

## AUTOMATIC EFFECTS OF ANTHROPOMORPHIZED OBJECTS ON BEHAVIOR

Tanya L. Chartrand  
*Duke University*

Gráinne M. Fitzsimons  
*Waterloo University*

Gavan J. Fitzsimons  
*Duke University*

Behavior can be automatically affected by the perception of other people, be they significant others or members of social groups (e.g., Bargh, Chen, & Burrows, 1996; Chartrand & Bargh, 1999; Fitzsimons & Bargh, 2003). The current research uses these findings as a basis for investigation of the psychological construct of anthropomorphism. Two studies explore whether subtle exposure to anthropomorphized objects such as domestic animals (e.g., dogs and cats) can activate associated concepts and automatically influence behavior. The findings suggest that even incidental exposure to animals associated with human characteristics influences behavior in an automatic fashion, such that people “match” the personality attributed to the nonhuman entity. This provides initial evidence for the role of anthropomorphism in guiding social behavior.

Virtually ignored in social psychological research, the anthropomorphism of common objects is nonetheless a widely acknowledged and ubiquitous process in social life. Anthropomorphism, or the tendency to attribute human motivation, characteristics, or behavior to nonhuman entities (Pickett et al., 2000), reflects and shapes *per-*

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Correspondence concerning this article should be addressed to Tanya Chartrand, Duke University, Box 90120, 134 Towerview Drive, Durham, NC, 27708. E-mail: tanya.chartrand@duke.edu, grainne@watarts.uwaterloo.ca, or gavan@duke.edu.

*ceptions* and *beliefs* about the nonhuman world. This paper examines the role anthropomorphism may also play in shaping *behavior* within the (human) social world. Specifically, we present an initial examination of the psychological usefulness of the anthropomorphism construct, using this construct to identify additional mechanisms by which objects influence behavior in nonconscious ways. If people perceive nonhuman objects to possess human characteristics, exposure to these objects may elicit important automatic effects on behavior, just as does exposure to (i.e., perception of) humans (e.g., Aarts, Hassin, & Gollwitzer, 2004; Baldwin, Carrell, & Lopez, 1990; Bargh et al., 1996; Chartrand & Bargh, 1996; Dijksterhuis & van Knippenberg, 2000; Fitzsimons & Bargh, 2003; Shah, 2003).

Many different types of nonhuman entities—animals, inanimate objects, and natural phenomena—are recipients of anthropomorphic attributions (Pickett et al., 2000). As one example, domestic pets are often described as being anthropomorphic in nature: People give pets human names, and ascribe personality traits and other human characteristics to both individual pets (e.g., my cat has a lot of neuroses, but my dog just wants to have a good time) as well as species of pets (e.g., cats are moody, dogs are friendly, rabbits are timid). Speaking to the ubiquity of this tendency, a recent survey of dog owners by the American Kennel Club found that almost 90 percent of women would like to see at least one quality of their dog in their significant other, and a full 34% agreed that “If my dog was a man, he’d be my boyfriend” (ABCNews, Feb. 2, 2006). Beyond pets and other kinds of animals, even inanimate objects such as computers, cars, and toys, are sometimes described as possessing humanlike traits, needs, desires, motives, and beliefs.

## THE CONNECTION BETWEEN BEHAVIORAL PRIMING AND ANTHROPOMORPHISM

The present research seeks to determine whether nonhuman objects have in fact achieved “anthropomorphic” status by becoming automatically associated with specific humanlike characteristics in memory, and to investigate what role anthropomorphism may play in shaping social behavior. To do so, the current article extends research on the automatic behavioral effects of exposure to other people (see Andersen & Chen, 2002) to the domain of anthropomorphized objects.

It is our contention that the research on behavioral priming can be used to better understand how anthropomorphized entities such as pets are mentally represented, and how they can affect our behavior in ways outside of conscious awareness, intent, or control. In particular, by examining the effects of priming people with pets, we can determine whether these animals are automatically associated with a set of specific human characteristics.

