

Mimicry as a Tool for Understanding the Emotions of Others

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ABSTRACT

How do people understand what others are emotionally experiencing? We argue that mimicking the nonverbal expressions of other people (i.e., copying the behaviors of others) can be a tool for facilitating the understanding of the emotions that they are experiencing. People express their emotions nonverbally and when mimicking these nonverbal expressions, this affects the mimickers' emotions correspondingly due to an afferent feedback mechanism. As a result of this mechanism, the mimicker catches the emotions of others more strongly, which facilitates emotion understanding. Implications are discussed for affective computing.

Author Keywords

Mimicry, nonverbal expressions, emotional contagion, empathy, emotional understanding.

ACM Classification Keywords

H.5.m Information interfaces and presentation: Miscellaneous

INTRODUCTION

How do people understand what others are emotionally experiencing? We argue that one way to know which emotions other people experience is by mimicking their nonverbal expressions (i.e., copying the behaviors of others). As people often nonverbally express their emotions and as these nonverbal expressions are linked to emotions, mimicking these expressions leads to experiencing the same kind of emotions as the expressor of the emotions is experiencing. This sharing of emotions due to mimicry enhances the understanding for what other people are emotionally experiencing.

MIMICKING EMOTIONAL EXPRESSIONS

Emotions are expressed verbally as well as nonverbally. Emotions are nonverbally expressed, for instance, in the face, shoulders, movements, gestures, postures, and tone of voice. For example, when people feel angry, they often lower and bring together their eyebrows, clench a fist, speak louder, and have an active posture. These nonverbal expressions of emotions are often spontaneously mimicked by others. For example, it has been shown that newborns already have the tendency to spontaneously mimic happy and angry facial expressions of other people [e.g. 10]. Furthermore, it has been shown that people spontaneously mimic the facial expressions of persons shown on photographs: they activate the same facial muscles as the person on the picture [4].

Mimicry, often, is unintentional and occurs outside our awareness. It also occurs among complete strangers [e.g. 2]. One of the proposed functions of this mimicry is that it bonds people together: When mimicking or being mimicked, people feel more liking for the other person, feel more close to the other person, and feel that the interaction with the other person is more positive [e.g. 1, 2, 14]. In addition to this bonding function, mimicry serves as a means to create emotional understanding between people [e.g. 17].

FEEDBACK MECHANISM

An important mechanism in how mimicry can be a tool for emotional understanding is the feedback mechanism. The feedback mechanism entails that the muscles that are activated elicit emotions and cognitions that are associated with these muscles [3, 7, 19]. When moving your eyebrows inward and downward, activating the corrugator supercillii muscle which is associated with feeling angry, you will — due to the feedback of this activated muscle — feel anger. The mechanism has been demonstrated often for facial expressions, vocal expressions, and postures [e.g. 6, 8]. So when people mimic the emotional expressions of others, they will experience the same kind of emotions due to the feedback of the activated muscles.

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EMPIRICAL EVIDENCE

This idea that mimicry leads to sharing each others emotions is also confirmed by research. For instance, it has been demonstrated that participants who observe a person showing facial expressions displayed on a video caught the emotions that were displayed by this person more strongly when mimicking these facial expressions [17]. This emotional contagion occurred for positive, as well as for negative emotional expressions. Furthermore, in a study in which two participants interacted face-to-face, it was demonstrated that mimicry led the two participants to experience more similar emotions [14]. More specifically, the results of this study showed that when mimicry occurred the emotions between the two interactants did not significantly differ, whereas when mimicry did not occur the two interactants experienced significantly different levels of happiness and anger. When the experienced emotions are used to infer what others are feeling, this enhances the understanding of others' emotions. A study confirming this idea showed that, as a result of mimicry, people who mimicked reported to understand the emotions and cognitions experienced by the other person better compared to people who did not mimic [15]. Thus, when one mimics the emotional expressions of another person, one becomes more emotionally attuned to this person, which leads to more emotion understanding for the person being mimicked.

In addition to mimicry facilitating catching and understanding the emotions of others, mimicry has been shown to facilitate the interpretation of affective signals [e.g. 13]. The emotions that are caught due to mimicking other people's facial expressions can serve as a proprioceptive cue in the recognition of emotions. Indeed, women who were not constrained from mimicking positive or negative facial expressions from pictures were faster in recognizing the affective valence of these facial expressions than women who were constrained from mimicking [13]. This advantage of mimicry was not present for male participants. The gender difference is explained in that women are more emotionally expressive than men, and facial feedback may be more important in fast emotion-related processing. The finding that gender differences exist in the facilitation of mimicry on emotion recognition contrasts findings of studies on emotional contagion that did not show gender differences in the effect of mimicry. This can be explained by a difference in the presentation of the stimuli. In the emotion recognition study [13] the facial expressions were very briefly presented. When having sufficient time to process emotions as in the emotional contagion studies [14, 15, 17], both men and women have an advantage of mimicry in processing emotions.

