

The Face of the Chameleon: The Experience of Facial Mimicry for the Mimicker and the Mimickee

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ABSTRACT. This research addressed three questions concerning facial mimicry: (a) Does the relationship between mimicry and liking characterize all facial expressions, or is it limited to specific expressions? (b) Is the relationship between facial mimicry and liking symmetrical for the mimicker and the mimickee? (c) Does conscious mimicry have consequences for emotion recognition? A paradigm is introduced in which participants interact over a computer setup with a confederate whose prerecorded facial displays of emotion are synchronized with participants' behavior to create the illusion of social interaction. In Experiment 1, the confederate did or did not mimic participants' facial displays of various subsets of basic emotions. Mimicry promoted greater liking for the confederate regardless of which emotions were mimicked. Experiment 2 reversed these roles: participants were instructed to mimic or not to mimic the confederate's facial displays. Mimicry did not affect liking for the confederate but it did impair emotion recognition.

Keywords: attitudes, attraction, impression formation, social interaction, social perception

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PEOPLE AUTOMATICALLY MIMIC ONE ANOTHER'S behavior (e.g., Cappella & Planalp, 1981; Dijksterhuis, 2005; Marsh, Richardson, & Schmidt, 2009), a feature of social interaction with benefits for the mimicker that include liking by the mimickee (Chartrand & Bargh, 1999), as well as offers of assistance (Kulesza, Dolinski, Huisman, & Majewski, 2014a; van Baaren, Holland, Kawakami, & van Knippenberg, 2004) and expressions of gratitude (Kulesza, Szypowska, Jarman, & Dolinski, 2014b; van Baaren, Holland, Steenaert, & van Knippenberg, 2003) by him or her. Specific forms of mimicry produce these benefits, including mirroring posture (e.g., leaning forward vs. backward), imitating movements (e.g., position changes of the arms and legs), and repeating words. People also imitate one another's facial expressions (Chartrand & Bargh, 1999; Frijda, 1986; Keltner & Haidt, 1999; Lakin, Jafferis, Cheng, & Chartrand, 2003), but some key aspects of this form of mimicry have yet to be systematically investigated. This is understandable in light of the difficulty in imposing experimental control over the fast-changing array of facial expressions that occur in social interaction (e.g., Condon & Ogston, 1967; Dimberg, 1990; Ekman & Friesen, 2003). Posture and limb movements occur on a timescale of seconds and are relatively easy to imitate (e.g., Chartrand & Bargh, 1999), whereas the complex musculature associated with specific facial expressions changes continuously on a momentary basis, making it difficult to manipulate synchronization in interacting individuals' facial expressions over an extended period of time.

Our aim in this article is to introduce a paradigm that creates the illusion of live social interaction while providing control over the nature and timing of facial expressions and the mimicry of these expressions. This approach thus allows for insight into outstanding issues concerning the experience of facial mimicry for both the mimicker and the mimickee in social interaction. In two experiments employing this paradigm, we focused on three issues in particular: (a) Does the relationship between mimicry and liking characterize all facial expressions, or is it limited to specific expressions? (b) Is the relationship between facial mimicry and liking symmetrical for the mimicker and the mimickee? (c) Does conscious control of facial mimicry have consequences for the mimicker's accuracy in emotion recognition?

Concerning the first issue, research has established that facial mimicry of emotion promotes liking by the mimickee for the mimicker, and vice versa (Stel & Vonk, 2010). It is unclear, however, whether this bi-directional effect reflects mimicry in general or instead is limited to the mimicry of specific expressions. The methodology employed by Stel and Vonk (2010) was not designed to address this issue, so the specificity of the effects of facial mimicry on liking remains to be determined. Facial expressions, of course, are directly linked to the experience and communication of both positive and negative emotions (e.g., Beattie, Webster, & Ross, 2010; Ekman, 1972; Ekman & Friesen, 2003; Foulsham, Cheng, Tracy, Henrich, & Kingstone, 2010; Hess & Fischer, 2013; Izard, 1971). Perhaps the relationship between mimicry and liking for the mimicker and the mimickee is observed only for facial expressions that convey positive emotions. A smiling face, for example, is perceived as more attractive (Hess, Beaupré, & Cheung, 2002) and cheerful (Otta, Abrosio, & Hoshino, 1996) than is a non-smiling face. And research has established that people whose facial expressions convey positive emotions promote positive feelings in the observer (Hess, Kappas, McHugo, Kleck, & Lanzetta, 1989; Hess, Kappas, McHugo, Lanzetta, & Kleck, 1992; Niedenthal, Mermillod, Maringer, & Hess, 2010), whereas those whose facial expressions convey negative emotions (e.g., disgust) are viewed negatively (Tapias, Glaser, Keltner, Vasquez, & Wickens, 2007; van Kleef, 2009) and are subject to relatively harsh moral judgments (Eskine, Kacirik & Prinz, 2011). Conceivably, then, the relationship between facial