An abundance of research in recent years has used behavioral priming techniques to explore how perceiving other people, be they significant others or members of social groups, can automatically influence behavior (e.g., Baldwin et al., 1990; Bargh et al., 1996; Chartrand & Bargh, 1999; Devine, 1989; Dijksterhuis & Bargh, 2001; Dijksterhuis & van Knippenberg, 1998; Fitzsimons & Bargh, 2003; Shah, 2003). Perceiving people can activate a set of automatic processes, both perceptual and motivational, that guide behavior (see Wheeler & Petty, 2001).

Research has compellingly demonstrated that priming members of known social groups or categories can guide behavior automatically. For example, people who are primed with professors outperform those primed with soccer hooligans in a

game of Trivial Pursuit (Dijksterhuis & van Knippenberg, 1998), and people primed with the elderly walk slower down a hall (Bargh et al., 1996) and display poorer memory (Dijksterhuis, Bargh, & Miedema, 2000). A common explanation of such findings is that traits associated with or embedded in the representation of a person category (i.e., a stereotype) become automatically activated and guide behavior through an ideomotor process referred to as the perception–behavior link (see Dijksterhuis & Bargh, 2001; cf. Wheeler & Petty, 2001). For example, people’s mental representation of the elderly is linked to the trait “slow,” so that when elderly people are encountered (or more often, when the elderly stereotype is primed in the lab), the trait of “slow” is activated, causing people to behave in a trait consistent fashion (walk more slowly themselves). Actual social perception has automatic behavioral effects as well. For instance, merely seeing someone engage in specific mannerisms is enough to make the perceiver engage in those same mannerisms (Chartrand & Bargh, 1999).

When a representation of a significant other is activated (through a priming procedure or by actually perceiving them), perceivers can also be affected in a nonconscious fashion (Andersen, Glassman, & Gold, 1998; Andersen, Reznik, & Manzella, 1996; Baldwin & Holmes, 1987; Baldwin et al., 1990; Mikulincer & Arad, 1999; Mikulincer & Shaver, 2001). For example, after being subliminally exposed to photographs of their disapproving department chair, graduate students evaluated their own research ideas less favorably (Baldwin et al., 1990), indicating that people’s self perceptions can be shaped in a nonconscious fashion by the psychological presence of another person.

Recent research has also demonstrated *motivational* effects of significant other priming. This research extends past work showing that goals can be automatically activated and pursued (Bargh, Gollwitzer, Lee–Chai, Barndollar, & Trötschel, 2001; Chartrand & Bargh, 1996) by identifying an important naturalistic trigger of these nonconscious goals: significant others. Aarts et al. (2004) found that reading about a person engaging in goal-directed behavior was enough to trigger that goal in the reader. Following up on this, Leander, Shah, and Chartrand (2008) found that the type of relationship one has with the person engaging in the goal-directed behavior can moderate these goal contagion effects, sometimes eliminating them (e.g., if the person feels threatened by the behavior of the other). In another stream of research, when representations of significant others were activated, people were more likely to approach a person who resembled a positive significant other and to avoid a person who resembled a negative significant other (Andersen et al., 1996). In addition, thinking of or being primed with a significant other can lead people to behave in line with the goals they commonly pursue with that person (Fitzsimons & Bargh, 2003), with the goals the other person has for them (Shah, 2003), or with the goal directly opposing the goal that person has for them (if they’re highly reactant, see Chartrand, Dalton, & Fitzsimons, 2007). For example, students who were primed with their mother outperformed control participants on an achievement task, but only if they previously reported wanting to impress their mother by achieving academically (Fitzsimons & Bargh, 2003).

Thus, a variety of complex behaviors can automatically result from the perception of other people, and these behaviors can be guided by various motivational and perceptual processes. If anthropomorphized objects are perceived as truly possessing the qualities and characteristics of human personality, promise exists for our

contention that such a complex set of behavioral reactions may occur when people perceive an anthropomorphized entity.

## THE CURRENT RESEARCH

People are exposed to and interact with anthropomorphized objects frequently, and yet little is known about how social behavior may be influenced or shaped by them. To find evidence for the role of anthropomorphism in social behavior, the present set of studies examined whether exposure to domestic pets elicits automatic behavioral effects. The first study investigated whether traits associated with specific animal species would guide behavior after exposure to images of these animals. In this study, participants were primed with images of cats and dogs and their loyalty behavior was measured. We predicted that dog-primed participants would behave more loyally, in line with the perception of dogs as being loyal animals. The second study sought to replicate these findings, rule out alternative explanations, and test the direction of the effect.

