Contextualizing Facial Activity

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RUNNING HEAD: Contextualizing facial activity

Contextualizing Facial Activity

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Key words: Facial expression, affect program theory, context, relational orientation

Abstract

Drawing on research reviewed in this special issue, the present paper discusses how various contextual factors impact on production and decoding of emotion-related facial activity. Although emotion-related variables often contribute to activation of prototypical “emotion expressions” and perceivers can often infer emotional meanings from these facial configurations, neither process is invariant or direct. Many facial movements are directed towards or away from events in the shared environment, and their effects depend on these relational orientations. Facial activity is not only a medium for descriptive representation of internal affective states, but also a means of adjusting to, and operating on, external objects, and of influencing other people’s appraisals of those objects.

Contextualizing Facial Activity

What do facial movements mean? Psychologists typically research this question in one of two ways (see Russell & Fernández-Dols, 1997). The first seeks meaning in processes leading to production of facial activity, focusing on how information is encoded in faces. The second (more common) approach is to investigate meanings that other people attribute to facial configurations, focusing on how information is decoded from faces. Although few studies collect both kinds of data, most theorists assume that information encoded in facial configurations broadly corresponds to information subsequently extracted by perceivers (see Scherer, Mortillaro, & Mehu, this issue). From this perspective, emotion communication may be disrupted by factors moderating production of facial response (e.g., display rules, Ekman, 1972) or decoding of facial meaning (e.g., decoding rules, Matsumoto, 1989).

A popular strategy for investigating both production and decoding is to focus on a highly selected set of static facial configurations assumed to reflect the basic emotions specified by Affect Program Theory (APT, e.g., Ekman 1972). Partly because of the methods originally used to compile these facial stimuli (e.g., Ekman & Friesen, 1976), they provide sufficient emotion-relevant information to permit some degree of within-culture consistency in decoders’ attributions of emotional meaning, especially when the judgment context pre-specifies emotion-category labels as required responses (see Nelson & Russell, this issue). Thus, English-language speakers tend to favor “disgust” over “anger” as the label for a scrunched-nose face. However, these circumscribed consistencies in judgment do not necessarily mean that the investigated facial configurations have special status as symptoms of emotion, or that their communicative meaning is normally transmitted independent of context (see also Fernández-Dols, this issue). Instead, APT faces may simply encapsulate certain patterns of relational orientation. For

example, nose-scrunching might make decoders think that the sender smells something bad (or is trying to communicate that something smells bad) and infer that disgust is more strongly associated with such a situation than anger.

Evidence reviewed in this special issue unsettles APT approaches in a number of ways. First, studies of antecedents of APT facial configurations usually find low-to-moderate associations with emotions even when interference from display rules or conflicting emotions seems unlikely (e.g., Fernández-Dols & Crivelli, this issue; Reisenzein, Studtmann, & Horstmann, this issue). Second, interpretation of APT faces depends on information presented either simultaneously or previously (Hassin, Aviezer, & Bentin, this issue; Krumhuber, Kappas, & Manstead, this issue), and on availability of linguistic categories (e.g., Lindquist & Gendron, this issue). Thus, static facial configurations do not seem to carry intrinsic, context-independent emotional meanings. Third, decoders' cultural background affects attribution of emotional meaning to APT faces suggesting that they are not universally perceived as markers of categorical emotions (Elfenbein, this issue; Nelson & Russell, this issue). In the following sections, I review evidence for these conclusions before considering more generally how facial activity relates to its dynamic context in practical and communicative situations. Not only are the meanings reflected in and conveyed by faces context-dependent, but also strategic facial communication can exploit relations between face and context.

Antecedents

Studying antecedents of facial configurations is far from straightforward. Emotional and non-emotional predictors and moderators are so diverse that they cannot all be investigated at once (e.g., Scherer, Mortillaro, & Mehu, this issue). Partly for this reason, researchers typically control for contextual factors rather than treating them as theoretically important antecedents in

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their own right. On the output side, most studies measure effects on tightly delimited aspects of facial activity instead of the full range of possible facial movements. Accordingly, the reviews by Reisenzein, Studtmann, and Horstmann (this issue) and by Fernández-Dols and Crivelli (this issue) focus on the issue of whether APT configurations consistently depend on the basic emotions they are said to express.

Reisenzein et al.’s review of experimental research finds that close associations between emotions and APT faces are the exception rather than the rule. For example, contraction of the zygomatic major is strongly related to amusement, but not to other forms of “happiness”. What accounts for these differences?

