Research Article

Emotion Elicitor or Emotion Messenger?

Subliminal Priming Reveals Two Faces of Facial Expressions

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ABSTRACT—*Facial emotional expressions can serve both as emotional stimuli and as communicative signals. The research reported here was conducted to illustrate how responses to both roles of facial emotional expressions unfold over time. As an emotion elicitor, a facial emotional expression (e.g., a disgusted face) activates a response that is similar to responses to other emotional stimuli of the same valence (e.g., a dirty, nonflushed toilet). As an emotion messenger, the same facial expression (e.g., a disgusted face) serves as a communicative signal by also activating the knowledge that the sender is experiencing a specific emotion (e.g., the sender feels disgusted). By varying the duration of exposure to disgusted, fearful, angry, and neutral faces in two subliminal-priming studies, we demonstrated that responses to faces as emotion elicitors occur prior to responses to faces as emotion messengers, and that both types of responses may unfold unconsciously.*

Facial emotional expressions have the capacity to evoke all kinds of responses. After all, "the face has the only skeletal muscles of the body that are used, not to move ourselves, but to move others" (Smith & Scott, 1997, p. 229). Perceivers of a facial emotional expression may not only respond to the expression itself, but may also react to the communicative message it reveals. A happy face, for example, may act as an *emotion elicitor* and elicit positive affect because, just like a picture of a young puppy, a happy face is a positive stimulus. However, such a face may also act as an *emotion messenger* and reveal specific knowledge about the motives and intentions of the sender. The happy face of a salesperson, for example, may reveal his or her ambition to sell a product. Both roles of facial emotional expressions seem crucial in human social functioning. That is why we propose that responses to both roles may be activated efficiently and unconsciously.

An essential difference between the two types of responses, however, is their specificity: Responses to the emotion-elicitor role of facial emotional expressions often are global and valence based because they are based on an initial assessment of the stimulus, whereas responses to the emotion-messenger role are relatively specific and knowledge based because they are based on secondary and relatively detailed information processing. These characteristics strongly suggest that during impression formation, responses to the emotion-elicitor role may occur earlier than responses to the emotion-messenger role. To test this dual-role perspective on automatic responses to facial emotional expressions, we conducted two subliminal-priming studies investigating the timing of emotion-elicitor and emotion-messenger effects of facial emotional expressions.

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FACIAL EXPRESSIONS AS EMOTION ELICITORS AND MESSENGERS

Facial emotional expressions are frequently referred to as the key in understanding human emotions (e.g., Russell & Fernandez-Dols, 1997). Research has revealed that facial emotional expressions can have different functions (Hess, Philippot, & Blairy, 1998; Keltner & Haidt, 1999). When they serve the role of emotion elicitor, they resemble any other emotional stimulus (see Murphy & Zajonc, 1993; Ruys, Spears, Gordijn, & De Vries, 2007; Stapel, Koomen, & Ruys, 2002; Winkielman, Berridge, & Wilbarger, 2005). A disgusted facial expression, for example, is similar to a dirty toilet bowl in that both stimuli may primarily elicit a global, negative withdrawal reaction. As emotion elicitors, facial emotional expressions may activate global, valence-based responses that may influence all kinds of unrelated judgments, preferences, and behaviors of the perceiver.

Facial expressions also have a different function, namely, that of emotion messenger (see Ekman, 1992; Fridlund, 1994; Izard, 1994; Jakobs, Fischer, & Manstead, 1997; Keltner & Haidt, 1999; Russell, 1994). As emotion messengers, facial emotional expressions signal information about the sender's feelings or motivations that is essential for successful communication. An angry facial expression, for instance, may signify the expresser's discomfort and dissatisfaction with a person or situation. To date, most research regarding the emotion-messenger role of facial expressions has focused on the first stages of emotion communication, that is, the recognition of facial emotional expressions and the meaning perceivers attach to these expressions (e.g., Ekman, 1992; Fernandez-Dols & Carroll, 1997). However, what seems crucial in the emotion-messenger role of facial emotional expressions is that perceivers not only detect the emotion (as in the case of the emotion-elicitor role), but also detect the sender-emotion link and attribute the emotion to the sender (Adolphs, 2006; Dimberg & Öhman, 1996). Thus, a response to the emotion-messenger role of, for example, an angry-looking boss, is a response to "my boss is angry," whereas a response to the emotion-elicitor role of this same stimulus is a response to anger in general.

