

RUNNING HEAD: IMITATION OF EMOTION

Imitation of Emotion: When Meaning leads to Aversion

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Abstract

Can imitation lead to less liking? Previous research on mimicry and imitation suggests that imitation should lead to more liking, at least when it concerns neutral behaviours. In the present studies, we looked at behaviour with a clear message: facial expressions. As predicted, we found in two studies that an affiliative facial expression (happiness) leads to more liking when imitated, whereas a non-affiliative facial expression (anger) leads to less liking when imitated. Thus, imitating someone does not always lead to more liking: imitating behaviour that communicates an unfriendly message can have negative consequences.

### Imitation of emotion: When meaning leads to aversion

It is easy to imagine a situation where you find yourself imitating someone else. You probably have at times spontaneously returned a friend's big smile with the same facial expression. Of course, people do not always respond to others by matching them, otherwise they would all quickly behave in exactly the same manner. However when people do imitate each other, it often makes interactions smoother: Several studies have shown that people like others that imitate them more than others that do not imitate them. And, *vice versa*, imitators like the people they imitate more than the people they do not imitate (Chartrand & Bargh, 1999; Stel & Vonk, 2008; Van Baaren, Holland, Kawakami, & Van Knippenberg, 2004). In other words, previous research suggests that imitating tends to have a positive effect on liking. Furthermore, it has even been described as a 'social glue': "...the consistent link between behavioral mimicry and liking suggests that this behavior may have ultimately evolved to serve a 'social glue' function, binding people together and creating harmonious relationships" (Lakin, Jefferis, Cheng, & Chartrand, 2003, p. 147).

However, it is important to note that these previous studies often focused on relatively neutral behaviour like face touching or foot tapping. Some behaviour clearly includes a message to the other person: Research shows for example that emotions differ widely on whether they are seen by others as affiliative or non-affiliative (Hess, Blairy, & Kleck, 2000; Knutson, 1996). Happiness is usually shown to encourage contact and show friendly intentions and is seen by others as highly affiliative, and anger is often expressed to show discontent or hostility towards someone and is seen as highly non-affiliative by others

(Hess et al., 2000; Knutson, 1996). It seems logical to argue that even though imitation generally leads to more liking, imitation of behaviours that are of their inherent meaning already clearly *affiliative* or *non-affiliative* may have a different effect on liking. In the present studies, we aim to test this logical assumption and show that imitating an affiliative emotional expression (happiness) may indeed lead to more liking, whereas imitating a non-affiliative emotional expression (anger) can lead to less liking.

#### *Imitation of emotional expressions*

What effect does the affiliative or non-affiliative aspect of emotion have on imitation? Imitation of more neutral behaviour generally leads to more liking and is often said to have an affiliative function (see Lakin et al., 2003). In that context the affiliative signals emotional behaviour may be sending are especially relevant. Behaviour that is inherently affiliative, such as emotional expressions (Fridlund, 1994), can be expected to influence the affiliative function of imitation unlike behaviour that is not inherently social. When people imitate such behaviour they are not merely copying behaviour. They are also sending the affiliative signal associated with that imitated behaviour. Sending each other such (non-) affiliative signals can obviously be expected to have an impact on how much people consequently like each other.

Imitating an affiliative emotional expression such as happiness is likely to lead to more liking, since the affiliative aspect of the behaviour is likely to facilitate the affiliative function of imitation. However, because imitating means sending the non-affiliative signal associated with that behaviour, imitating a non-affiliative emotional expression such as

anger will probably result in *less* liking. Both sender and observer are sending highly non-affiliative signals to each other cancelling out any positive effect that the mere act of imitation might have.

The literature on imitation and mimicry often implies that these processes are the cement of society and function as a sort of social glue (e.g., Lakin et al., 2003). From this perspective it follows that in situations where mimicry has negative effects on liking there should be less mimicry. Thus, precisely because we expect imitating anger will have negative effects we should also expect anger will generally not be imitated spontaneously. Therefore, to be able to study the effects imitating such non-affiliative behaviour has on liking, it is necessary to study intentional imitation (instruct people to imitate). Much of the previous research on imitation and liking, however, studied spontaneous imitation: That is, participants in these studies were generally unaware they were imitating. This difference in methods could potentially pose a problem; however, recent research shows that intentional imitation is likely to have similar effects on liking compared to spontaneous imitation (Stel & Vonk, 2008). Moreover, other studies comparing the two kinds of imitation suggest that the choice for intentional imitation might actually be a conservative one: Intentional imitation is slower and more effortful (Dimberg, Thunberg, & Grunedal, 2002), and intentional imitation is more sensitive to situational demands and cultural influences (Ekman, 1992).

