

## ARTYKUŁY

[*Articles*]

### HOW BEHAVIORAL MIMICRY INFLUENCES IMPRESSION FORMATION PROCESSES: A POSITIVE IMPRESSION BIAS\*

Weronika D. Trzmielewska<sup>1</sup>, Paweł Brzóska<sup>2</sup>

**Summary.** The study aimed to examine the effect of mimicry on impression formation in ambiguity presentation of the target. Participants ( $N = 115$ ) were mimicked or were not mimicked by confederate. Subsequently, they read an ambiguous description of the target, and were instructed to (1) offer the three traits that best characterize the target, and (2) rate the veracity of the target's four bipolar traits pairs (positive vs. negative). People who were mimicked described the target more favorably (in positive and overall agentic and communal valence) at the first trait offered. No group differences for the second and third trait, nor index of favorability (means of traits) were found. All traits had higher agentic than communal valence for each condition. Mimicry, in a close-ended task, influenced ratings on negative valence traits (reckless and conceited), but had no effect on positive valence traits. The implications of the automatic activation of social information-processing are discussed.

**Key words:** impression formation, affiliation, mimicry, communion and agency

---

\* **Acknowledgments.** We thank professor Bogdan Wojciszke for his insightful comments on this research project.

<sup>1</sup> SWPS Uniwersytet Humanistycznospołeczny w Warszawie (SWPS University of Social Sciences and Humanities in Warsaw), ORCID: 0000-0002-4818-3067.

<sup>2</sup> SWPS Uniwersytet Humanistycznospołeczny w Poznaniu (SWPS University of Social Sciences and Humanities in Poznan), ORCID: 0000-0002-5230-2663.

---

Adres do korespondencji: Weronika, D. Trzmielewska,  
e-mail: wtrzmielewska@swps.edu.pl

## Introduction

How people perceive others is based on immediate impressions, which are open to many interpretations because social interactions are characterized by ambiguity (McKillip, Barrett, Dimiceli, 1978). For example, one situation can be interpreted by the same person in various ways because different mental structures can be activated in people on certain occasions (Bruner, 1957). Therefore, especially when a situation can be perceived in many ways, then the most accessible category, rather than the sum of possible cognitions, should steer an individual's later judgments (Tversky, Kahneman, 1974; Ford, Thompson, 2000).

The influence of an activated category on later judgments usually takes the form of an automated and effortless *assimilation effect* (Dijksterhuis, Aarts, 2010), indicating that ambiguous information may be judged consistently with the primed category (i.e., may fit, Bruner, 1957). Furthermore, sometimes the impact of an activated category on judgments is related to the *contrast effect*, which consists of moving judgments away from contextually activated information. This may occur when people are somewhat aware of their cognitive distortion (i.e., stereotypes) and try to counteract them or when extreme examples are primed and ambiguous stimuli judged (Herr, Sherman, Fazio, 1983).

Many social cognition studies have focused on trait impression formation through nonconscious verbal priming using trait categories (Higgins, Rholes, Jones, 1977; Chartrand, Bargh, 1996; Bargh, 2006). In a seminal study, exposure to words describing traits related to adventurousness (vs. recklessness) affected the subsequent judgment of a stimulus person (Higgins, Rholes, Jones, 1977). People exposed to adventurousness-related words perceived the target as being more adventurous than reckless. Among those exposed to recklessness-related words, a reverse pattern was observed. Moreover, to be effective, activated information should be applicable (i.e., be information-relevant) to the interpretations of the target. Therefore, changes in information processing, through a type of trait priming, can lead to different judgments of the same person. Such an assimilation effect can exist independently of the valence (negative vs. positive) of the prime category about the target. Notably, category accessibility can be evoked through nonverbal priming—by exposure to certain social behaviors (Bargh, 1997). One such social behavior includes simple mimicry (Chartrand, Bargh, 1999).

### Mimicry

Humans unconsciously mimic the gestures, facial expressions, or speech of others during social interactions (Chartrand, Bargh, 1999; Clarke, 2013; Kulesza et al., 2015). However, it does not mean that mimicry cannot be used strategically (Duffy et al., 2019). Mimicry can cause many positive social consequences, even when people are unaware of its presence or when they do not know each other

(Chartrand, Bargh, 1999). Mimicry may play a functional role in social settings because it can bond people together (*social glue hypothesis*, Lakin et al., 2003). With that dominant view, mimicry automatically raises affiliative goals in people's minds. It makes mimicry a reasonable tool for investigating impression formation processes in social interactions (Chartrand, Bargh, 1999). However, actual goals, which arise unconsciously, may affect the way that people process information because such nonverbal priming may lead to goal-directed cognition (Dijksterhuis, Aarts, 2010). According to the assumptions above, this study aimed to consider how mimicry affects impression formation in ambiguity presentation of the target (with no initial attitude of this target). Specifically, the experiment tested whether people being mimicked form a more positive impression of stranger target (than those not being mimicked) when they may interpret the target's behaviors in many ways.

### **Positive changes in person perception after mimicry**

Mounting evidence suggests that mimicry increases liking for the mimicker by the mimickee i.e., the person being mimicked (Kouzakova et al., 2010). However, this link sometimes disappears and mechanisms behind this inconsistency are unknown (Drury, Van Swol, 2005). In these studies, participants are often instructed to complete a social task with an unknown confederate, who does or does not mimic their behaviors. Participants typically receive little information, such as names, about the interaction partners. In addition to liking, mimicry serves as an embodied cue of social competence. Mimickers can be judged by the mimickee as being more competent, confident, or persuasive (Van Swol, 2003; Jacob et al., 2011). However, such links sometimes fail (Kulesza et al., 2017; Bocian et al., 2018). Still, in a study by Bocian et al., the mimicker was perceived by the mimickee as having more warmth (caring, helpful, etc.) than someone who did not mimic. Moreover, in virtual reality environments, people respond more favorably, within the dimensions of warmth and competence, to virtual agents who are mimicking them (Verberne et al., 2013). Therefore, mimickers may reap the benefits of enhanced, favorable interpersonal perceptions by those they mimicked. Such effects may arise without complex information or initial attitudes toward the mimicker.

