RESEARCH IN OCCUPATIONAL STRESS AND WELL BEING

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NEW DEVELOPMENTS IN THEORETICAL AND CONCEPTUAL APPROACHES TO JOB STRESS

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OVERVIEW

In our 8th volume of Research in Occupational Stress and Well Being, we offer eight chapters that examine theoretical, conceptual, and methodological advances to job stress research. Our lead chapter, by Christopher Rosen, Chu-Hsiang Chang, Emilija Djaudjivic, and Erin Eaton, provides a thorough review of conceptual and empirical research examining occupational stress and performance. They review and critique theories that help to explain the workplace stressor-performance relationship and they develop an eight-category taxonomy of workplace stressors. Finally, they evaluate how well contemporary research has dealt with limitations and weaknesses previously identified in earlier research.

In the second chapter, Simone Grebner, Achim Elfering, and Norbert Semmer develop the Success Resource Model of Job Stress. Their model illustrates four dimensions of subjective occupational success: goal attainment, pro-social success, positive feedback, and career success. Success is argued to be an important resource that leads to a number of positive outcomes such as positive affect and emotions, health and well-being, learning, and energy. In the third chapter, E. Kevin Kelloway, Michelle Inness, Julian Barling, Lori Francis, and Nick Turner develop an intriguing construct they call “loving one’s job.” They examine three components of love of one’s job and then develop the theoretical and conceptual ties between truly loving your job and employee well-being.

The fourth chapter, by Irvin Schonfeld and Edwin Farrell, challenges our sole focus on traditional empirical approaches to the study of job stress and examines how using qualitative methods can enrich our empirical work. Using extensive examples from research on job stress in teachers, they demonstrate how qualitative and quantitative methods support each other in occupational stress research. The fifth chapter, by Kevin Eschleman and Nathan Bowling, is a fascinating account of how and why it is important to examine facial expressions. They integrate the facial expression and occupational well-being literatures and argue that objective measures of facial expressions have distinct advantages over self-reports of occupational stress and well-being.
In the sixth chapter, Jason Kain and Steve Jex review the conceptual and empirical literature on the popular job demands-control model. They examine critically the recent extensions of this model and offer a number of suggestions as to how to advance this theoretical perspective. The final two chapters examine the role of information and communication technology and employee stress and well-being. O'Driscoll, Brough, Timms, and Sawang examine some key facilitators and barriers to user acceptance of and engagement with information technology and the subsequent associations with health and well-being. Using the job demands-resource perspective, Arla Day, Natasha Scott, and E. Kevin Kelloway develop a model depicting the role of information and communication technology on experienced strain, burnout, engagement, and performance. Together, these chapters offer insight into how we can improve and advance job stress research. These chapters challenge our traditional conceptual and methodological thinking and offer some exciting directions for future research. We hope you enjoy volume 8 of Research in Occupational Stress and Well Being.

Pamela L. Perrewé
Daniel C. Ganster
Editors

OCCUPATIONAL STRESSORS AND JOB PERFORMANCE: AN UPDATED REVIEW AND RECOMMENDATIONS

Christopher C. Rosen, Chu-Hsiang Chang, Emilija Djurdjevic and Erin Eatough

ABSTRACT

This chapter provides an updated review of research examining the relationship between occupational stressors and job performance. We begin by presenting an eight-category taxonomy of workplace stressors and we then review theories that explain the relationships between workplace stressors and job performance. The subsequent literature review is divided into two sections. In the first section, we present a summary of Jex's (1998) review of research on the job stress-job performance relationship. In the second section, we provide an updated review of the literature, which includes studies that have been published since 1998. In this review, we evaluate how well the contemporary research has dealt with weaknesses and limitations previously identified in the literature, we identify and evaluate current trends, and we offer recommendations and directions for future research.
FACING THE LIMITATIONS TO SELF-REPORTED WELL-BEING: INTEGRATING THE FACIAL EXPRESSION AND WELL-BEING LITERATURES

Kevin J. Eschleman and Nathan A. Bowling

ABSTRACT

Theorists, such as Darwin and Aristotle, have long argued that facial expressions communicate information about a person's emotional state. Recently, validated coding strategies for facial expressions have been developed, which enable researchers to reliably assess a person's affect. Although social, health, and clinical psychologists have regularly employed these objective measures of facial expressions (OMFE), occupational stress and well-being researchers are yet to benefit from this method. The subsequent chapter integrates the facial expression and occupational well-being literature. Specifically, we discuss the advantages of OMFE over self-reports and implications of OMFE for future research on occupational well-being.
Given the dynamic nature of job stress, affective reactions that occur during the stress process are an avenue for research and developments in stress theory (Green & Zellars, 1999). Current assessments of affective reactions in the stress process are limited because they are predominately assessed through self-reports. To effectively test job stress theories that involve dynamic changes in affective reactions to job stressors, researchers need to shift their conceptual approach to well-being by incorporating more objective measures of affect. More specifically, objective measures of facial expressions (OMFE) are a validated approach to assessing affective reactions and may lead to theoretical advancements in stress and well-being. In this chapter, we discuss common conceptualizations of well-being and the limitations of assessing well-being with self-report measures. We also introduce the facial expression coding, defend the validity of the objective assessment tool, and discuss the utility of OMFE in future stress and well-being research.

**SELF-REPORTED WELL-BEING**

*Conceptualization of Well-Being*

A common conceptualization of affective well-being is in the form of a hierarchical structure (Tellegen, Watson, & Clark, 1999). The lower levels of the hierarchy involve affective experiences that are more narrow and transient, whereas the top of the hierarchy includes affective experiences that are more broad and stable. For instance, mood and emotion are located at the lower levels of the hierarchy, whereas trait affect is located at the top. Mood and emotion differ in that mood is a broader concept than emotion. Mood is experienced with greater duration and more frequently (Gray & Watson, 2001). Emotions are intense and last up to a few minutes, whereas moods can last hours or days. In addition, mood and emotion differ in the experiences that trigger them. Emotions are triggered by specific stimuli or a defining moment, whereas mood is a summary of a person’s overall affective state (Watson & Clark, 1994).

Mood and emotions are similar in that they refer to feeling states that can be broadly characterized as pleasant or unpleasant (i.e., positive or negative) and reflect what a person is experiencing internally (Parkinson, Totterdell, Bruner, & Reynolds, 1996). In addition, it is believed that mood and emotion have common components, controlled by similar processes (Parkinson et al., 1996), and are both accompanied by a physiological response (Larsen, 2000).

Because of these similarities, emotion and mood are often researched together using the broad label affect; referring to all mental states involving evaluative feelings (Parkinson et al., 1996). Ascending the hierarchical model (Tellegen et al., 1999), stable experiences of affect that lack a defining event are seen as personality traits. In sum, affective states include three common characteristics: (1) describe transient experiences, (2) include a subjective component, and (3) have both a psychological and a physiological element (Weiss, 2002).

*Common Methods and Scales for Assessing Well-Being*

The assessment of employee well-being is heavily dependent on self-report. The use of self-reports to assess affect in the workplace was prevalent in the early stages of research in this area (e.g., Hersey, 1932) and is currently the method of choice among organizational psychologists (Weiss, 2002). Well-being in the late 1930s was primarily assessed using a job satisfaction scale (Weiss, 2002); more recently, this conceptualization has been recognized as being too narrow. As a result, numerous scales that address a broad range of issues dealing with well-being now exist. This is an effort to assess the more broadly defined construct of affective well-being. Although we cannot provide an exhaustive list of well-being scales currently in use, it is important to review some of the most common measures to demonstrate inherent flaws in the measurement of self-reported well-being.

