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The Schema-Driven Chameleon:

How Mimicry Affects Executive and Self-Regulatory Resources

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Abstract

We propose that behavioral mimicry is guided by schemas that enable efficient social coordination. If mimicry is schema-driven, then the operation of these schemas should be disrupted if partners behave in counternormative ways – such as mimicking people they generally would not or vice versa – rendering social interaction inefficient and demanding more executive and self-regulatory resources. To test this hypothesis, Experiments 1-3 used a resource depletion paradigm in which participants performed a resource-demanding task after interacting with a confederate who mimicked them or did not. Experiment 1 demonstrated impaired task performance among participants who were not mimicked by a peer. Experiments 2 and 3 replicated this effect and also demonstrated a significant reversal in social contexts where mimicry is counternormative, suggesting that inefficiency emerges from *schema inconsistency*, not from the absence of mimicry *per se*. Experiment 4 used a divided attention paradigm and found that resources are taxed throughout schema-inconsistent interactions. These findings suggest that much-needed resources are preserved when the amount of mimicry displayed by interacting individuals adheres to norms, while resources are depleted when mimicry norms are violated.

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The Schema-Driven Chameleon:

How Mimicry Affects Executive and Self-Regulatory Resources

Several decades of research have revealed people to be like chameleons. We change our behaviors to blend in with our social environments in the same way that chameleons change their colors to blend in with their physical environments. We pick up regional accents when on vacation, we shake our foot if we observe our friend's foot shaking, and we do these things without recognizing these behaviors in our interaction partners or even in ourselves (Chartrand & Bargh, 1999; DePaulo & Friedman, 1998; Hatfield, Cacioppo, & Rapson, 1994). This chameleon-like behavior, whereby people nonconsciously and automatically imitate other people's physical movements, facial expressions, speech patterns, and emotions, is referred to as *mimicry*. The current research focuses on behavioral mimicry – the imitation of postures, gestures, and mannerisms.

Evidence is accumulating to suggest that, at least in the case of behavioral mimicry, people are not always like chameleons. Social contexts and social motives dictate whether and to what extent mimicry occurs. For instance, mimicry varies as a function of interaction partners' religious group membership (Yabar, Johnston, Miles, & Peace, 2006), racial group membership (Heider & Skowronski, 2009), and familial relation (Bernieri, Reznick, & Rosenthal, 1988). Mimicry is less common when people expect their interaction partner to be competitive (Lanzetta and Englis 1989) and more common when people are feeling too distinct from others or when they are interacting with someone who has power over their outcomes, someone who has ostracized them, or someone who is a peer (for reviews, see Chartrand & Dalton, 2009; Chartrand & van Baaren, 2009). The collective evidence, therefore, suggests that different social contexts have different norms regarding mimicry.

In the current research, we explore the consequences of adhering to or violating mimicry norms in a social interaction. We suggest that people have implicit schemas for the amount of mimicry that typically takes place in a given type of social interaction. We propose that a key benefit of adhering to mimicry norms is that the social interaction is schema-driven and therefore efficient; it poses a minimal burden on much-needed executive and self-self-regulatory resources. However, when mimicry norms are violated, reliance on schemas is disrupted and social interaction becomes inefficient. To make this point concrete, consider the finding that mimicry is common (normative) in interactions among peers (Cheng & Chartrand, 2003). According to our perspective, social interaction between peers should run efficiently if mimicry occurs, but inefficiently if mimicry does not occur. By burdening resources, counternormative mimicry should lead to impairments on tasks that require executive and self-regulatory resources. The following section expands on this perspective.

Mimicry: A Schema-Driven Process?

Behavioral mimicry is a rich and complex social coordination process. Not only are many physical movements precisely coordinated, but coordination can entail either the presence or absence of imitation depending on one's changing social motives and contexts. Yet despite the complexity of the physical and social coordination processes involved, mimicry changes in different situations without people even realizing that it is occurring (Chartrand & Bargh, 1999; Dimberg, Thunberg, & Elmehed, 2000). This finding suggests that the rules and knowledge required to maneuver most of this complexity are relied on so routinely that they become ingrained in an individual's knowledge base and can be executed without burdening executive processes (also see Finkel, Campbell, & Brunell, 2006a; Hatfield et al., 1994). Mimicry could then operate in the same way as other subtle but crucial aspects of social coordination, such as

when and for how long to make eye contact, what distance to stand in relation to an interaction partner, at what volume to speak, and so on; the rules and knowledge governing mimicry's physical and social coordination could be represented cognitively in organized units, or schemas.

Indeed, aspects of behavioral mimicry have been described as schema-driven elsewhere in the literature. Barresi and Moore (1996) applied the concept to explain the perception-behavior link – a mechanism through which mimicry can automatically occur. They argued that there is semantic overlap between the schemas that are active when an individual engages in an action and the schemas that are active when an individual perceives the actions of others. Consequently, these overlapping representations tend to co-activate, thereby fostering behavioral mimicry (Barresi & Moore, 1996). Extended beyond the perception-behavior link, we suggest that schemas provide a cognitive architecture that enables mimicry to not only operate automatically, but also to adapt to complex social factors. To elaborate, because different social interactions have different norms regarding mimicry, schemas almost certainly would have evolved to incorporate mimicry's action patterns and norms (also see Holloway, Waldrip, & Ickes, 2009; Freeman & Martin, 2004). Mimicry would then be directed by different schemas in different social contexts.

In addition, people often are not consciously aware of the knowledge that schemas contain or of their use of schemas. This is particularly true for social coordination schemas, as situational variations in nonverbal behaviors are typically executed without awareness or control (Dimberg et al., 2000; Sue et al., 2007). This further implies that mimicry is directed by *implicit* schemas. A schema-based view of mimicry therefore suggests that by relying on different implicit schemas in different interactions, individuals can master the physical and social coordination demands of mimicry without any conscious intervention.

The purpose of the current research is to test one key implication of the schema-based view. If mimicry is guided by implicit schemas, these schemas should foster efficient social interaction because schema-driven processes operate using minimal executive and self-regulatory resources (Neisser, 1976). Importantly, because the knowledge contained in these schemas would include behavioral repertoires and norms (Holloway et al., 2009), mimicry's efficiency should depend on its adherence to social norms. As stated previously, mimicry norms vary depending on factors such as racial group membership (Heider & Skowronski, 2009) and peer group membership and power differentials (Cheng & Chartrand, 2003). If norms regarding mimicry change from one social interaction to the next, then mimicry should change as well. If it does not (e.g., if mimicry occurs in a situation where generally it would not), then a social interaction characterized by mimicry should become inefficient. This argument is the foundation for the current research. In the following section, we expand on the implications of schemas for efficiency and on our research approach.

Mimicry Schemas and Efficient Social Interaction

In social contexts where social norms and expectations are met, individuals can navigate their environments efficiently – that is, using limited executive and self-regulatory resources (Macrae, Milne, & Bodenhausen, 1994; Taylor & Crocker, 1981). Efficiency is gained both as an actor executing behaviors (Barsalou, Niedenthal, Barbey, & Ruppert, 2003; Förster & Strack, 1996) and as an observer perceiving the actions of others. In the latter case, when an observer perceives information that is consistent with pre-existing schemas, processing this information is efficient in that it requires minimal effort; however, when information cannot be assimilated via schemas, processing requires more time and greater capacity (Bargh & Thein, 1985). This finding has been observed with several types of schemas, including schemas about social groups,

or stereotypes. For example, people process stereotype-consistent information more easily than stereotype-inconsistent information (Fiske & Neuberg, 1990; Macrae et al., 1994). Moreover, stereotype inconsistency induces physiological responses symptomatic of uncertainty and impairs performance on other tasks (Mendes, Blascovich, Hunter, Bickel, & Jost, 2007), an indirect indication that processing requires greater effort when information is schema-inconsistent rather than schema-consistent.