### **Changes in a priori negative attitudes after mimicry**

The mere presence of mimicry is considered a strategy to reduce stereotypes (i.e., after mimicry, the initial negative attitude can be more positive). Contact with mimicking virtual outgroup members improved intergroup relationships (on liking and feeling of closeness toward outgroup VR mimicker, Hasler et al., 2014). Such an effect may exist only in people who expressed low, but not high, a priori liking of outgroup members. Unfortunately, in Hasler's study, no measure was used for feelings of the entire outgroup, making it impossible to generalize the effects to the entire

outgroup population. Contrarily, in the other study, only mimickers from the participant's ingroup (but not mimickers from an outgroup) gained liking from mimicked participants (Likowski et al., 2008). The *repair* effect of mimicry on social interactions can spread beyond mimicker–mimickee dyads. In a study, behavioral mimicry (i.e., non-believer confederate mimicking participants who declared themselves believers) led to more favorable judgments toward the entire participants' outgroup (Zglinicka, Kulesza, 2014). This effect occurred on the moral, and not on efficiency and personality, dimensions. In this study, no initial attitudes toward an outgroup were measured.

Although studies have indicated that readily accessible categories can influence impression formation of ambiguous targets, this relationship is not completely understood. Several studies have tested such relationships, involving verbal trait priming performed in artificial settings (Higgins, Rholes, Jones, 1977, for critics, see Galinsky, Glucksberg, 2000). Investigations of impression formation through the more naturalistic nonverbal priming, which uses mimicry, have also been performed. However, most studies, have tested the impact of mimicry on impression formation about targets who mimic the participants (i.e., confederates with whom participants participate in the study, e.g., Chartrand, Bargh, 1999). Therefore, those judgments refer to the mimickers and not to other people in general. In these studies, the participants usually know some basic information (names or educational levels) about the targets. A few studies, involving judges toward targets (or products, Kulesza et al., 2017), but with a priori negative attitudes (1) toward mimickers from the participant's outgroup (Hasler et al., 2014) or (2) the entire participant's outgroup (stereotyped groups, Zglinicka, Kulesza, 2014).

## Study aims

In this study, the goal was to extend previous research and examined whether mimicry influences impression formation of the target (1) with whom the participant did not get acquainted, (2) without initial attitudes (either positive or negative) toward him, and (3) with the presentation of the target with ambiguous verbal description which seem novel in the mimicry research field (i.e., target behaviors can be interpreted by participants as positive or negative). Because impression ratings were likely based only on quantitative measurements in earlier studies, in this study, two indicators (qualitative and quantitative) of impression formation were used. Based on the literature review, it was hypothesized that:

- Hypothesis 1. People being mimicked will like their mimicker more than people not being mimicked. Liking also served as a mimicry manipulation check (e.g., Kouzakova et al., 2010).
- Hypothesis 2. People being mimicked will offer traits that describe the target more favorably than people not being mimicked.
- Hypothesis 3. People being mimicked will rate the target's positive valence traits to the higher level than people not mimicked.

- Hypothesis 4. People being mimicked will rate the target's negative valence traits to the lower level than people not mimicked.

Description of the target includes mostly his agentic behaviors for interpretation (Higgins, Rholes, Jones, 1977), so it was also explored whether the traits offered by participants differ on their agentic and communal valence between (and within) conditions. Supplemental materials and datasets underlying the presented study are available at [https://osf.io/agh6t/?view\\_only=6b55a47282e645668949c12a144f7e55](https://osf.io/agh6t/?view_only=6b55a47282e645668949c12a144f7e55).

## Method

### Participants

Data were collected from 40 undergraduates (28 women,  $M_{\text{age}} = 26.75$ ,  $SD_{\text{age}} = 8.03$ ) at SWPS University of Social Sciences and Humanities in Poznan in exchange for course credit and from 80 employees from local corporations who were awarded in training of interpersonal communication skills (55 women,  $M_{\text{age}} = 28.80$ ,  $SD_{\text{age}} = 8.01$ ). These two groups did not differ significantly in age ( $t[118] = -1.32$ ,  $p = .189$ ) and sex ratio ( $\chi^2[1, N = 120] = .02$ ,  $p = .889$ ), therefore, both groups were treated together because of this equivalence. Five participants revealed during the debriefing that they had ascertained the aims of the study and were excluded from analyses. The final sample consisted of 115 participants (81 women,  $M_{\text{age}} = 28.23$ ,  $SD_{\text{age}} = 7.94$ ) randomly assigned to the mimicry ( $N = 57$ ) or no-mimicry ( $N = 58$ ) condition. Ethical approval for this study was obtained at the SWPS University of Social Sciences and Humanities from the Ethics Committee for Scientific Research, Faculty of Psychology in Sopot (WKE/S 16/11/65).

### Mimicry manipulation

A common mimicry method was applied (Chartrand, Bargh, 1999). Trained confederates mimicked or did not mimic the participant's non-verbal behaviors during a social interaction task (interview). Participants were randomly assigned to mimicry or to no-mimicry conditions. In the mimicry condition, the confederate was instructed to sit in a relaxed position and to mimic behaviors presented by the participant (e.g., nodding, rubbing neck) with a delay of about 2–3 seconds. Confederates repeated behaviors used by participants around every second presence. Not in every, to avoid the unnaturalness of the conversation or detection of mimicry by participants (Kavanagh et al., 2011). In the no-mimicry condition, the confederate was instructed to sit in a relaxed position and refrain from mimicking participants' non-verbal behaviors. To make sure that confederates will not automatically mimic participants, they sit relatively still, put palms flat on a desk and both flat feet on the floor (Chartrand, Bargh, 1999).

