

¹Knowing Feelings and Feeling Feelings: Are they Connected?

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Abstract

Empathic accuracy (knowing what someone else is feeling) is a topic of continuing scientific inquiry, with recent studies showing that subjects can assess strangers' feelings even in emotionally complex situations. Our study aimed to identify mediators of empathic accuracy, hypothesizing that subjects who are most accurate in "knowing" what a target person feels will "feel" what that target person feels. We operationalized and measured this emotional similarity between subjects and targets in two aspects of emotion: autonomic physiology and facial behavior. Physiological similarity was measured using bivariate time series analyses to predict subjects' physiological responses from targets' physiological responses. Facial similarity was measured using autoregressive time series analyses to predict subjects' facial behavior from targets' facial behavior. Empathic accuracy was measured using sequential time series analyses to compare subjects' continuous ratings of targets' emotional valence (negative-neutral-positive) with targets' own ratings. We hypothesized that empathically accurate subjects would show similar patterns of physiological and facial behavior to their designated targets. Using stepwise multiple regression analyses, we found that subjects' ability to detect targets' positive emotion was best predicted by facial similarity ($t = 2.27, p = .03$) and subjects' ability to detect targets' negative emotion was best predicted by physiological similarity ($t = 2.57, p = .01$). Our results support the conclusions that: (a) knowing what someone feels may be mediated by feeling what they feel and (b) facial and autonomic similarity play unique roles in reading another person's positive versus negative emotions.

Introduction

Empathic accuracy, the ability to know what someone else is feeling, has received increased attention in recent years. Some individuals are very accurate in rating how a stranger feels from moment to moment, even in emotionally complex interactions. Others, however, are not very skilled at this task (Levenson & Ruef, 1992; Ickes, Stinson, Bissonnette & Garcia, 1990). Despite a large number of studies, the ways people come to know what others are feeling and the basis for observed individual differences in this ability are not fully understood.

We believe that one way empathic accuracy occurs is through *emotional contagion*. An individual rating the emotions of a target person may come to feel the same emotions as the target. Raters may then gauge the emotions of the target, in part, by using their own emotional response. To test this hypothesis, it first needs to be determined whether a rater is in fact feeling similar emotions to the target. Our approach has been to quantify similarity in emotional experience by comparing raters' and targets' emotional behavior and physiology, both of which may indicate how a person is feeling.

Preliminary evidence supporting our hypothesis was found in the physiological domain. Levenson and Ruef (1992) found that people who accurately rated the negative emotions of a target person also evidenced patterns of autonomic activity similar to the target's pattern of autonomic activity. This *physiological linkage* between rater and target can be interpreted as support for our hypothesis of similarity in emotion.

Similarity in autonomic activation, however, is not a sufficient condition for inferring similarity in emotion. Therefore, for the present study, we added a measure of similarity in emotional facial behavior between rater and target. Research on facial expressions suggests that certain emotions are characterized by distinctive patterns of facial behavior (Ekman, 1973). Thus, similarities in facial expressions, considered in tandem with similarities in autonomic physiology, should provide an even stronger test of the hypothesized association between empathic accuracy and emotional contagion.

We explored whether people who accurately know what someone else is feeling also feel what the other person is feeling, as evidenced by similarity in emotional facial expressions and in autonomic activation.

Hypotheses

Hypothesis 1: Raters who show greater similarity in facial expression to targets will also show greater similarity in autonomic arousal to that same target.

Rationale: If emotional contagion does occur, facial expressions and physiology should be related given that both are indices of emotion.

Hypothesis 2: Raters who show greater similarity in facial expression and autonomic arousal to targets will be more accurate in determining the targets' emotions.

Rationale: Similarity in facial and autonomic indicators of emotion are suggestive of emotional contagion that we believe is an important mediator of empathic accuracy.

Methods

Participants

Raters were 23 men and women from the area surrounding the University of California, Berkeley. All raters were married and over the age 21.