UNCONSCIOUS ELICITATION

Despite this important difference in specificity between reactions to the emotion-elicitor role and responses to the emotion-messenger role, we think both types of responses may occur quickly and without conscious awareness. The quick and effective evaluative processing of facial emotional expressions can help people to immediately escape from danger and to take advantage of potential opportunities. Thus, unconsciously detecting the friendly or aggressive facial expression of an opponent can be important for one's survival (Atkinson & Adolphs, 2005; Cacioppo & Gardner, 1999; Zajonc, 1980). This view is supported by empirical evidence showing that subliminal exposure to facial emotional expressions elicits emotion-congruent physiological reactions and brain-activation patterns (De Gelder, 2005; Dimberg, Thunberg, & Elmehed, 2000; Phillips et al., 2004) and may unconsciously color unrelated preferences and judgments (Murphy & Zajonc, 1993; Winkielman et al., 2005).

This evidence regarding the unconscious detection of facial emotional expressions pertains mostly to their emotion-elicitor role. More recent research, however, suggests that an unconscious reaction to their emotion-messenger role—requiring the activation of more specific knowledge—is also possible. This work shows that subliminally presented facial emotional expressions can evoke not only global, valence-based affective reactions, but also more specific, knowledge-based affective reactions, such as affective responses that are sensitive to facial gender or ethnicity information (Ruys et al., 2007; Stapel & Koomen, 2006; Stapel et al., 2002). The important point for present purposes is that people are capable of unconsciously detecting descriptive, knowledge-based information (i.e., the social category of the face), in addition to global, valence-based information (i.e., the expressed emotion). It thus seems a likely possibility that responses to both the emotion-elicitor role and the emotion-messenger role unfold unconsciously.

ADDITIONAL PROCESSING OF THE SENDER-EMOTION LINK

What is less clear, however, is when the emotion-elicitor and emotion-messenger functions come into play. This information is crucial because responses to the emotion-elicitor and emotion-messenger roles of facial emotional expressions differ and may sometimes even be opposite (see Lanzetta & Englis, 1989). For example, seeing a smile may evoke a general positive response (to the role of the smile as an emotion elicitor), but when this smile comes from one's worst enemy, it may evoke a more specific, probably quite negative reaction (to the role of the smile as an emotion messenger), such as anger. How can researchers separate these two types of responses? We think the answer to this question lies in how they unfold over time: Global evaluative (emotion-elicitor) reactions to stimuli are typically triggered earlier than specific descriptive (emotion-messenger) reactions. This is because information processing often unfolds from the global to the local (e.g., Rosenthal, 2004; Werner, 1956). Neurological research supports this view, showing that there are independent systems for coarse, evaluative processing and detailed, perceptual processing (e.g., Adolphs, 2003; LeDoux, 1989). Moreover, research on event-related potential (ERP) brain responses to emotional faces (Palermo & Rhodes, 2007) has shown that crude affective categorization often occurs rapidly, whereas fine-grained processes necessary to recognize the identity of a face or to discriminate between basic emotional expressions typically need more time. Thus, responses to the emotion-messenger role may need more time to develop than responses to the emotion-elicitor role because the former require the activation of knowledge (i.e., the sender-emotion link) in addition to the activation of the emotion (Atkinson & Adolphs, 2005).

The divergent temporal characteristics of responses to the elicitor versus messenger role allow one to separate these responses by varying the duration of exposure to facial emotional expressions. As we showed in earlier research using parafoveal subliminal priming, super-quick subliminal exposures to priming stimuli trigger primarily global, valence-based responses, whereas quick subliminal exposures to priming stimuli trigger mostly specific, knowledge-based responses (see Ruys & Stapel, 2008; Stapel & Koomen, 2005, 2006; Stapel et al., 2002). For example, super-quick subliminal priming of concepts (e.g., *honest* vs. *dishonest*) elicited global, valence-based reactions (*positive* vs. *negative*), whereas quick subliminal priming of these concepts elicited knowledge-based reactions (*honest* vs. *dishonest*).