## Measures and materials

**Liking the mimicker.** To investigate whether mimicry manipulation increases the liking of the mimicker participants indicated the veracity (1 = *definitely not*; 7 = *definitely yes*) of seven items (e.g., “This person triggers a positive feeling in me”) which were averaged to create an index (Cronbach’s  $\alpha = .91$ ). This method has been used previously in Polish-speaking samples (Kulesza, Dolinski, Wicher, 2016).

**Impression formation.** To examine individual differences in how participants form an impression of the target, two measures were used. Participants engaged in the open-ended and closed-ended response tasks where, in both cases, they were presented with an ambiguous description of a target who was described using a person-perception paradigm (inspired by Higgins, Rholes, Jones, 1977) as:

Konrad spent a great amount of his time in search of what he liked to call excitement. He had already climbed, shot the Colorado rapids in a kayak, and piloted a jet-powered boat – without knowing very much about boats. He had risked injury and even death. Now he was in search of new excitement. He was thinking, perhaps, he would do some skydiving or maybe cross the Atlantic in a sailboat [adventurous/reckless]. By the way, he acted one could readily guess that Konrad was well aware of his ability to do many things well [self-confident/conceited]. Konrad’s contacts with people were rather limited. He felt he didn’t need to rely on anyone [independent/alooof]. Once Konrad made up his mind to do something it was as good as done no matter how long it might take or how difficult the going might be. Only rarely did he change his mind even when it might well have been better if he had [persistent/stubborn].

Traits presented in the text in square parentheses were not given for participants. In the open-ended portion, participants were asked to list the three traits that best characterize the target. These traits were scored and averaged as positive/negative (more/less favorable, ranging from  $-4.49$  to  $+4.40$ , Abele, Wojciszke, 2007, Study 1). Additionally, traits were scored on their agency, and communion value (more/less agentic/communal, both ranging from  $-4.55$  to  $+4.75$ , Abele, Wojciszke, 2007, Study 1).

In the closed-ended portion – which came second, participants rated the veracity (1 = *definitely not*; 7 = *definitely yes*) of four bipolar adjective pairs (“independent”/“alooof”; “reckless”/“adventurous”; “self-confident”/“conceited”; “persistent”/“stubborn”) to describe the target (Higgins, Rholes, Jones, 1977). These traits were further averaged to create indexes of positive and negative valence traits. The negative traits index was calculated as the mean only of alooof, reckless, and conceited traits. The stubborn trait was excluded from the final index because when based on results of Polish samples, its valence was above zero (i.e.,  $.72$ , Abele, Wojciszke, 2007, Study 1), so that, it can be perceived by Polish people as a relatively positive characteristic. Values for the rest of traits were as following for independent ( $+3.22$ ), adventurous ( $+3.81$ ), self-confident ( $+3.17$ ), persistent ( $+3.82$ ), alooof ( $-1.14$ ), reckless ( $-2.36$ ), conceited ( $-2.77$ ). There were also a few masking items (e.g., “feels fear”) to rate the target (see supplementary materials).

*Demographics.* At the end of the study, participants reported their gender and age in years. They were also asked what they thought the study was about.

Additional questionnaires were completed for answering research questions unrelated to the current project.

## **Procedure**

Participation took place individually with only a confederate present. They were seated facing each other, with approximately four feet between them. All participants had been informed about their rights and the general aims of the study. Upon commencement of the study, the confederate introduced themselves as a local university student in market research who was conducting a study to fulfill course requirements (Kulesza, Dolinski, Wicher, 2016). For the student sample participants were told they were involved in a study to assess and improve the quality of teaching at university. For the worker sample, they were told they were involved in a study to assess and improve workplace culture. Each interview took approximately 7–10 minutes and was composed of 12 questions asked in the same order. The participants were free to briefly respond to each of those questions; responses were not recorded. During the interview, the confederate mimicked (or not) the participant's non-verbal behaviors. Once the interview was complete, the participants completed self-report surveys and were asked if they had guessed the purpose of the experiment. Lastly, the participants were thanked, debriefed, and, for those who needed it, were awarded course credit.

## **Analyses**

The data distributions in both conditions were significantly different from normal for most of the dependent variables (Shapiro-Wilk tests,  $W$ s ranging from = .64 to .95,  $p$ s < .050), meaning that most dependent variables were not normally distributed (except for traits index in the no-mimicry condition,  $W$ s = .96,  $p$  = .102). Therefore, the Mann-Whitney  $U$  test was conducted to test the main group differences.

# **Results**

## **Descriptive statistics and manipulation check**

Randomization (mimicry vs. no-mimicry condition) was successful for age, in mimicry ( $M_{\text{age}} = 28.47$ ,  $SD_{\text{age}} = 8.17$ ) and no-mimicry condition ( $M_{\text{age}} = 27.77$ ,  $SD_{\text{age}} = 7.97$ ),  $t(118) = .48$ ,  $p = .636$  and sex ratio,  $\chi^2(1, N = 120) = 3.17$ ,  $p = .075$ . Participants being mimicked like their mimicker more than participants not mimicked ( $U = 1290$ ,  $z = 2.04$ ,  $p = .041$ ,  $r_b = .22$ , see Table 1).



