been shown to occur with nonconscious goal activation and pursuit just as they do with conscious goal pursuit (Bargh & Chartrand, 1999; Bargh, Gollwitzer, Lee Chai, & Barndollar, 1998).

Automatic evaluation research has documented the pervasive tendency for people to classify all environmental stimuli as either positive or negative. This process, too, has been shown to produce adaptive consequences. For one thing, it alerts us to what is beneficial and helpful and what is dangerous in our environment when conscious attention and thought are elsewhere, and it signals the valence of the current environment by automatically affecting the individual's mood (Chartrand & Bargh, 1999). Moreover, approach and avoidance behavioral tendencies are put into motion immediately by positive instead of negative automatic evaluations (Chen & Bargh, 1999), readying the individual to react in an appropriate manner, yet through an entirely nonconscious mechanism.

In the present research we have continued this trend by focusing on the adaptive function of the chameleon effect. Nonconscious behavior mimicry was found to increase liking for the partner and the reported smoothness of the interactions, and individuals who often take the perspective of others engage in it more than do other people.

It should be acknowledged that previous demonstrations of the perception–behavior link did not produce such positive social

effects. For instance, in the original Bargh, Chen, et al. (1996) studies, individuals engaged in stereotype-consistent behavior (e.g., hostility) following automatic activation of that stereotype (e.g., for African Americans). Subsequent research has found that such nonconsciously produced stereotype-consistent behavior can produce a self-fulfilling prophecy (Chen & Bargh, 1997), in that one's interaction partner reacts to one's behavior in kind, yet one is not aware of the effect of one's own behavior in causing that stereotype-confirming behavioral response.

That the stereotype version of the perception–behavior effect can produce negative outcomes should come as no surprise, because stereotype effects on perception and judgment are also largely negative. But stereotypes are categories gone awry—they take the perceiver beyond the information actually present in the other person's behavior. This does not mean that categories per se are maladaptive or problematic; to the contrary, they are absolutely essential for normal, moment-to-moment functioning, to simplify the world, to give it meaning, and to furnish anticipations about what is likely to happen next (e.g., Barsalou, 1992; Smith & Medin, 1981). It follows that the typical form of the chameleon effect—behavior tendencies generated nonconsciously from the perceived behavior of one's interaction partner—is, unlike the stereotype version, largely adaptive and of high social utility. This is what we sought to demonstrate in Experiments 2 and 3. The usual form of the chameleon effect, we assert, is to enhance the positivity of social interactions.

Individual Differences in Nonconscious Mimicry

In Experiment 3, we focused on one personality variable that moderated the chameleon effect; however, we do not mean to suggest that no other moderators exist. Further research may well uncover additional individual difference variables that can increase or decrease the extent to which individuals nonconsciously mimic those around them. One such possibility is the *communal/exchange orientation* dimension proposed by Clark and colleagues (Clark & Mills, 1979; Clark, Mills, & Powell, 1986). Individuals with a *communal* orientation towards others might exhibit more nonconscious mimicry than those with an *exchange* orientation, because communally oriented people are, by definition, more perceptually attuned to the needs of others. Moreover, by the same logic, there may be greater frequency of chameleon-like social behavior in collectivistic versus individualistic societies, because the former more than the latter are characterized by interdependence (e.g., Markus & Kitayama, 1991). Therefore, collectivistic cultures are likely to be characterized by a relatively intensified attentional and perceptual focus by individuals on the behavior of others, and in light of the present experimental findings, this increased perception of others' behavior would be expected to produce greater rapport and smoother social interactions.

Implications for Group Processes

At the level of the social group, then, to the extent that members are mimicking each others' facial expressions, postures, mannerisms, and other behaviors, there is likely to be greater cohesion and liking within the group. In Experiment 1, we found that mimicry occurred even in the most minimal circumstances in which the interactants were unacquainted and had no goal to affiliate; thus, it may be that newly formed groups would benefit from nonconscious mimicry and imitation as well as would established groups. We suspect that the chameleon effect contributes to effective behavior coordination among members of a group. The synchrony and immediacy of such behavior coordination in moving schools of fish or flocks of birds, for example, are the result of an automatic, direct effect of perception on behavior (Breder, 1976; Pitcher, 1979; Reynolds, 1987, 1993)—one that clearly does not require conscious choice or reflection to operate. Moreover, the positive effects of empathy, liking, and bonding that occur automatically because of the chameleon effect would likely benefit most newly formed groups in which relationships among the members do not yet exist or are fragile—it would also tend to shape initial feelings among group members in a positive direction.

Such speculations aside, the chameleon effect is clearly a basic and important social psychological phenomenon, one to which all can relate on a personal level. It is our hope that research will continue to elucidate the conditions under which the effect is augmented or diminished. Extending the paradigms into more complex and dynamic group settings seems to us to be an important next step to this end. It seems unlikely to us that such pervasive, nonconscious effects on social behavior as the chameleon effect arose by accident, and such effects are more likely than not to have positive, desirable effects for the individual and for the groups to which he or she belongs.

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