## EXPERIMENT 1

Dogs come when you call them. Cats take a message and get back to you.

—*Mary Bly*

He's loyal, irresistibly sweet and always up for snuggling. Is it any wonder that many women would date their dogs?

—*ABCNews, Feb. 2, 2006*

As echoed in the two sayings above, dogs are commonly perceived to be much more loyal animals than are cats. Pilot testing (discussed below) confirmed this: dogs (but not cats) were perceived as loyal in nature. We note that there is some debate as to whether certain personality traits can be legitimately ascribed to animals, with some arguing that humans are merely projecting their own characteristics onto the animals (Best, 1963; Guthrie, 1993; Mitchell & Hamm, 1997; Watts, 2006) and others arguing that inferences of animal "personality" accurately reflect temperamental characteristics of the animals (Gosling, 2001; Gosling & John, 1999; Gosling, Kwan, & John, 2003). For our purposes, we shall label the belief that dogs are loyal as anthropomorphism, setting aside the issue of its accuracy for now (but see General Discussion). From our perspective, it is the association in people's minds between animals and the personality traits that should lead to the automatic behavior.

Using this difference between the personality traits ascribed to cats and dogs, Experiment 1 formed the first test of our hypothesis that exposure to anthropomorphized objects may guide behavior according to the perceived "personality" of the object. Participants viewed images of commonly encountered nonhuman objects, namely domestic cats and dogs. If the anthropomorphic representation of these two animals includes their personality traits, participants presented with images of dogs should behave more loyally than should participants presented with images of cats or neutral images.

## PILOT TESTING

### METHOD

Fourteen participants completed this questionnaire before participating in an unrelated experiment for fulfillment of a course requirement. Half of the participants answered questions about cats, and the other half answered questions about dogs. Participants were first asked to generate personality traits they felt that cats/dogs possessed. Upon finishing this task, participants were given a list of traits, and asked to rate the extent to which they perceived cats/dogs to possess each of these traits (on a 1–9 scale, where 1 = *not at all*, and 9 = *extremely*). The list included the trait word “loyal.”

### RESULTS

Five of 7 participants in the dog condition spontaneously reported the trait “loyal” for dogs, and 0 of 7 participants in the cat condition reported “loyal” for cats. A chi-square test indicated that this difference was significant,  $\chi^2(1, N = 14) = 7.78, p < .01$ . The results of the rating scale similarly supported our hypothesis: As indicated by a significant t-test,  $t(12) = -4.96, p < .001$ , participants rated dogs as much higher in loyalty ( $M = 9, SD = 0$ ) than cats ( $M = 4.43, SD = 2.44$ ). Thus, pilot testing demonstrated that dogs are reported as being more loyal than are cats.

### METHOD

#### Participants

Twenty-eight undergraduate students participated for partial fulfillment of a course requirement. Participants were randomly assigned to experimental condition, with 14 in the cat-prime condition and 14 in the dog-prime condition.

#### Materials and Procedure

Participants met the experimenter in a designated lab room. The experimenter asserted that she was pilot-testing materials to be used in a later experiment, and asked participants to give her comments and suggestions on the materials at the end of the experiment. Participants then began the first task, which was described as a “spatial-temporal ordering task,” and asked participants to place sets of three photos in the order they thought the events in the photos likely occurred, by writing a number from 1-3 under the photo. Instructions indicated that the purpose of pilot-testing this task was to determine if these materials were at the appropriate difficulty level. Participants were told that the order of the photos was designed to be unclear, and if any sets were too easy to order, participants should indicate that by placing an asterisk next to the photos.

The ordering task served as a supraliminal priming task, designed to activate the mental representation of cats or dogs. In each conditions, four of the seven sets of photos featured cats (or dogs); the other three sets of photos featured digital clocks, Big Ben, and the Eiffel Tower.