Table 1. Descriptive statistics for all dependent variables in both conditions

Variable	No-mimicry ( <i>N</i> = 58)			Mimicry ( <i>N</i> = 57)		
	<i>Mdn</i>	<i>M</i>	<i>SD</i>	<i>Mdn</i>	<i>M</i>	<i>SD</i>
Liking	5.71	5.79	.75	6.14	6.08	.86
Open-ended rating of the target						
Valence of 1st Trait	3.17	1.66	2.52	3.62	2.89	1.42
Valence of 2nd Trait	2.42	1.86	2.13	3.15	2.14	2.01
Valence of 3rd Trait	3.17	1.98	2.03	3.17	1.79	2.42
Trait index	1.98	1.74	1.53	2.21	2.26	.98
Closed-ended rating of the target						
Independent	6.00	6.12	.96	6.00	6.14	1.19
Aloof	6.00	5.67	1.44	6.00	5.47	1.50
Adventurous	6.50	6.21	.93	7.00	6.39	.80
Reckless	4.50	4.50	1.60	4.00	3.89	1.77
Self-confident	7.00	6.19	1.08	7.00	6.32	1.00
Conceited	4.00	4.03	1.60	4.00	3.58	1.66
Persistent	6.00	6.21	.89	7.00	6.32	.95
Stubborn	6.00	6.12	1.08	6.00	6.14	.97
Positive traits index	6.25	6.18	.65	6.50	6.29	.67
Negative traits index	4.83	4.74	.98	4.33	4.32	1.04

### Open-ended rating of the target

Participants being mimicked described the target more favorable in the first trait offered ( $U = 1287, z = 2.07, p = .039, r_b = .22$ ), than participants not mimicked. No significant effect for the second ( $U = 1448, z = .54, p = .586, r_b = .07$ ), and the third



trait ( $U = 1487, z = .32, p = .752, r_b = -.03$ ), nor for favorability traits index was found ( $U = 1378, z = 1.54, p = .124, r_b = .17$ , see Table 1 and Figure 1).

Additionally, participants being mimicked described the first trait of the target more favorably, on agentic ( $U = 1158, z = 2.79, p = .005, r_b = .30$ ) and communal ( $U = 1282, z = 2.09, p = .037, r_b = .22$ ) valence than not mimicked. For agentic valence no significant effect was found for the second ( $U = 1482, z = .34, p = .731, r_b = .04$ ) and the third trait ( $U = 1406, z = .80, p = .426, r_b = .09$ ). Agentic traits index was higher in mimicry than in no-mimicry condition ( $U = 1316, z = 1.89, p = .059, r_b = .20$ , see Table 2 and Figure 2). The same pattern was found for communal valence for second ( $U = 1457, z = .49, p = .621, r_b = .05$ ) and third trait ( $U = 1344, z = 1.16, p = .246, r_b = -.13$ , see Table 2 and Figure 3) offered by participants. No significant differences were found between both conditions for the communal traits index valence ( $U = 1620, z = .19, p = .851, r_b = .02$ ).

Additionally, the differences between agentic and communal traits valence within conditions were analyzed. Three traits offered by participants were scored higher on agentic than communal valence in both conditions ( $Z > 5.69, p < .001$ , see Table S1 in supplementary materials).

Table 2. Descriptive statistics for agentic and communal traits valence in the open-ended task

Variable	No-mimicry ( $N = 58$ )			Mimicry ( $N = 57$ )		
	<i>Mdn</i>	<i>M</i>	<i>SD</i>	<i>Mdn</i>	<i>M</i>	<i>SD</i>
Valence of 1st Trait Agency	3.25	1.99	2.47	3.80	3.31	1.44
Valence of 1st Trait Communion	.35	.18	1.65	1.30	.82	1.18
Valence of 2nd Trait Agency	3.40	2.54	2.07	3.40	2.90	1.75
Valence of 2nd Trait Communion	.30	.15	1.41	.35	.23	1.39
Valence of 3rd Trait Agency	3.40	2.61	1.85	3.80	2.55	2.20
Valence of 3rd Trait Communion	.15	.45	1.56	.35	-.11	1.60
Agency index	2.53	2.35	1.44	3.08	2.91	.86
Communion index	.23	.24	.99	.20	.32	.67

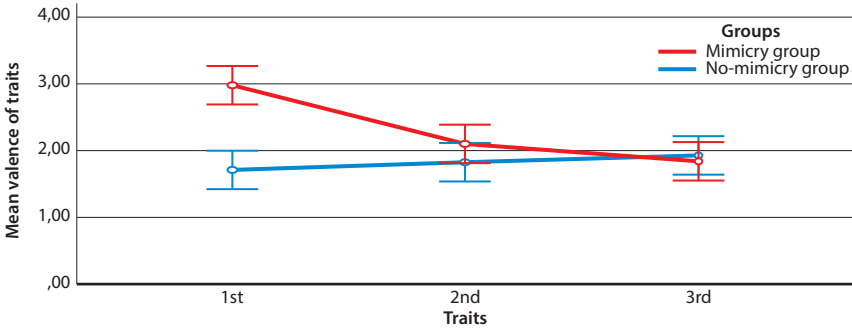


Figure 1. Mean of the three traits offered by participants, favorability valence, subgroup differences

Note. Error bars = +/- 1 standard error. Scale from -4.49 to +4.40.

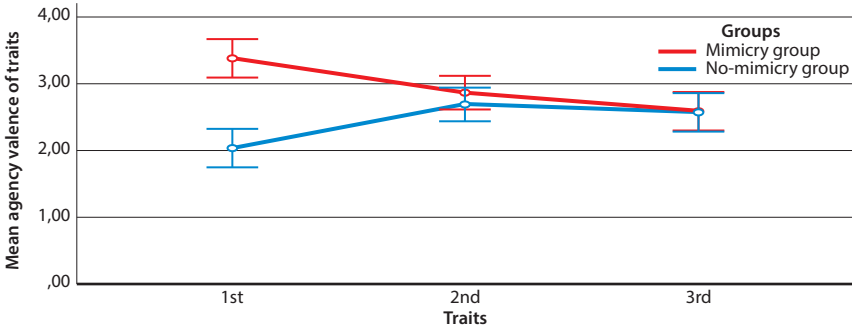


Figure 2. Mean of the three traits offered by participants, agentic valence, subgroup differences

Note. Error bars = +/- 1 standard error. Scale from -4.55 to + 4.75.