Social factors moderate some of emotion’s effects on facial activity (e.g., Fridlund, 1994). Indeed, several studies show that smiling is more likely during direct interaction with other people, and is absent, infrequent, or evanescent in private or low-sociality situations, even when happiness is intense (see Fernández-Dols & Crivelli, this issue). This context-dependence suggests that some facial movements are communicative rather than directly expressive (Chovil, 1997; Fridlund, 1994). Thus, relatively greater smiling in amusement situations may reflect their actual or implicit sociality (e.g., Fridlund, 1991).

One study that apparently fails to find weaker happiness-smiling associations in non-interactive settings is Matsumoto and Willingham’s (2006) investigation of Judo medalists at the 2004 Olympic Games. These authors reported that smiling followed victory across all sampled levels of sociality. Leaving aside the issue of whether interpersonal interaction was genuinely absent during purportedly non-social periods (see Fernández-Dols & Crivelli, this issue), it is worth considering how facial movements were recorded in this particular study. Instead of assessing smile frequency or duration across preset time intervals, Matsumoto and Willingham

1 coded still photographs taken at the moment when facial activity reached maximal intensity.
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5 Thus, their results tell us whether gold medalists smiled at any moment after winning their event,
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8 but permit only limited comparisons of the amount of smiling between contexts.
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10 Inconsistent measurement practices are also apparent across the laboratory studies
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12 reviewed by Reisenzein and colleagues. For example, the anomalously high intra-individual
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14 correlations between sadness and observer-coded “sad” expressions reported in Mauss et al.’s
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16 (2005) study may partly reflect their specific method of calculation. In particular, a range of
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18 possible time-lags was sampled to determine the maximal level of association. Although this
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20 procedure is justifiable on theoretical grounds, the resulting coefficients cannot be directly
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22 compared with standard non-lagged correlations.
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27 Theorists disagree not only about the temporal onset of facial movement (e.g.,
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29 Matsumoto, Willingham, & Oltmanns, 2009), but also its typical duration. Some proponents of APT
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31 imply that emotions and their corresponding facial expressions typically last only a matter of
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33 seconds (e.g., Ekman, 1992; Ekman & Friesen, 1982). Does this mean that an athlete who has
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35 just won an Olympic event stops being happy well before a minute has passed? Maybe repeated
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37 reactivation of thoughts (and/or social motives) relating to the recent victory continually reignites
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39 emotional and facial reactions. Conversing with someone else might similarly remind victors of
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41 different aspects and implications of their success. If so, APT facial configurations might only
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43 be observed intermittently, at moments when there is some transition in appraisal, emotion
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45 intensity, or social relations. Perhaps, then, some of the documented effects of sociality depend
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47 on it triggering such transitions.
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53 Although emotion-face associations clearly vary, both naturalistic and laboratory findings
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55 suggest that APT-predicted configurations accompany targeted emotions in some contexts. Is
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there something special about these contexts? One possibility is that they resemble those in which prototypic representations of the associated emotion concept (e.g., Fehr & Russell, 1984) originally developed. For example, even if episodes labeled as “anger” are not consistently associated with APT anger faces, those more central to the anger prototype may be (cf. Horstmann, 2002). When face-to-face with an antagonist, our facial muscles tense and we stare back with gritted teeth. Such a stance may demonstrate determination to hold firm (action readiness, Frijda & Tcherkassof, 1997), and communicate the danger of escalating hostilities, much like the words “I am angry with you.” However, neither these words nor the “anger” face necessarily accompany angry situations when interpersonal contact is less direct, or when any impulsive aggression would take forms other than physical resistance.

Seeing facial expressions as part of prototypical emotion representations rather than actual emotion episodes helps explain common beliefs that emotions and expressions are tightly correlated (as well as exaggerated perceptions of own expressiveness, e.g., Barr & Kleck, 1995; Gilovich, Savitsky, & Medvec, 1998; see also Parkinson, 2008). When people think about anger or happiness, the APT-endorsed facial configuration may readily come to mind. Correspondingly, when people are inclined to convey anger interpersonally without explicitly describing their emotional state, the fact that shared representations feature this configuration permits its use as a shorthand encapsulation of relational meaning (a facial metonym that represents the emotion episode in terms of one of its possible aspects). Another reason for the moderating effect of sociality, then, is that people may use facial metonyms to communicate emotion to other people, drawing on their shared knowledge of prototypes.

Decoding

Most papers in this issue focus on extraction of meaning from facial configurations rather than factors leading to their original production. At least some facial movements probably evolved as signals that communicate information about processes underlying their production (see Waller & Michiletta, this issue). However, explicit meanings decoded from facial configurations need not always reflect their antecedent conditions (see also Fernández-Dols & Crivelli, this issue). The following subsections address processes involved in perception and interpretation of facial meaning, and consider how various contextual factors affect these processes.