In sum then, we expect imitation will only cause increased liking when a facial expression is seen as affiliative (when the expression is happy). When it is seen as non-

affiliative (when the expression is angry), we expect that intentionally sending such a non-affiliative signal back (imitating) will lead to less liking. We investigate these hypotheses in two studies. In both studies we looked at the impact of emotion (happy / angry) and imitation on liking. In Study 1, we used computer generated faces (avatars) as targets to have maximum control over facial features and strength of the emotional expression. In Study 2, we used videos of real people as targets.

### Study 1

#### *Method*

*Participants and design.* University students ( $n = 225$ ) took part in Study 1. The study had an emotion (happy / angry) versus imitation instruction (imitation yes / no) design and with liking as the dependent variable. Participants were randomly assigned to the four conditions and were distributed equally across conditions.

*Material.* The participants were shown a short video in which a facial expression changed from neutral to a specific emotion: angry or happy. In this study we used computer generated faces (avatars) as targets<sup>1</sup>.

*Procedure.* Participants were told that they would look at and evaluate videos in order to test material for future research. They were also told that in order to prevent them thinking too much about the video they would get a specific instruction. In the imitation condition, the participants were asked to imitate the target. In the control condition the participants were asked to just look at the video. All participants were recorded with a webcam in order to be able to check whether they were following our instructions. After the

video the participants completed several questions including the main dependent measure. After that participants were asked what they thought the study was about and they were debriefed.

*Dependent measure.* To measure liking we used the question ‘what was your first impression of the person in the video’. Participants answered by dragging a marker on a line from negative to positive. The position on the line corresponded with a number between 1 and 100. We asked people about their ‘first impressions’ because we felt that directly asking about to what extent they “liked” the target would be likely to bias their responses in a positive direction (see Podsakoff, MacKenzie, Lee, & Podsakoff, 2003; Sudman, Bradburn, & Schwarz, 1996).

To give credibility to the cover story and to be able rule out or control for other explanations we asked several other questions, including questions about the video (“what was your first impression of the video itself”), and experienced emotions (“Do you feel...?”). For these measures the same scales were used as for the main dependent measure.

### *Results*

In order to determine whether the participants followed our instructions we scored our webcam recordings on the presence and intensity of facial expressions. Because some participants disappeared out of view we were able to score 192 of the total number of recordings of which 95 saw the happy emotion and 97 saw the angry emotion. Two experienced judges, who were blind to conditions, independently scored the 192 recordings

on intensity of expressions (happy and angry among others) on scales from 0 to 5 (a score of 0 was used when the expression was absent). To determine inter-rater reliability we computed intraclass correlations, using a two way random model and consistency definition (McGraw & Wong, 1996; Shrout & Fleiss, 1979). The scores were .77 for the happiness ratings and .78 for the anger ratings, which is excellent according to the criteria specified by Cichetti and Sparrow (1981). We then took the averages of the two judges as the dependent variables in our manipulation check. We found a significant effect of imitation for both the angry emotion,  $F(1,95) = 8.91, p = .004, \eta_p^2 = .09$ , and the happy emotion,  $F(1,93) = 15.06, p < .001, \eta_p^2 = .14$ . Participants showed stronger anger expressions when they were asked to imitate the angry emotion compared to when they were asked just to look ( $M = 2.49, SD = 1.44$  vs  $M = 1.55, SD = 1.68$ ). Participants also showed stronger happy expressions if they were asked to imitate the happy emotion compared to when they were asked just to look ( $M = 2.64, SD = 1.49$  vs  $M = 1.42, SD = 1.58$ ). So our participants did follow our instructions.

Next, we analysed the results of emotion and instruction on liking of the target. In line with our expectations there was a significant interaction between instruction and emotion on liking,  $F(1,221) = 4.87, p = .028, \eta_p^2 = .02$ . Although the means were in the expected directions (see Table 1), simple effects analysis for happiness and anger unfortunately showed that the effect of instruction was not significant within each emotion –when using two-tailed tests ( $F(1,221) = 2.29, p = .13, \eta_p^2 = .01$  and  $F(1,221) = 2.58, p = .11, \eta_p^2 = .01$  respectively). Nevertheless, simple effects analysis did show a strong effect

of emotion within imitation instruction: When the participants imitated an angry person they liked this person less than when they imitated a happy person,  $F(1,221) = 19.46$ ,  $p < .001$ ,  $\eta_p^2 = .08$  (see Table 1). As predicted, no significant differences were found for emotion within the ‘just look’ instruction,  $F(1,221) = 1.84$ ,  $p = .18$ ,  $\eta_p^2 = .01$  (see Table 1).

No other effects were found on any of the other measures (all  $F$ 's  $< 1$ ). This is important to note because it suggests that the interaction effect on the liking measure can not be interpreted as a response bias that could have been found on any evaluative measure. Thus, imitating an angry target did not cause participants to become more negative *in general*, it merely caused participants to become more negative about the *target*.