After participants completed the ordering task, the experimenter gave them the second task, which was described as an “interpersonal reactions questionnaire.” Participants were provided with a questionnaire that asked about a same-sex friend. Written instructions asked participants to read scenarios about interpersonal situations, and then rate the degree to which they agreed with statements about what they would do in each of the situations. This questionnaire was designed to assess the loyalty of participants’ responses to imagined transgressions by their friends; it was loosely based upon Rusbult and colleagues’ methods (e.g., Rusbult, 1993; Finkel, Rusbult, Kumashiro, & Hannon, 2002) but was created for this experiment. Four scenarios were provided in a counter-balanced order, and for each scenario, participants were asked to rate agreement with four statements about how loyally they would respond in that situation, e.g., “I would stick by my friend no matter what; I would wait for things to get better; I would probably spend less time with her (reverse-coded); I would end my friendship with her (reverse-coded).”

After completion of this questionnaire, participants completed a “funneled debriefing” questionnaire (see Bargh & Chartrand, 2000), which asked them: (a) what they believed had been the purpose of the study, (b) whether they thought any of the tasks were related, and if so, how they were related, and (c) if the ordering task influenced their responses to the interpersonal reactions questionnaire, and if so, how they felt their responses had been affected. When all participants had completed the debriefing questionnaire, the purpose and nature of the experiment was explained fully. Students were then given written debriefing forms and thanked for their participation.

## RESULTS AND DISCUSSION

### Main Analyses

The 16 items measuring loyalty (4 statements per scenario) achieved high reliability ( $\alpha = .81$ ); thus, the mean of the 16 items was computed as the overall loyalty score. A one-way ANOVA of Priming Condition (cat, dog) was performed on this overall loyalty score.

As predicted, a significant main effect of Priming Condition on loyalty responses was obtained,  $F(1, 26) = 7.39, p = .01$ . Participants in the dog-prime condition responded more loyally ( $M = 7.04$ ) than did those in the cat-prime condition ( $M = 6.17$ ).

Dogs are perceived (by most members of American culture) to possess the personality trait of loyalty, while other domestic pets—such as cats—are not similarly seen as loyal. Taking advantage of this dissimilarity between the perceptions of two relatively similar objects, this study was designed to determine whether exposure to anthropomorphized objects can guide and shape social behavior in a predictable fashion.

Indeed, the results of this study provide preliminary support for our hypothesis that exposure to anthropomorphized objects can elicit automatic behavioral responses. Participants supraliminally exposed to images of dogs responded more loyally to their friends’ hypothetical transgressions than did participants supraliminally exposed to images of cats. This finding suggests that simply perceiving an anthropomorphized object causes the psychological characteristics ascribed

to said object to become activated and guide behavior in a nonconscious fashion. Previous studies have shown that perceiving members of social groups can activate corresponding stereotyped traits and guide behavior (e.g., Bargh et al., 1996; Dijksterhuis & van Knippenberg, 1998). The current findings extend these results to the domain of anthropomorphized objects, with animal species eliciting similar automatic effects as do social categories like people. Importantly, these findings indicate that perceptions of nonhuman objects are associated with humanlike characteristics, and as such, they affect perceivers' behavior in the same fashion as do significant others and members of social groups.

## EXPERIMENT 2

A second study was conducted to replicate the basic finding of the first. Moreover, we added a control condition to explore what was driving the effect. That is, dog-primed participants were found to be more loyal than cat-primed participants in Experiment 1, but was all the action among dog-primed participants? One might speculate that this should be the case; after all, it is dogs that are presumably linked to loyalty in most people's minds. And many cat lovers would assert that cats are in fact loyal once an owner has earned that loyalty.

However, perhaps cats are stereotyped as being *not* loyal (especially if automatically compared to dogs). Line (1999) argues that the loyalty of cats, once the mother has brought up her kittens, is to themselves. These views appear to have made it into the popular culture, and into definitions of these words themselves. For instance, common dictionary definitions related to cats often include quite negative definitions, many of which have nonloyal undertones. For example, both Merriam-Webster and dictionary.com include the word "treacherous" in their definitions of feline, and Merriam-Webster includes "a malicious woman" while dictionary.com includes "a woman given to spiteful or malicious gossip" (one manifestation of disloyalty) in each of their definitions of cat. If these stereotypes hold, then it is possible that being primed with cats will automatically lead people to be *less* loyal than a control group. If so, it would suggest that mental representations of anthropomorphized objects not only have links to traits, but may also have links to traits they are presumed to *not* have. We sought to test this idea in Experiment 2.