Visual processing

Atkinson and Smithson (this issue) and Whalen and colleagues (this issue) present evidence concerning registration, uptake, and subsequent processing of visual information contained in APT faces and the neural correlates of these processes. Atkinson and Smithson focus on distinctions between foveal and extrafoveal processing, and show how subcortical representations contribute to active redirection of gaze towards diagnostic features. In particular, the amygdala is implicated in guiding saccadic movements to the eye region of APT “fear” faces allowing perceivers to detect their most informative cues.

Whalen and colleagues (this issue) also show that amygdala activity during exposure to these facial stimuli reflects information value relating to predictive uncertainty rather than immediate affective responses. These findings complement Scherer and colleagues’ (this issue) argument that novelty detection triggers eye-widening during the production of facial movements (see Mortillaro, Mehu, & Scherer, 2011). Thus, perceivers may learn that this facial stimulus predicts novel and potentially significant events. Relations between encoded and

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3 decoded information become more complicated when two or more parties actively interact with
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5 one another in real time and selectively present and seek information from each other's dynamic
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7 facial presentations.
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10 Even during non-interactive exposure to static facial stimuli, Atkinson and Smithson
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12 argue that gaze-fixation patterns depend partly on contextual factors, potentially including
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14 postural stimuli (Aviezer et al., 2008; Hassin et al., this volume), and experimenters' instructions
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16 to identify specific emotion categories. These effects on early stages of information uptake may
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18 bring downstream consequences for explicit interpretations of emotional meaning. Thus, context
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20 brings both implicit and explicit effects operating sequentially or in parallel at a variety of levels.
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24 *Category information*
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27 Three papers in this special issue address the role of the linguistic context in shaping
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29 perceptions and interpretations of APT faces. Widen (this issue) shows that young children
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31 initially interpret facial stimuli in terms of good or bad feelings and only later deploy more
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33 differentiated categorical representations. Lindquist and Gendron (this issue) present evidence
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35 that facial configurations encode dimensional information relating to pleasure and arousal which
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37 needs to be supplemented by the conceptual knowledge embodied in emotion categories before
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39 adult perceivers can infer discrete APT meanings. Fugate (this issue) focuses on the role of
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41 emotion labels in generating categorical discrimination of dimensional facial stimuli, and
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43 demonstrates a conceptual (i.e., top-down) rather than merely perceptual (i.e., bottom-up) basis
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45 for such effects. Taken together, the evidence unsettles any assumption that discrete emotions
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47 are intrinsically embodied in decontextualized APT faces. Socialized emotion categories provide
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49 a frame of reference that attunes perceivers to distinctions between loosely structured classes of
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facial stimuli. Contextual data from the environment and from other aspects of the sender's presentation may also play a similar role.

Target information

Over the years, many researchers have investigated effects of situational context on interpretation of facial configurations (see Hassin, Aviezer, & Bentin, this issue, for a review). Contextual information is usually manipulated by varying narrative or pictorial representations of emotional situations. For certain judgment tasks, contextual information that is sufficiently salient can override facial information (see Aviezer et al., 2009). In this special issue, attention shifts from the external context to simultaneous or consecutive information from the target of judgment. How, then, are emotional attributions affected by senders' non-facial cues, and by the dynamic features of facial information itself?

Hassin, Aviezer, and Bentin (this issue) provide evidence that presenting discrepant bodily postures can influence processing and categorization of an associated facially expressed emotion. Effects depend on the perceptual similarity between the APT stimulus face and the face prototypically associated with the bodily posture. For example, because APT "anger" faces resemble APT "disgust" faces more than they resemble APT "fear" faces, "disgust" postures have a greater impact than "fear" postures on interpretation of simultaneous "anger" faces. Such "confusability effects" may also depend on compatibility of the relational orientations conveyed by facial and bodily stimuli and their relevance to any simultaneously presented objects (such as the dirty nappies included in Hassin et al.'s stimulus materials).

Rigato and Farroni (this issue) demonstrate that targets' gaze direction also shapes perceivers' responses to APT facial stimuli. For example, from an early age smiling faces accompanied by direct gaze have special significance as signals facilitating social interaction and

the development of intersubjectivity. However, “fear” expressions accompanied by direct gaze may be ambiguous because fear involves avoidance whereas direct gaze often implies approach (an incompatible relational orientation). Such effects probably depend on whether there is a clear object at which the sender’s gaze is directed. Indeed, direct gaze is consistent with fear of the perceiver, whereas averted gaze is consistent with fear of something else. Relatedly, research by Bayliss, Frischen, Fenske, and Tipper (2007), and Mumenthaler and Sander (2012) shows that gaze direction moderates effects of APT faces on appraisal of simultaneously presented objects.