mimicry and liking is specific to positive facial expressions (e.g., smiling), with the mimicry of negative facial expressions (e.g., frowning) having no impact on mutual liking between the mimicker and the mimickee—or perhaps even undermining liking.

On the other hand, there is evidence that the link between mimicry and liking (for the mimicker in this case) primarily reflects liking for responsive interaction partners and decreased liking for non-responsive interaction partners (Lemay, Clark, & Feeney, 2007; McIntosh, Reichmann-Decker, Winkelman, & Wilbarger, 2006). Because mimicry signals responsiveness, perhaps the facial mimicry of any emotion—whether positive or negative—promotes liking for the mimicker on the part of the mimickee. This possibility is consistent with the well-established finding that mimicry occurs spontaneously for negative emotions as well as for positive emotions (Bavelas, Black, Lemery, & Mullett, 1986; Häfner & IJzerman, 2011; Vaughan & Lanzetta, 1980; Zajonc, Adelman, Murphy, & Niedenthal, 1987; Zajonc, Pietromonaco, & Bargh, 1982). In this view, mimicry is a vehicle for empathy and thus functions as “social glue” that creates and maintains social bonds (e.g., Chartrand & Bargh, 1999; Dijksterhuis, 2005; LaFrance, 1979; Lakin et al., 2003; Stel, van Baaren, & Vonk, 2008). This purported function of mimicry figures prominently in models of embodied cognition (Barsalou, Niedenthal, Barbey, & Ruppert, 2003; Niedenthal, 2007).

The second issue concerns the affective consequences of facial mimicry for the mimicker. As noted above, facial mimicry in general promotes liking by the mimickee for the mimicker, but it has not been established unequivocally that mimicry provides the same benefit for the mimickee. Correlational data suggest symmetry in the mimicry-liking relationship (e.g., LaFrance, 1979; Lakin et al. 2003), but such evidence admits to different causal interpretations. As noted above, Stel and Vonk (2010) provided experimental evidence that mimicry promotes liking for the mimickee, but it is unclear whether mimicry per se was a causal factor. Thus, participants who mimicked were probably mimicked in turn, while those who did not mimic provided no input for reciprocal mimicry. Rather than mimicry promoting liking, then, the breakdown in reciprocal mimicry may have undermined liking. Swaab, Maddux, and Sinaceur (2011), meanwhile, provide evidence that mimicry does not provide benefits by the mimicker for the mimickee.

In this article, we introduce a new paradigm designed to investigate these two issues. Two studies employing this paradigm will investigate whether facial mimicry-liking relationship is general across all emotions or instead is limited to particular emotions, and whether the effect of facial mimicry on liking is symmetrical, with benefits for both the mimicker and the mimickee. These goals are accomplished by having participants interact over a computer setup with a confederate whose prerecorded facial displays of emotion are synchronized with participants' behavior. In this way, we create the illusion of live social interaction while retaining experimental control over the facial mimicry that occurs. In Experiment 1, the confederate does or does not mimic participants' facial displays of specific emotions. These roles are reversed in Experiment 2: Participants are instructed to mimic or not to mimic the confederate's facial displays.

The third issue centers on the difference between spontaneous and automatic mimicry versus strategic and controlled mimicry. Although facial mimicry is an unconscious feature of social interaction, people use facial emotions to influence one another (Clark, Pataki, & Carver, 1996; Maisel & Gable, 2009), and they sometimes consciously mimic one another's facial emotions for strategic purposes (Likowski, Mühlberger, Seibt, Pauli, & Weyers, 2011), such as tension reduction in interpersonal encounters, ingratiation (Jones, 1964), and negotiation advantage (Maddux, Mullen, & Galinsky, 2008). Unlike other forms of nonverbal behavior (e.g., gestures, body

orientation), however, facial mimicry changes on a rapid time scale (Chartrand & Bargh, 1999, Experiment 1; Dimberg, 1990) and thus may be more difficult to bring under conscious control. Perhaps conscious facial mimicry utilizes and depletes executive resources, with the associated lack of spontaneity undermining interaction smoothness and inhibiting the development of positive feelings toward the mimicker (Lakin et al., 2003).