The assessment of well-being is heavily reliant on scales based on positive and negative affect (Weiss, 2002). Specifically, the Positive and Negative Affect Schedule (PANAS) is the most common scale used to assess an affective-oriented content domain (Gray & Watson, 2007). Previous measurement tools designed to assess an affective-oriented content domain often showed low reliability or poor convergent and discriminant validity when compared to the PANAS (Watson, Clark, & Tellegen, 1988). Depending on the researcher’s goals, the instructions for the PANAS can be modified to assess the affect that one is currently experiencing or has experienced during the “past few days,” “past week,” “past month,” “past year,” or “in general.” A respondent is presented emotions that vary in intensity and valence (e.g., bored, annoyed, ecstatic, and anxious) and are instructed to rate how often these emotions were experienced. Whereas instructions with shorter time frames (e.g., right now) are an assessment of mood, instructions with longer time frames (e.g., in general) assess dispositional or trait affect.
Other scales include the Job-Related Affective Well-Being Scale (JAWS; Van Katwyk, Fox, Spector, & Kelloway, 2000) and the Physical Symptoms Inventory (Spector & Jex, 1998). The JAWS instructs employees to rate the amount to which any part of the job has made them feel one of thirty emotions over the past 30 days. In addition to psychological well-being, measures of physiological well-being are also common in occupational stress research, in which respondents indicate if they have experienced a minor physical symptom over the past 30 days (Spector & Jex, 1998).

A recurring theme in the aforementioned scales is the requirement of the respondent to recall a psychological or physiological experience. Although we discuss the inherent flaws with self-report scales in more detail in the subsequent section of this chapter, researchers often attempt to overcome some of the limitations of self-reports in various ways. For example, Levenson and Gottman (1983, 1985) employed continuous self-reports in which participants first engaged in emotion eliciting activities and then watched a video replay of these activities. While watching these video replays of the activities, the participants used a dial to rate their recalled affect. Although this method enabled the researchers to assess the participant's affective response without interrupting the activity, the self-report of affect is still dependent on the participant reporting a memory of affect. Another attempt to improve self-reports of affect is done by having respondents report affect while they are undergoing an emotional event. This method is also flawed because the interruption may interfere with the affective experience to an unknown extent (Rosenberg & Ekman, 1994). In other words, stopping an activity to report current feelings changes the natural sequence of events and experiences and reduces generalizability of the experiment. The use of diaries is also a common method to assess well-being (e.g., Eid & Diener, 1999; Fleeson & Cantor, 1995; Tugade, Fredrickson, & Barrett, 2004). Although diaries rely less on memory of an affective experience than other methods, diaries are still dependent on self-report of affect.

Potential Limitations of Self-Reports of Well-Being

Although organizational researchers typically assess employee emotions using self-report questionnaires, there are several potential limitations associated with self-reports (for reviews of self-report research in organizations, see Podsakoff & Organ, 1986; Spector, 1994). Researchers who use self-report measures assume that participants know the answers to the questions being asked and are able and willing to respond accurately. However, there are reasons to believe that employees often provide inaccurate reports of their emotions. The limitations of self-reports include context effects, impression management/self-deception, problems associated with recalling past emotions, lack of awareness of one's own emotions, common-method variance (CMV), and construct validity concerns.

Context Effects

Social scientists who conduct questionnaire research have long been aware of the potentially biasing influences of the context in which participants provide self-reported responses (Schwarz, 1999; Tourangeau & Rasmshi, 1988). The nature of prior questionnaire content, for example, can impact responses to subsequent items (Bowling, Boss, Hammond, & Dorsey, 2009; Strack, Schwarz, & Schneidinger, 1985). Bowling et al. (2009), for example, found that the inclusion of content that reminded respondents of either positive or negative aspects of their jobs affected their subsequent responses to job satisfaction items. Other research has found that completing a self-report measure of depression can influence subsequent reports of emotions (Mark, Sinclair, & Wellens, 1991).

As a whole, the aforementioned findings demonstrate how context effects could potentially bias participants' responses when self-report measures of affect are employed. Using OMFE to assess affect may be a viable means of overcoming this limitation. That is, because OMFE can be assessed unobtrusively, there is little fear that such a measure would "prime" participants' memories and thus impact their responses to other measures.

Impression Management and Self-Deception

When using self-report measures to assess socially sensitive attitudes or behaviors (e.g., racial attitudes, sexual preferences, and illegal behavior), researchers are often concerned about participants providing responses that exaggerate their positive qualities or understate their negative qualities (Tourangeau & Smith, 1996). Such biased responding can be done intentionally and with the purpose of misleading the researcher, or it can be done unintentionally (Paulhus, 1984). When done unintentionally, this behavior is referred to as impression management. When done unintentionally, it is referred to as self-deception.

These biases may be particularly common when researchers assess self-reported employee affect. Commonly studied emotions include both positive affect (e.g., happiness, joy, and pride) and negative affect (e.g., anger, fear,
and frustration). When self-report measures are used, participants may exaggerate the extent to which they experience positive emotions and understate the extent to which they experience negative emotions (Chen, Dai, Spector, & Jex, 1997). This may be particularly true when participants are concerned that their supervisors or co-workers will learn of their responses. The use of OMFE could help overcome the biasing effects of impression management and self-deception, however. Unlike self-report measures, OMFE can be used unobtrusively, and thus participants may not distort their results because they are unaware that a sensitive construct is being measured. Furthermore, there is extensive empirical evidence suggesting that people generally find it difficult to mislead trained observers by consciously manipulating their facial expressions (Ekman, Friesen, & O'Sullivan, 1988).

Problems Recalling Past Emotions

Researchers often ask participants to provide retrospective reports of past emotions. The PANAS (Watson et al., 1988) and the JAWS (Van Katwyk et al., 2000) scales are often used to assess emotions experienced during the past 30 days. There is reason to believe, however, that people may find it difficult to accurately report past emotions. Research examining retrospective reports of emotions has found that summary reports of past emotions are highly impacted by highly intense and recently experienced emotions and lack the sensitivity to recall the actual duration of an emotional experience (Robinson & Clore, 2002). Robinson and Clore (2002) argue that emotional experiences can be neither stored nor retrieved. Although similar emotions can be generated by mentally reconstructing an experience or situation (Wyer, Clore, & Isbell, 1999), this experience is a new emotion (Galin, 1994). In other words, when an employee recalls how they felt over an extended period of time, he or she will reconstruct an emotional experience that is at least slightly different.

The inability to reconstruct the exact emotional experience is partly because a person's emotion-related memory is similar to other forms of memory in that the ability to recall contextual details diminishes with time (Eich & Schooler, 2000). Retrospective reports include biases associated with both episodic and semantic memory. Episodic memory is the retrieval of specific moments from the past that are used to construct a similar emotional experience. Semantic memory is composed of generalized beliefs about emotions that would be present during a time frame.

For example, imagine that an employee who is instructed to report her well-being at work over the past hour. Given the short time frame of the question, the employee will be able to engage in episodic memory recall in which she will remember specific situational cues to reconstruct the emotional experiences during the past hour. These cues could include remembering that there was not enough time to finish lunch or that the boss made a belittling remark. In addition, the employee may remember specific thoughts, such as recalling herself saying, "I feel tired." If the time frame were increased from one hour to two weeks, the employee would shift from episodic memory recall to semantic. As a result, fewer contextual details will be remembered, and memories will be based on the decontextualized, symbolic beliefs. In other words, the employee will no longer extract specific memories about the workday, but rather rely on her belief of how she should have felt during that time. Demonstrating the effect of beliefs on retrospective reports of well-being, Mitchell, Thompson, Peterson, and Cronk (1997) found that employees' retrospective reports of well-being after returning from a vacation were higher than reports of well-being while they were on vacation. Employees believed they were happier during vacation than they actually were.