To test the robustness of our findings, we conducted Study 2. In this study, emotion was a within-subjects variable so that we could see whether the effects of imitating an angry video interfered with the effects of imitating a subsequent happy video. Aside from this we used videos of real faces (Van der Velde, Stapel & Gordijn, 2004) rather than avatars to ensure that the study would more closely resemble a situation in daily life.

## Study 2

### *Method*

University students ( $n = 47$ ) participated in Study 2. Each participant looked at and judged the angry video first and then looked at and judged the happy video. For each participant, instruction (imitate or not) was constant throughout the study and participants were randomly assigned to either the imitation or ‘just look’ instruction. Thus the design

was a mixed design with emotion as the within-subjects variable and instruction as the between-subjects variable. The rest of the study was identical to the first study.

### *Results*

In order to determine whether the participants followed our instructions we first scored our webcam recordings on the presence and intensity of facial expressions. In this study we were able to score the recordings of only 21 participants due to faulty camera positioning and participants disappearing out of view, 21 of these recordings were scoreable for the time they saw the happy emotion and 20 were scoreable for the time they saw the angry emotion. Two experienced judges, who were blind to conditions, independently scored the recordings of the participants, for the duration that they were watching the videos, on intensity of expressions on a scale from 0 to 5 (a score of 0 was used when the expression was absent). To determine inter-rater reliability we computed intraclass correlations, similar to Study 1. The scores were .87 for the happiness ratings and .89 for the anger ratings, which is excellent according to the criteria. We then took the averages of the two judges' ratings for happiness and anger as the dependent variables in our manipulation check. We found a significant effect of imitation for both the angry emotion,  $F(1,19) = 31.43, p < .001, \eta_p^2 = .63$  and the happy emotion,  $F(1,18) = 30.40, p < .001, \eta_p^2 = .63$ . Participants showed stronger anger expressions when they were asked to imitate the angry emotion compared to when they were asked just to look ( $M = 2.56, SD = 1.47$  vs  $M = 0.08, SD = 0.29$ ). There were also stronger happy expressions for the participants who were asked to imitate the happy emotion ( $M = 2.72, SD = 1.52$  vs  $M =$

0.14,  $SD = 0.32$ ). So our participants followed the instructions and also did not imitate if they were not asked to.

Next, we analysed the results of emotion and instruction on liking of the target using a repeated measures analysis. During outlier analysis we found one score that had a distance of more than 2.0 the Inter Quartile Range (IQR) to the median. Since the outlier criterion for IQR is scores that are over 1.5 IQR this is a definite outlier. We therefore removed this score from further analysis.

The repeated measures analysis showed there was a clear interaction between emotion and instruction on liking,  $F(1,44) = 11.26, p = .002, \eta_p^2 = .20$ . After imitating an angry person participants liked this person less compared to the control group,  $F(1,44) = 4.66, p = .036, \eta_p^2 = .10$ , and after imitating a happy person they liked this person more,  $F(1,44) = 4.13, p = .048, \eta_p^2 = .09$  (see Table 2 for the means). Analyses for each instruction separately also showed an effect of emotion within the imitation instruction: When the participants imitated an angry person they liked this person less than when they imitated a happy person,  $F(1,24) = 13.13, p = .001, \eta_p^2 = .35$ . Again no effect of emotion on liking was found within the 'just look' instruction,  $F(1,20) = 1.23, p = .28, \eta_p^2 = .06$  (see Table 2).

It is important to note that all participants first saw the angry person and then the happy person. If being angry at an angry person induced a negative response bias (see Study 1), this should have disrupted the results on the happy video. The opposite was true: The means for the happy condition were even higher than before. Again we did not find

any other effects on the other measures (all  $F_s < 1$ ). Thus, again, these findings support the hypothesis that even though imitating a happy target causes participants to like that target more, imitating an angry target causes participants to like the target less.

### Discussion

Behaviour is meaningful and often has a communicative function. This is especially true for emotional behaviour. When people show emotions, they often do this to let other people know what they are feeling. Thus, a happy face is often intended to be (and recognised by others) as affiliative, whereas an angry face is often intended to be (and recognised by others) as non-affiliative. The present findings support the notion that when behaviour is meaningful, imitation does not necessarily breed liking. Specifically, imitating non-affiliative behaviour, such as an angry frown, may lead to less rather than more liking. Interestingly, this imitation-may-decrease-liking effect is in disagreement with a host of recent social cognition studies of imitation effects (see Lakin et al., 2003 for an overview). These previous studies, however, have never looked at the effect of imitating meaningful non-affiliative behaviour. Thus, the present studies show that to truly understand the consequences of imitation, it is important to look at the (social) meaning of what is imitated.