Krumhuber, Kappas, and Manstead (this issue) focus on how the dynamic quality of facial movements shapes their interpretation. The central message is that static facial images are less diagnostic than moving images, especially when expressions are subtle or degraded (e.g., Bould & Morris, 2008) and when participants are free to mimic the presented stimuli (e.g., Maringer, Krumhuber, Fischer, & Niedenthal, 2011). Information about the trajectory of facial movements provides stronger cues about the nature of relational activity including emotional orientation to current circumstances. Adding further information about the dynamic attunement (or disattunement) of bodily, eye, and facial movements to unfolding environmental events (including other dynamic bodies, eyes, and faces) is likely to be even more revealing.

Universality

Elfenbein (this issue) focuses on one set of factors that might contribute to cultural differences in nonverbal communication. In her view, facial configurations provide a universal language for expressing emotions (as in APT), but different cultural “accents” subtly alter these basic expressions. Decoders who are unfamiliar with these accents (e.g., because of their different cultural background) will therefore be less accurate than in-group members in their judgment of encoders’ facially expressed emotions (*ingroup advantage*).

However, other cultural differences such as availability of matching linguistic categories may also contribute to decoding (see Lindquist & Gendron, this issue), as suggested by comparisons between judgment tasks using Indo-European and other languages (Nelson & Russell, this issue). Indeed, nonverbal accents are unlikely to provide an exclusive explanation of all cultural differences in emotion attribution to APT faces. For example, the more dramatic differences in so-called recognition accuracy observed in isolated cultures seem to go beyond subtle differences in expression of identical emotional meanings.

Nelson and Russell (this issue) update Russell's (1994) influential review of studies assessing cross-cultural consistency of emotion attributions to APT facial stimuli, and confirm that judgments depend on both the nature of the facial stimulus and the decoder's cultural background. Any culture-independent interpretations of faces may reflect processes and factors broadly correlated with emotional meanings rather than emotions themselves. For example, the evidence is consistent with dimensional accounts, or with the view that APT faces carry information about relational orientation (including direction of attention, approach, and withdrawal).

Relational Orientation

This issue's articles review a wide range of factors that moderate or directly influence production or decoding of facial activity, including culture, language, judgment tasks, posture, gaze, and facial dynamics. Despite psychological research's predominant focus on static, isolated, and disembodied faces (see Fernández-Dols, this issue), the data make it clear that emotional meaning is neither encoded in, nor decoded from, internal features of static facial configurations alone. Taking this conclusion further, I argue that the operation of facial activity often depends on its dynamic mode of relation to the situational context. Most previous research

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has treated contextual factors as independent or extraneous variables. Investigating facial activity that is embedded in unfolding meaningful contexts rather than abstracted from those contexts may lead to different conclusions (see also Fernández-Dols & Crivelli, this volume). For example, ethological approaches showing how facial movements of non-human animals reflect and communicate relational activity (e.g., Waller & Michiletta, this issue) might profitably be extended to humans.

Future research should focus on the relational orientations of facial configurations and movements, as embodied in directedness of sensory organs and more general movements, and their spatial and temporal relations to events in the shared environment. For instance, facial activity often serves practical functions as part of more articulated movements involving the whole body (e.g., Dewey, 1895) that are directed at or away from objects (including other people). Thus, facial actions may serve as constituents of approach or withdrawal (e.g., Arnold, 1960), as well as more specific defensive, aggressive, or accepting orientations (de Rivera, 1984). For example, people turn away from or turn their nose up at objects that look or smell disgusting. These activities directly serve the purpose of regulating contact with unpleasant stimulation and may occur irrespective of the availability of appropriate addressees.

Facial activity directed towards objects in the sight of other perceivers may also influence their orientations to those objects (Mead, 1934). For example, Sorce and colleagues' (1985) classic study of social referencing suggests that a mother's "fear" expression directed at the visual cliff confronting her one-year-old offspring leads the toddler to avoid that object. Further, in Repacholi and Meltzoff's (2007) study, 18-month old infants who had observed someone directing anger towards another person who was playing with an object, subsequently played with and looked at that object less, especially when in view of the previously angry person.