Although experience-sampling designs using self-report measures of current emotions (e.g., flies & Judge, 2002) are one approach to deal with the problems associated with recalling past emotions, we believe that the use of OMFE could also prove useful. For example, researchers could use video recordings of participants to assess participants' facial expressions in real-time.

Awareness of Emotions

Researchers who use self-report measures assume that participants are aware of the emotions that they are experiencing. There is evidence, however, that this assumption may often be wrong. For example, there is growing evidence that emotional responses are partially implicit (i.e., they occur outside of one's awareness) and that self-reported explicit emotions often correlate weakly with implicit emotions (Greenwald, McGhee, & Schwartz, 1998). Self-report measures therefore may miss an important aspect of emotions. We believe that OMFE may be useful for assessing implicit emotions. Our assumption is based on research showing that specific muscle movements in the face are an automatic (non-controlled) response (Ekman, Friesen, & Simons, 1985).

Common-Method Variance

CMV, which is variance attributable to the method one uses and not to the construct being assessed, is often cited as a limitation in studies that depend
exclusively on self-report measures (for reviews of CMV, see Podsakoff, MacKenzie, Lee, & Podsakoff, 2003; Spector, 2006). CMV is often assumed to artificially inflate the observed relationships between variables assessed using self-reports, although it can also artificially attenuate observed relationships. For example, if self-reports were used to assess both abusive supervision and job satisfaction, many researchers would assume that the observed relationship between these two variables could be artificially inflated because both were assessed with the same method. Although there is extensive evidence that the problems generally associated with CMV are largely overstated, the widespread belief that CMV artificially inflates observed correlations persists (Spector, 2006).

Fortunately, there are several approaches to combat CMV (Podsakoff et al., 2003; Semmer, Grebner, & Elfering, 2004; Spector & Brannick, 2009). One approach is to use a combination of both self-report and non-self-report measures. A researcher concerned about CMV, for example, could examine the relationship between a predictor variable assessed with an objective measure and a criterion variable assessed using a self-report measure. Relevant to this chapter, self-report measures can be used to assess the predictors and consequences of employee emotions, and OMFE can be used to assess emotions.

VALIDITY OF FACIAL EXPRESSION ASSESSMENT

Universality of Facial Expressions

The assessment of affect through facial expression recognition is dependent on the consistent expression and recognition across contexts and cultures. In support of the theory of universality, researchers have found that rates from varying cultures consistently identify the same affective experience expressed in a face (Ekman, 1972; Izard, 1971). These studies provide evidence of a relationship between affect and facial expressions, but also that these expressions are consistently recognized across cultures. Although some researchers may disagree that humans express and recognize specific emotions across all cultures (e.g., Russell, 1994), several researchers have argued in favor of universality. In fact, six emotions are consistently found to be associated with the face in various cultures: happiness, sadness, surprise, fear, anger, and disgust (Boucher & Carlson, 1980; DiCara & Ascar, 1982; Ekman, 1972; Ekman, Sorenson, & Friesen, 1969; Ekman et al., 1987; Izard, 1971; McAndrew, 1986; Nis & Valsiner, 1977). A meta-analysis on facial expression recognition supported the findings of six basic emotions, but also includes contempt as a universally recognized emotion (Elfenbein & Ambady, 2002). It should be noted that contempt had a lower inter-rater agreement than the aforementioned six emotions.

Additional evidence for the universality of facial expressions can be found in more recent research of facial expressions in different cultures and among the visually impaired. Facial expressions have been used to identify emotional experiences of Olympic athletes from varying countries in the world (Matsumoto & Willingham, 2006). Similarly, Matsumoto and Willingham (2009) found no cultural differences in the spontaneous facial expression of emotion of Olympic and Paralympics athletes. In addition, spontaneous facial expression of emotion is found to be similar between blind and sighted athletes, indicating that these expressions are not observationally learned.

Although some researchers have argued that the universality of the relationship between facial expression and emotion is no longer a debated topic in psychology (Matsumoto, 1990), reviews of cross-cultural research on facial expression recognition reveal that some inconsistencies in the findings exist (Russell, 1994). Russell (1994) found that emotion recognition accuracy will partially depend on the response format and the emotion labels used in a study. In addition, unpublished studies conducted in isolated and illiterate cultures by Ekman, Sorenson, and Friesen found that only happiness was accurately recognized (Russell, 1994). Although this is evidence against the theory of universality, it should be noted that the experimenters believe the results were likely influenced by the interaction between the participant and the translator (Sorenson, 1976).

A more recent review of the association between emotion and facial expressions indicates that universality is at least partially accurate, but the influence of culture and context is undeniable present in both expression and recognition (Elfenbein & Ambady, 2002). It has also been found that the ability to recognize emotions increases as cultures and context become more similar (Elfenbein & Ambady, 2003). Variation between cultures in expression and recognition may be the result of three factors (Ekman, 1982). First, some gestures are culture specific and others are universal. Second, cultural norms regulate, mask, inhibit, or exaggerate natural facial expressions. Last, the causes or elicitors of emotion may vary across cultures. Although these factors are discussed in regard to cultural differences and between-person variability, they are also relevant in addressing the within-person variability in expressions (Matsumoto & Kupperbusch, 2001). In sum, there is evidence that expression and
recognition of emotion are present in the face and that people have the innate ability to identify these expressions in photographs, but cultural and contextual variation is an undeniable limitation. The challenges posed by a person’s motivation to regulate, mask, inhibit, or exaggerate a natural facial expression has propelled researchers to develop a micro-level analysis of facial expressions and develop a standardized coding method.

**Objective Measures of Facial Expressions**

The relationship between facial muscle activity and affect is evidence that activity in the face reflects a person’s underlying emotions. This relationship enabled researchers to develop a facial coding method that overcomes several of the cultural and contextual concerns regarding facial expression recognition. A microanalytic approach to the association between facial expressions and affect led to the recognition of three pivotal muscular regions in the face (Ekman et al., 2002). These regions include the corrugator, zygomatic, and orbicularis oculi muscles. The corrugator muscle is located in the brow region. The zygomatic muscle is located in the cheek region. The orbicularis oculi muscle is located around the eye. Zygomatic activity is correlated with elicitation of positive emotions, whereas corrugator activity is correlated with elicitation of negative emotions (e.g., Brown & Schwartz, 1980; Cacioppo & Petty, 1981; Sirota, Schwartz, & Kristeller, 1982). In addition, activity in the orbicularis oculi is associated with more accurate ratings of positive emotions when a person is attempting to mask the emotion and deceive the rater (Ekman et al., 1985). In other words, smiles displayed without activation in the orbicularis oculi are considered to be regulated facial expressions that do not coincide with positive emotional experiences. To measure muscular activity in the face, researchers rely on the assumption that a muscular region can be isolated despite the fact that facial muscles contain fibers that are interwoven (Cohn & Ekman, 2005). Under this assumption, research on facial activity has used several tools to code movement or measure electrical activity.