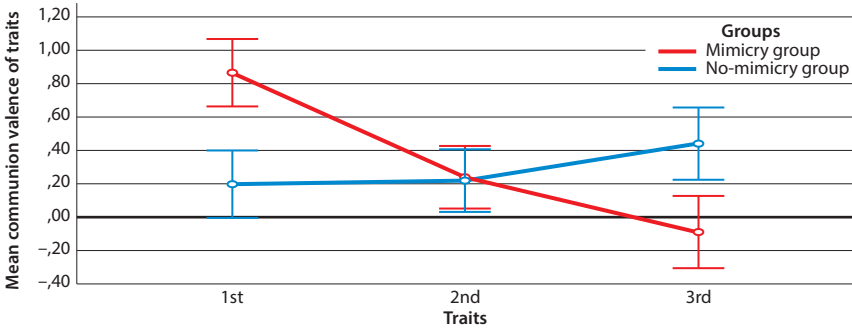


Figure 3. Mean of the three traits offered by participants, communal valence, subgroup differences

Note. Error bars = +/- 1 standard error. Scale from -4.55 to + 4.75.

## Closed-ended rating of the target

Participants being mimicked described the target lower on the two negative valence traits – on reckless ( $U = 1301, z = 2.00, p = .045, r_b = .21$ ) and conceited ( $U = 1330, z = 1.84, p = .066, r_b = .20$ ), but the second effect was marginal. Ratings for aloof ( $U = 1521, z = .77, p = .440, r_b = -.08$ ) and stubborn ( $U = 1635, z = .11, p = .911, r_b = -.01$ ) traits showed no group differences. Ratings for negative traits valence index in mimicry condition were lower than in no-mimicry condition ( $U = 1280, z = 2.10, p = .036, r_b = .23$ , see Table 1).

Ratings of positive valence traits showed no group differences, respectively for independent ( $U = 1560, z = .56, p = .574, r_b = .06$ ), adventurous ( $U = 1501, z = .94, p = .348, r_b = .09$ ), self-confident ( $U = 1555, z = .61, p = .543, r_b = .06$ ) and persistent ( $U = 1504, z = .91, p = .362, r_b = .09$ ), nor for positive traits valence index ( $U = 1469, z = 1.04, p = .298, r_b = .11$ , see Table 1).

## Discussion

In this study, it was tested whether mimicry influences impression formation processes of ambiguously presented target persons. Moreover, it was examined whether mimicry increased liking for the mimicker in the mimickee. First, people being mimicked liked their mimicker more than people not mimicked. Second, in the open-ended task, people described the target more favorably, on overall positive, and additionally agentic and communal valence, but this effect occurred only in the first trait offered by participants. Additionally, all traits offered by participants were scored higher on agentic than communal valence under each condition. Third, in close-ended tasks, mimicry partially affected negative valence traits, and unexpectedly, ratings of positive valence traits showed no group differences.

The findings that mimicry increased liking for the mimicker are consistent with assumptions that mimicking behaviors fulfill an important social function because they bond people together by establishing a prosocial orientation overall (Lakin et al., 2003). The evidence for this claim comes from social and neurocognitive studies (Chartrand, Bargh, 1999; Wang, Hamilton, 2012) and suggests that mimicry manipulation was successful.

In the open-ended task, people being mimicked produced more favorable (positively valence) traits than those not being mimicked. This result is consistent with theories of impression formation, where processing information, especially in ambiguous contexts, may evoke cognitively available categories that people use in later judgments (Bruner, 1957). Exposure to a certain category is suggested to evoke corresponding feelings in people, which could affect future evaluations (Higgins, Rholes, Jones, 1977). Therefore, it would be that the inferences and judgments about others could be guided by a good feeling, as mimicry seems to induce affiliation

feelings, which are positively related with (e.g., life satisfaction, Diener, Seligman, 2002). That is, such positive affiliative feelings would be generalized to the unknown target. Obtained findings are somewhat consistent with those of other studies on mimicry, showing that the positive effects of mimicry can spread beyond the mimicker–mimickee dyad (Tanner et al., 2008; Zglinicka, Kulesza, 2014). For example, people being mimicked judged more favorable products without initial attitudes toward them (Tanner et al., 2008, or at least slightly positive see Kulesza et al., 2017). However, in the present study findings reveal new insights, suggesting that mimicry can trigger more positive impression formation even when faced with ambiguous information about the presented person (unrelated with the interacting mimicking partner).

Under the influence of mimicry, the first traits offered by participants were rated higher on their communal and agentic valence. Therefore, in response to mimicry, the target traits were immediately perceived as more positive as well as more communal and agentic in valence. Such results can be in part related to the *halo effect*, which is the observer's tendency to assign unobserved positive characteristics to objects based on one previously positive impression (Anderson, 1981). Thus, mimicry would bring an associative nature of immediate impression formation when faced with ambiguously presented targets. These results are also consistent with theories of social cognition. Communal and agentic features seem dominant in people's spontaneous judgments about others, and even though both are most often unrelated in a person's perception, the targets can be perceived both as high in communion and agency (the halo effect, Abele, Wojciszke, 2014). However, such assumptions are tentative, because communal values of traits offered in this study were generally low (and lower than agentic). Further studies should verify these assumptions more carefully.

Findings from this study may have shed some light on prior research because mimicry did not influence the second and third traits offered by participants. Such a pattern can be explained by theoretical claims (Srull, Wyer, 1980). It has been assumed that once a category is evoked, its accessibility may decay over time (or replaced with another category). By contrast, delayed influence on primed category can be larger than immediate one (the stored portions of information could be immediately forgotten, unlike in the case of categorization, Bartlett, 1932; Woodworth, Schlosberg, 1954). Given this inconsistency and a lack of systematic studies that test how effects of mimicry are distributed with the passage of time, a reliable meta-analysis of mimicry research should be conducted to improve the understanding of patterns obtained in this study.