## METHOD

### Participants

One hundred and twenty one undergraduate participants (74 females) completed materials for this study as part of a mass-testing session. Gender did not produce any main effects or interactions, and was thus dropped from all analyses.

### Materials and Procedure

Participants completed two tasks as part of an hour-long set of tasks. Participants believed the two tasks were separate and unrelated to each other. In the first task, participants were asked to read a short passage about a veterinary student and the topics she was currently studying at veterinary school. They were told they would subsequently be asked to recall details from the passage. The passage provided fic-

tional statistical information about a domestic pet, such as the approximate lifespan and effects of common behaviors on the lifespan, such as spending time outdoors and wearing an identification tag. All this information was held constant across the three priming conditions. The only manipulation was whether the student was studying for an exam about canaries, cats, or dogs. As an example, one line read: "Dogs/cats/canaries who have regular veterinary visits live an average of four years longer than those who do not." After reading the passage, participants were asked to recall one fact about the domestic animal from the passage. Participants were also asked to indicate, ostensibly for purposes of controlling the effects of personal attitudes and expertise on memory, to put a check mark next to one of three statements asking about their relative preference for cats, dogs, and birds. Those statements read: "I prefer dogs to cats and birds; I prefer cats to dogs and birds; I prefer birds to dogs and cats."

In the second task, participants completed a five-item loyalty questionnaire that consisted of shortened versions of the scenarios from Study 1. Participants were asked to indicate, on a 1–9 scale, whether they would engage in the behaviors mentioned, which were designed to be prototypical loyal behaviors, such as defending a friend when others are gossiping about him/her, and standing by a friend going through a difficult relationship break-up.

## RESULTS AND DISCUSSION

### Preliminary Analyses

The five-item loyalty questionnaire ( $\alpha = .74$ ) had a mean response of 6.61 and a standard deviation of 1.47.

### Primary Analyses

A one-way ANOVA was performed on the loyalty data, producing a significant main effect of Priming Condition,  $F(2, 118) = 8.10, p < .001$ . As predicted, dog-primed participants responded more loyally ( $M = 7.2$ ) than did cat-primed ( $M = 5.94; F(1, 76) = 17.43, p < .001$ ) or canary-primed ( $M = 6.61; F(1, 83) = 3.97, p = .05$ ) participants. Cat-primed participants responded significantly less loyally than canary-primed participants,  $F(1, 77) = 4.17, p < .05$ . Whether participants self-identified as a dog person, cat person, or bird person did not have an effect on loyalty scores, nor did it interact with Priming Condition.

Thus, Experiment 2 provides additional support for our hypothesis that anthropomorphized objects can automatically influence behavior in a trait-consistent fashion. Dog-primed participants were more loyal than cat-primed participants. Interestingly, identifying as the type of person who likes one animal more than the others did not moderate the effect. One might have predicted that being primed with dogs should lead to automatic loyal behavior especially for those who are either *familiar* with dogs (more aware of the presumed link between dogs and loyalty) or who *like* dogs (and therefore are more convinced of the positive association between dogs and loyalty). The current result that dogs prime loyalty equally for those who are dog people, cat people, and bird people rules out alternative explanations based on familiarity with dogs or liking for dogs. Thus, the association between loyalty and dogs appears to be a universally held cultural belief.

Importantly, this study also had a control condition which allowed us to test what exactly was driving the effect. Not only did dogs activate the concept of loyalty in participants, causing them to behave more loyally than the cat primed or control primed group, but cats activated the concept of "not loyal," causing cat-primed participants to be less loyal themselves than those primed with canaries (an animal not related to loyalty). Thus, anthropomorphized objects as mental representations have links not only to traits that they exemplify, but also to traits that they notably do not. How exactly this "negative link" is represented remains for future research.

## GENERAL DISCUSSION

To find evidence for the role that anthropomorphism may play in social behavior, the present research investigated how exposure to anthropomorphized objects such as domestic pets may elicit automatic behavioral responses. Across two studies, participants responded to anthropomorphized objects (cats, dogs) by behaving in line with the personality commonly ascribed to the entities, and did so with no conscious awareness that their behavior was influenced by perceiving these entities.