The methods used to assess facial expressions at a microlevel include a computer-based facial imaging analysis, measurement of muscular activity using electromyography (EMG) or a trained observer-based measurement (Ekman et al., 2002). Computer-based coding of facial expressions provides a digitized method of assessing facial activity. Although this method has been used in recent studies (e.g., Cohn & Schmidt, 2004; Dinges et al., 2005), several concerns with the method still exist and need to be addressed before the method can be consistently applied (Cohn & Ekman, 2005). More established methods of assessing facial expressions include EMG and trained observer-based coding. Facial EMG is a measurement of electrical activity in the skeletal muscles of the face (Fridlund & Cacioppo, 1986). EMGs have overcome reliability issues by following a standardized system to place an electrode on the appropriate muscular region. Validity concerns are also minimal because of good concurrent and predictive relationships with emotions recorded from both self-reports and observer-reports (e.g., Cacioppo, Martzke, Petty, & Tassinary, 1988; Cacioppo et al., 1992; Cohn, Schmidt, Gross, & Ekman, 2002). Although EMG can be a valuable measurement tool, several costs limit its application in research. Most notably, an EMG requires specialized equipment and a trained staff, electrodes can be intrusive and limit muscular activity, and it is difficult to apply in a naturalistic setting. To overcome these limitations without sacrificing the sensitivity of detecting muscle activation, observer-based coding methods have been developed (Ekman et al., 2002).

Comparisons between manual coding and facial EMG have been rare (Cohn & Schmidt, 2004). One of the most common and valid observer-based coding methods is the facial action coding system (FACS; Ekman et al., 2002). The FACS is highly correlated with EMG readings ($r = .85$) when muscle activity is assessed in people highly trained in activating specific muscles (Cohn & Ekman, 2005; Ekman, Schwartz, & Friesen, 1978). The FACS method has been shown to accurately predict an emotional experience (Ekman, Friesen, & Ancoli, 1980), distinguish when an affective change occurs (Ekman et al., 1985), differentiate between genuine and simulated expressions (Ekman, Hagar, & Friesen, 1981), and distinguish that spontaneous emotional experiences entail more intense movements and are less symmetrical than facial expressions that are requested and posed (Ekman et al., 1981). Although the FACS can be more easily applied to a naturalistic setting than EMG measurements and requires less advanced equipment, the time requirements limit the use of the FACS in research. The FACS requires approximately 100 hours to learn and between 1 minute and 10 hours to code facial activity in a 15-second period (Ekman & Friesen, 1978). However, the time requirements are less when analyzing photographs compared to video.

The extensive time requirement of the FACS is easily understood by reviewing the complexity of the coding method. The FACS identifies 44 unique action units (AUs) or basic movements that the human face is capable of producing (see Table 1 for a description of each of the AUs). As a
Table 1. A Description of Action Units in the Facial Action Coding System.

<table>
<thead>
<tr>
<th>AU</th>
<th>Name</th>
<th>AU</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper face AUs</td>
<td>Lower face AUs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Inner brow raise</td>
<td>9</td>
<td>Nose wrinkle</td>
</tr>
<tr>
<td>2</td>
<td>Outer brow raise</td>
<td>10</td>
<td>Upper lip raiser</td>
</tr>
<tr>
<td>4</td>
<td>Brow lowerer</td>
<td>11</td>
<td>Nasolabial furrow deepener</td>
</tr>
<tr>
<td>5</td>
<td>Upper lid raise</td>
<td>12</td>
<td>Lip corner puller</td>
</tr>
<tr>
<td>6</td>
<td>Cheek raise</td>
<td>13</td>
<td>Sharp lip puller</td>
</tr>
<tr>
<td>7</td>
<td>Lids tight</td>
<td>14</td>
<td>Dimpler</td>
</tr>
<tr>
<td>43</td>
<td>Eye closure</td>
<td>15</td>
<td>Lip corner depressor</td>
</tr>
<tr>
<td>45</td>
<td>Blink</td>
<td>16</td>
<td>Lower lip depress</td>
</tr>
<tr>
<td>46</td>
<td>Wink</td>
<td>17</td>
<td>Chin raiser</td>
</tr>
<tr>
<td>70</td>
<td>Brows not visible</td>
<td>18</td>
<td>Lip pucker</td>
</tr>
<tr>
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Source: Reprinted with permission from Ekman, Friesen, and Hagar (2002).

Note: AU = action unit.

Advancements in coding strategies for facial expressions have enabled trained observers to distinguish between a genuine and regulated facial expression. An obstacle to OMFE is a person's desire to regulate or mask their true feelings, similar to the role of impression management in self-report scales. This limitation is not surprising because a person's facial expressions are often used as a medium to convey information to others. As a result, an actor's ability to regulate or mask a natural expression is a potential concern of OMFE. For example, imagine a high-stress occupation such as a soldier. Although a soldier is in a life-threatening occupation, it is not advantageous for him or her to display anxiety or fear. As a result, even when the soldier experiences a state of anxiety, the facial expression is unlikely to provide information of the underlying emotion to an untrained observer. A similar example can be imagined with professional athletes. Additionally, many occupations (e.g., customer service) require employees to regulate their emotions and express feelings that promote organizational goals and values (Hochschild, 1983). In short, employees are often motivated, for personal or organizational purposes, to regulate their facial expressions in an effort to hide their underlying feelings.

Although regulated expressions may limit the ability to recognize affective experiences in the face, it is likely that the face will leak information (Ekman et al., 1988). In fact, raters have been successful in some cases in discriminating between posed and spontaneous expressions (e.g., Reuter-Lorenz & Davidson, 1981). Although early studies on the
regulation of facial expressions found that raters were unable to consistently distinguish between true and false emotion (e.g., Greene, O'Hair, Cody, & Yen, 1985; Hemsley, 1977; Hocking & Leathers, 1980), these studies are limited in that raters only observed macrolevel indicators of expressions (e.g., smiles; Ekman et al., 1988). In fact, without microlevel assessment training, detecting a genuine expression is no better than chance (Frank, Ekman, & Friesen, 1993). Similar findings have been found in research examining the ability of employees in various occupations to distinguish between genuine and false emotions using facial expressions (Ekman & O'Sullivan, 1991). Specifically, Ekman and O'Sullivan (1991) found that only secret service employees were better than chance at identifying genuine emotions, whereas psychiatrists, federal polygraphers, lawyers, judges, police officers, and students were unsuccessful. An untrained observer is likely to use inaccurate cues that are based on social norms. Although untrained observers that rely on macrolevel indicators or inaccurate cues can severely reduce the validity of OMFE, a microlevel assessment of facial activity can overcome such limitations.

A microlevel assessment of facial activity can focus on various muscular activation patterns in an attempt to identify genuine expressions. For instance, Fridlund (1988) found that asymmetry in facial actions is more likely in requested, specific facial actions or conversation than in responding to a joke or startled. In addition, Hess and Kleck (1990) used the apex, onset, and offset of muscular activity to distinguish between spontaneous and deliberate expressions. More recent research has detected genuine expressions by using a trained rater to focus activity in the orbicularis oculi muscular region, rather than general observations of a smile (e.g., Ekman et al., 1988; Harker & Keltner, 2001; Matsumoto & Willingham, 2006, 2009). For example, Matsumoto and Willingham (2006, 2009) were able to identify genuine expressions in Olympic and Paralympics champions. The researchers found that although the athletes who finished 1st, 2nd, 3rd, or 4th showed general expressions of happiness, the athletes who finished 2nd and 4th expressed micro-level indicators of negative emotions. These findings are not surprising given that these athletes had just lost their most recent competitive event. In addition, the 2nd place winners are usually unhappy because they can easily imagine what could have been (i.e., “I could have gotten 1st place”). On the contrary, the 3rd place winners can easily imagine themselves not being on the podium, and hence, they are filled with more positive emotions than negative. The underlying negative emotions detected in these studies would not likely be identified without the microlevel assessment of different muscular regions. Similarly, Harker and

Keltner (2001) identified activity in the orbicularis oculi in posed yearbook photographs. Activity in the orbicularis oculi indicated the true emotional experience, rather than a regulated expression, and predicted well-being outcomes up to 30 years later. In sum, advancements in coding strategy have enabled trained raters to distinguish between genuine and regulated facial expressions; enabling researchers to assess true underlying emotion displayed in a person's facial activity. The validity of OMFE is also demonstrated in a comparison with self-reports.