We propose that in the same way schemas about social groups can be adhered to or violated, so too can schemas about mimicry. To elaborate, we argue that social coordination is schema-driven and efficient when social norms regarding mimicry are met. But when these norms are violated, reliance on schemas is disrupted and an otherwise efficient social interaction becomes more complex. The increased complexity requires the deployment of more resources to regulate social coordination processes. But because mimicry's underlying schemas operate implicitly, even schema-inconsistent mimicry and its self-regulatory burden would generally be so subtle that they would not be consciously perceived (Finkel et al., 2006b). Nevertheless, the exertion required for the redeployment of resources would cause performance on subsequent or concurrent tasks that require these resources to be impaired. This implies that by using a divided attention, cognitive load, or resource depletion paradigm, one can observe the efficiency or inefficiency of a social interaction indirectly.

Our first three experiments tested this efficiency hypothesis using a resource depletion paradigm (Baumeister et al., 1994; Baumeister, Bratslavsky, Muraven, & Tice, 1998). Tasks used in this paradigm implicate the part of the self that "makes decisions, initiates actions, and in other ways exerts control over both self and environment" (Baumeister, 1998, p. 712). Performing a task that depletes self-regulatory resources (versus one that does not) predicts

poorer performance on other resource-demanding tasks performed shortly thereafter, presumably because performance on both tasks is fueled by a common, finite pool of resources (Baumeister et al., 1998). Using this paradigm, research has shown that resources are taxed by managing self-presentation concerns (Vohs, Baumeister, & Ciarocco, 2005), discussing racially sensitive topics with individuals from different racial groups (Richeson & Shelton, 2003; Richeson & Trawalter, 2005), and experiencing poor coordination on tasks performed with a partner, such as collaborative problem solving or data entry (Finkel et al., 2006b). One study has even linked mimicry to resource depletion, demonstrating that participants who were mimicked subsequently exhibited superior self-regulation than did participants who were not (Finkel et al., 2006b, Experiment 5). The purpose of using mimicry in that study was to show that inefficiency in so-called high-maintenance interactions occurs outside of conscious awareness. Nevertheless, that experiment offers a basic paradigm to explore whether mimicry is schema-driven and, in fact, to expand on those findings in an important way.

Finkel et al. assumed that mimicry's effect on resource depletion depended on its presence or absence – an assumption that, according to the current perspective, is oversimplified. We argue instead that resource depletion depends on mimicry's adherence to social norms. For instance, research conducted with White and Black participants suggests that mimicry of an interaction partner is more common (normative) in same-race interactions but less common (counternormative) in cross-race interactions (Heider and Skowronski, 2009). According to our perspective, being mimicked by an interaction partner (compared to not being mimicked) should lead to superior self-regulation following a same-race interaction, but inferior self-regulation following a cross-race interaction. As a second example, consider that mimicry of an interaction partner is more common (normative) when the interaction partner is of higher status and power

and less common (counternormative) when the interaction partner lacks status and power (Cheng & Chartrand, 2003; Ellyson & Dovidio, 1985). We would argue that being mimicked by an interaction partner (compared to not being mimicked) would lead to superior self-regulation following an interaction with a lower status partner, but inferior self-regulation following an interaction with a higher status partner. These examples illustrate that mimicry's downstream consequences for self-regulation should depend on whether or not mimicry is normative in a particular context, not simply on its presence vs. absence.

Our fourth study tested this efficiency hypothesis using a divided attention paradigm in which individuals divide their attention between a social interaction and a second task that demands attentional resources. While the resource depletion paradigm reveals performance impairment subsequent to the social interaction, the divided attention paradigm can reveal impairment throughout the social interaction. Although counternormative mimicry would be subtle, observing even subtle irregularities in an interaction partners' nonverbal behavior should automatically capture attention in much the same way that a person's attention can be automatically captured by any novel or atypical stimulus that violates his or her prior knowledge or expectations (Taylor & Fiske, 1978; Wong & Weiner, 1981). Importantly, counternormative mimicry would be so subtle that it would not be consciously detected; the process whereby attention is captured and maintained would occur outside of conscious awareness (Bargh, 1994; Langer, 1978). Nevertheless, with heightened attentional demands would come an increase in effortful processing and working memory demands, thereby taking an interactant's resources away from the second task (Mendes et al., 2007). This argument leads to the prediction that, in a situation where mimicry is normative, interacting with a partner who does not engage in mimicry

(compared to one who does) should lead to impaired performance on (and throughout) a concurrent, attention demanding task.

Research Overview

In sum, we propose that behavioral mimicry is a schema-driven process, and we examine in four experiments the effects of disruptions in mimicry schemas on executive and self-regulatory functioning. In all four experiments, participants interact with a research confederate who mimics them or does not. Mimicry schemas are disrupted by violating mimicry norms, i.e., by omitting mimicry from an interaction where it typically would occur, or vice versa. If mimicry is guided by (implicit) schemas, then disrupting the operation of these schemas should make social coordination inefficient, ultimately impairing performance on a resource-demanding task. Schema-consistent mimicry should bolster task performance, while schema-inconsistent mimicry should diminish it.

Experiment 1 tested the prediction that individuals who are not mimicked in an interaction where mimicry is normative – i.e., an interaction with a peer – should subsequently perform worse on a resource-demanding task, while individuals who are mimicked by that peer should not show any performance deficit on the task. Experiments 2 and 3 incorporated social contexts with different norms regarding mimicry. Experiment 2 looks at interracial interactions and tested the hypothesis that same-race interactions are inefficient when mimicry is absent, while cross-race interactions are inefficient when mimicry is present. Experiment 3 looked at power dynamics between workers and leaders and tested the hypothesis that interactions are inefficient when workers do not mimic leaders, or when leaders do mimic workers. Experiment 4 moved to a divided attention paradigm to test whether the consequences of violating mimicry norms for self-regulatory and executive functioning can be detected throughout a social interaction.

Experiment 1

Prior research has shown that mimicry is more common in interactions wherein people believe that they are interacting with a peer (specifically, a fellow introductory psychology student) compared to a non-peer (Cheng & Chartrand, 2003). Because mimicry is normative in social interactions among peers, we chose this context to test the hypothesis that, in a social context where mimicry is normative, social interaction is efficient for people who are mimicked and inefficient for those who are not. In the current research, participants were either mimicked or not by a research confederate posing as a fellow introductory psychology student, then participants completed a resource-demanding task on their own. This task involved taste-testing a high caloric, unhealthy snack, which requires effort because participants must resist the temptation to over-consume the snack (Herman & Polivy, 2004). To the extent the initial social interaction requires resources, participants' ability to resist temptation on the second task should be impaired (Baumeister et al., 1998). Thus, we predicted that participants who were not mimicked would consume more of the snack than participants who were mimicked.

In addition to the mimicry and no mimicry conditions, we included a control condition in which the participant and confederate were separated by a partition, which blocked the transmission of visual information during the interaction. Visual information provides the minimum conditions necessary for unintended behavioral coordination to occur (Schmidt & O'Brian, 1997). Thus, this setup is akin to communicating via telephone; without visual cues, schemas regarding nonverbal behaviors cannot operate. Because mimicry schemas do not operate, they can be neither adhered to nor violated, which suggests that control participants' snack consumption could serve as a baseline to diagnose whether consumption increases in the mimicry condition or decreases in the no mimicry condition (or both). In this peer-interaction

experiment, the absence of mimicry should be counternormative and therefore depleting. Accordingly, we predicted that participants who were not mimicked would consume more of the snack than control participants.