Because facial displays differ in subtle ways (Ekman & Friesen, 2003), the depletion of resources associated with conscious mimicry might also undermine accuracy in emotion recognition. Stel and van Knippenberg (2008) found that female participants who were instructed to *inhibit* their mimicry of a target's facial expressions were slower to recognize the affect in the target's expressions. Assuming the mechanism responsible for this effect is depletion of executive resources, one might expect to observe similar impairment when participants are consciously concerned with mimicking the facial expressions of an interaction partner. There is little relevant research concerning this possibility, and what evidence exists is mixed. Facial mimicry has been shown to facilitate emotion recognition (Oberman, Winkielman, & Ramachandran, 2007), but there is also evidence that it impairs emotional understanding as well as the ability to detect lies (Blairy, Herrera, & Hess, 1999; Stel, van Dijk, & Olivier, 2009). Yet other research suggests that instructed facial mimicry is not more distracting or demanding of executive resources than is spontaneous (uninstructed) mimicry (Stel et al., 2008). Under some circumstances, in fact, instructed mimicry may deplete resources *less* than uninstructed mimicry (Cheng & Chartrand, 2003). Most research has not distinguished between conscious and nonconscious mimicry, however, so the disruptive potential of conscious mimicry on accuracy remains a possibility. This issue is addressed in Experiment 2, in which participants are instructed to mimic the facial displays of the confederate.

In sum, this article presents a new paradigm that creates the illusion of face-to-face interaction, isolates specific facial displays, and controls participants' role as mimicker versus mimicker.

EXPERIMENT 1

METHOD AND MATERIALS

Two-hundred-fifteen college students (175 women, 40 men; age $M = 23.7$, $SD = 3.49$) participated individually in a study ostensibly assessing a new cross-cultural methodology to see whether six basic emotions—*anger*, *disgust*, *fear*, *happiness*, *sadness*, *surprise*—are universally recognized (Ekman, 1972). They were led to believe that they were interacting with another person over instant video chat (cf. Lakin & Chartrand, 2003, Experiment 2) with the sound muted. They sat at a desk facing a computer monitor (1.5 feet away) with a built-in camera that enabled them to observe and be observed by the other person. The participant's task was to facially express the basic emotions over 50 trials to the other person. The participant expressed each emotion when instructed to do so by a prerecording of a male voice that was presented over the computer's loudspeakers. Each emotion was verbalized by the male in a monotone voice to avoid conveying the emotion's valence. Upon hearing each emotion, participants facially expressed it so that it presumably could be seen by the other person. Participants agreed to be recorded, so we could determine whether they displayed each emotion as it was presented to them. This was done by having a trained observer rate whether participants displayed emotion (yes vs. no) on

each trial. These ratings indicated that all participants followed the instructions on every trial, although the degree to which the facial displays matched the relevant emotion was not rated.

The other person (an experimental confederate) was a professional actress (unknown to the participant), seated at a desk facing her computer monitor, and visible on the participant's monitor from the waist up. She was in her thirties, fairly attractive, and wore a cardigan sweater. Her purported task was to observe the participant's facial expressions and write down her guesses regarding the emotion conveyed. Her portion of the interaction was actually a recording that synchronized with the participant's list of emotions. In the *mimicry condition*, she unobtrusively and naturally displayed the same emotion that was expressed by the participant on each trial. In doing so, she looked at the video camera so that she appeared to be interacting face-to-face with the participant. After displaying each emotion, she looked away from the camera and wrote down her judgment of the emotion that was expressed by the participant. The participant could observe her writing down the emotion, but he or she could not see what she wrote. In the *non-mimicry condition*, the confederate wrote down her judgments of the participant's expressed emotions without first displaying the emotions. Sample video recordings of the confederate's behavior in both conditions are available at www.chameleoneffect.eu.