Comparison between OMFE and Self-Reports

Although the limitations of self-reports of affect have been discussed, comparisons between OMFE and self-reports provide empirical evidence that OMFE can be used to overcome many of these concerns and are an accurate assessment of well-being. OMFE has been shown to moderately correlate with self-reported emotions with a range from .35 to .55 (Ekman et al., 1980). The moderate correlation between the two measures is evidence that the two measures have some empirical and conceptual overlap, but are assessing at least some distinct constructs. The differences between OMFE and self-reports may be because some people have greater difficulty expressing or identifying their state of well-being. As a result, OMFE are more sensitive to differences in affective states. For instance, whereas self-reports of well-being did not differ between patients with major depression, schizophrenics with blunted affect, non-blunted affect, and a normal control group, differences were found with OMFE (Berenbaum & Oltmanns, 1992).

OMFE have also been shown to more accurately assess low intensity affective experiences than self-reports (Rosenberg & Ekman, 2005). Rosenberg and Ekman (2005) conducted an experiment in which they showed participants video clips that had been created to elicit varying emotions. In the first condition, participants watched the video once and then a recording of themselves reacting to the video. The participants, in the second condition, stopped the recording each time they came to a moment in which they had an affective experience. Using OMFE, the researchers found that self-reports of an affective experience were given at the same time as high intensity facial expressions 87 percent of the time. Conversely, self-reports of an affective experience were given at the same time as low intensity facial expressions only 27 percent of the time.
Rosenberg and Ekman’s findings indicate that OMFE provide similar results as self-reports for only high intensity emotions. The divergence for low intensity affect may indicate that self-reports are primarily assessing high intensity affect, whereas OMFE assess a greater range of emotions. This finding is not surprising given that common self-report affective well-being measures (e.g., PANAS) are an assessment of primarily high intensity affect (Barrett & Russell, 1999). Additional limitations of self-reports are also addressed using OMFE. In the subsequent section discussing areas of future research, we provide a more detailed description of the studies most relevant to occupational stress and well-being and discuss how OMFE can improve assessment and the theoretical underpinnings of well-being.

AREAS OF FUTURE RESEARCH

Methodological Advancements

Psychological and Physiological Well-Being

The use of OMFE in assessing employee well-being is likely to provide several methodological advancements in assessing psychological and physiological well-being in the workplace. For instance, OMFE will address the concern regarding CMV, retrospective reports and memory distortion, and the effect of social desirability bias. In addition, OMFE can be used to help improve current self-report scales by enabling researchers to better distinguish between affect and cognition in well-being measures, most notably in job satisfaction measures. Job satisfaction scales are notoriously poor assessments of affective-oriented well-being (Brief & Roberson, 1989; Organ & Near, 1985). Because OMFE are not subject to several cognitive processes (i.e., memory, social desirability, evaluative comparisons), OMFE is a predominately affective-oriented assessment of well-being. To overcome the concern for current self-report scales, OMFE can be used in lieu of or in conjunction with current scales in an effort to assess an employee’s affective response to the job. A second option is to include an OMFE in the development or identification of self-report scales that are more affective-oriented and closer to the intended job satisfaction construct. In the very least, OMFE will help researchers identify self-reports scales of psychological well-being that are most closely related to the intended construct being researched.

In addition to psychological well-being, the use of OMFE may improve the assessment of physiological well-being. Self-reports of physiological well-being are subject to many of the same limitations as self-reports of psychological well-being. For instance, people have relatively poor access to their bodily reactions and have difficulty identifying subtle physiological responses. As a result, beliefs about situational factors are used to make inferences about their bodily processes (Pennebaker, 2000), which is one explanation of why people often overestimate prior pain (Rachman & Eysenck, 1998). Physiological strain may even be more problematic than psychological strain in some settings. For instance, imagine an employee that abuses a sick leave policy by claiming a physical injury or illness. Because physical ailments are likely to be perceived as an uncontrollable circumstance (Hebl & Kleck, 2002), supervisors may not question the validity of the excuse. In fact, organizational outcomes, such as hiring decisions, are more likely to be negatively influenced by psychological disabilities (i.e., depression) than physical disabilities (Hazer & Bedell, 2000). As a result, it is not a stretch to imagine employees abusing policy by over reporting physiological strain.

Self-reports of physiological strain may also be severly under-reported in some occupations. Blue collar and manual labor employees such as factory workers and construction workers can potentially lose hours or their jobs if they do not reach physical standards. Professional athletes are also likely to under-report experiences of pain because their salary is highly dependent on their physical durability. It is also possible that it is socially unacceptable in these professions to acknowledge physical pain. Because of these potential concerns, predicting false claims, exaggeration, and under-reports of physiological strain is a research avenue that could benefit from OMFE.

Health and clinical psychologists have used OMFE in an effort to overcome these limitations. Similar to emotions, people communicate pain in many ways (Craig & Prkachin, 1983), which include facial cues. Chronic back pain (Craig, Hyde, & Patrick, 1991), electric shock (Prkachin, 1992), blood pressure and heat rate (Lerner, Dahl, Hariri, & Taylor, 2007; Peters et al., 2003), and changes in coronary heart disease (Rosenberg et al., 2001) are associated with OMFE. In fact, OMFE coding of anger was a better predictor of changes in coronary heart disease than a well-established self-report scale of hostility (Rosenberg et al., 2001). In addition, Rosenberg and colleagues found that regulated smiles distinguished between ischemic and nonischemic participants, with ischemics showing more false smiles. In other words, participants experiencing a physiological ailment attempted to mask their positive emotional expressions.

OMFE are also associated with endocrinological responses to stressors. For instance, participants with a psychological disorder that is often associated with endocrine disorders (i.e., schizophrenia) displayed
consistently different facial expressions than participants not diagnosed with schizophrenia when an emotional stimulus was presented (Kohler et al., 2008). In a more direct assessment of the relationship between endocrinological responses and OMFE, Lerner et al. (2007) found a relationship between OMFE and cortisol reactions. Participants participated in a high-stress task for five minutes. Greater expressions of fear were associated with higher cortisol levels, whereas greater expressions of anger and disgust were associated with lower levels. These findings were expected because fear is associated with thoughts of uncertainty and a lack of control over the environment, whereas anger and disgust are associated with thoughts of certainty and control (Smith & Ellsworth, 1985).

It should be noted that researchers have had some difficulty identifying pain with OMFE when participants are instructed to hide or disguise their pain (Craig et al., 1991). Although several AUs (e.g., brow lower, cheek raise, lid tighten, upper lip raise) are associated with expressions of pain (Craig et al., 1991; LeResche & Dworkin, 1988) and present during faking and exaggeration (e.g., inner brow raise; Craig et al., 1991), it is likely that OMFE judges are more accurate in identifying exaggerated pain than deception (Craig, Prkachin, & Grunau, 1992). Nonetheless, OMFE could be extremely valuable in research pertaining to the validity of an employee’s self-report of physiological well-being.