Method

Participants. Participants were 30 Introductory Psychology undergraduates attending a small, private university in the southeast United States. They participated individually in 35-min sessions in exchange for $12. Male and female participants (18 female) were distributed equally across experimental conditions.[1] We required that students be free from certain food allergies and dietary restrictions to participate in this particular experiment. We did not assess race in Study 1, although participants came from a predominantly White undergraduate institution. Also, the experimenter and confederate reported that the large majority of participants were White.

Procedure. Participants came to the lab to participate in a study with a fellow Introductory Psychology student but, unbeknownst to them, they interacted with a (female) research confederate. They completed a photo description task together (Chartrand & Bargh, 1999), after which participants completed a "taste-test" on their own. In the mimicry and no mimicry conditions, participants could observe the confederate throughout the photo description task. In the control condition, the participant was prevented from observing the confederate because a partition was placed on the table between them. The presence of this partition did not affect the procedure for the photo description task, which is described next.

For the photo description task, the participant and confederate were seated across from each other with a small coffee table between them. The experimenter placed two sets of photographs face-down on the coffee table and read aloud that the participants would take turns describing their photos to each other, that each description should be approximately one minute long, and

that they should avoid showing each other the photos. The two sets each contained six photos selected from magazines such as *Time* and *National Geographic*. One set was randomly pre-assigned to the confederate and a script was prepared to enable the confederate to deliver consistent descriptions. Although the confederate's descriptions were scripted, she inserted hesitations and disfluencies in her speech pattern to give it an air of spontaneity.

After explaining the task, the experimenter casually asked the confederate to begin. To minimize her influence on the participant's behavior, the experimenter maintained a neutral body position (feet flat on the floor, hands folded in her lap, and seated upright in her chair), and then departed the room after the confederate and participant each described one photo. At this time, the experimental manipulation began.

Participants were randomly assigned to one of three conditions. In the mimicry condition, the experimenter unobtrusively imitated the participant's physical postures, mannerisms, and gestures, such as crossed arms, crossed legs, face-touching, hair-touching, slouching, or hand gesturing. The confederate mimicked the participant's behaviors with a lag time of approximately 2 seconds and maintained the participant's postures for as long as the participant held them. In the no mimicry condition, the confederate maintained behavioral misalignment with the research participant throughout the task. For example, when the participant crossed his or her legs, the confederate sat with feet flat on the floor; when the participant sat upright, the confederate slouched forward; when the participant's hands were planted on his or her lap, the confederate's hands gestured. If the participant attempted to mimic the confederate, the confederate deliberately changed her behaviors to remain out of sync with the participant. Throughout the interaction, the confederate's body positions, gestures, and mannerisms differed from those of the participant. In the control condition, the confederate simply described the

photos. The mean time required for the photo description task was 11.9 min (*SD* = 1.8) and did not vary by condition (*F*s < 1).

Following the photo description task, the confederate was escorted to a separate room, ostensibly to carry out the remainder of the study alone. Participants were told that their next task would be a taste preferences test. They were seated at a different table in the testing room and a bowl of small cookies and a questionnaire were placed before them. The questionnaire instructed participants to eat at least one cookie before answering the questions and to eat as many cookies as they wanted while completing the task. To support the cover story, participants rated the cookies using 5-point scales on dimensions such as sweetness and quality. But our real interest was in measuring cookie consumption, the total grams of cookies consumed, which we calculated by subtracting the weight of the bowl after each session from the bowl's initial weight. After 3 min, the experimenter returned to collect the remaining cookies and questionnaire.

At this point, a battery of questionnaires was administered to assess whether mood, subjectively experienced depletion, self-efficacy beliefs, liking of the task or confederate, or subjectively experienced ease or difficulty of the interaction would mediate the results. A similar battery was used in several studies by Finkel et al. (2006b) to determine whether consciously experienced processes would mediated the effect of high-maintenance interactions on self-regulation. They found no evidence for mediation by any self-report measures. We replicated Finkel et al.'s null findings here, and in our subsequent experiments, so these measures will not be discussed further. Instead, we will explore mechanism through moderation (experimental manipulation) rather than mediation; this moderational approach does not rely on conscious awareness or self-report (Spencer, Zanna, and Fong, 2005).

Participants then completed a funneled debriefing – a questionnaire that asked increasingly specific questions designed to probe for awareness of the experimental purpose and procedures. The questionnaire began with general questions, including "What do you think this study is about?"; "Did any part of this study seem strange to you or were you suspicious of anything?"; "Describe your interaction with the other participant." More specific questions at the end of the questionnaire included "Did you notice any of the other participant's mannerisms or body language during the picture description task you did together?"; "The other participant was actually a member of the research team. While you were doing the picture description task, were you suspicious of this or not?" A research assistant who was blind to the experimental hypotheses evaluated participants' responses for suspicion or awareness. Results suggested that all participants were unaware that the experiment had anything to do with behavioral coordination, were unaware that their interaction partner was a research confederate, were not suspicious of their partner's mannerisms during the interaction or found their interaction odd, and were unable to guess the true relation between the tasks. Finally, the general debriefing was administered.

Results and Discussion

We conducted a one-way ANOVA with Mimicry Condition (mimicry, no mimicry, or control) as a between-subjects factor and found a significant effect of Mimicry Condition on cookie consumption, $F\,(2, 27) = 5.23$, $p < .05$, $\eta^2 = .18$, see Figure 1. Planned comparisons revealed that participants who were not mimicked consumed more grams of cookies than participants who were mimicked, $F\,(1, 27) = 4.21$, $p < .05$, $\eta^2 = .13$, and more grams of cookies than control participants, $F\,(1, 27) = 5.51$, $p < .05$, $\eta^2 = .25$. These findings support our

prediction that cookie consumption would increase in the no mimicry condition compared to the mimicry condition due to resource depletion in the no mimicry condition.

These results suggest that the absence of mimicry in an interaction among peers burdens executive and self-regulatory resources, while the presence of mimicry preserves these much-needed resources. Although our predictions were borne out by the data, the methods we used were not without their limitations. One could argue that by focusing on a social interaction where mimicry would typically occur, it is unclear whether the results in the no mimicry condition are due to the violation of social norms, as we argue, or simply, as implied by Finkel et al. (2006), to the absence of mimicry. Moreover, one could argue that the control condition reduced self-presentation concerns, or created challenges that were not present in the other conditions, which affected subsequent performance. We conduct Studies 2-4 in large part to address these concerns. Rather than examining a context where mimicry norms are confounded with the mimicry manipulation or are altogether inactive, we instead examine contexts in which these norms would be reversed. We seek to replicate the Study 1 results in conditions where mimicry is normative, while reversing these results when we move to conditions where mimicry is counternormative.

Experiment 2

We have argued that interactions are schema-driven and efficient to the extent that they adhere to social norms, not necessarily to the extent that they involve mimicry. This perspective implies that efficiency is hampered when the extent of mimicry in an interaction violates social norms, not necessarily when mimicry is lacking. If a category of social interaction has developed in such a way that coordination entails a different set of underlying behaviors, then the *presence* of mimicry could violate social norms. In these interactions, we would predict a

reversal of the effect of mimicry on resource depletion, whereby depletion would result from being mimicked rather than not being mimicked.