THE PRESENT STUDIES

In the studies reported here, we used this paradigm to test our dual-role perspective on the perception of facial emotional expressions and the specific hypothesis that emotion-elicitor effects of subliminal exposure to such expressions occur prior to emotion-messenger effects. We expected that super-quick subliminal exposures to facial emotional expressions would activate responses to the emotion-elicitor role because these are valence based, and that quick subliminal exposures to these expressions would activate mainly responses to the emotion-messenger role because these are knowledge based. Given previous findings (Ruys & Stapel, 2008), we expected that the activation of knowledge-based responses would reduce the likelihood of mood effects. Without the activation of knowledge, valence-based responses are diffuse and object free. Consequently, they may "spill over" onto people's moods. However, activation of knowledge bounds valence-based responses to an object (e.g., a face expressing a specific emotion), making spillover effects on mood less likely.

In Study 1, participants were exposed either super-quickly or quickly to fearful, disgusted, angry, or neutral faces. We then measured participants' responses to the emotion-elicitor and emotion-messenger roles with a global feelings measure and with global and specific cognitive measures. We expected responses to the emotion-elicitor role of a facial emotional expression to affect primarily our global measures because responses of this type are global and valence based. We expected responses to the emotion-messenger role to influence mostly our cognitive measures because responses of this type are descriptive and knowledge based. Specifically, super-quick exposures to fearful, disgusted, or angry faces were expected to activate global negative responses, whereas quick exposures to these faces were expected to activate knowledge about the emotion being displayed.

In Study 2, we made a few adjustments to test the robustness of our findings: We added specific feelings measures and used new, more sensitive, cognitive measures. Also, the order of the feeling and cognitive measures was counterbalanced to rule out the possibility that our findings in Study 1 were due to the order in which the measures were administered.

STUDY 1

Method

Participants

Undergraduates ($N = 120$) participated in Study 1 for partial course credit. They were randomly assigned to the conditions of a 2 (prime exposure: quick, super-quick) $\times$ 4 (prime emotion: disgust, fear, anger, neutral) between-participants design.

Procedure and Measures

Upon arrival, participants were shown into one of eight cubicles and seated in front of a computer. They were told that they would participate in several unrelated studies.

Priming. First, participants performed a parafoveal vigilance task (Bargh & Pietromonaco, 1982; Stapel et al., 2002) in which emotional faces were presented outside awareness. Participants were told that very short flashes (actually, the priming stimuli) would appear on the screen at unpredictable places and times and that their task was to decide as quickly and accurately as possible whether each flash appeared on the left or right side of the screen. The experimenter instructed participants to place their index fingers on two keys of the keyboard and to press the left key, labeled "L," if a flash appeared on the left side of the screen, and the right key, labeled "R," if a flash appeared on the right side of the screen. A fixation point consisting of one "X" was presented continually in the center of the screen.

The priming stimuli were located 7.6 cm from fixation, such that they were within the parafoveal visual field (from 2° to 6° of visual angle) and outside the foveal visual field (Chartrand & Bargh, 1996). Participants received 10 practice and 60 experimental trials.

The priming stimuli were emotional faces taken from Ekman and Friesen (1976). The faces that were flashed in the 10 practice trials and in 40 of the experimental trials were neutral. In the remaining 20 experimental trials, the flashed faces were disgusted, fearful, angry, or neutral, depending on the participant's condition. The order in which the faces were flashed was random. In the quick condition, faces were flashed for 120 ms. In the super-quick condition, faces were flashed for 40 ms. In all conditions, each face was immediately followed by a 120-ms mask, which was a gray square (consisting of black and white dots) the same size as the priming stimuli. The interval between the offset of the mask and the onset of the next face was randomly varied from 2 to 7 s.

After completing the vigilance task, participants were thanked for their participation.

Cognitive Measures. The next task was a word-completion task, which consisted of 18 word fragments that could be completed as disgust words, fear words, anger words, general negative words, general positive words, and neutral words (3 per category). For each category of fragments, we counted the number of completed words that were related to the intended category. Activation of valence-based responses to the disgusted, fearful, and angry faces was expected to result in more fragments being completed as general negative words than found in the neutral condition, whereas activation of knowledge-based responses was expected, in addition, to increase participants' tendency to complete fragments as words related specifically to the primed emotion (e.g., activation of "disgust" was expected to increase participants' tendency to complete fragments as disgust words).