Longitudinal Models
Although occupational stress and well-being researchers have emphasized the importance of longitudinal designs to more accurately test theoretical models (Zapf, Dorman, & Frese, 1996), collecting this data can be a difficult task. In an effort to assess change, researchers have relied on retrospective assessments of change in well-being. However, these reports drastically differ from the longitudinal assessment of well-being (Sprecher, 1999). The use of facial expressions and video recording devices can provide researchers with additional opportunities to assess well-being over time. Archival photographs and videos can now be used to detect well-being days, weeks, months, or even years in the past. A creative study design coded college yearbook photographs of participants who were in their 40s and 50s at the time of the study (Harker & Keltner, 2001). This design enabled Harker and Keltner to assess how affective experiences several decades prior can predict future well-being. Since this creative study design, several researchers have coded yearbook photographs (Hertenstein, Hansel, Butts, & Hile, 2009), used multiple archival photographs to assess affective development (Freese, Meland, & Irwin, 2008), or taken their own photographs to assess well-being

Objective Measures of Facial Expressions

14 months later (Bonanno, Keltner, Holen, & Horowitz, 1995). In sum, the use of facial expression coding will ease the arduous task of collecting longitudinal data. In fact, the coding system will enable researchers to become more creative in their study designs and searches for archival data. One can only guess how many times a person is photographed or recorded in a lifetime. In addition to assessing well-being over months or years, the ability to assess real-time emotions will enable researchers to design microlevel longitudinal designs that assess the process in which emotions emerge and change during a task or experience.

Real-Time Emotions

One of the most notable advancements in well-being research is the use of facial expressions to assess real-time emotions. This benefit is demonstrated in a study by Dinges et al. (2005), in which the researchers examined the anxiety levels during a high performance demand task (flight simulation). The researchers were interested in assessing how specific parts of the simulation would affect anxiety as well as how the overall experience would affect anxiety. Anxiety levels were assessed with a computer-based facial expression coding method. As a result of this method, the researchers were able to gain insight into which part of the task produces the most strain without relying on a retrospective report. In addition, a more accurate assessment of the total task effect was gained because the task was not intermittently stopped to collect self-reports.

Testing Theoretical Models

Affect vs. Cognition
The ability to assess real-time emotions also enables researchers to gather more detailed information about an emotional experience, which can then be used to test several theories. Specifically, facial expressions can be used to assess the amount of time it takes for an emotion to occur after a stimulus is presented (latency) and the duration of the emotion. For example, Ekman et al. (1985) examined reaction times to affective experiences using OMFE. The examination of whether a startle response to an affective stimulus should be considered an emotion would help clarify the long debate of whether affect or cognition comes first (Zajonc, 1980). Considering a startle as an emotion would support Zajonc’s claim that affect does not require a cognitive appraisal and refute the claim by Lazarus (1982) that a startle is a reflex instead of an emotion because cognition does not play a causal role.
OMFE enabled Ekman et al. (1985) to record not only the emotion experienced but also the amount of time it took to experience each emotion. Participants were placed in a condition with an unanticipated startle, anticipated startle, inhibited startle, and a simulated startle. The OMFE was used to demonstrate that a startle reaction and emotions show very distinct facial movements. This finding refuted the claim that a startle was an extreme emotional version of surprise. The differences between a startle and surprise are much greater than other emotions that are claimed to be conceptually similar. In addition, the use of the OMFE enabled the researchers to provide evidence that the startle reaction is not an emotion. The reasoning for the claim was that a startle could not be completely inhibited by participants, the startle could not be reproduced with the same brief latency and duration, and distinct facial features were displayed during a startle reaction. Ekman et al.'s study provides evidence that OMFE can be used to distinguish minute changes in the face as well as estimate the latency for the onset of an emotion and the duration. The data in this study could not have been accurately assessed using self-report methods.

**Opponent Process Theory**

The empirical findings from Ekman et al. (1985) are an indication that OMFE can be applied to psychological theories that describe the onset and duration of emotional experiences. Opponent process theory, for example, can be used to describe the initial emotional response (primary process) as well as the inhibitory responses (opponent process) that an individual automatically engages in (Bowling, Beehr, Wagner, & Libkuman, 2005; Landy, 1978). OMFE would allow researchers to test how fast affect emerges and how fast it fades. In addition, OMFE could be used to assess the strength of a person opponent process. Because researchers (Bowling et al., 2005) have suggested the integration of the opponent process theory into organizational research, OMFE will likely serve as a valuable tool in this process. In sum, OMFE will enable researchers to test questions that would previously require an EMG, but without removing the individual from a naturalistic setting.

**Transactional Theory of Stress and Coping**

The ability to assess real-time emotions will also enable researchers to more accurately integrate emotional experiences with cognitively oriented theoretical stress models. Perrewé and Zellars (1999) have introduced a stress model that integrates emotional experiences with Lazarus and Folkman's (1984, 1987) transactional theory of stress and coping. The transactional model emphasizes the interaction between a person and the environment and involves two appraisal processes. The primary appraisal consists of the detection of a work stressor as well as the relevance and potential threat to well-being. If the individual perceives the stressor to be threatening and relevant, then he or she will engage in a secondary appraisal. The secondary appraisal is the evaluation of the resources available and the ability to cope with the stressor. In other words, the individual will determine how and whether a more positive environment can be created.

In an effort to advance the transactional model, Perrewé and Zellars (1999) suggested that perceived causes of the felt stress and emotional experiences mediate the primary and secondary appraisals. Specifically, after the primary appraisal, an individual will perceive the cause of the stressor as internal or external and controllable or uncontrollable. These perceptions will then lead to specific affective responses (e.g., guilt, shame, anger, and frustration), which in turn lead to the selection of a coping strategy (the secondary appraisal). For example, imagine an employee who is experiencing high levels of task overload that was caused by a lack of effort over the past several work days. This employee is likely to perceive the cause of the stressor to be internal and avoidable because if the employee had not slacked off (internal-controllable), he or she would not have been in this situation. As a result, this employee will experience feelings of guilt, which in turn could lead to a greater work effort (problem-focused coping). In a similar example, imagine that an employee is experiencing task overload because a coworker has been slacking off. The employee is likely to perceive this stressor to be caused externally (by the coworker) and avoidable (if the coworker had not voluntarily reduced their effort). As a result, the employee will likely experience anger and engage in an emotion-focused coping strategy (e.g., withdraw or cognitive reappraisal).

The integration of emotion and the transactional models is not devoid of critiques and limitations; however, OMFE address several of the concerns. A primary concern for the integrated model is the use of self-reports for both the independent and the dependent variables (Frese & Zapf, 1999; Schaubroeck, 1999). As we have discussed, CMV can inflate an observed relationship. Additional concerns that will limit the ability of researchers to accurately specify the model is the reliance on retrospective reports of emotions, the difficulty to assess the complexities of an emotional experience in an organizational setting, and the possibility that emotions occur before attributions or after the coping behavior (Schaubroeck, 1999).

Although the aforementioned limitations are valid concerns that can limit a researcher's ability to accurately specify and test the integrated model,
they can be overcome by OMFE. First, the concern for common-method bias is overcome by using an objective assessment of emotions. In fact, the use of OMFE will enable researchers to use subjective appraisals of stressors without an overdependence on self-reports. Second, the ability to assess real-time emotions using video recordings will avoid retrospective reports that are severely flawed. Video recordings of facial expressions will also overcome the concern regarding the complexities of an emotional experience. Specifically, OMFE can be used to assess the onset, duration, apex, and intensity of an emotional experience without the use of an EMG and the immediate awareness of the employee. Finally, the detailed information regarding the emotional experience will enable researchers to have a more accurate assessment of the onset of an emotion and whether it occurs before attributions, as a mediator between attributions and coping, or after the coping behavior. Given that multiple emotions can occur simultaneously and to varying degrees within the model (Perrewé & Zellars, 1999), it is expected that specification of the model will improve with the microlevel information provided by OMFE. In short, OMFE enable stress models that incorporate emotions and well-being to be more accurately specified and tested.

Social Information Processing Theory
Incorporating principles from social information processing theory (Salancik & Pfeffer, 1978) with OMFE can also advance research on how an employee determines or constructs their state of well-being. Salancik and Pfeffer (1978) describe how employees adapt attitudes, behavior, and beliefs to their social context. As a result, researchers can learn the most about an employee by studying the social environment in which behavior occurs. The social environment is used as a source of information or cue which employees use to interpret events. When cues regarding job stressors or characteristics are conflicting and ambiguous, employees depend on communication with others to derive perceptions of the work environment and their affective responses. In other words, employees convey information to each other using facial cues that are used to evaluate the environment.