Stimulus Tapes

Four 15-minute, videotaped conversations of spouses discussing issues of importance to their marriage served as the stimulus materials for this study. In two of the tapes the assigned target was the wife and in the other two it was the husband. Each participant viewed one tape in which the husband was the target and one in which the wife was the target. Viewing order was counterbalanced.

Data Collection

Emotion ratings. While viewing the videotapes, raters provided continuous ratings of the targets' emotional valence using a rating dial. The rating dial traversed a 9-point scale anchored with the legends *extremely negative* and *extremely positive*, with *neutral* at the midpoint (see Figure 1 below). Shortly after the original interactions, targets had used the same rating dial procedure to indicate how they had felt during the interactions.

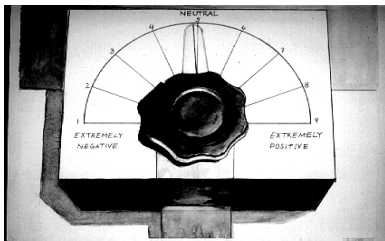


Figure 1: Rating dial apparatus used for producing emotion ratings and coding facial behavior

Physiology. While participants rated targets' emotions, we obtained second-by-second data on following five physiological measures: heart rate, skin conductance, general somatic activity, pulse transmission time to the finger and finger pulse amplitude. These same five physiological measures were obtained from targets while they were engaged in the original conversations.

Facial behavior. Raters' facial expressions during the rating task and targets' facial expressions during the interaction were coded for moment-by-moment emotional valence by a group of independent coders using the rating procedure described above (Figure 1).

Data Reduction

Empathic Accuracy Score. Emotion ratings from both rater and target were reduced into 10-second periods, each of which was classified as positive, negative, or neutral based on criteria that made use of both absolute and normalized rating dial data (Levenson & Ruef, 1992). Empathic accuracy was determined separately for positive and negative affect periods using a sequential analysis that compared raters' ratings for a given period with targets' ratings for the *same* period.

Facial Behavior Linkage Score. Facial data (aggregated across coders) were normalized (within subjects) and then similarity of facial behavior between raters and targets was determined using autoregressive time series analyses in which raters' facial behavior was predicted from targets' facial behavior.

Physiological Linkage Score. All physiological measures were averaged into 10-second periods. A bivariate time series analysis was then used to determine the extent that raters' and targets' physiological data accounted for variance in each others' physiological data beyond that accounted for by the autocorrelation in their own data.

Results

To test our first hypothesis that raters who show greater similarity in facial expression to targets will also show greater similarity in autonomic arousal to that same target, we correlated physiological linkage scores with facial linkage scores. Contrary to our hypothesis, the association between physiological linkage and facial linkage was *not* significant ($r = -0.06$).

To test our second hypotheses that raters who show greater similarity in facial expression and greater similarity in autonomic arousal to targets will be more accurate in determining targets' emotions we conducted two stepwise, multiple regression analyses using our two indices of emotional contagion (facial behavior linkage, physiological linkage) as our predictor variables. For the first regression we used empathic accuracy for positive emotional periods as the criterion variable and for the second we used accuracy for negative emotional periods. We chose a stepwise regression because we were interested in the optimal predictive model. We

anticipated that both facial behavior linkage and physiological linkage would enter into the final regression equation, with the combination accounting for more variance than either variable considered alone.

Contrary to expectations, raters' ability to detect targets' positive emotion was predicted primarily by facial linkage ($t = 2.82, p < .007$), while raters' ability to detect targets' negative emotions was predicted primarily by physiological linkage ($t = 2.53, p < .015$).

To break down the above findings, we examined the zero-order correlations between our accuracy and linkage scores and between the two accuracy scores (see Table 1). The significant correlation between the two accuracy scores suggests that people who are empathically accurate are skilled at rating both negative and positive emotions. However, the pattern of correlations also suggested that quite different processes might underlie empathic accuracy for the two kinds of emotions.