Feelings Measure. Participants then completed the measure of global feelings. Using a scale ranging from *negative* (1) to *positive* (7), they answered the question: "How positive or negative

TABLE 1

Mean Number of Fragments Completed as Category-Related Words, as a Function of Prime Emotion and Exposure Duration: Study 1

Exposure duration and fragment type	Prime emotion			
	Disgust	Fear	Anger	Neutral
Quick (120 ms)				
Disgust fragments	2.33_a (0.62)	1.20_b (0.94)	1.20_b (0.68)	1.53_b (0.74)
Fear fragments	0.80_b (0.78)	1.87_a (0.92)	1.13_b (0.92)	1.00_b (0.93)
Anger fragments	0.93_b (0.70)	0.93_b (0.70)	1.80_a (0.86)	0.80_b (0.78)
Negative fragments	2.27_a (0.46)	2.33_a (0.82)	2.20_a (0.41)	1.33_b (0.98)
Super-quick (40 ms)				
Disgust fragments	1.27_a (0.96)	1.07_a (0.80)	1.27_a (0.96)	1.33_a (0.72)
Fear fragments	1.07_a (0.59)	0.87_a (0.74)	1.07_a (0.59)	1.00_a (0.66)
Anger fragments	0.87_a (0.74)	1.07_a (0.80)	0.87_a (0.74)	0.87_a (0.83)
Negative fragments	1.80_a (0.56)	2.07_a (0.80)	2.27_a (0.46)	0.93_b (0.88)

Note. Standard deviations are given in parentheses. For each fragment type, the score could range from 0 to 3. Within each row, means with different subscripts differ significantly from each other ($p < .05$).

is your mood at this moment?" (Responses were reverse-coded for data analysis.)

Debriefing. Previous subliminal priming studies have shown that the paradigm we employed provides sufficient safeguards to prevent participants from becoming aware of the priming stimuli (see Chartrand & Bargh, 1996; Erdley & D'Agostino, 1988; Stapel et al., 2002). However, to ensure that this was the case, we included an extensive funneled debriefing procedure at the end of the study. During the debriefing, participants were asked increasingly specific questions (see Stapel et al., 2002) probing their awareness of the priming stimuli, their awareness of the influence of the priming task on later judgments, and their general suspicion concerning the goal of the study. This procedure demonstrated that none of the participants were aware of the content of the priming stimuli. Finally, participants were thanked and debriefed.

Results

As predicted, 2 (prime exposure: quick, super-quick) × 4 (prime emotion: disgust, fear, anger, neutral) analyses of variance (ANOVAs) on our cognitive and feelings measures revealed knowledge-based responses when the emotion-eliciting primes were flashed quickly and valence-based responses when the emotion-eliciting primes were flashed super-quickly. Tables 1 and 2 present the results for our word-completion and feelings measures.

Word Completions

Specifically, the predicted interaction of prime emotion and prime exposure was found for our emotion-specific word-completion measures—disgust: $F(3, 112) = 2.86$, $p < .04$, $\eta^2 = .07$; fear: $F(3, 112) = 3.80$, $p < .01$, $\eta^2 = .09$; anger: $F(3, 112) = 3.09$, $p < .03$, $\eta^2 = .08$. Participants completed more word fragments as disgust-related words after quick exposures to disgusted faces than after quick exposures to fearful, angry, or neutral faces (all ps $< .05$). Likewise, participants completed more fragments as fear-related words after quick exposures to fearful faces than after quick exposures to disgusted, angry, or neutral faces (all ps $< .05$), and participants completed more fragments as anger-related words after quick exposures to angry faces than after quick exposures to disgusted, fearful, or neutral faces (all ps $< .05$). However, when exposures were super-quick, the word-completion task showed no emotion-specific effects (all Fs < 1).