## IMPLICATIONS FOR THE CONSTRUCT OF ANTHROPOMORPHISM

First, these findings contribute to the understanding of how anthropomorphized objects such as pets are mentally represented, providing initial evidence that non-human entities such as house pets are automatically associated with a set of specific human characteristics. Recent research has used behavioral priming techniques to provide evidence that representations of significant others contain the traits, goals, values, etc., of those significant others (e.g., Baldwin et al., 1990; Shah, 2003). In a similar vein, the current research used the tools of behavioral priming to demonstrate that representations of nonhuman objects like pets are associated with distinct human personality characteristics. That is, just as priming with significant others leads to behavior that matches the other's characteristics (Baldwin & Holmes, 1987; Baldwin et al., 1990; Shah, 2003), so does priming anthropomorphized objects lead to behavior that matches that object's humanlike characteristics. Because priming participants with dogs led to automatic increases in loyal behavior, we can assume that the mental representation of dogs is associated with the trait "loyalty." Thus, these findings provide initial support for our contention that anthropomorphized objects are represented as complex social stimuli, with automatic associations to a variety of distinct and unique personality characteristics.

As mentioned earlier, there is some debate as to whether assigning personality traits to animals constitutes anthropomorphism. Although traditional views of anthropomorphism, defined as attributing human characteristics to non-human animals and objects, would include such behavior in its definition (Mitchell & Hamm, 1997), Gosling and colleagues have recently argued that animals in fact possess reliable and stable temperamental "personality" characteristics, and that using certain traits to describe animals should not be considered anthropomorphism. For example, Gosling et al. (2003) found that personality judgments of dogs were as accurate as judgments of humans, and conclude that "personality differences do exist and

can be measured in animals other than humans" (p. 1161). If one takes this view, then it might not be as surprising that social behavior in the current studies was automatically shaped by the animal primes. However, those holding a more traditional view of anthropomorphism might find it a bigger leap that non-human animals can affect us and change our social behavior in the same way that our significant others do. In any case, there is now evidence that the associations people hold between animals and their perceived personality traits do affect our subsequent behavior in nonconscious, unintended ways.

To strengthen our argument that anthropomorphized objects can elicit these kinds of automatic effects on behavior, it would be fruitful in future research to extend our investigation beyond the domain of domestic animals, which may be perceived as particularly similar to humans. Domestic pets are living creatures, and often included as members of families, so they may be more likely to elicit behavioral responses than would other anthropomorphized objects. Evidence now exists that consumer brands can also lead individuals to take on the traits associated with those brands (Fitzsimons, Chartrand, & Fitzsimons, in press). For example, those primed subliminally with the Apple logo are more creative on a subsequent task than those primed with the IBM logo. Future research can further explore other types of anthropomorphized objects and the automatic effects they have on behavior.

#### IMPLICATIONS FOR THEORIES OF AUTOMATIC BEHAVIOR

Beyond understanding how anthropomorphized objects are mentally represented, the current findings on the anthropomorphism of nonhuman objects also has interesting implications for behavior within the social world. First, mirroring research on the automatic influence of perceiving humans on behavior (e.g., Baldwin et al., 1990; Bargh et al., 1996; Chartrand & Bargh, 1999; Dijksterhuis & van Knippenberg, 2000; Fitzsimons & Bargh, 2003; Shah, 2003), this research has demonstrated that perceiving anthropomorphized objects can shape behavior automatically in predictable ways. Thus, these findings extend previous research on theories of automatic behavior (e.g., Bargh, 1990; Dijksterhuis & Bargh, 2001; Wheeler & Petty, 2001), by showing that *anthropomorphized objects* can also serve as sources of nonconscious construct activation, in the same way as can other environmental stimuli (e.g., features of situations, significant others).

Previous research has demonstrated three kinds of triggers for nonconscious behavior: the abstract concepts themselves, situations, and people. First, behavior has repeatedly been shown to be automatically guided by the presentation of semantic associates of the concept of interest; for example, the presentation of words like *cooperative*, *share*, and *accommodate* can lead to cooperative behavior (Bargh et al., 2001). Secondly, behavior can be automatically guided by situations in which that behavior is common; for example, people act more quietly when primed with "libraries" (e.g., Aarts & Dijksterhuis, 2003; Bargh, Raymond, Pryor, & Strack, 1995; Chen, Lee-Chai, & Bargh, 2001; Kay, Wheeler, Bargh, & Ross, 2004). Lastly, behavior can be automatically guided by the presentation of other people (e.g., Bargh et al., 1996; Chartrand & Bargh, 1999; Fitzsimons & Bargh, 2003; Shah, 2003).