According to a substantial empirical literature, one category of social interactions where behavioral coordination is not the norm is cross-race interactions. Subtle but pervasive differences occur in behaviors such as eye contact, blinking (a sign of negative arousal and tension), standing distance, smiling, and hand and body movements in same-race compared to cross-race interactions (Crosby, Bromley, & Saxe, 1980; Dovidio, Kawakami, Johnson, Johnson & Howard, 1997; Fazio, Jackson, Dunton & Williams, 1995; Richeson & Shelton, 2003; Word, Zanna, & Cooper, 1974). For instance, compared to White participants engaged in same-race interactions, those in cross-race interactions move their hands and bodies less (Richeson & Shelton, 2003). In one recent study, Heider and Skowronski (2009) measured participants' tendency to mimic a research confederate while performing a photo description task and found less mimicry in cross-race interactions (i.e., White-Black interactions) compared to same-race interactions (i.e., White-White or Black-Black interactions). Indeed, nearly all interracial interactions are prone to verbal and behavioral variations and these variations go largely undetected by both actors and observers (Sue et al., 2007). This literature suggests that norms regarding mimicry vary in same-race compared to cross-race interactions, which makes the domain of interracial interaction well-suited to our research purpose.

If mimicry is guided by implicit schemas, then these schemas would incorporate the nonverbal behavioral norms for same-race and cross-race interactions. Based on the literature, we would predict that the presence of mimicry would be schema-consistent in same-race interactions, while the absence of mimicry would be schema-consistent in cross-race interactions. Because schema-consistency should preserve resources and schema-inconsistency

should deplete them, we predicted that participants' resources would be more depleted if they were not mimicked (compared to mimicked) in a same-race interaction or if they were mimicked (compared to not mimicked) in a cross-race interaction. To test this hypothesis, we manipulated whether participants were mimicked or not by a research confederate of either the same race or a different race. Resource depletion was then measured using the Stroop Task (Richeson & Shelton, 2003; Richeson & Trawalter, 2005).

Method

Participants. Participants were 92 students attending a small, private university in the southeast United States. They participated individually in 35-min sessions in exchange for $12. Forty-seven of these participants were White and the remaining 45 were racial minorities, including 40 Blacks, 4 East Asians, and 1 South Asian. (All hypothesis tests yielded identical conclusions if we omitted five Asian participants from our sample.) One participant's response times on the Stroop Task were greater than 2 standard deviations above the mean and were excluded; this exclusion did not significantly influence the results.

Procedure. Participants interacted with either a White female or Black female confederate in a photo description task, and then performed the Stroop Task on their own. The procedure for the photo description task was the same as in Experiment 1. Participants were randomly assigned to be either mimicked or not by the confederate throughout the task. The mean time required for the photo description task was 11.4 min (SD = 1.8) and did not vary by condition (Fs < 1).

After escorting the confederate to a different room, the experimenter seated the participant at a computer to complete the Stroop Task (Stroop, 1935). Participants read the task instructions from the monitor, completed a practice session, asked any clarification questions, and then completed the test trials. In the Stroop Task, participants were instructed to indicate the color of

the font in which various stimuli appeared by pressing one of four keys corresponding to four different colors (red, blue, yellow, and green). The stimuli included a series of Xs (XXX), a word that matched the font color (e.g., the word "green" presented in green font), and a word that mismatched the font color (e.g., the word "green" presented in red font). Literate adults tend to automatically read the word rather than name the color in which the word appears, which slows down response times on mismatched trials. Subtracting reaction times for the series of Xs from reaction times for mismatched trials gives a measure called *Stroop Interference,* which can be used to measure resource depletion (Richeson & Shelton, 2003; Richeson & Trawalter, 2005).

After 5 min elapsed (the time required for the Stroop Task), the experimenter reentered the room and administered a funneled debriefing (similar to Experiment 1's) followed by a general debriefing. No participants were aware of the mimicry, aware of the true relation between the tasks, suspicious about the confederate's identity or behaviors, or found their interaction odd.

Results and Discussion

We analyzed Stroop Interference scores in a 2-way ANOVA with Mimicry Condition (mimicry or no mimicry) and Interaction Type (same-race or cross-race) as between-subjects variables. The results yielded the predicted interaction, $F\,(1, 88) = 7.18$, $p < .01$, $\eta^2 = .07$, and no main effects, $Fs < 1$, see Figure 2. Replicating the results of Experiment 1, planned comparisons found that participants in same-race interactions exhibited greater Stroop Interference if they were not mimicked than if they were, $F\,(1, 88) = 4.03$, $p < .05$, $\eta^2 = .04$. As predicted, this pattern was reversed among participants in cross-race interactions, who exhibited greater Stroop Interference if they were mimicked than if they were not, $F\,(1, 88) = 4.46$, $p < .05$, $\eta^2 = .04$.

Incorporating a social context where mimicry is not the norm enabled us to unconfound the effect of experiencing mimicry or not from the effect of (implicitly) expecting mimicry or not. If

it were the presence or absence of mimicry driving the results, then participants would have been more depleted following the absence of mimicry than following the presence of mimicry regardless of race. This was not, however, what we found. Indeed, we found that depletion resulted from the absence of mimicry only in same-race interactions, but resulted from the presence of mimicry in cross-race interactions. These findings support the hypothesis that mimicry's efficiency depends on its adherence to social norms. If social norms regarding mimicry change from one context to the next (e.g., from same-race to cross-race interactions), the extent of mimicry in a social interaction must change as well. Otherwise, interactions require effortful exertions that deplete self-self-regulatory resources and, in turn, cause impairment on a subsequent task requiring self-regulation (e.g., the Stroop Task). A limitation of examining the context of interracial interactions is that participants cannot be randomly assigned to one race or another. Experiment 3 incorporates social contexts with power differentials, where random assignment is possible.

Experiment 3

It is well-established that nonverbal behaviors vary as a function of power dynamics (Ellyson & Dovidio, 1985; Tiedens & Fragale, 2003). In particular, people are more likely to mimic a person a person of higher status and power than a person without status and power (Cheng & Chartrand, 2003; Giles & Powesland, 1975). It has even been argued that mimicry is a nonconscious strategy used by some people to affiliate with more powerful others, but not less powerful others (Cheng & Chartrand, 2003). Because differences in power create differences in mimicry, one's power in a situation should determine whether being mimicked (or not) violates social norms. Thus, we can use social contexts with different power dynamics to test the hypothesis that mimicry's efficiency relies on its conformity to social norms.

In this experiment, two factors were manipulated: whether participants were assigned to be a worker or a leader in an upcoming task, and whether or not participants were mimicked by a confederate who was assigned the complementary role. As in Experiment 2, we measured resource depletion via Stroop Interference. Because social norms would dictate that people mimic those with power, we predicted that participants assigned to be leaders would exert greater effort in the interaction and therefore show greater interference when a worker did not mimic them compared to when a worker did mimic them. In contrast, because social norms would dictate that people do not mimic those without power, we predicted that participants assigned to be workers would exert greater effort in the interaction and therefore show greater interference when a leader mimicked them compared to when a leader did not mimic them.

Method

Participants. Participants were 77 students attending a small, private university in the southeast United States. They participated individually in 35-min sessions in exchange for $12. One participant's response times on the Stroop Task were greater than 2 standard deviations above the mean and were excluded; this exclusion did not significantly influence the results.

Procedure. At the beginning of the study, the participant and a male research confederate were led to believe that they would do three tasks: a joint task, an independent task, and then another joint task. They were further instructed that one of them would be assigned to be the task leader and the other the worker for the third task (procedure adapted from Cheng & Chartrand, 2003), and were told to which role they had been randomly assigned. The third task would not take place, but informing participants of this upcoming task manipulated power dynamics between them. Next, the photo description task began. Participants were randomly assigned to be mimicked or not by the confederate throughout the task. The time required to

complete the photo description task was 11.6 min (*SD* = 2.3) and did not vary as a function of condition (*F*s<1). Participants then completed the Stroop Task, funneled debriefing, and general debriefing. No participants were aware of the mimicry, aware of the true relation between the tasks, suspicious about the confederate's identity or behaviors, or found their interaction odd.