As expected, scores for completing fragments as general negative words showed a main effect of prime emotion, $F(3, 112) = 16.37$, $p < .001$, $\eta^2 = .31$. A post hoc analysis comparing the scores of participants primed with disgusted, fearful, or angry facial expressions with the scores of participants primed with neutral facial expressions revealed that participants completed more fragments as general negative words when disgusted, fearful, or angry facial expressions were the primes than when neutral stimuli were the primes, and this effect was independent of exposure duration, $F(1, 116) = 47.87$, $p < .001$, $\eta^2 = .29$.

TABLE 2

Mean Mood Ratings as a Function of Prime Emotion and Exposure Duration: Study 1

Exposure duration	Prime emotion			
	Disgust	Fear	Anger	Neutral
Quick (120 ms)	2.73_c (0.70)	2.53_c (0.74)	2.47_c (0.83)	2.67_c (1.18)
Super-quick (40 ms)	4.40_a (0.63)	3.80_b (0.78)	3.93_{ab} (0.70)	2.40_c (0.51)

Note. Standard deviations are given in parentheses. Mood ratings were made on a scale from 1 to 7; higher means indicate more negative mood. Within each row, means with different subscripts differ significantly from each other ($p < .05$).

Mood Ratings

The ANOVA performed on the mood ratings also revealed the predicted interaction of prime emotion and prime exposure, $F(3, 112) = 9.57, p < .001, \eta^2 = .20$. Post hoc analyses revealed more negative mood when disgusted, fearful, or angry facial expressions were flashed super-quickly than when neutral facial expressions were flashed super-quickly (all ps $< .05$). As expected, when the facial expressions were flashed quickly, mood ratings after disgusted, fearful, and angry primes did not differ from mood ratings after neutral primes ($F < 1$).

STUDY 2

Method

Undergraduates ($N = 120$) participated in Study 2 for partial course credit. They were randomly assigned to the conditions of a 2 (prime exposure: quick, super-quick) × 4 (prime emotion: disgust, fear, anger, neutral) between-participants design.

The priming procedure was identical to that in Study 1. However, different dependent measures were used: We measured cognitive activation of emotion concepts with emotion-specific scenarios and measured specific and global feelings with subjective rating scales. The order of these measures was counterbalanced across participants.

Participants read three scenarios per emotion (anger, disgust, fear). All scenarios were presented in a mixed order. In one of the fear scenarios, participants imagined walking on the street at night and noticing that a suspicious person was moving toward them. They then indicated the likelihood that they would cross the street. We expected that participants who interpreted the situation as scary would be more likely to indicate that they would cross the street than participants who did not interpret the situation as scary. In one of the disgust scenarios, participants indicated the extent to which they would be willing to eat strange foods in an exotic country. We expected that participants who interpreted the situation as revolting would be less likely to indicate that they would eat strange foods than participants who did not interpret the situation as revolting. In one of the anger scenarios, participants imagined that their bicycle was stolen because it was not locked. They then indicated the likelihood that they would kick the lamppost where the bicycle had been parked. We expected that participants who interpreted the situation as frustrating would be more likely to indicate that they would kick the lamppost than participants who did not interpret the situation as frustrating. For each scenario, participants indicated the likelihood that they would perform the suggested action, using a 9-point scale from *very unlikely* (1) to *highly likely* (9). For the analyses, scores were recoded such that a high score represented a high likelihood of interpreting the scenario in terms of the intended emotion. We expected that the activation of knowledge about a specific emotion (after quick, but not super-quick, exposures to the facial emotional expressions) would increase the likelihood of making interpretations in terms of the intended emotion.

The feelings measures consisted of a general feeling question and eight specific emotion scales. Participants indicated their mood on a 7-point scale ranging from *negative* (1) to *positive* (7). Responses were reverse-coded for data analysis. Then, participants indicated the extent to which they felt fearful, disgusted, satisfied, relieved, proud, angry, shameful, and joyful, using 5-point scales ranging from *absolutely not* (1) to *absolutely yes* (5). We expected that the activation of valence-based responses would affect our general feelings measure, as it did in Study 1. However, we did not expect to find any effects on our specific feelings measures because—as we argued earlier—when the processing of a facial emotional expression is relatively specific, it is likely that the messenger role gains precedence and thus that a sender-emotion link is activated ("He is disgusted"). The activation of a sender-emotion link is unlikely to elicit the specific emotion in the perceiver ("I feel disgusted").