By illustrating that anthropomorphized objects can elicit automatic effects on behavior, the current findings significantly increase the generality of nonconsciously guided phenomena in everyday life.

## REFERENCES

- Aarts, H., Hassin, R., & Gollwitzer, P.M. (2004). Goal contagion: Perceiving is for pursuing. *Journal of Personality and Social Psychology, 87*, 23–37.
- Aarts, H., Dijksterhuis, A. (2003). The silence of the library: Environment, situational norm, and social behavior. *Journal of Personality and Social Psychology, 84*, 18–28.
- Andersen, S. M., & Chen, S. (2002). The relational self: An interpersonal social-cognitive theory. *Psychological Review, 109*, 347–362.
- Andersen, S. M., Glassman, N. S., & Gold, D. (1998). Mental representations of the self, significant others, and nonsignificant others: Structure and processing of private and public aspects. *Journal of Personality and Social Psychology, 75*, 845–861.
- Andersen, S. M., Reznik, I., & Manzella, L. M. (1996). Eliciting transient affect, motivation, and expectancies in transference: Significant-other representations and the self in social relations. *Journal of Personality and Social Psychology, 71*, 1108–1129.
- Baldwin, M. W., Carrell, S. E., & Lopez, D. F. (1990). Priming relationship schemas: My advisor and the Pope are watching me from the back of my mind. *Journal of Experimental Social Psychology, 26*, 435–454.
- Baldwin, M. W., & Holmes, J. (1987). Salient private audiences and awareness of the self. *Journal of Personality and Social Psychology, 52*, 1087–1098.
- Bargh, J.A. (1990). Auto-motives: Preconscious determinants of social interaction. In E. T. Higgins & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition* (Vol. 2, pp. 93–130). New York: Guilford Press.
- Bargh, J. A., & Chartrand, T. L. (2000). The mind in the middle: A practical guide to priming and automaticity research. In H. T. Reis & C. M. Judd (Eds.), *Handbook of Research Methods in Social and Personality Psychology* (pp. 253–285). New York: Cambridge University Press.
- Bargh, J. A., Chen, M., & Burrows, L. (1996). Automaticity of social behavior: Direct effects of trait construct and stereotype activation on action. *Journal of Personality and Social Psychology, 71*, 230–244.
- Bargh, J. A., Gollwitzer, P. M., Lee-Chai, A. Y., Barndollar, K., & Tröetschel, R. (2001). The automated will: Nonconscious activation and pursuit of behavioral goals. *Journal of Personality and Social Psychology, 81*, 1014–1027.
- Bargh, J. A., Raymond, P., Pryor, J. B., & Strack, F. (1995). Attractiveness of the underling: An automatic power → sex association and its consequences for sexual harassment and aggression. *Journal of Personality and Social Psychology, 68*, 768–781.
- Best, J.B. (1963). Protopsychoanalysis. *Scientific American, 208*, 54–75.
- Chartrand, T.L., & Bargh, J.A. (1996). Automatic activation of impression formation and memorization goals: Nonconscious goal priming reproduces effects of explicit task instructions. *Journal of Personality and Social Psychology, 71*, 464–478.
- Chartrand, T.L., & Bargh, J. A. (1999). The chameleon effect: The perception-behavior link and social interaction. *Journal of Personality and Social Psychology, 6*, 893–910.
- Chartrand, T.L., Dalton, A., & Fitzsimons, G.J. (2007). Nonconscious relationship reactance: When significant others prime opposing goals. *Journal of Experimental Social Psychology, 43*, 717–726.
- Chen, S., Lee-Chai, A. Y., & Bargh, J. A. (2001). Relationship orientation as a moderator of the effects of social power. *Journal of Personality and Social Psychology, 80*, 173–187.
- Devine, P. G. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology, 56*, 5–18.
- Dijksterhuis, A., & Bargh, J. A. (2001). The perception-behavior expressway: Automatic effects of social perception on social behavior. In M. P. Zanna (Ed.), *Advances in Experimental Social Psychology, 33*, 1–40. San Diego, CA: Academic Press.
- Dijksterhuis, A., Bargh, J. A., & Miedema, J. (2000). Of men and mackerels: Attention and automatic behavior. In H. Bless & J. P. Forgas (Eds.), *Subjective experience in social cognition and behavior*, (pp. 36–51). Philadelphia: Psychology Press.
- Dijksterhuis, A., & Van Knippenberg, A. (1998). The relation between perception and behavior or how to win a game of Trivial Pursuit. *Journal of Personality and Social Psychology, 74*, 865–877.