To isolate specific facial expressions, 7 different lists of 50 words describing unique and discrete basic emotions were generated, with each list consisting of different combinations of these emotions (see Table 1). A randomly chosen list was presented to the participant over the computer's loudspeakers. One list included all 6 emotions, with anger, disgust, fear, and sadness each presented 8 times, and happiness and surprise each presented 9 times. The other 6 lists each omitted one of the emotions, with the other emotions presented 10 times each. Because each list consisted of 50 trials, the differences between lists in the number of times each emotion was presented was considered unlikely to be noticed by the participant. For each list, the emotions were presented in random order, 5 seconds apart, with the constraint that no emotion was presented twice in succession. Because of this control over the content and timing of participants' facial displays, it was possible to synchronize the actress's prerecorded behavior with participants' behavior so that the interaction appeared to be live from participants' perspective. The experimental design, in sum, was a 2 (mimicry vs. no mimicry by the actress) \times 7 (list of emotions) between-subjects factorial.

Upon completion of the 50 trials, participants answered seven items (e.g., "I like this person", "I think that this person is nice") assessing liking for the other person, each anchored by *fully*

TABLE 1
The Lists of Emotions Delivered to the Participant in Each Experimental Condition

Condition	Number of appearances						Total
	Anger	Disgust	Fear	Happiness	Sadness	Surprise	
All emotions	8	8	8	9	8	9	50
Omitted anger	—	10	10	10	10	10	50
Omitted disgust	10	—	10	10	10	10	50
Omitted fear	10	10	—	10	10	10	50
Omitted happiness	10	10	10	—	10	10	50
Omitted sadness	10	10	10	10	—	10	50
Omitted surprise	10	10	10	10	10	—	50

disagree (1) and *fully agree* (7). The items formed an internally consistent scale (Cronbach's $\alpha = .95$), so responses to them were averaged to create a measure of liking.

RESULTS

Based on a funnel debriefing procedure (Chartrand & Bargh, 1996), data from 5 participants were excluded from analyses because they indicated suspicion that the procedure was not an actual online interaction. None of the remaining participants reported noticing anything unnatural about the actress's behavior, nor did they indicate awareness of the hypotheses. Examination of the video recordings revealed that participants followed the emotion display instructions.

Preliminary analyses revealed no effects for gender, so this variable was not included in subsequent analyses. A 2 (mimicry vs. non-mimicry) \times 7 (list) ANOVA revealed a significant effect for mimicry, $F(1, 196) = 109.2, p < .001; \eta^2 = .36$. Mimicry promoted greater liking for the actress ($M = 5.35, SD = 1.04$) than did non-mimicry ($M = 3.81, SD = 1.09$). Neither the exclusion of a basic emotion nor the interaction between mimicry and exclusion were statistically significant, $F(6, 196) = .74 (p > .62)$ and 1.39 , respectively ($p > .22$). Mimicry of a positive emotion (happiness) promoted liking, but so did mimicry of the negative emotions when happiness was excluded from the list of emotions displayed by participants.

Consistent with prior research, these results demonstrate that being mimicked by someone promotes greater liking for the person than does not being mimicked (Stel & Vonk, 2010). The results go beyond prior research, however, in showing that the mimicry-liking relationship did not depend on the valence of the mimicked facial emotion. The actress who mimicked participants was liked even when the positive emotion of happiness was not displayed by participants (and thus not mimicked by the actress).

Experiment 2 assessed the complementary breakdown in symmetry: the effect on liking for an interaction partner when one does not mimic the partner. When facial mimicry occurs automatically in social interaction (Chartrand & Bargh, 1999; Dimberg, 1990), the suppression of this tendency may require executive resources and impair liking for an interaction partner (Stel & Vonk, 2010). But mimicry is not normative in some contexts (e.g., Leander, Chartrand, & Bargh, 2012). In such instances, its expression, rather than its suppression, may engage executive resources (Stel & van Knippenberg, 2008). If so, facial mimicry might not enhance liking for the mimickee, and it might impair accurate emotion recognition as well.

To investigate these issues, we reversed the participant-actress relationship in Experiment 2: the actress displayed facial emotions and participants were instructed to mimic or not to mimic these displays. Participants also guessed the displayed emotions, so we could assess whether accuracy was affected by mimicry expression versus suppression.