Results

As predicted, 2 (prime exposure: quick, super-quick) × 4 (prime emotion: disgust, fear, anger, neutral) ANOVAs on our cognitive and feelings measures revealed the activation of knowledge-based responses when the emotion-eliciting primes were flashed quickly and the activation of valence-based responses when the emotion-eliciting primes were flashed super-quickly. Tables 3 and 4 present the results for our scenario and feelings measures.

Emotion Scenarios

The predicted interaction of prime emotion and prime exposure was obtained on our emotion-specific scenario measures—disgust: $F(3, 112) = 22.93, p < .001, \eta^2 = .38$; fear: $F(3, 112) = 48.54, p < .001, \eta^2 = .57$; anger: $F(3, 112) = 12.83, p < .001, \eta^2 = .26$. Participants' rated likelihood of performing disgust-compatible actions (e.g., of not eating strange foods) was higher after quick exposures to disgusted facial expressions than after quick exposures to fearful, angry, or neutral facial expressions (all ps $< .05$). Likewise, rated likelihood of performing fear-compatible actions (e.g., crossing the street) was higher after quick exposures to fearful facial expressions than after quick exposures to disgusted, angry, or neutral facial expressions (all ps $< .05$), and rated likelihood of performing anger-compatible actions (e.g., kicking the lamppost) was higher after quick exposures to angry facial expressions than after quick exposures to disgusted, fearful, or neutral facial expressions (all ps $< .05$).

When the emotion-eliciting primes were flashed super-quickly, there were no emotion-specific effects, but instead global negativity effects appeared: Participants' rated likelihood of performing fear-compatible actions, disgust-compatible actions, and anger-compatible actions was higher after super-quick exposures to disgusted, fearful, or angry facial expressions than after super-quick exposures to neutral stimuli (all ps $< .05$). Thus, partici-

TABLE 3

Mean Likelihood of Interpreting the Scenarios in Terms of the Intended Negative Emotion, as a Function of Prime Emotion and Exposure Duration: Study 2

Exposure duration and scenario type	Prime emotion			
	Disgust	Fear	Anger	Neutral
Quick (120 ms)				
Disgust scenarios	5.98_a (0.71)	3.42_b (0.92)	3.40_b (0.63)	3.20_b (0.72)
Fear scenarios	3.80_b (0.56)	6.76_a (0.79)	3.62_b (0.45)	3.42_b (0.75)
Anger scenarios	3.51_b (1.06)	3.49_b (0.81)	6.13_a (1.38)	3.33_b (0.67)
Super-quick (40 ms)				
Disgust scenarios	4.87_a (0.58)	4.60_a (0.62)	5.27_a (0.67)	3.47_b (0.95)
Fear scenarios	5.11_a (0.56)	4.82_a (0.70)	5.44_a (0.54)	3.89_b (0.78)
Anger scenarios	4.51_a (0.58)	4.38_a (0.47)	4.37_a (0.82)	3.36_b (0.64)

Note. Standard deviations are given in parentheses. Ratings were made on a scale from 1 to 9; higher means indicate that the scenarios were interpreted more negatively. Within each row, means with different subscripts differ significantly from each other ($p < .05$).

pants were more likely to interpret the scenarios negatively when they were super-quickly primed with any kind of negative facial emotional expression than when they were super-quickly primed with a neutral facial expression.

Feelings Measures

Our global feelings measure also showed the predicted interaction of prime emotion and prime exposure, $F(3, 112) = 3.02$, $p < .03$, $\eta^2 = .08$. Participants reported a more negative mood when disgusted, fearful, or angry facial expressions were flashed super-quickly than when neutral expressions were flashed super-quickly (all ps $< .05$). Again, in the quick conditions, mood ratings did not differ with prime emotion ($F < 1$). As expected, our specific-emotion measures showed no effects.

