

in our social-emotional life. Most emotion theorists consider the experience of emotion to be passive, in that people cannot deliberately choose when to have an emotion, which emotion to have, or for how long. Our findings suggest that there may be a need to modify that view. If we can determine the conditions under which voluntarily producing an emotional facial configuration produces the subjective experience of emotion and emotional-specific autonomic activity, it could provide a more active means of altering our emotional life.

Dimburg (1982) reported that people often make an expression on their own faces when viewing the expression of another person. Meltzoff and Moore (1977) and Field, Woodson, Greenberg, and Cohen (1982) showed that facial imitation appears as early as the second day of life. Combined with our findings, a new social role for facial expression is suggested. By making the configuration seen on the face of another person, the imitator may begin to experience the same affective and physiological state as the other person. Viewed in this way, facial expression may not simply be a social signal, but may also provide a means for establishing mutual feeling, thereby playing a role in the establishment of empathy, attachment, and bonding. Although this clearly reaches beyond our present data, it is somewhat reassuring to find ourselves in the company of a quite astute observer of the human condition, Edgar Allan Poe, who wrote more than a hundred years ago:

"When I wish to find out how wise or how stupid or how good or how wicked is anyone, or what are his thoughts at the moment, I fashion the expression of my face, as accurately as possible, in accordance with the expression of his, and then wait to see what thoughts or sentiments arise in my mind or heart, as if to match or correspond with the expression."

Conclusions

First we will consider some of the issues that were raised but not settled by these studies:

1. We did not demonstrate that the different patterns of autonomic activity generated by voluntarily making emotional facial configurations are the same as would be found when emotion is aroused spontaneously. However, based on similarities with the relieved emotions task in our work, similarities with other tasks used by others, and the important role played by the subjective experience of emotion in our findings, we expect to find that many of these patterns generalize across modes of elicitation.

2. We did not fully rule out the possibility that derivation of the emotional label from the instruc-

tions to make the emotional facial configurations could play a role in these findings.

3. We do not know if the capacity of directed facial actions to generate emotion-specific autonomic activity will generalize to subjects who are not selected on the basis of their ability to control their facial muscles.

4. We do not yet know the temporal relation between subjective emotional experience and autonomic nervous system activity when both are generated by voluntary facial action (i.e., does the autonomic activation precede, follow, or occur simultaneously with the subjective experience?). A definitive answer to this question will be difficult to obtain given the delays involved between central impulses and measurable peripheral manifestations for both subjective experience and autonomic activity.

5. We do not yet have the evidence needed to specify the mechanism by which directed facial actions generate emotion-specific activity.

We will now consider what we believe the results of these five experiments *did* demonstrate:

1. The directed facial action task produces significant levels of subjective experience of the associated emotions.

2. The directed facial action task produces a number of reliable autonomic differences among the six primary emotions of anger, disgust, fear, happiness, sadness, and surprise. These differences take the form of distinctions between negative and positive emotions, distinctions among negative emotions, and distinctions involving the emotion of surprise.

3. Three common psychophysiological measures (heart rate, finger temperature, and skin conductance) each distinguish different subsets of emotions. Of these three measures, only heart rate and finger temperature make distinctions among negative emotions. A fourth measure of muscle activity does not distinguish among any of the emotions that we studied.

4. Autonomic distinctions between negative and positive emotions and among negative emotions that are found in group data are also found in the data from individual subjects.

5. Autonomic distinctions among emotions occur for both men and women, and for trained actors, facial scientists, and untrained subjects.

6. The capacity of the directed facial action task to produce autonomic distinctions among emotions does not require that subjects see their own faces in a mirror or see the face of a coach.

7. The autonomic distinctions among emotions produced by the directed facial action task still occur when the associated emotion is not experienced,

but the differences are more pronounced when the associated emotion is experienced.

8. Autonomic differentiation among emotions produced by the directed facial action task does not require that the facial configuration that is produced is a perfect representation of the associated universal emotional expression; however, the differences are more pronounced and the subjective ex-

perience of the associated emotion is increased when facial configurations closely resemble the associated emotional expressions.

9. The capacity of the directed facial action task to produce autonomic distinctions among emotions is not an artifact of somatic muscle activity or of differences in the difficulty of making the different facial configurations.

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