EXPERIMENT 2

METHOD AND MATERIALS

Participants were 245 students (174 women, 71 men; age $M = 24.6, SD = 5.38$). The procedure differed from Experiment 1 in one respect: participants' task was to observe the emotional

expressions of the other person (the actress) and write down what they felt each emotion was. A questionnaire consisting of 50 blank spaces, one for each facial display by the actress, was provided for this purpose. Participants were told they would be interacting with another person over the computer setup. In fact, they viewed a prerecorded video of the actress displaying each of the emotions on 50 trials. She expressed a new emotion every 5 seconds. Pilot research revealed that this was sufficient time for participants to observe and write down their guesses for each facially expressed emotion. As in Experiment 1, there were seven recordings: one consisting of all six emotions and six with one of the basic emotions omitted from each.

In the *mimicry* condition, participants were asked to imitate the actress's facial expressions, ostensibly because "mimicry increases recognizing expressions" (cf. Stel & van Knippenberg, 2008). In the *non-mimicry* condition, they were asked to inhibit mimicry of her facial expressions, ostensibly because "mimicry decreases recognizing expressions." Participants agreed to be recorded, so we could determine whether they followed these instructions. As in Experiment 1, a trained observer rated whether or not participants facially displayed an emotion on each trial. Results showed that participants followed their respective instructions: all participants in the mimicry condition displayed an emotion on each trial, whereas none of the participants in the non-mimicry condition did so. The degree to which the facial displays of participants in the mimicry condition matched the confederate's emotional display was not rated. Sample videos of participants' behavior in both conditions can be accessed at www.chameleoneffect.eu. We should note that very few studies have instructed participants to imitate another person (Maddux et al., 2008; Stel & Vonk, 2010; Swaab et al., 2011), and none of these have employed an objective manipulation check to determine if participants followed the mimicry instructions. Maddux and colleagues (2008), for instance, simply asked participants to indicate the percentage of time they followed the mimicry instructions.

Upon completion of the video interaction, participants answered the seven items employed in Experiment 1. These formed an internally consistent scale (*Cronbach's* $\alpha = .92$), so responses to them were averaged to create a measure of liking.

RESULTS

Data from 30 participants were excluded from the analyses because they expressed suspicion that the procedure was not an actual online interaction. In the mimicry condition, 17 participants were excluded, with no systematic difference across the emotion conditions (i.e., 2 in omitted fear; 2 in omitted joy; 4 in omitted surprise; 2 in omitted disgust; 7 in omitted sadness). In the no-mimicry condition, 13 participants were excluded (1 in all emotions present; 4 in omitted fear; 1 in omitted joy; 3 in omitted surprise; 1 in omitted anger; 1 in omitted disgust; 2 in omitted sadness). None of the remaining participants reported noticing anything unnatural about the actress' behavior, nor did they indicate awareness of the hypotheses.

A 2 (mimicry vs. non-mimicry) \times 7 (list) ANOVA revealed a significant effect for list, $F(6, 201) = 3.12$, $p < .05$; $\eta^2 = .085$. A multiple comparison Bonferroni correction revealed that liking was equally high for all lists, except when the actress did not express happiness (Table 2). This is consistent with research showing that people are liked more when they smile (Hess et al., 2002; Otta et al., 1996).

TABLE 2
Comparison Between Conditions for Mean Liking (Study 2) of the Bogus Interaction Partner

<i>Condition</i>	<i>Liking</i> M (SD)
All emotions	5.17 (.96) ^a
Omitted anger	5.18 (1.02) ^a
Omitted disgust	5.06 (1.04) ^a
Omitted fear	5.18 (.97) ^a
Omitted happiness	4.30 (1.14) ^b
Omitted sadness	5.10 (.82) ^a
Omitted surprise	5.07 (.97) ^a

Note. Means that do not share a common subscript differ at $p < .05$ using Bonferroni adjustment.

Neither the mimicry main effect, $F(1, 201) = .68$, nor the mimicry \times list interaction, $F(6, 201) = .86$, were significant. Examination of the recordings revealed that participants followed the mimicry versus non-mimicry instructions. So, contrary to the results reported by Stel and Vonk (2010), participants who suppressed mimicry of the actress's facial emotions did not express less liking for her. At this point, we cannot say whether the different results obtained by Stel and Vonk (2010) and by us is attributable to methodological differences. As noted at the outset, however, participants in the Stel and Vonk (2010) study were probably mimicked in return, while those who did not mimic provided no input for reciprocal mimicry. Perhaps, then, it was the breakdown in reciprocal mimicry that undermined liking the in their non-mimicry condition.