Results and Discussion

We analyzed Stroop Interference scores in a 2-way ANOVA with Mimicry Condition (mimicry or no mimicry) and Power Condition (leader or worker) as between-subjects variables. The results yielded the predicted interaction, F (1, 72) = 7.29, $p < .01$, $\eta^2 = .05$, and no main effects, $Fs < 1$, see Figure 3. Replicating the results of Experiments 1 and 2, planned comparisons showed that participants assigned to be leaders exhibited greater Stroop Interference if they were not mimicked than if they were mimicked, F (1, 72) = 4.38, $p < .05$, $\eta^2 = .05$. As predicted, this pattern was reversed among participants assigned to be workers, who exhibited greater Stroop Interference if they were mimicked than if they were not mimicked, F (1, 72) = 3.01, $p < .10$, $\eta^2 = .04$.

These findings provide additional evidence for the hypothesis that mimicry leads to efficient social interaction provided that it is consistent with social norms. Social interaction was efficient when mimicry norms for power and status were adhered to, i.e., when a worker mimicked a leader or when a leader did not mimic a worker. However, social interaction was inefficient when these norms were violated, i.e., when a worker did not mimic a leader or when a leader mimicked a worker. Replicating the findings of Experiments 1 and 2, the efficiency or inefficiency of social interaction had consequences for performance on a subsequent, resource-demanding task. By examining performance on a subsequent task, these studies cannot address the onset of the resource burden. We preferred to use a resource depletion paradigm in

Experiments 1 through 3 primarily because assessing task performance after the social interaction would not interfere with the mimicry manipulation, but in Experiment 4 we adopted a divided attention paradigm to test the hypothesis that violating mimicry norms taxes resources early on and throughout a social interaction.

Experiment 4

Experiment 4 examined whether being mimicked or not would affect individuals' ability to divide their attention between a social interaction and a second attention-demanding task. Our schema-based theory of mimicry predicts that it should. According to this perspective, an observer uses minimal resources (including attentional resources) when the nonverbal aspects of an actor's behavior are consistent with social norms because schemas easily assimilate this information. Disfluencies in social coordination, however, should capture an observer's attention and increase effortful processing, thereby impairing performance on any task that relies on the same attentional processes (Mendes et al., 2007).

A divided attention paradigm also enables us to gain insights into the efficiency or inefficiency of the social interaction on a moment-to-moment basis. Resource depletion models conceptualize self-regulatory depletion as a cumulative effect akin to a muscle's strength wearing out over time (Baumeister et al., 1994); accordingly, the resource depletion paradigm is designed to assess cumulative effects. However, we attribute our results to the disruption of underlying social coordination schemas, which should occur almost immediately and persist throughout the interaction. Switching to a divided attention paradigm allowed us to test the hypothesis that counternormative mimicry taxes resources early on and throughout a social interaction.

Experiment 4 returned to the simpler experimental design where we limit our analysis to cases where mimicry is normatively expected and focused on the same-race interaction context used in Experiment 2. Participants completed an attention-demanding task (a signal detection task) while interacting with a same-race confederate who mimicked them or not. We predicted that, compared to those who were mimicked, participants who were not mimicked would perform poorly throughout the signal detection task.

Method

Participants. Participants were 20 White, undergraduate students attending a small, private university in the southeast United States. All participants were native English speakers. They participated individually in 35-min sessions in exchange for $12.

Procedure. Participants interacted with a White male confederate in a photo description task while simultaneously performing a signal detection task. Participants were randomly assigned to be either mimicked or not by the confederate throughout the task. The mean time required for the task was approximately 12.5 min (SD = 2.0) and did not vary by condition (Fs < 1).

For this experiment, several changes were made to the photo description task. First, the set of photos was increased in number from 12 to 20. This step increased the task's duration, which ensured that performance on the signal detection task always occurred under divided attention. Second, to encourage participants to attend equally to both tasks, we promised a $50 cash prize to the participant who performed best on both tasks (which, incidentally, was issued to that happy individual at the end of the study). Third, we created a more complex photo description task with more precise instructions. Participants were instructed to keep their descriptions between 30 and 45 seconds (if they deviated from this range, the experimenter instructed them to speed up or slow down (as appropriate) over a microphone from a control room) and to generate

at minimum 7 statements for each photo, with a minimum of 6 statements describing the photo's visual content and a minimum of 1 "free association" (described as an inference about how the circumstance in the photo came about). Finally, participants were told that questions regarding their partner's photo descriptions would follow the task.

For the concurrent signal detection task, participants attended to words presented over a single earphone. A word was presented every two seconds and their task was to click a mouse (attached to a computer that recorded their responses) when they heard an animal word. They were told that the computer would track both the accuracy and speed of their responses, so it was important to try to respond with accuracy and speed. Participants heard 300 words in total, of which 270 were non-animals (e.g., bliss, clove, jar, soak) and 30 were animals (e.g., cat, goose, mule, wolf). Most of these words were obtained from a list created by Coch and Holcomb (2003), but some additional animal words were added. Each word was presented once and in a different, randomly determined order for each participant. At a rate of one word per two seconds, participants listened to words for 10 minutes.

Performance on the signal detection task was assessed using the d' statistic, which captured participants' ability to discriminate between animal and non-animal words by measuring accuracy at detecting animal words (hit rate) while correcting for any bias toward indicating incorrectly that an animal word had been presented (false alarm rate). The *d'* statistic was calculated by subtracting the *z*-score of the hit rate from the *z*-score of the false alarm rate, but following the recommendation of Snodgrass and Corwin (1988), we applied a correction for computing hit and false alarm rates before d' was calculated. This correction eliminates hit rates of 1.0 and false alarm rates of 0 from the data (measures for these values are undefined because their corresponding *z*-scores are infinite). We corrected all hit (false alarm) rates by adding 0.5

to each frequency of hits (false alarms) and dividing by N+1, where N is the number of animal (non-animal) words presented (see Snodgrass & Corwin, 1988, p. 35).

Upon completion of the tasks, participants were escorted to an adjoining room, where they completed a funneled debriefing and then received a general debriefing. No participants were aware of the mimicry, aware of the true relation between the tasks, suspicious about the confederate's identity or behaviors, or found their interaction odd.

Results and Discussion

Separate *d′* scores were calculated for each 2 min block of the signal detection task, for a total of five *d′* scores. We analyzed *d′* scores in a repeated measures ANOVA with Mimicry Condition (mimicry or no mimicry) as a between-subjects factor and Block (1, 2, 3, 4, or 5) as a repeated measure. The set-up of the experimental room required that the mouse be operated with one's right hand; handedness did not, however, significantly affect *d′* scores ($F < 1$).

Compared to participants who were mimicked, participants who were not mimicked were less able to discriminate animal from non-animal words on the signal detection task (indicated by lower *d′* scores), F (1, 17) = 14.34, $p < .001$, $\eta^2 = .24$, see Figure 4. There was no effect of Block, F (4, 17) = 1.13, $p = .35$, and Block did not interact with Mimicry Condition, $F < 1$, which suggests that the performance of the mimicry and no mimicry groups, though different from each other, did not differ over the course of the signal detection task. We then tested the simple effect of Mimicry Condition on *d′* scores for the first block. We found that, after a mere 2 minutes, *d′* scores were lower in the no mimicry condition ($M = -.20$; $SD = 0.55$) compared to the mimicry condition ($M = .31$; $SD = .67$), F (1, 17) = 3.48, $p < .10$, $\eta^2 = .06$.