Furthermore, when looking at the results from close-ended ratings, mimicry had an effect only on the two negative valence traits. Importantly, in this study, not all traits originally presented as negative in nature (Higgins, Rholes, Jones, 1977) were comparatively rated when based on results of Polish samples (Abele, Wojciszke, 2007, Study 1). That is, in the case of a stubborn trait, its valence was

above zero and not below. The other three traits were indeed perceived by the Polish population sample as negative traits. Interestingly, mimicry only affected traits with stronger negative values (reckless and conceited). This pattern can be supported by other findings, which showed that mimicry can work as a tool to *repair* social relations (Hasler et al., 2014). In these studies, mimicry was shown to improve ratings toward outgroup members (mimicker) only when people declared low a prior liking of that entire outgroup. Results obtained in this study, are not very intuitive, because negative judgments may have greater power over positive ones (bad may be stronger than good, Baumeister et al., 2001). Negative information is processed more thoroughly than positive information. From a functional point of view, such a pattern is adaptive. People may discriminate between harmful and beneficial stimuli and can be more motivated to avoid bad than to approach good ones (Peeters, 1995). However, given the (1) ultrasocial nature of humans, (2) advantages of social behavior, and (3) dangers in the social environment, mimicry *repair* effects on negative traits would be reflected as socially adaptive (Palagi et al., 2020). One tendency that may have equipped people to bond together in the face of danger is to look for cues of similarity in others as windows to their cooperative tendencies. One of the cues people may have used to detect similarity would be mimicry. Therefore, it could be more adaptive to reduce the importance of negative traits during judgments of a person, for instance, in the face of a greater threat. Although intriguing, such assumptions are speculative, and therefore, strong conclusions must wait for more rigorous investigations.

Unexpectedly, mimicry had no impact on the target ratings on his positive valence traits in the close-ended task. These results can be viewed as somewhat inconsistent with those of a study, in which mimicry was shown to spread beyond the mimicker and enhance judgments toward people unrelated to the mimicker (Zglinicka, Kulesza, 2014). However, that study considered judgments related to potential a priori negative attitudes toward the targets. Obtained results can be also considered related to the prior study using trait priming (Higgins, Rholes, Jones, 1977). Later (delayed) judgments were found to be effective when activated categories were applicable to objects. Additional analysis in this study showed that the mean value of negative traits used in close-ended tasks was close to zero (i.e., .50) for agentic valence and less than zero (i.e., -1.60) for communal valence. So that the effects of mimicry would last longer in a case of more applicable (communal) category arising from nonverbal priming. It could share some similarities with prior research, where mimicry improved ratings toward outgroup members; however, this effect exists only on warmth and not competence and personality dimensions (Zglinicka, Kulesza, 2014). More studies are needed to better understand these findings using a bigger sample size. The effects of positive traits in close-ended tasks are maybe weaker, and therefore, a larger study sample is needed to find any significant differences.

## Limitations and future directions

The first limitation is related to the type of mimicry manipulation (Chartrand, Bargh, 1999). In this popular paradigm, confederates cannot be completely blind to the research hypothesis (they know the study is about mimicry). This may lead to experimenter bias. Furthermore, no control for confederate behaviors, which may naturally occur during an experiment (e.g., warm tone of voice), was used and would influence the study results (Wang, Ramsey, Hamilton, 2011). In the future, video recordings should be used to code behaviors presented by confederates. The second limitation is related to challenges with good-design no-mimicry conditions. In this study, confederates in the no-mimicry group remained behaviorally inactive (Chartrand, Bargh, 1999). This behavior would be perceived as unnatural (Kavanagh et al., 2011) because during real-life interactions there is often compatibility between verbal and nonverbal language. Adding the natural movement repertoire of confederates (unrelated to the participant's) to the no-mimicry condition would be worthwhile. The third limitation is related to the materials used in this study. Description of the target included mostly his agentic, but not communal, behaviors for interpretation. It would be interesting to implement both presentations of behaviors to identify any differences of mimicry influence on both. Moreover, investigating the mechanisms underlying these outcomes would be worthwhile. For instance, examining whether changes in liking for others, experienced emotions (e.g., happiness), or self-construal can mediate such relationships (Saribay, Rim, Uleman, 2012).

## Conclusions

Exposure to simple mimicry may influence how impressions are formed. Mimicry can evoke affiliative feelings, which may adjust to future judgments (assimilation effect). Studies on mimicry investigated such processes with relatively unambiguity—with some basic information about the target (usually the mimicker) or with a priori negative attitudes toward the stimulus object. Because social interactions are characterized by ambiguity, in this study, we aimed to test the effects of mimicry on first impressions when exposed to an ambiguous presentation of the (unknown) target. Our findings revealed that the experience of mimicry in one situation may influence the direction of judgment in another situation when presented with behaviors that may be interpreted in many ways (judgments may shift according to the unconsciously primed category). When forming impressions in social interactions, people typically rely on limited and ambiguous information about others. These findings contribute to the literature by showing that mimicry may be related in such situations to first impression biases, especially in forming immediate judgments. This information is significant because how individuals form impressions may affect behavioral tendencies, attitudes, and decisions toward others (even as meaningful as a willingness to get acquainted with strangers or trust them

and how people make decisions regarding others and themselves). These findings suggest possible practical implications. We recommend making people aware of mimicry's effects on impression formation and its consequences.