Table 1: Correlation between Empathic Accuracy Scores and Indices of Emotional Contagion.

	Facial Linkage	Physiological Linkage	Positive Accuracy	Negative Accuracy
Facial Linkage				
Physiological Linkage	ns			
Positive Accuracy	.386**	ns		
Negative Accuracy	ns	.372*	.434**	

** $p < .01$, * $p < .05$, ns = not significant

Hypotheses Revisited

Hypothesis 1: Raters who show greater similarity in facial expression to targets will also show greater similarity in autonomic arousal to that same target. This hypothesis was not supported.

Hypothesis 2: Raters who show greater similarity in facial expression and greater similarity in autonomic arousal to targets will be more accurate in determining the target's emotions. This hypothesis was partially supported.

Discussion

Emotional Contagion

Surprisingly, we found that similarity in autonomic arousal was not related to similarity in facial expression. In light of our second finding, we can assume that these two indices of emotional contagion are providing unique information that can be useful in determining how someone else is feeling. Specifically, having a similar facial expression may facilitate knowing when another person is feeling positive emotions. Having a similar autonomic response may facilitate knowing when another person is feeling negative emotions. We interpret both of these findings as being supportive of a connection between emotional contagion and empathetic accuracy. However, the differential correlations between our contagion and accuracy variables suggest that somewhat different mechanisms are involved for positive versus negative emotions

Positive Empathic Accuracy

All positive emotions share a common facial signal--the smile. Of all facial expressions, smiles are thought to be particularly contagious (Hinsz & Tomhave, 1991; Jorgenson, 1978). Thus, raters who find themselves smiling when attempting to detect a target's emotions may use their own smiles as indication that the target was feeling in a similarly positive way.

To test this speculation, we used our facial behavior linkage score, which is based on similarity of both positive and negative facial behavior to conduct a post-hoc analysis. We correlated the facial behavior linkage scores with the number of matches of positive and negative facial expressions between rater and target. Consistent with our speculation, it was the number of positive facial matches ($r = .45, p < .01$) and not the number of negative matches ($r = .09, ns$) that was significantly related to the facial behavior linkage score.

Negative Empathic Accuracy

Negative emotions do not share a single facial signal but rather there are different signals for emotions such as anger, fear, sadness, and disgust. Further, negative emotional displays are frequent targets for societal display rules and conventions. For these reasons, the relationship between empathic accuracy for negative emotions and facial behavior could be weaker than that found for positive emotions and positive facial behavior. On the other hand, negative emotions are more likely to produce significant levels of autonomic activation (Levenson, 1992) and greater patterning of autonomic activation (Levenson, Ekman, & Friesen, 1983) than positive emotions. Thus, the emotional contagion produced by watching another person experience negative emotion would be more likely to produce autonomic activation than watching a target experiencing positive emotion. This speculation is consistent with studies showing that watching the distress of others can lead to autonomic arousal on the part of the observer (Eisenberg et al., 1988). The findings of the present study, however, go beyond activation, suggesting that under conditions of high empathetic accuracy, raters' physiology may actually come to mirror targets' physiology.

Conclusions

The relationship between empathic accuracy and emotional contagion proved to be more complex than we had hypothesized. We have emphasized that linkage in physiology and facial behavior underlie empathic accuracy, a relationship that might be simplified by

stating that feeling what another feels leads us to know what they feel. Of course, the correlational nature of these data leaves room for the inverse (i.e., knowing what another feels leads us to feel what they feel).

Future studies on this topic should employ additional measures of emotional contagion (e.g., continuous measures of raters self-reported feelings; coding of specific facial expressions) to see if these shed further light on the different processes that might be involved in knowing positive versus negative emotions. The connection between knowing feelings and feeling feelings is an intriguing one, with important implications for a wide range of social processes.