Although organizational psychologists have not incorporated facial reciprocity and OMFE, clinical psychology and social psychology researchers have used OMFE to assess interactive behavior patterns between two people (e.g., Steimer-Krause, Krause, & Wagner, 1990) or in response to photographs (e.g., Harker & Keltner, 2001). Photographs that were coded with an OMFE as expressing positive emotionality were positively associated with perceptions of approachability, acceptance, and trustworthiness of those individuals presented in the photographs (Harker & Keltner, 2001). A pertinent question to this situation is what information can supervisors convey to their employees by having a positive expression? Or, can a positive expression by a supervisor and coworkers result in a positive evaluation of a high stressor work environment?

In addition, OMFE could be used in social information processing research to determine whether employees change their attitudes to be consistent with others in their environment. An employee who is surrounded by coworkers who are dissatisfied with their jobs and excessively gripe may alter his or her own perceptions of the workplace to coincide with the unhappy coworkers. Or, the employee may report negative feelings to conform to social norms, despite experiencing underlying feelings of satisfaction. This misrepresentation of emotions may even be done without the employee being aware (i.e., self deception), in which case OMFE will enable researchers to assess this degree of misrepresentation and gain a better understanding of the social influences in attitude formation, adjustment, and expression. In sum, OMFE will enable researchers to more accurately evaluate the social cues employees rely on to construct their perception of the work environment and their state of well-being.

Emotional Labor and Emotional Intelligence
Although an employee's state of well-being is dependent on the social cues in the environment, the emotional display may vary depending on the occupation. High emotional labor occupations require an employee to display emotions as part of their job and promote organizational or professional goals, also known as surface acting, as opposed to deep acting. Deep acting is when an employee modifies his or her emotional state to match the work requirements (Hochschild, 1983). Medical professionals, for example, are trained in bedside manner and are often required to display feelings of sympathy or joy to their patients. Career success for other professionals, such as actors, is almost solely dependent on their ability to convey emotions that appear to be authentic. Because facial expressions can be regulated by attenuating, amplifying, simulating, or masking the expression of emotion (Ekman et al., 1980), OMFE could be used as a training tool to help high emotional labor employees convey expressions that appear to be more authentic. Even when professional actors provided both an authentic emotional experience and acted an unfelt emotional
experience, an OMFE was successful in identifying facial characteristic that
differed between the two expressions (Gosselin, Krouac, & Dore, 1995). To
this end, OMFE could be valuable for training employees who are already
highly skilled in emotion regulation.

Emotional labor is also associated with employee well-being. Emotion
regulation requires the use of a limited pool of energy resources (Richards &
Gross, 1999) and is often found to be associated with stress-related
physiological arousal (e.g., Butler et al., 2003), psychological strain (e.g.,
Schaubroeck & Jones, 2000), and performance on secondary tasks
(Richards & Gross, 1999, 2000). In an effort to advance well-being and
emotional labor research, OMFE can be used as a tool to assess the amount
of emotional regulation taking place. Currently, to assess surface acting,
researchers rely on self-report scales that ask employees to rate how often
they engage in certain behaviors at work (e.g., I resist expressing my true
feelings; Grandey, Fisk, & Steiner, 2005). In contrast, OMFE can enable a
researcher to assess surface acting by coding the frequency of the behavior
as well as the intensity of the regulation.

In addition to training a person to regulate emotional displays, OMFE
can be used to train employees to detect emotional states in customers
and clients. Although OMFE require extensive training to successfully
identify emotional expressions, some people have the ability to detect
emotions using facial cues. In other words, some people have a high
emotional intelligence and can identify the emotional states of other people.
For instance, Secret Service agents are able to detect emotions using
facial expressions at a probability greater than chance (Ekman &
O'Sullivan, 1991). Future researchers should evaluate whether training in
facial expression recognition can increase an employee's emotional
intelligence. Although the validity of OMFE coding is dependent on still
video frames or photographs, it may be possible that some of the more
prominent muscle movements can be identified during a social interaction
and be used as a training tool. OMFE may also be used to design a facial
expression recognition test. Greater ability to recognize facial expressions is
positively associated with sales performance (Byron, Terrananova, &
Nowicki, 2006). As a result, Byron and colleagues suggest the inclusion of
a facial expression recognition test in selection batteries for interpersonal
jobs. In sum, OMFE will not only improve the assessment of well-being but
also serve as a valuable tool in training employees to properly regulate
emotional expressions and to identify the emotional states of customers
or clients.

Affective-Oriented Personality Traits and Well-Being

Research examining the effects of dispositions on well-being can also benefit
from the use of OMFE. In fact, previous research has employed OMFE as
both the predictor and criterion variables in the disposition – well-being
relationship. Ruch (2005) found that participant extraversion predicted
facial expressions displaying positive emotions and intensity of the
expression. In addition, Ruch found that an increase in state extraversion
levels by providing alcohol to the participants increased ratings of positive
facial expressions. Overall, extraverts expressed more positive facial
expressions than introverts when a positive stimulus was presented. OMFE
have also been linked to structured interview ratings of types A and B
personality (Chesney, Ekman, Friesen, Black, & Hecker, 1990). In more
detail, type A and type B individuals differed in OMFE coding for glare and
disgust, with type A individuals displaying higher scores for both facial
expressions. In sum, OMFE are consistently associated with affective-
oriented dispositions.

Although the aforementioned studies discuss the association between
OMFE and dispositions, OMFE may also be a valid tool in the assessment
of dispositions. Harker and Keltner (2001) conducted a longitudinal study
on the relationship between college yearbook photographs and both
personality traits and life outcomes up to 30 years later. An OMFE was
used to examine whether a genuine positive expression (activation of the
orbicularis oculi muscle region during a smile) would represent a disposition
and predict future well-being. As expected, facial expressions in college
yearbook photographs were associated with affiliation, competence, and
negative emotionality decades later. Consequently, researchers have begun
to use OMFE and photographs to assess a person's affective-oriented
disposition and subsequent well-being in effort to replicate and expand on
Harker and Keltner's findings (Freeso et al., 2008; Hertenstein et al., 2009).
Although Freese et al. (2008) found mixed results in an attempt to replicate
previous findings, Hertenstein et al. (2009) found that authentic smiles in a
photographs predicted divorce tendencies later in life. Although a single
photograph has been used to predict criteria decades later (Harker &
Keltner, 2001; Hertenstein et al., 2009), taking the average emotional state
displayed in photographs throughout a person's life is likely to be a better
assessment of dispositional tendencies (Freeso et al., 2008). In fact, using
OMFE to code photographs for negative and positive emotions over an
extended time frame (e.g., a 30-day period or a person's entire adult life) will
likely differentially predict affective-oriented criteria when compared to common dispositional scales that use similar time frames (e.g., the PANAS).

**Stress Interventions**

In our discussion on social information processing theory, we described the role of social and environmental cues in the construction of an employee's state of well-being. This effect also applies to organizational stress interventions. Interventions often involve a stressor and a well-being evaluation in which employees report which stressors are prevalent and the frequency of negative emotions. In addition, self-reports of stressors and strains are gathered after the intervention to evaluate the effectiveness of the program (for a review of stress intervention design see Newman & Beehr, 1979; Richardson & Rothstein, 2008). According to social information processing theory (Salancik & Pfeffer, 1978), self-reports of stressors and strains are likely to invoke mood or spurious effects. Employees who are satisfied with their jobs, for example, may be given a stressor evaluation form in which they are instructed to report the frequency of several stressors. Although the employee was originally satisfied with his or her job, the introduction of the scale has resulted in the stressors becoming the salient characteristic in the environment. In other words, the stressor scale has changed the perception of the employee. Similar effects can be expected when an employee is asked to complete questionnaires regarding strain. As a result, the use of OMFE to evaluate well-being for organizational interventions will lead to a more accurate assessment of effectiveness and avoid the ethical and costly concerns of invoking a negative emotional state.