These findings replicate and extend Experiments 1-3 in an important way. By switching to a divided attention paradigm, we were able to show that the violation of mimicry norms attracts

attention away from other attention-demanding tasks, an effect that occurs in the opening moments of the social interaction and persists for its duration.[2]

General Discussion

The results of four experiments provide compelling evidence to support the schema-driven view of mimicry. According to this view, schemas enable mimicry to efficiently coordinate social interaction. Yet the efficient operation of complex social coordination processes such as mimicry would require that interactions adhere to social norms. We reasoned that norms would be violated and, in turn, reliance on mimicry schemas would be disrupted, if mimicry were absent from a social context where it typically would be present (Experiments 1-4), or if mimicry were present in a social context where it typically would be absent (Experiments 2-3). We assessed the consequences of norm violations for performance on a subsequent or concurrent resource-demanding task and found that violating norms led to poorer performance.

To summarize, Experiment 1 showed that individuals who were not mimicked by a peer performed poorly on a subsequent resource-demanding task, while individuals who were mimicked by a peer showed no performance deficit on that task (relative to a control condition). These findings suggest that in an interaction where mimicry would typically occur, the absence of mimicry depletes resources, while its presence preserves resources. Experiments 2 and 3 added social contexts where mimicry would be atypical based on prevailing social norms, which allowed us to orthogonally manipulate whether mimicry occurred and whether mimicry was normative. Experiment 2 manipulated whether social interaction was interracial or not and found that same-race interactions were inefficient when mimicry was absent, while cross-race interactions were inefficient when mimicry was present. Experiment 3 manipulated power dynamics between workers and leaders and found that interactions were inefficient when leaders

mimicked workers or when workers did not mimic leaders. Finally, we sought to generalize our findings to a divided attention paradigm. Experiment 4 showed that individuals who were not mimicked by a same-race partner performed poorly on a concurrent resource-demanding task and also demonstrated that the resource burden created by this counternormative behavior could be detected early on and throughout a social interaction.

Implicit Mimicry Schemas and Nonconscious Norm Violation

This research suggests that mimicry schemas operate implicitly. Across studies, none of the participants were aware of being mimicked or even suspicious of the confederate's behaviors, even when these behaviors were counternormative. This result builds on the literature suggesting that knowledge and expectations regarding social coordination can be held implicitly and violated nonconsciously (Finkel et al., 2006a, 2006b). Although fluid social coordination is the norm (Hatfield et al., 1994), and we expect most social interactions to run smoothly (Sears, 1983), most individuals are not consciously aware of social coordination failures.

This phenomenon is in contrast to more consciously mediated cases of expectancy violation. It has been proposed elsewhere (Olson, Roese, & Zanna, 1996) that in response to expectancy violations, individuals interpret, assess, and analyze the inconsistent information. That is, individuals try to understand why the disconfirmation occurred, decide whether the information can be integrated with the expectancy or whether the expectancy needs to be revised, and consider the future implications of the disconfirming information. But this elaborate cognitive process presupposes that the perceiver is consciously aware of his or her expectations and of the fact that these expectations have been violated. Neither of these presuppositions applies to the case of schema-inconsistent mimicry. Given that most individuals are not aware that mimicry is a significant component of their day-to-day interactions, not only would they fail to recognize

when their expectations regarding mimicry have been violated, but they would fail to recognize that they have expectations at all because the components of fluid social coordination are so ingrained that they are typically only implicitly available. Although patterns of mimicry can violate social norms, this violation does not prompt participants to attune to social coordination details as subtle as mimicry dynamics.

Moreover, given the nonconscious nature of mimicry dynamics, it is no surprise that mimicry's consequences for executive and self-regulatory functioning are not mediated by conscious processes. Similar dissociations between depletion effects and self-reported measures have been found in other studies (e.g., Ciarocco, Sommer, & Baumeister, 2001; Finkel et al., 2006b; Muraven & Slessareva, 2003; Schmeichel, Vohs, & Baumeister, 2003; Wallace & Baumeister, 2002), thereby leaving open the intriguing possibility that resource depletion implicates psychological processes that are not consciously accessible to the very individuals experiencing them.

Limitations and Future Directions

Prior research suggests that mimicry is more or less common in different social contexts (e.g., Johnston, 2002; Cheng & Chartrand, 2003) and has shown that in interactions where mimicry is normative, such as peer interaction, mimicry occurs at a level above chance (Chartrand & Bargh, 1999). However, the literature has not focused heavily on identifying what amount of mimicry is normative in interactions where mimicry is not the norm. In these interactions, does mimicry occur at chance level or below chance level? There is some indication that mimicry should occur below chance level in interactions where mimicry is not the norm. First, Bernieri et al. (1988) found that behavioral coordination is enhanced above chance level in related mother-child interactions, but is actually lower than chance level in unrelated

mother-child interactions – a pattern they described as *dissynchrony*. Second, Lanzetta and Englis (1989) found that mimicry is uncommon in competitive situations and Tiedens and Fragale (2003) extended these findings to show that submissive postures are responded to with dominant postures and vice versa among individuals trying to exert power, a pattern they described as *behavioral complementarity*. Third, Yabar et al. (2006) examined mimicry of face-touching behavior and found that participants mimicked a confederate's face-touching more when the confederate was believed to be a religious in-group member compared to a religious out-group member. By measuring baseline level of face-touching among participants prior to the interaction, the authors were able to determine that face-touching was reduced below baseline in the interaction with the out-group member, a finding they described as *counter-mimicry*. Collectively, these results suggest that mimicry occurs at below chance levels in contexts where mimicry is not the norm. Based on these findings, confederates in our no mimicry conditions were instructed to maintain misalignment, which would produce below-chance levels of mimicry. However, given the limited amount of prior research in this area, there are many avenues for future research to explore.

For instance, research could examine precisely what situational or dispositional characteristics produce mimicry at chance or below chance levels. For instance, personality variables like reactance (Brehm, 1966) are associated with a behavioral backlash that might extend even to the domain of nonverbal behaviors. Social motives might also come into play. For instance, social identity research suggests that people engage in behaviors that will signal to others their group status (Berger & Heath, 2007). To avoid confusion about affiliative intent, do people also (nondeliberately) engage in alternative nonverbal behaviors? Perhaps when people

are motivated to convey who they are and who they are not, mimicry would be affected, but in domains where they have no stake, perhaps baseline levels of mimicry would occur.

Contributions and Future Directions

This research contributes to the mimicry literature the conceptual point that mimicry is guided by schemas and the empirical point that these schemes foster smooth and efficient social coordination, thereby preserving much-needed executive and self-regulatory resources. We believe that this contribution builds on the extant mimicry literature in several significant ways. First, the notion that mimicry is guided by schemas can integrate prior research suggesting that mimicry is automatic and socially flexible, as well as the findings of the current research, into a cohesive framework in which mimicry is governed by implicit social coordination schemas.

Second, prior research has focused largely on the positive social consequences of mimicry, including prosocial feelings and behaviors, liking, and rapport (for a review, see Chartrand & Dalton, 2009), thereby positioning mimicry as a fundamental, if not vital, component of social behavior. Yet the scope of this research has rarely extended beyond the social benefits that accompany greater amounts of mimicry. In fact, exploration into mimicry's negative consequences has been limited to associating lower amounts of mimicry with lower levels of otherwise positive social consequences (e.g., prosocial behavior and liking). The current research, however, highlights that more mimicry does not always lead to positive outcomes. In fact, mimicry can have negative consequences for self-regulatory functioning if it occurs in situations where it typically would not.

Other theories of nonverbal behavior might also lead one to predict that mimicry is not an inherently positive act. Ekman and colleagues (e.g., Ekman, Friesen, & Ancoli, 1980) have argued that a given behavior can take on a variety of different meanings depending on context.