- Dijksterhuis, A., & van Knippenberg, A. (2000). Behavioral indecision: Effects of self-focus on automatic behavior. *Social Cognition, 18*(1), 55–74.
- Finkel E. J., Rusbult, C. E., Kumashiro, M., & Hannon, P. A. (2002). Dealing with betrayal in close relationships: Does commitment promote forgiveness of betrayal? *Journal of Personality and Social Psychology, 82*, 956–974.
- Fitzsimons, G. M., & Bargh, J. A. (2003). Thinking of you: Nonconscious pursuit of interpersonal goals associated with relationship partners. *Journal of Personality and Social Psychology, 84*, 148–164.
- Fitzsimons, G. M., Chartrand, T.L., & Fitzsimons, G. J. (in press). Automatic effects of brand exposure on behavior. *Journal of Consumer Research*.
- Gosling, S. D. (2001). From mice to men: What can we learn about personality from animal research? *Psychological Bulletin, 127*, 45–86.
- Gosling, S.D., & John, O.P. (1999). Personality dimension in non-human animals: A cross-species review. *Current Directions in Psychological Science, 8*, 69–75.
- Gosling, S.D., Kwan, V.S.Y., & John, O.P. (2003). A dog's got personality: A cross-species comparative approach to personality judgments in dogs and humans. *Journal of Personality and Social Psychology, 85*, 1161–1169.
- Guthrie, S.E. (1993). *Faces in the clouds: A new theory of religion*. New York: Oxford University Press.
- Kay, A. C., Wheeler, S. C., Bargh, J. A., & Ross, L. (2004). Material priming: The influence of mundane physical objects on situational construal and competitive behavioral choice. *Organizational Behavior and Human Decision Processes, 95*, 83–96.
- Leander, P., Shah, J., & Chartrand, T.L. (2007). *Goal contagion: Moderating role of relationship type*. Manuscript in preparation, Duke University.
- Line, M.B. (1999). Types of organizational culture. *Library Management, 20*, 73–75.
- Mikulincer, M., & Arad, D. (1999). Attachment working models and cognitive openness in close relationships: A test of chronic and temporary accessibility effects. *Journal of Personality & Social Psychology, 77*, 710–725.
- Mikulincer, M., & Shaver, P. R. (2001). Attachment theory and intergroup bias: Evidence that priming the secure base schema attenuates negative reactions to out-groups. *Journal of Personality & Social Psychology, 81*, 97–115.
- Mitchell, R.W., & Hamm, M. (1997). The interpretation of animal psychology: Anthropomorphism or behavior reading? *Behaviour, 134*, 173–204.
- Pickett, J. P., et al. (2000). Anthropomorphism. *The American Heritage Dictionary of the English Language, (4th Ed.)*. Boston: Houghton Mifflin Company.
- Rusbult, C. E. (1993). Understanding responses to dissatisfaction in close relationships: The exit-voice-loyalty-neglect model. In S. Worchel & J. A. Simpson (Eds.), *Conflict between people and groups: Causes, processes, and resolutions* (pp. 30–59). Chicago: Nelson-Hall.
- Shah, J. (2003). Automatic for the people: How representations of significant others implicitly affect goal pursuit. *Journal of Personality and Social Psychology, 84*, 661–681.
- Watts, G. (2006). Knowing me, knowing ewe. *Lancet, 368*, 270–272.
- Wheeler, S. C., & Petty, R. E. (2001). The effects of stereotype activation on behavior: A review of possible mechanisms. *Psychological Bulletin, 127*, 797–826.