GENERAL DISCUSSION

In two studies, we found strong support for our dual-role perspective on automatic responses to facial emotional expressions. Our results show that valence-based responses occur when subliminal exposure to emotional faces is super-quick, whereas more knowledge-based responses arise when subliminal exposure to emotional faces is quick. In both studies, participants felt more negative after super-quick subliminal exposure to disgusted, fearful, or angry faces than after super-quick subliminal exposures to neutral faces. Furthermore, participants were also more inclined to complete word fragments in a general negative way (Study 1) and to interpret our cognitive scenarios more negatively (Study 2) after super-quick subliminal exposure to disgusted, fearful, or angry faces than after super-quick subliminal exposures to neutral faces. These findings indicate that super-quick exposures to facial emotional expressions induce primarily a reaction to the emotion-elicitor role: a diffuse, evaluative response that may influence people's mood states and activate general negative cognitions.

Our studies also demonstrate that quick exposures to disgusted, fearful, or angry faces result in the activation of emotion-specific knowledge, without influencing people's global, affective feelings. After quick (but not super-quick) subliminal exposures to faces expressing a specific emotion (e.g., fearful faces), participants used knowledge about that emotion to complete word fragments (Study 1) and to interpret scenarios (Study 2) in terms of that specific emotion (e.g., fear). These findings indicate that quick exposures to facial emotional expressions elicit a reaction to the emotion-messenger role: a meaningful, knowledge-based response that activates emotion-specific cognitions.

We also showed that subliminal exposure to facial emotional expressions did not evoke specific emotional feelings in the perceivers. This finding may be interpreted as contradicting one of the basic assumptions of emotional-contagion studies and facial mimicry research, namely, that imitation of emotion elicits emotion. Indeed, research has shown that subliminal exposures to facial emotional expressions elicit emotion-specific physiognomic and physiological activity (Dimberg et al., 2000; Ekman, Levenson, & Friesen, 1983). Some researchers have overinterpreted these findings to mean that imitating other people's expressions typically elicits the corresponding emotions (Adelmann & Zajonc,

TABLE 4

Mean Mood Ratings as a Function of Prime Emotion and Exposure Duration: Study 2

Exposure duration	Prime emotion			
	Disgust	Fear	Anger	Neutral
Quick (120 ms)	2.33_a (0.72)	2.47_a (1.46)	2.40_a (1.06)	2.33_a (0.82)
Super-quick (40 ms)	3.60_b (0.74)	3.47_b (0.83)	3.60_b (0.70)	2.33_a (0.62)

Note. Standard deviations are given in parentheses. Mood ratings were made on a scale from 1 to 7; higher means indicate more negative mood. Within each row, means with different subscripts differ significantly from each other ($p < .05$).

1989; Hatfield, Cacioppo, & Rapson, 1992; but see Atkinson & Adolphs, 2005; Neumann & Strack, 2000). Crucially, however, to date there is no systematic empirical evidence that the imitation of emotional expressions may evoke either global or specific emotions. It is hardly surprising that we found no support for such a spontaneous link because automatically taking over other people's emotions can be quite dysfunctional. It does not seem functional to always feel angry when other people feel angry, or to always feel scared when other people feel scared. It *does* make sense, however, to immediately know about other people's feelings of anger or fear, so as to determine one's own optimal course of action. The finding that people do not automatically take over other people's emotions is in keeping with what our dual-role perspective on the perception of facial emotional expressions implies: Reactions to the emotion-messenger role activate primarily knowledge about the specific emotion and the link between the sender and the emotion. This knowledge about other people's emotions does not necessarily lead to the experience of those emotions (see Stapel, 2003). Reactions to the emotion-elicitor role activate primarily the valence of the emotion and result in feelings that are less specific than the emotion displayed by the facial expression.

It is important to emphasize, however, that knowledge activated by emotional facial expressions may be capable of evoking a secondary emotional response. For example, knowing that your boss is angry might make you think about potential consequences of your boss's anger, which might make you feel scared. Thus, having knowledge about another person's emotion may in turn evoke an emotional response in a perceiver, and this response may not necessarily equate with the emotion of the sender. What is most important for our present purposes, however, is that knowledge about the sender's emotion needs to be activated before this secondary emotional response can occur.

In sum, the current research shows that facial emotional expressions first initiate a global, evaluative response to the face as emotional stimulus, and that this response is then followed by more detailed information processing of the face as communicative signal. The unconscious unfolding of automatic responses to facial emotional expressions starts with a valence-based response to the emotion-elicitor role that gains meaning over time by the activation of a knowledge-based response to the emotion-messenger role.

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