A smile, for instance, can convey either warmth or anxiety. Echoing this sentiment, Tickle-Degnen and Rosenthal stated that "the use of specific nonverbal acts in research must be viewed as context dependent, and generalization from a particular context to another is justifiable to the degree that the new context can be shown to be structurally similar to the previously investigated one" (1990, p. 288). These theories would lead one to expect social context to play a powerful role in determining the consequences of nonverbal acts such as mimicry, and might even lead one to speculate that mimicry can have consequences for executive and self-regulatory resources. This insight raises several questions worthy for future research.

In particular, future research could delve more deeply into the relationship between mimicry and executive and self-regulatory resources. For instance, research could explore situations in which well-coordinated social interaction might actually replenish resources, thereby improving self-regulatory functioning. Although we found no evidence for this effect in Experiment 1, this effect might be obtained in a social context that is laden with positive affect, such as interactions between close relationship partners. Mimicry between relationship partners could generate positive affect that, in turn, could possibly boost self-regulatory functioning (Tice, Baumeister, & Zhang, 2004).

In a similar vein, research could explore whether resource depletion has downstream consequences for people's tendency to mimic others. The relationship between mimicry and self-regulatory depletion might be bidirectional, with schema-inconsistent mimicry causing depletion and depletion causing schema-inconsistent mimicry. Consistent with this possibility, Vohs et al. (2005) found that atypical forms of self-presentation produce resource depletion and that resource depletion produces relatively ineffective forms of self-presentation. Alternatively, the relationship between mimicry and resource depletion might be asymmetrical, with poorly

coordinated mimicry causing depletion, but depletion causing well coordinated mimicry. This alternative seems counterintuitive, but there is research to support it. Neumann and Strack (2000) reported that people are more likely to mimic a voice on a tape when they are under cognitive load, suggesting that mimicry increases when one's resources are taxed. In addition, Baumeister et al. (1998, Study 4) reported that depletion increases reliance on default options. To the extent that reliance on schemas is the default in social interactions, depletion might improve the efficiency of social coordination. Although it is too early to make solid predictions, these lines of inquiry have clear potential to contribute to our understanding of mimicry.

Conclusion

There are many indications that mimicry makes interpersonal interactions more effective because of its power to communicate even the most complex internal states, such as affiliative intent and empathic feelings. What is perhaps even more impressive than the complexity of messages that can be conveyed through mimicry is the efficiency with which it operates. To the extent that mimicry is well coordinated between interacting individuals, it preserves much-needed self-regulatory resources. We attribute mimicry's social coordination feats to the existence of schemas that operate outside of awareness, without intention, and with efficiency. Perhaps it should come as no surprise that such schemas exist given the complexities of social life – the diverse meanings of behaviors as a function of context, and the diversity of nonverbal acts that we display in different social contexts. If each aspect of our complex and nuanced social interactions required effort, then even the most basic of our social interactions would be exhausting.

Endnotes

[1] This was true in subsequent studies as well, i.e., gender was approximately equal across conditions. Moreover, in all studies, our analyses indicated no main effects or interactions with gender.

[2] In addition to depleting attentional resources, counternormative mimicry might deplete physical resources if participants exert more physical effort in their interaction (we thank Gavan Fitzsimons for this suggestion). Participants might engage in more physical movement if they experience discomfort (although discomfort was not apparent on self-report measures, including the funneled debriefing), or if they (nonconsciously) attempt to mimic their interaction partner. If depleting, these physical movements could contribute to performance impairments on the attention-demanding task. To address this possibility, the experimental sessions were videotaped and a hypothesis-blind research assistant coded the total number and duration of upper body movements and lower body movements. We conducted a repeated measures ANOVA with Mimicry Condition (mimicry or no mimicry) as the between-subjects variable, Upper Body Movements and Lower Body Movements as the repeated measures, and baseline levels of Upper Body Movements and Lower Body Movements as covariates (baselines were calculated over a 3 minute period before the study began while participants were alone in the testing room). Results revealed no difference in the movement of participants in the mimicry and no mimicry conditions, either with total number of movements or with duration of time spent moving as the dependent variable, Fs < 1. Therefore, it appears that depletion among participants who were not mimicked in a context where mimicry would be normative was unrelated to physical resources being differentially taxed in this condition.

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Figure Captions

Figure 1. Experiment 1: Average grams of cookies consumed by participants as a function of whether they had previously been mimicked by a confederate, not mimicked by a confederate, or interacted with a confederate in the absence of nonverbal behavioral cues (control condition).

Figure 2. Experiment 2: Mean Stroop Interference scores as a function of whether participants had previously been mimicked or not by a confederate and whether participants had engaged in a same-race or cross-race interaction.

Figure 3. Experiment 3: Mean Stroop Interference scores as a function of whether participants had previously been mimicked or not by a confederate and whether participants were assigned the role of leader or worker on an upcoming task.

Figure 4. Experiment 4: Mean *d'* scores (reflecting participants' ability to discriminate animal words from non-animal words) for each 2 min block of a signal detection task as a function of whether participants were simultaneously being mimicked or not by a confederate.