We also analyzed two measures of participants' accuracy in rating the actress's emotional displays: the raw number of inaccurate identifications (e.g., rating a display of anger as fear) and the number of non-ratings (i.e., blanks on the rating form). Interestingly, results revealed a significant effect for list on the number of mistakes, $F(6, 229) = 7.85$, $p = .001$; $\eta^2 = .17$. A multi-comparison test with the Bonferroni adjustment revealed that inaccurate ratings were most frequent when all six emotions were displayed ($M = 5.09$, $SD = 2.08$), and when fear ($M = 1.85$, $SD = 1.53$; $p < .001$), anger ($M = 2.42$, $SD = 2.93$; $p < .004$), disgust ($M = 1.85$, $SD = 1.53$; $p = .04$) and sadness ($M = 2.71$, $SD = 2.59$; $p = .009$) were excluded. Participants' accuracy, then, was lower when they were asked to identify all emotions and when they were asked to identify only negative emotions (i.e., the lists omitting happiness and surprise). Additionally, inaccurate ratings were more frequent in the omitted surprise condition ($M = 5.31$, $SD = 3.93$) than in any other omission condition. Specifically, a multi-comparison test with the Bonferroni correction revealed that this condition ("omitted surprise") significantly differed from the conditions in which fear ($M = 1.85$, $SD = 1.53$; $p < .001$), anger ($M = 2.42$, $SD = 2.93$; $p < .001$), disgust ($M = 2.87$, $SD = 2.97$; $p < .012$), and sadness ($M = 2.71$, $SD = 2.59$; $t(241) = 4$, $p < .002$) were omitted.

Of greater interest, results revealed that participants who were instructed to mimic the actress were *less* accurate in identifying her facial displays of emotion. In particular, there was a tendency for mimicry participants to make more mistakes than non-mimicry participants, $F(1, 229) = 3.24$, $p = .073$; $\eta^2 = .14$ (mimicry $M = 3.74$, $SD = 3.28$; non-mimicry $M = 3.03$, $SD = 2.85$). The mimicry participants also omitted more ratings, $F(1, 230) = 5.25$, $p = .023$;

$\eta^2 = .02$ (mimicry $M = 1.52$, $SD = 3.26$; non-mimicry $M = .67$, $SD = 1.67$);). The interaction between mimicry and list was not significant for either measure ($p > .4$ in both cases), nor was there a significant correlation between liking and either accuracy measure (Pearson $r = .098$, $p > .5$ for liking and the number of mistakes, and $r = .025$, $p > .7$, for liking and omitted ratings).

DISCUSSION

The results of Experiment 1 revealed that being mimicked promotes liking for the mimicker, regardless of the content or valence of the emotion being mimicked. This is consistent with the suggestion that mimicry facilitates the creation and maintenance of social bonds (e.g., Dijksterhuis, 2005; LaFrance, 1979; Lakin et al., 2003), with this “social glue” function served by the mimicry of negative as well as positive facial displays. The results of Experiment 2, however, revealed that facial mimicry did not promote liking for the mimicker on the part of the mimicker. This suggests that the social bonding effect of mimicry is not symmetrical for the mimicker and the mimicker, in that the effect is greater for the person being mimicked than for the person doing the mimicking.

Experiment 2 also revealed that conscious mimicry of the confederate tended to impair accuracy in assessing the emotions expressed by the confederate. This finding seems to contradict the suggestion that the *suppression* of mimicry depletes cognitive resources (e.g., Stel & van Knippenberg, 2008; Stel & Vonk, 2010), an alleged effect that can undermine the spontaneity of social interaction and interfere with the attention necessary to read subtle facial cues to emotion. We agree that imposing conscious control on an automatic process can disrupt its fluency (e.g., Kulesza, Vallacher, & Nowak, 2013; Vallacher & Wegner, 1987) and interfere with other processes—but we suggest that the relevance of this effect for the expression versus suppression of mimicry is contingent on other factors.