In sum, mimicry has been shown to facilitate feeling what the other person is feeling, leading to more emotion understanding. Although mimicry often occurs unintentional and spontaneous, the effects of intentional (instructed) mimicry do not differ from the effects of

spontaneous (non-instructed) mimicry [e.g. 16]. Both types of mimicry (spontaneous or intentional) lead one to adopt the same expressions as their interaction partner, which – via the feedback of activated muscles– lead to experiencing the corresponding emotions. Thus, mimicry can be intentionally used as a tool for facilitating the understanding of the emotions experienced by others.

LIMITATIONS

At this point we would also like to discuss the limitations of using mimicry as a tool for emotion understanding. First of all, as mimicry enhances emotion understanding via the feedback mechanism, this means that mimicry does not serve as a tool for emotion understanding when having a different working feedback mechanism, or possibly, when having no feedback mechanism at all. This has been demonstrated by a study showing that participants with Autistic Spectrum Disorders (ASD) have a differently working facial feedback mechanism: Participants with ASD did not rate pictures of objects as more likeable when muscles were activated that correspond with positive emotions than when no emotional muscles were activated, whereas participants without ASD did rate the pictures as more likeable due to feedback of the muscles that correspond with positive emotions [16]. This deficit in the feedback mechanism for ASDs can explain why they experience a deficit in understanding the emotions of others. In part, ASDs' trouble with emotional understanding is due to a deficit in spontaneous mimicry: Participants with ASD were impaired in spontaneous mimicry [9]. However, simply instructing ASDs to intentionally mimic the expressions of others (of which they were capable of) did not lead to more emotion understanding because they have a different working feedback mechanism [16]. So mimicry can serve as a tool for emotional understanding, only when there is no impairment in the feedback mechanism.

Another limitation is that mimicry leads to more understanding of the emotions that are expressed by the other person. This means that when persons are less expressive of their emotions or try to mislead how they are truly feeling by expressing different emotions, mimicking does not help in understanding what the person may be emotionally experiencing. In the case of deception when a person intentionally tries to mislead another person by displaying emotions that are not truly felt, mimicry even leads to a worse understanding of how the person may be truly feeling. This is because via mimicry, you become to feel the emotions that are expressed by the other person. When you use these emotions to infer how another person might be feeling, you are less accurate than when you did not mimic these false expressions. This is demonstrated by a study showing that not mimicking (compared to spontaneous and instructed mimicry) the facial expressions of a liar led to more accurate estimations of how the person truly felt [18].

Furthermore, it is important to note that mimicry may not lead to an exact match in the extent to which mimickers and mimicked feel a certain mix of emotions. The mimicked expressions sent afferent feedback to the brain, which re-enacts associated information, that is, information is re-enacted that is associated with the muscles within the mimicker. This means that mimickers will feel the emotion that for them is associated with the activated muscles. Although a smile is associated with feeling positive for almost everyone, differences may exist in the strength of the association and the intensity of the emotion associated with the expression. For emotional expressions that differ between cultures, this implies that mimicking a person from another culture who shows culture-specific expressions does not lead to the re-enactment of associated emotions.

Finally, we do not, of course, argue that mimicry is the only way to understand the emotions of others. A lot of processes play a role in emotional understanding. We do argue, however, that mimicry is an important process that influences emotional understanding and, therefore, can be used as a tool to facilitate the understanding of the emotions experienced by others.

AFFECTIVE COMPUTING

Current knowledge on mimicry facilitating emotional understanding via facial feedback could be used in affective computing. The findings that mimicking the expressions of others lead to better emotional understanding imply that there are observable signals in the person's face that can facilitate emotion understanding when mimicking these emotions. In the field of affective computing, this means that computers could be more accurate in learning about the emotions of others by registering and translating the nonverbal expressions of a person. To be able to do so, the computer should first read the coordinates of the facial expressions and register any movements in them. This can be done, for instance, using a face tracker system [12]. The advantage of a tracker system over human perception is that computers are more accurate in 'observing' the expressions as humans do not attend to all facial cues and are less capable in reading expressions of mixed emotions. Secondly, a feedback mechanism should be built—similar to the mechanism of humans—that attach meaning to the movements. Many classification systems exist [e.g., 11], but the system is expected to be most accurate when based on a database of non-posed human expressions that are linked to what these people report to be truly experiencing at the moment of the expression.

Difficulties that could arise in accurately reading the emotions of others using a computer are similar to the difficulties that arise when using mimicry. First, the feedback mechanism that needs to be built linking expressions with emotions should be accurate. Although at this point expressions of the more basic emotions can be accurately classified, it is still difficult to read emotions that have an overlap in the facial features with other emotions

[e.g., 11]. Finally, a computer should take into account the possibility that people may not be expressing what they are truly experiencing due to their motives in certain situations. This is a problem because motives are hard to be derived from expressions and context. Truly felt and false emotional displays, however, do differ in the muscles that are activated, as well as in the intensity, duration, laterality, and timing of this activation [e.g., 5]. These should be included in the classification system as well.

CONCLUSION

In conclusion, mimicking the expressions of others causes one to feel the emotions that are associated with these expressions, leading to more emotional understanding. Thus, when people are expressing what they are truly experiencing, mimicry can be used as a tool for a better understanding of the emotions of other people. This knowledge can be applied in the field of affective computing in which the challenge is to build an accurate feedback system that can link expressions with emotions and that can take into account context and individual motives.

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