Facial features and their movements probably evolved partly to permit communication of relational orientation to others. For example, the contrast ratio between iris and sclera permits easy tracking of the human eye's movements by others (Kobayashi & Kohshima, 1997). Similarly, eyebrows may enhance the visibility of eye-widening (Buck, 1984). Despite the adaptive functions of facial communication, it is also likely that socialization plays a role in the development of its specific meanings and uses. For example, facial configurations may acquire symbolic meaning from repeated associations with the performance of practical or communicative functions. As suggested above, people may learn to use certain patterns of facial movement as metonymic representations standing for more extended sequences of relational activity. Thus, widening eyes in response to uncertain or unexpected visual stimuli may come to be used as an indication of confusion or surprise. Some of these symbolic facial movements may also be given more articulated conventionalized meanings within a given culture (especially when the relational orientation they represent is hypercognized, Levy, 1973). Depending on the prototypic representation of the society's emotion concepts, they may develop meanings that go beyond the occasions for their original unselfconscious occurrence.

Relational orientations of facial activity do not operate unidirectionally on objects (or persons), but are also attuned to the reciprocal orientations of other people (Parkinson, 2008). The facial movements involved in mutual adjustments of orientations are likely to be acutely sensitive to the perceptual availability of other parties to the interpersonal exchange (cf. Bavelas, Black, Lemery, & Mullett, 1986).

Of course, emotions and appraisals are not always oriented entirely at perceptually available objects. In some private situations lacking even implicit sociality, facial activity may be entirely absent, or else take idiosyncratic forms depending on mental transactions with

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imagined, remembered, or anticipated objects. In public, even facial orientations to mental objects can serve communicative functions. For example, I may be attentive to a ticking clock that signals the impending proximity of an unwanted rendezvous even when those around me attach different meanings to time passing. When interacting with others, mutual regulation and adjustment of facial activity can help to calibrate relational orientations of parties approaching the same situation from different perspectives (e.g., Latané & Darley, 1968), establishing “common ground” (e.g., Clark, 1993) between interactants before referential communication is effective. Clearly, these processes also depend on any verbal messages that are exchanged. Indeed, more research should focus on how nonverbal and verbal aspects of communication interact or perform independent functions in social interaction (e.g., Wagner & Lee, 1999). In any case, an important part of the context for emotion-related facial activity is the ongoing responsivity of others, including their facial responsivity.

Recent investigations of facial activity’s interpersonal effects go beyond extraction of explicit meaning and include implicit measures of priming and performance (e.g., Roelofs, Hageraars, & Stins, 2010; Whalen et al., this volume; Wilkowski & Meier, 2010). Such studies reinforce the conclusion that facial activity not only functions to influence attributions of basic emotions but also brings more direct consequences for relational orientations. Apart from emotion, it is self-evident that faces are involved in a wide range of psychological function (including respiration, nutrition, thermoregulation, perception, attention, grooming, and communication, Parkinson, 2005). In each case, what the face does (or what is done to the face) is part of a wider system that also involves other organs, systems, and external events. Depending on its relation to these other aspects, the same facial movement can serve a variety of purposes.

Summary and Conclusions

At the start of this paper, I asked what facial configurations mean. Based on evidence from this special issue, it seems unlikely that even the highly selected set of facial configurations said to represent basic emotions are always produced in response to those emotions, or that they directly express those emotions to others irrespective of context. APT faces do not always appear when the predicted emotion is present, and sometimes do appear when it is not (e.g., Schneider & Josephs, 1991). Further, adults who are not explicitly provided with basic emotion categories do not automatically allocate APT expressions to these categories, and neither do young children yet to acquire categorical emotion representations. Finally, the meanings that perceivers do extract depend on processing constraints and contextual information deriving from prior and simultaneous gaze, gesture, and posture, together with external circumstances.

Building on these insights, I have argued that APT-inspired research has been limited in at least three general ways. First, the focus on categorical emotions as causes and meanings of facial configurations draws attention away from the wider range of processes that affect and are affected by facial configurations. Second, investigating faces in isolation from context makes it difficult to detect consequences of faces' orientation to objects and events in the wider environment (see also Fernández-Dols, this issue). Third, treatment of faces as either antecedents or consequences, independent or dependent variables, ignores dynamic processes of relational activity, in which facial movements unfold over time to perform practical and communicative functions (in relation to the objects and events to which they are directed). Facial movements can be actions as well as reactions, and their relation to emotional processes is rarely simply expressive.

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Instead of treating facial configurations as descriptive representations of intrapsychically specified meanings, researchers need to develop ways of investigating facial activity as it operates between people and in relation to the environments they share. Explicit and implicit processes of meaning transmission are certainly an important part of the phenomenon in question. However, facial movements also play more direct roles in adjusting relations with objects and other people. It is not enough to look for emotional meanings in facial configurations, focusing on separable encoding and decoding processes. We also need to explore the roles played by facial activity in broader embodied adjustments to, and operations on, the responsive practical and social environment.

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