## References

- Abele, A.E., & Wojciszke, B. (2007). Agency and communion from the perspective of self versus others. *Journal of Personality and Social Psychology, 93*(5), 751–763, doi: 10.1037/0022-3514.93.5.751
- Abele, A.E., & Wojciszke, B. (2014). Communal and agentic content in social cognition: A dual perspective model. *Advances in Experimental Social Psychology, 50*, 195–255, doi: 10.1016/B978-0-12-800284-1.00004-7
- Anderson, N.H. (1981). *Foundations of information integration theory*. New York: Academic Press.
- Bargh, J.A. (1997). The automaticity of everyday life. In R.S. Wyer, Jr. (Ed.), *The automaticity of everyday life: Advances in social cognition* (Vol. 10, pp. 1–61). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.
- Bargh, J.A. (2006). What have we been priming all these years? On the development, mechanisms, and ecology of nonconscious social behavior. *European Journal of Social Psychology, 36*(2), 147–168, doi: 10.1002/ejsp.336
- Bartlett, F.C. (1932). *Remembering*. Cambridge University Press.
- Baumeister, R.F., Bratslavsky, E., Finkenauer, C., & Vohs, K.D. (2001). Bad is stronger than good. *Review of General Psychology, 5*(4), 323–370, doi: 10.1037/1089-2680.5.4.323
- Bocian, K., Baryla, W., Kulesza, W.M., Schnall, S., & Wojciszke, B. (2018). The mere liking effect: Attitudinal influences on attributions of moral character. *Journal of Experimental Social Psychology, 79*, 9–20, doi: 10.1016/j.jesp.2018.06.007
- Bruner, J.S. (1957). On perceptual readiness. *Psychological Review, 64*(2), 123–152, doi: 10.1037/h0043805
- Chartrand, T.L., & Bargh, J.A. (1996). Automatic activation of impression formation and memorization goals: Nonconscious goal priming reproduces effects of explicit task instructions. *Journal of Personality and Social Psychology, 71*(3), 464–478, doi: 10.1037/0022-3514.71.3.464
- Chartrand, T.L., & Bargh, J.A. (1999). The chameleon effect: The perception-behaviour link and social interaction. *Journal of Personality and Social Psychology, 6*, 893–910, doi: 10.1037/0022-3514.76.6.893
- Clarke, D.D. (2013). *Language and action: A structural model of behaviour*. Oxford: Pergamon Press.
- Diener, E., & Seligman, M.E.P. (2002). Very happy people. *Psychological Science, 13*(1), 81–84, doi: 10.1111/1467-9280.00415
- Dijksterhuis, A., & Aarts, H. (2010). Goals, attention, and (un)consciousness. *Annual Review of Psychology, 61*(1), 467–490, doi: 10.1146/annurev.psych.093008



- Drury, M., & Van Swol, L.M. (2005). *Are people who mimic others perceived as more friendly, likeable, persuasive, and knowledgeable?* Paper presented at the annual conference of the National Communication Association (NCA). Boston, MA.
- Duffy, K.A., Luber, B., Adcock, R.A., & Chartrand, T.L. (2019). Enhancing activation in the right temporoparietal junction using theta-burst stimulation: Disambiguating between two hypotheses of top-down control of behavioral mimicry. *PLOS ONE*, *14*(1), e0211279, doi: 10.1371/journal.pone.0211279
- Ford, T.E., & Thompson, E.P. (2000). Preconscious and postconscious processes underlying construct accessibility effects: An extended search model. *Personality and Social Psychology Review*, *4*(4), 317–336, doi: 10.1207/S15327957PSPR0404\_3
- Galinsky, A. & Glucksberg, S. (2000). Inhibition of the literal: Metaphors and idioms as judgmental primes. *Social Cognition*, *18*(1), 35–54, doi: 10.1521/SOCO.2000.18.1.35
- Hale, J., & Hamilton, A.F. de C. (2016). Cognitive mechanisms for responding to mimicry from others. *Neuroscience & Biobehavioral Reviews*, *63*, 106–123, doi: 10.1016/j.neubiorev.2016.02.0
- Hasler, B.S., Hirschberger, G., Shani-Sherman, T., & Friedman, D.A. (2014). Virtual peacemakers: Mimicry increases empathy in simulated contact with virtual outgroup members. *Cyberpsychology, Behavior, and Social Networking*, *17*, 766–771, doi: 10.1089/cyber.2014.0213
- Herr, P.M., Sherman, S.J., & Fazio, R.H. (1983). On the consequences of priming: Assimilation and contrast effects. *Journal of Experimental Social Psychology*, *19*(4), 323–340, doi: 10.1016/0022-1031(83)90026-4
- Higgins, E.T., Rholes, W.S., & Jones, C.R. (1977). Category accessibility and impression formation. *Journal of Experimental Social Psychology*, *13*(2), 141–154, doi: 10.1016/S0022-1031(77)80007-3
- Jacob, C., Guéguen, N., Martin, A., & Boulbry, G. (2011). Retail salespeople's mimicry of customers: Effects on consumer behavior. *Journal of Retailing and Consumer Services*, *18*(5), 381–388, doi: 10.1016/j.jretconser.2010.11
- Kavanagh, L.C., Suhler, C.L., Churchland, P.S., & Winkielman, P. (2011). When it's an error to mirror: The surprising reputational costs of mimicry. *Psychological Science*, *22*(10), 1274–1276, doi: 10.1177/0956797611418678
- Kouzakova, M., Karremans, J.C., van Baaren, R.B., & van Knippenberg, A. (2010). A stranger's cold shoulder makes the heart grow fonder: Why not being mimicked by a stranger enhances long standing relationship evaluations. *Social Psychology and Personality Science*, *1*(1), 87–93, doi: 10.1177/1948550609355718
- Kulesza, W., Dolinski, D., Migon, M., Rizulla, A., Gamian-Wilk, M., & Grzyb, T. (2017). The use of mimicry to improve evaluation of unsought beverages. *Food Quality and Preference*, *62*, 137–143, doi: 10.1016/j.foodqual.2017.06.004
- Kulesza, W.M., Cisłak, A., Vallacher, R.R., Nowak, A., Czekiel, M., & Bedyńska, S. (2015). The face of the chameleon: The experience of facial mimicry for the mimicker and the mimickee. *The Journal of Social Psychology*, *155*(6), 590–604, doi: 10.1080/00224545.2015.1032195