In certain real-world settings, mimicry may represent a conscious rather than a nonconscious process. People seem to understand, implicitly if not explicitly, that mimicry of a person’s facially expressed emotions can engender liking by the person, and thus they may employ this strategy in social interactions where such liking has instrumental value. Ingratiation, for example, can involve a conscious effort to mimic the facial displays of another person to order to gain the person’s liking (Jones, 1964). Mimicry is too complex and too fast, however, for it to be consciously controlled effectively and efficiently (Condon & Ogston, 1967). Conscious effort devoted to facial mimicry may thus deplete cognitive resources and undermine people’s ability to distinguish subtle differences in the facial configurations associated with specific emotions (Ekman & Friesen, 2003). The distinction between positive and negative facial displays may be perceived, but specific emotions within each category may not be readily distinguishable if the mimicker is concentrating on his or her own facial displays of emotion.

Conceivably, then, both conscious mimicry and the conscious suppression of mimicry can deplete cognitive resources and undermine accuracy in emotion detection, but do so under different circumstances. Likely factors responsible for these opposing effects are abundant in social interaction. When interacting with friends or with anyone in informal settings, for example, mimicry may occur spontaneously, without conscious awareness or control. Conscious suppression of this automatic tendency may deplete cognitive resources, as Stel and van Knippenberg (2008) suggested, and thus undermine liking, and perhaps accurate recognition of emotional

expressions as well (Oberman et al., 2007). However, when interacting with a stranger in a task-oriented setting—as in the present research—mimicry tendencies may be weaker (e.g., Leander et al., 2012), perhaps because affiliation goals are less salient (Lakin et al., 2003). Mimicking a person's facial expressions in such contexts thus may represent a controlled process that requires cognitive resources (and perhaps engages self-conscious attention), with a resultant decrement in attention to the subtle facial cues of the person (cf. Kulesza et al., 2014b; Niederhoffer & Pennebaker, 2002; van Leeuwen, van Baaren, Martin, Dijksterhuis, & Bekkering, 2009). Mimicry of facial expressions is also less likely to occur spontaneously when interacting with members of an outgroup as opposed to members of one's ingroup (e.g., Bourgeois & Hess, 2008; Dalton, Chartrand, & Finkel, 2010). Presumably, a conscious effort to mimic an outgroup member's facial expressions would deplete cognitive resources, promoting awkwardness in the interaction and impairing accurate recognition of the person's emotions.

Clearly, future research is necessary to address this issue. More generally, important contextual factors associated with social interaction—the degree of interpersonal familiarity, the salience of affiliation goals, the power differential between interactants, the formality versus informality of the setting, the consequences of the interaction, and so forth—need to be considered when exploring the nonconscious versus conscious components of mimicry and the consequences of this distinction for other processes (e.g., emotion detection, rapport, influence).

It should be noted that behavioral mimicry (e.g., the chameleon effect) and emotional mimicry have been described by some investigators as different phenomena (Hess & Fischer, 2013). Emotional mimicry is manifest as the imitation of facial expressions, however, and thus can be seen as a special case of behavioral mimicry (Lakin et al., 2003). In this vein, it is noteworthy that Stel and Vonk (2010) drew on the theoretical background associated with research on the chameleon effect in their investigations of facial mimicry. Nonetheless, the present paradigm could be modified to allow for the investigation of the effects of behavioral mimicry (e.g., the imitation of posture or limb movements) for both the mimicker and the mimickee in social interaction. Comparison of the results of such research with the results observed for facial mimicry might prove informative regarding the common versus unique features of emotional and behavioral mimicry.

The results of this research are clearly heuristic rather than definitive. For example, although Experiment 1 revealed that liking for a mimicker is not dependent on specific facial displays, future research could explore whether the proportion of mimicked facial expressions is critical, so that the exclusion of two or more emotions would undermine liking for the mimicker. And to establish unequivocally the impact of specific emotions, one could reverse the exclusion manipulation of the present studies, so that only one basic emotion at a time is mimicked across the 50 trials. This might show, for example, that mimicry of happiness is sufficient to promote liking, even when the other emotions go unmimicked.