It is important to note that even though the two emotions we used to study the impact of “meaning” on the imitation-liking link differed in valence, our results can not be explained simply in terms of the positivity of happiness or negativity of anger. As a recent study by Stel and Vonk (2008) comparing imitation of sadness and happiness has shown,

sometimes (in the case of sadness) imitating negative emotions may increase liking. Thus, not all negative emotions are created equal. We would like to argue that the difference is related to the affiliativeness of these emotions: Sadness is neutral on affiliation, whereas anger is a non-affiliative emotion (see Hess et al., 2000; Knutson, 1996). A fruitful avenue for future research may thus be to compare the effects of imitating sadness and anger and other negative emotions that differ on how affiliative they come across.

Another issue that may be studied in future research is the idea that for the present effects to occur it may not be necessary that people imitate. Just staring angrily at someone might be enough to induce disliking. Since scowling at a person already implies you do not like them overmuch, this certainly may be possible. We would argue, however, that when two people look angry at each other this gives more information about the interaction than when one is angry and the other is not, and therefore will give stronger effects on liking. The important message in the present studies, however, is that imitation does not *always* and does not *necessarily* increase liking, as many imitation studies have argued or implied (e.g., Chartrand & Bargh, 1999; Lakin et al., 2003; Van Baaren et al., 2004).

In line with the literature on imitation we argued that if imitation is the cement of society and functions as a social glue, imitation should be absent entirely or at least decrease to a level invisible to other people when it has negative effects on liking. We thus expected anger to be imitated less than happiness. Participants in our studies indeed did not spontaneously mimic anger. Some previous studies show imitation of emotions smiles and frowns (Blairy, Herrera, & Hess, 1999; Dimberg & Thunberg, 1998; Dimberg, Thunberg,

& Elmehed, 2000; Hess & Blair, 2001). These studies often use non-vivid stimuli such as photos. Other studies using more vivid stimuli however have results that more closely fit our theory showing little imitation of frowns compared to smiles (Hinsz & Tomhave, 1991; Estow, Jamieson, & Yates, 2007). However, unexpectedly, the smiling person was also not spontaneously imitated in our studies (but see also Ruys & Stapel, 2008). It could be that our stimuli were already vivid enough to elicit feelings of liking or disliking after instructed imitation but needed to be even more vivid or personally relevant for participants to have visibly imitated the happy targets spontaneously. It would be interesting to further investigate to what extent spontaneous imitation occurs or does not occur when it is or is not functional.

Because we did not expect any spontaneous imitation of anger to occur it was necessary to use intentional imitation in our studies. However, because previous studies often used spontaneous imitation the possibility remains that the results were obtained merely because of the difference in imitation. For example, the simple fact that people were aware that they were meant to imitate the other person's behaviour could have resulted in more people guessing the real purpose of the research and thus influencing the results. We of course checked for this possibility and we did not find any such effects: people were generally completely unaware why they were asked to imitate. More importantly, research suggests intentional imitation is likely to be an equal or even a more conservative choice than spontaneous imitation (Dimberg et al, 2002; Ekman, 1992; Stel & Vonk, 2008). Thus, although it would be good to be able to compare the two forms of imitation in one design,

we think that it is likely that spontaneous imitation of non-affiliative behaviour will also have a negative effect on liking, perhaps an even stronger effect.

In conclusion then, the link between imitation and liking is not as simple as the relevant literature suggests. Imitation and liking are not always positively related. Especially when the behaviour is meaningful, the link between imitation and liking may sometimes be negative.. Whether the imitator thinks the behaviour is affiliative or non-affiliative has a great impact on the effect imitation has on liking. Imitating non-affiliative behaviour can have negative consequences.

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Table 1

The means of first impression of the target as a function of emotion and instruction for Study 1.

Emotion	Instruction	
	Imitation	'Just Look'
Happy	58.7 <sub>a</sub> (24.6)	50.8 <sub>ab</sub> (25.1)
Angry	35.5 <sub>b</sub> (29.4)	43.8 <sub>ab</sub> (30.6)

*Note.* Scores are given on a scale from 1 (negative) to 100 (positive). The standard deviations are in parentheses. Means that do not share the same subscript are significantly different ( $p < .05$ ).

Table 2

The means of first impression of the target as a function of emotion and instruction for Study 2.

Emotion	Instruction	
	Imitation	'Just look'
Happy	61.8 <sub>a</sub>	50.5 <sub>b</sub>
	(19.1)	(18.5)
Angry	42.6 <sub>c</sub>	56.0 <sub>b</sub>
	(23.8)	(16.9)

*Note.* Scores are given on a scale from 1 (negative) to 100 (positive). The standard deviations are in parentheses. Means that do not share the same subscript are significantly different ( $p < .05$ )

## Footnotes

<sup>1</sup> For more information about the stimuli contact the first author.

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