- Kulesza, W.M., Dolinski, D., & Wicher, P. (2016). Knowing that you mimic me: The link between mimicry, awareness and liking. *Social Influence, 11*(1), 68–74, doi: 10.1080/15534510.2016.1148072
- Lakin, J.L., Jefferis, V.E., Cheng, C.M., & Chartrand, T.L. (2003). The chameleon effect as social glue: Evidence for the evolutionary significance of nonconscious mimicry. *Journal of Nonverbal Behavior, 27*, 145–162, doi: 10.1023/A:1025389814290
- Likowski, K.U., Mühlberger, A., Seibt, B., Pauli, P., & Weyers, P. (2008). Modulation of facial mimicry by attitudes. *Journal of Experimental Social Psychology, 44*(4), 1065–1072, doi: 10.1016/j.jesp.2007.10.007
- McKillip, J., Barrett, G., & Dimiceli, A.J. (1978). Trait ambiguity and impression formation: Sufficiency tests of the meaning change model. *The Journal of General Psychology, 98*(2), 161–171, doi: 10.1080/00221309.1978.9920869
- Palagi E., Celeghein A., Tamietto M., Winkielman P., & Norscia I. (2020). The neuroethology of spontaneous mimicry and emotional contagion in human and non-human animals. *Neuroscience Biobehavioral Review, 111*, 149–165, doi: 10.1016/j.neubiorev.2020.01.020
- Peeters, G. (1995). What's negative about hatred and positive about love? On negation in cognition, affect, and behavior. In H.C.M. de Swart, & L.J.M. Bergman (Eds.), *Perspectives on negation* (pp. 123–133). Tilburg University Press.
- Saribay, S.A., Rim, S., & Uleman, J.S. (2012). Primed self-construal, culture, and stages of impression formation. *Social Psychology, 43*(4), 196–204, doi: 10.1027/1864-9335/a000120
- Srull, T.K., & Wyer, R.S. (1980). Category accessibility and social perception: Some implications for the study of person memory and interpersonal judgments. *Journal of Personality and Social Psychology, 38*(6), 841–856, doi: 10.1037/0022-3514.38.6.841
- Tanner, R.J., Ferraro, R., Chartrand, T.L., Bettman, J.R., & Baaren, R.V. (2008). Of chameleons and consumption: The impact of mimicry on choice and preferences. *Journal of Consumer Research, 34*(6), 754–766, doi: 10.1086/522322
- Tversky, A., & Kahneman, D. (1974). Heuristics and biases. *Science, 185*, 1124–1131, doi: 10.1126/science.185.4157.1124
- Van Swol, L.M. (2003). The effects of nonverbal mirroring on perceived persuasiveness, agreement with an imitator, and reciprocity in a group discussion. *Communication Research, 30*(4), 461–480, doi: 10.1177/0093650203253318
- Verberne, F.M.F., Ham, J.R.C., Ponnada, A., & Midden, C.J.H. (2013). Trusting digital chameleons: The effect of mimicry by a virtual social agent on user trust. In S. Berkovsky, & J. Freyne (Eds.), *Persuasive technology: 8th International Conference* (pp. 234–245). Berlin: Springer, doi: 10.1007/978-3-642-37157-8\_28
- Wang, Y., & Hamilton, A.F. de C. (2012). Social top-down response modulation (STORM): A model of the control of mimicry in social interaction. *Frontiers in Human Neuroscience, 6*, doi: 10.3389/fnhum.2012.00153
- Wang, Y., Ramsey, R., & Hamilton, A.F. de C. (2011). The control of mimicry by eye contact is mediated by medial prefrontal cortex. *Journal of Neuroscience, 31*(33), 12001–12010, doi: 10.1523/JNEUROSCI.0845-11.2011

Woodworth, R.S., & Schlosberg, H. (1954). *Experimental psychology*. New York: Holt.  
Zglinicka, A., & Kulesza, W. (2014). The chameleon effect and the stereotypes of non believers held by religious person. *Roczniki Psychologiczne*, 1, 183–195.

JAK NAŚLADOWNICTWO WPLYWA  
NA PROCES FORMOWANIA PIERWSZEGO WRAŻENIA:  
TENDENCYJNE POZYTYWNE ODCHYLENIE

**Streszczenie.** Celem badania było sprawdzenie wpływu naśladownictwa (mimikry) na proces formowania pierwszego wrażenia o nieznanym osobie, na podstawie przedstawionego opisu niejednoznacznego jej zachowania (badani mogli zakwalifikować zachowanie nieznanego jako pozytywnie bądź negatywnie). Uczestnicy ( $N = 115$ ) byli naśladowani lub nie byli naśladowani przez asystenta badacza. Następni zapoznali się z niejednoznacznym opisem zachowania osoby, i byli instruowani, aby (1) zaproponować trzy cechy, które najadekwatniej oddają charakterystykę osoby, (2) ocenić prawdziwość czterech par cech nieznanego (każda z par zawierała cechę o pozytywnym *vs.* negatywnym wartościowaniu). Naśladowani opisywali osobę przychylniej w przypadku pierwszej oferowanej cechy (pod względem pozytywnego wartościowania, ale też nacechowania na wymiarze wspólnotowym i sprawczym). Nie stwierdzono różnic międzygrupowych dla drugiej i trzeciej proponowanej cechy ani indeksu pozytywnego wartościowania cech (średniej wartości z trzech cech). W obu warunkach oferowane cechy nieznanego były silniej nacechowane poprzez wymiar sprawczy niż wspólnotowy. W przypadku ocen osoby nieznanego w zadaniu zamkniętym naśladownictwo wpłynęło na oceny cech o wartościowaniu negatywnym (lekkość i zrozumiałość), nie miało natomiast wpływu na oceny cech o wartościowaniu pozytywnym. W artykule omówiono implikacje wynikające z automatycznej aktywizacji procesów przetwarzania informacji społecznych.

**Słowa kluczowe:** formowanie pierwszego wrażenia, przynależność społeczna, mimikra, sprawczość i wspólnotowość

Data wpłynięcia: 4.12.2021

Data wpłynięcia po poprawkach: 1.03.2022

Data zatwierdzenia tekstu do druku: 4.03.2022