Yet other issues concerning the mechanisms and consequences of mimicry can be addressed within this standardized approach. As noted in the Introduction, for example, some have suggested that the apparent link between mimicry and liking for the mimicker actually reflects decreased liking for non-responsive interaction partners (Lemay et al., 2007; McIntosh et al., 2006). To investigate this alternative interpretation, the confederate in the present paradigm could demonstrate responsiveness without mimicry by displaying emotions that do not correspond to those expressed by the participant, either within an emotional valence (e.g., a smile in response to surprise) or across different emotional valences (e.g., a smile in response to disgust).

If responsiveness rather than mimicry *per se* is responsible for liking, participants should like a responsive confederate more than a non-responsive one, regardless of the manner and extent to which they are mimicked.

This paradigm is also conducive to investigating the perceptual processes mediating facial mimicry in social interaction. Eye-tracking methodology (Duchowski, 2007) could be employed, for example, to track participants' focus of attention when viewing the confederate on the computer monitor, both as they mimic the confederate and are ostensibly mimicked by this person. Perhaps people are differentially sensitive to the confederate's eyes or mouth, for example, depending on the emotion in question or on the extent to which mimicry is conscious versus nonconscious.

Beyond addressing such issues, future research needs to investigate the robustness of this paradigm across important procedural variations. For example, we utilized a female confederate in the present studies—as others have done in research on mimicry (e.g., Lakin & Chartrand, 2003)—so it remains to be seen whether a similar pattern of results would be obtained if participants felt they were interacting with a male over the instant videochat arrangement. Although gender has not been found to play a substantial role in the vast majority of prior mimicry studies concerning the chameleon effect (e.g., Ashton-James, van Baaren, Chartrand, Decety, & Karremans, 2007; Stel et al., 2008; van Baaren et al., 2004; van Baaren, Chartrand, Decety, & Karremans, 2007; van Leeuwen, Veling, van Baaren, & Dijksterhuis, 2009; see Stel & Knippenberg, 2008, for an exception), there is evidence that women who behave in a stereotypically emotional manner are better liked than those who do not, and that women who do not express any emotions are perceived rather negatively (e.g., Hess, Adams, Grammer, & Kleck, 2009; Hess, Senécal, Kirouac, Herrera, Philippot, & Kleck, 2000; Hutson-Comeaux & Kelly, 2002; Krumhuber, Manstead, & Kappas, 2007; Plant, Kling, & Smith, 2004). Conceivably, then, the diminished liking observed in Study 1 for the female confederate who did not mimic participants' facial emotions would be attenuated for a male confederate who does not display emotion.

Characteristics of the purported interaction partner—for example, physical attractiveness (Guéguen, 2009; Karremans & Verwijmeren, 2008; Kulesza et al., 2014b) and apparent status (Cheng & Chartrand, 2003; Tanner, Ferraro, Chartrand, Bettman, & van Baaren, 2008)—may also mediate the relationships observed in the present studies and thus are candidates for inclusion in future iterations of this paradigm. And of course, any findings observed in the United States (an individualistic society) using this paradigm should be replicated in different societies (e.g., those with a greater emphasis on interdependence; Ashton-James et al., 2007).

Another issue calling for future research is the high exclusion rate in Experiment 2. Slightly more than 10% of the participants were dropped from the analyses because they expressed suspicions about the “live” interaction. It can be noted, though, that this exclusion rate is comparable to that characterizing other research focusing on similar issues. Chartrand and Bargh (1999), for example, excluded data from 11% of the participants in their first study and data from 8% of participants in their second study. Cheng and Chartrand (2003), meanwhile, excluded data from 23% of the participants in their second study. And Lakin and Chartrand (2003) excluded data from 14% of the participants in their first experiment and from 9% of the participants in their second experiment. Nevertheless, the exclusion rate in this line of research is worth considering and perhaps could be investigated in its own right. Participants asked to consciously engage in an automatic process, for example, may become unduly suspicious about the rationale for doing so. Alternatively, in attending to the details of an overlearned behavior, participants may identify

what they are asked to do in relatively low-level terms and thus become especially attentive to possible higher-level meanings that might not otherwise be considered (Vallacher & Wegner, 1987).

In light of the various issues and relevant procedural variations noted above, it is all the more important to employ a common paradigm so that the findings associated with these variables can be compared and eventually allow for the emergence of a coherent account of facial mimicry. In enabling the investigation of the complexity and subtlety of facial interaction in a controlled manner while maintaining the illusion of social interaction, the paradigm introduced in this research holds potential for paving the way toward such integration.

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