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Reactions to facial expressions: effects of social context and speech anxiety on responses to neutral, anger, and joy expressions

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Abstract

Male and female participants ($n = 19$) high or low in speech fear viewed pictures of faces posed in anger, neutral, and joyful expressions for 8 s each. Zygomaticus major and corrugator supercilii EMG, skin conductance, and heart rate were measured during picture viewing, and subjective ratings were made after each picture. Compared to anger expressions, joy expressions were responded to with greater zygomatic EMG, less corrugator EMG, and greater heart rate and skin conductance. Physiological response to neutral expressions was similar to response to anger expressions . Expressions posed by women were responded to physiologically more negatively than expressions posed by men. More fearful participants exhibited more negative and less positive facial expressions, and skin conductance responses suggesting greater attention when viewing negative expressions. Results suggest that reactions to facial expressions are influenced by social context, and are not simple mimicry.

Keywords: Emotional expression; Facial EMG; Social context; Speech anxiety

1. Introduction

When people are exposed to pictures of positive and negative facial expressions, they produce facial expressions that mimic the affective displays they are viewing (Dimberg, 1982).

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Specifically, viewed anger expressions produce increased corrugator supercilii ("frown") muscle activity, and joyful expressions produce increased zygomaticus major ("smile") muscle activity. These expressions are made spontaneously, without instruction to respond, and occur even when participants are told not to respond expressively or are given instructions to, for example, frown at the joyful face (Dimberg et al., 2002). The expressions are also quite rapid, appearing within about a half second following exposure to the stimuli (Dimberg et al., 1998, 2002). These findings and others have been taken as evidence that mimicry of facial expression is automatically controlled and thus independent of other environmental modifiers (Chartrand and Bargh, 1999), though it is open to debate whether the processes controlling these expressions are emotional, social, or some combination (Fridlund, 1991).

Though automatically elicited, mimicked facial expressions are influenced by social variables; for example, when one is cooperating with a confederate mimicry occurs, but a competitive situation can evoke counter-mimicry (Lanzetta and Englis, 1989). Similarly, mimicking of a politician's emotional expressions is greater when one agrees with that person's political positions (Bourgeois and Hess, 1999; McHugo et al., 1991), and negative expressions can be elicited in response to positive displays by politicians with whom one disagrees (McHugo et al., 1991). It has recently been argued that mimicry is not only affected by, but is also a cause of, interpersonal empathy (Chartrand and Bargh, 1999). In addition, emotional expressiveness is greatly influenced by the social context in which the expression occurs (Brody and Hall, 1993; Vrana and Rollock, 1998, 2002). An expressive display is influenced by the gender, ethnicity, and power status of both the sender and receiver of the message (Kirouac and Hess, 1999). Such contextual effects may be controlled via different neural pathways (Dimberg et al., 2002) and emerge over a different time course (Vrana and Rollock, 1998) than the initial automatic expression.

Despite the importance of these contextual variables, they have not been examined systematically in research on responses to facial emotional displays. Indeed, in the majority of these studies the gender and ethnicity of the participants or the persons posing the facial expressions are not reported. Some studies have employed only female participants in the belief that they are more emotionally expressive (e.g., Dimberg, 1997), though gender differences in expressivity are dependent on the particular emotion, task, and context (Brody and Hall, 1993). One study (Dimberg and Lundquist, 1990) that did examine male and female participants' expressions in response to pictures of men and women posed in happy and angry expressions found that female participants evidenced greater reactivity, but that expressions did not differ depending on the gender of the person posing the angry or happy face. This occurred even though the female stimuli were rated as more intense (e.g., rated as more angry in the anger expressions and more friendly in the happy expressions) than the male stimuli. The current study further examines social contextual variables within Dimberg's well-validated and productive paradigm for investigating facial reactions to facial expressions by varying and analyzing for gender differences in both participants and the stimulus persons displaying the facial expressions.

Social context affects responses to expressive displays in part because context affects one's interpretation of the expression and its meaning (Hess et al., 1999). In this regard, another area that has not been fully investigated is that of facial reactions to a neutral facial expression. Studies have generally employed anger and joy faces for negative and positive