Figure 1

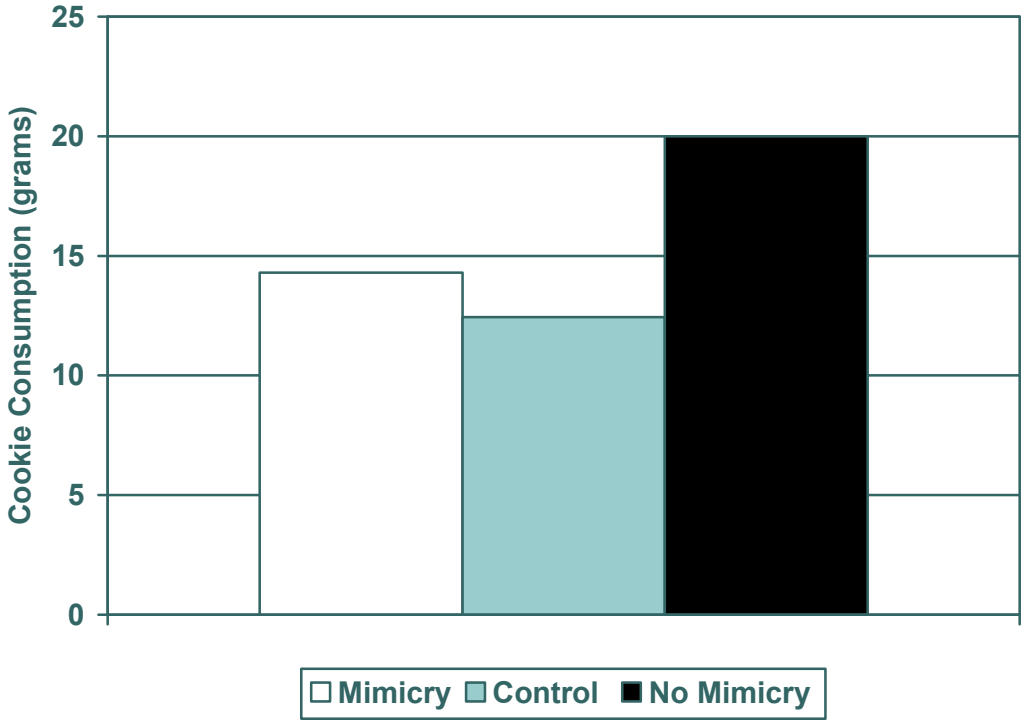

25
20
15
10
5
0
Cookie Consumption (grams)
Mimicry
Control
No Mimicry

Figure 2

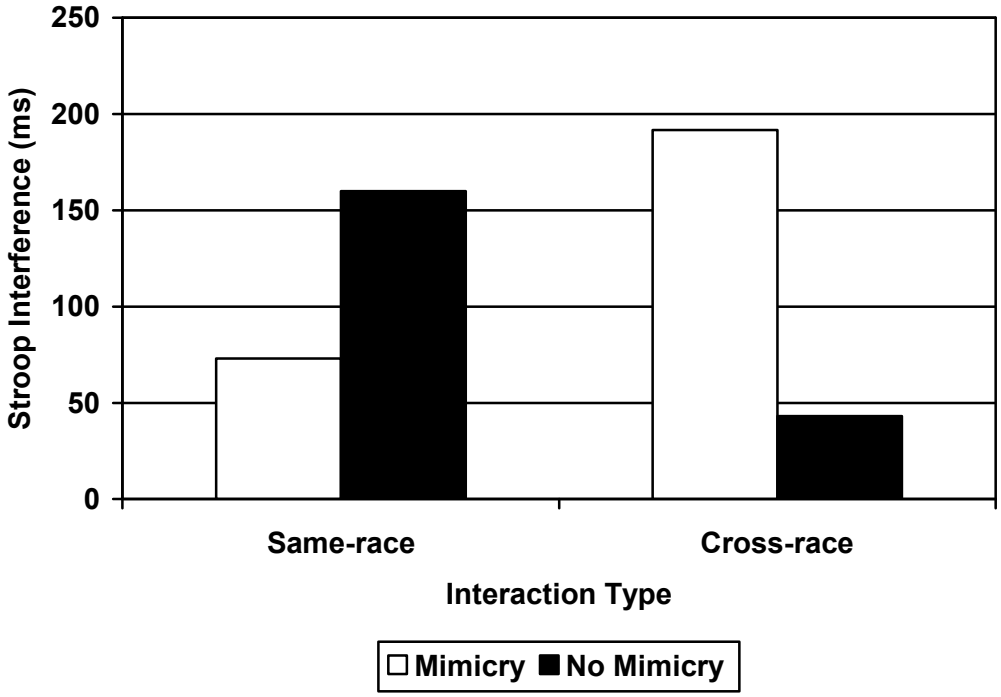

250
200
150
100
50
0
Stroop Interference (ms)
Same-race
Cross-race
Interaction Type
Mimicry
No Mimicry

Figure 3

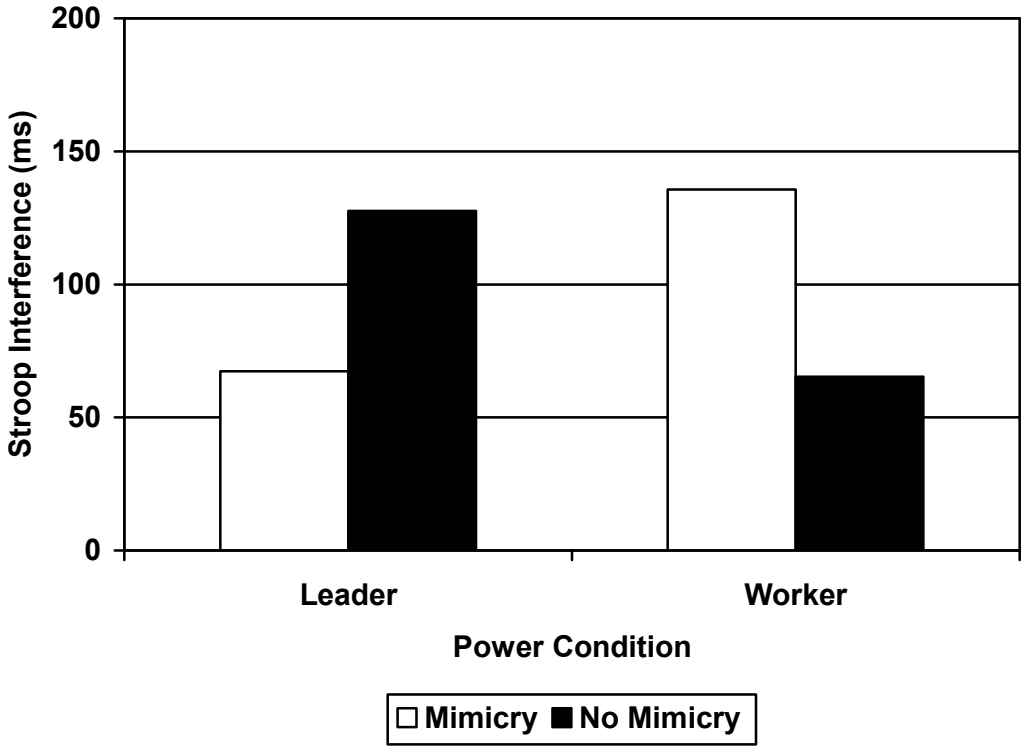
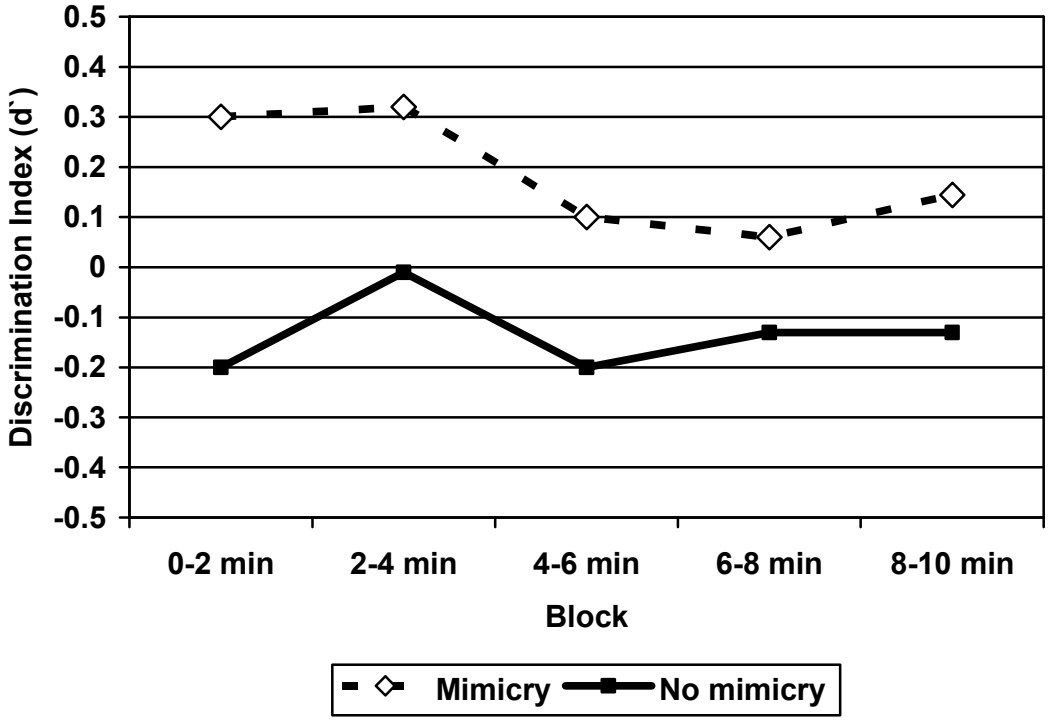

200
150
100
50
0
Stroop Interference (ms)
Leader
Worker
Power Condition
Mimicry
No Mimicry

Figure 4


0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
Discrimination Index (d`)
0-2 min
2-4 min
4-6 min
6-8 min
8-10 min
Block
Mimicry
No mimicry