A similar suggestion is provided by Brief (1998) in which he contends that future organizational research could examine facial expressions of employees to determine affective responses to changes in organizational policy and restructuring. Brief's suggestion for future research is based on the findings that EMG machines could be used to gauge attitudes to agreeable and disagreeable messages (Cacioppo & Petty, 1981). In sum, the evaluation of intervention effectiveness is likely to be most accurate if objective assessments of well-being are used.

The decision concerning which employees to include in an intervention can be just as important as properly assessing the effectiveness. Although researchers have successfully employed self-reports to identify which individuals are most susceptible to stressors (e.g., Kobasa, 1979), OMFE may be a better predictor of treatment success. Support for this claim can be found in research pertaining to treatment interventions for individuals with affective disorders (Ekman, Matsumoto, & Friesen, 2005). Ekman and colleagues (2005) examined whether a psychological rating scale (i.e., brief psychiatric rating scale; BPRS; Overall & Gorham, 1962) would predict clinical improvement better than OMFE ratings of true positive emotions. Both measures were applied when the patients were admitted. The researchers found that contempt and false positive emotions (no activation in the orbicularis oculi) were better predictors of patient improvement than the BPRS. This study has significant implications for organizational research. For example, organizations attempting to improve employee well-being through policy changes may be able to predict the effectiveness of the intervention by assessing contempt and regulated expressions of happiness with OMFE.

**Self-Conscious Emotions**

An area of organizational research that is neglected is the assessment of self-conscious emotions in the workplace. Self-conscious emotions entail self-awareness and the comparison of one's action to standards and rules (Keltner & Buswell, 1996). Because these emotions place the individual in an unfavorable light, self-reports are likely an inappropriate method of assessment. In fact, because of the sensitive nature of self-conscious emotions, requiring an employee to reconstruct an emotional experience is possibly a violation of ethical standards and employee privacy. OMFE will enable researchers to explore these emotions without forcing employees to reconstruct a negative experience.

OMFE researchers have been successful in developing coding strategies for self-conscious emotions. Keltner and Buswell (1996) found OMFE could be used to consistently identify distinct non-verbal displays of embarrassment. Specifically, embarrassed participants showed more smile controls, gazed downward for long durations, and first head movements or gaze shifts were in the left direction. In contrast, amused participants displayed more smiles and gazed to the right. With an objective assessment of self-conscious emotions, researchers will gain insight into the relationships between organizational events and employee reactions.

We provide several suggestions for future researchers regarding self-conscious emotions. First, self-conscious emotions play central roles in socialization of an individual into a culture and his or her compliance to conventions, norms, and morals of the group (Lewis, 1993; Miller & Leary,
1992). As a result, feelings of embarrassment are likely to moderate the relationship between engaging in counterproductive work behaviors and efforts to correct for the employee's transgression. Some employees, for example, may experience embarrassment when committing a behavior that violates organizational norms. As a result, embarrassed employees may be more likely to attempt to rectify the situation (e.g., apologizing or doing extra work). In addition, Perrewé and Zellars (1999) emphasize the role of self-conscious emotions (e.g., shame) in their model of emotions, stress, and coping. Specifically, self-conscious emotions are likely to be a mediator between a stressor (attributed to internal causes and perceived as uncontrollable) and unproductive forms of emotion-focused coping (e.g., withdrawal behavior).

Last, the use of the OMFE to code for self-conscious emotions may also aid in understanding behavioral and attitudinal responses to harassment. Limited research has examined reconciliation efforts by victims of harassment (e.g., Aquino, Tripp, & Bies, 2001, 2006). Employees experiencing self-conscious emotions are likely to have lower commitment and satisfaction and will be less likely to report the event or attempt to reconcile with the perpetrator. In addition, self-conscious emotions experienced by the perpetrator after harassing a fellow employee will likely predict future transgressions by the perpetrator. In sum, self-conscious emotions are an affective experience that has received little attention by well-being researchers and is highly susceptible to social desirability bias. OMFE can serve as a valuable tool in overcoming these limitations and enable researchers to explore the role of these sensitive emotions in an organizational context.

Practical Issues

Researchers must address several practical concerns for OMFE to be a valid assessment tool. First, multiple coders are needed to estimate the inter-rater reliability. Although a second rater is needed to assess the validity of the coding method, a reliability estimate can be obtained by coding a small random sample of the participants (e.g., Harker & Keltner, 2001; Keltner, 1995). Second, coders should be blind to the experimental conditions and hypotheses (e.g., Lerner et al., 2007). Third, the resolution of the photographs can become a concern for the coders. However, Harker and Keltner's (2001) coding was successful despite relying on photographs taken from college yearbooks over 40 years before the study. Given the date of the photographs, it is doubtful that the resolution of the photographs was high. Harker and Keltner were able to overcome this issue by enlarging the photograph to 5×7 inches. Next, if researchers are relying on archival photographs, the researcher should inquire about any modifications done to the photographs (e.g., photograph editing software to remove wrinkles). Photograph modifications, however, are not a concern for researchers collecting their own photographs.

Finally, researchers employing OMFE should be aware of the advancements in coding strategies. Development of computer-imaging software to code facial movement is an ongoing process and may soon become a more common and efficient method to code facial movement (Movellan & Bartlett, 2005). Although advancements in computer-imaging software will save coding time, a user will still need to be a trained coder to accurately interpret the results. As computer-coding methods improve, new research avenues will be created. For instance, computer-coding may be used to improve the perception—action loop and increase a person's engagement on computer tasks (Movellan & Bartlett, 2005). In more detail, computer-imaging software may soon be advanced enough to detect a person's affective state and adjust the computer task to promote more positive affective responses from the user. This adjustment is analogous to the way good teachers adjust their teaching strategies to get students more engaged. In an organizational context, an adaptive computer program may help improve employee engagement on a computerized training tutorial by adapting to the emotional state of the employee. In sum, future researchers should be aware of the advancements in coding strategies that are currently being developed. These advancements will likely enable researchers to pose new questions and test hypotheses that are not currently foreseeable.

SUMMARY

Although we discussed the advantages of employing an objective measure of well-being over self-reports, we do not wish to suggest the abandonment of self-report. In fact, subjective assessments provide information about a person's well-being that an OMFE cannot assess. Our goal for this chapter, rather, was to review a fertile area of facial expression research and suggest that organizational researchers consider OMFE in future research designs. The utility of OFME has already been identified by clinical, health, and social psychologists. In addition, the advancements in coding strategies have enabled psychologists to become trained to code basic AUs in less time.
(approximately 100 hours of training) and with more accuracy and detail. As a result, occupational stress and well-being researchers will be able to assess real-time emotions with precise assessments of the onset, apex, and offset of an emotional experience while in a naturalistic setting. The most interesting advantage of OMFE is the implications it will have for research design. With the ability to use video recording technology to assess employee emotions from archival data and without the immediate awareness of the employee, researchers will undoubtedly produce creative designs to address unanswered questions. In conclusion, the integration of the facial expression and occupational well-being literatures is well overdue. Occupational stress and well-being researchers will likely find OMFE to be an advantageous tool when assessing employee well-being.

REFERENCES

Objective Measures of Facial Expressions

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