

# Emotion in Schizophrenia: Old Mystery, New Understanding

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## Abstract

Early theories of schizophrenia emphasized emotional features, yet empirical research into the nature of emotion in schizophrenia has only recently been conducted. Drawing from the paradigms developed by emotion researchers and theorists, a number of replicable findings on emotion in schizophrenia have now emerged. Compared with nonpatients, schizophrenia patients exhibit very few outward displays of emotion, yet they exhibit subtle, microexpressive displays. Schizophrenia patients report experiencing strong emotions in response to emotional material, yet they do not often report experiencing strong pleasant emotions in daily living. These emotion disturbances have important social and intervention implications, and they point to a number of important directions for research.

## Keywords

schizophrenia; emotional expression; emotional experience; psychophysiology

It has appeared both from crude observation and from detailed study of the facial expression that the alleged indifference, apathy, and emotional disharmony of the schizophrenic is more a matter of impression than correct evaluation of the inner experience of such a patient. It has followed that the study of such inner affective experiences by positive objective means seems urgently indicated if the nature

of the schizophrenic processes is to be elucidated.

—Harry Stack Sullivan (1927, p. 482)

Early psychological theorists such as Sullivan, Kraepelin, and Bleuler wrote extensively about the emotional lives of schizophrenia patients. In particular, they noted a peculiar mystery: Some patients with schizophrenia reported feeling strong emotions, yet their faces belied these internal experiences. These early writers provided vivid descriptions of emotional disturbances that often accompanied schizophrenia; yet their pleas for research on emotion in schizophrenia were largely ignored until recently.

Recent methodological advancements, including the development of reliable, clinical rating scales, have made the study of emotional features in schizophrenia more feasible. For example, the Scale for the Assessment of Negative Symptoms (SANS; Andreasen, 1983) includes a subscale for the symptom of flat affect, which refers to a lack of outward emotional expression. One unfortunate shortcoming of these ratings scales is that they typically assess only one component of emotion. However, emotion is most clearly defined by a consideration of multiple components, including expression, experience, cognition, and psychophysiology.

Perhaps one of the most important advancements in the study of emotion and schizophrenia has been the adoption of methods developed in other areas of psychology and social science. In particular, paradigms from basic emotion research have enabled investigators

interested in schizophrenia to examine the concordance among components of emotion. For example, in recent laboratory studies of emotion in schizophrenia, participants' facial expressions have been videotaped during the presentation of emotionally evocative stimuli, such as film clips or slides. Participants have filled out questionnaires describing their subjective emotional reactions to the stimuli, and some studies have also used psychophysiological methods, such as measures of heart rate and skin conductance (i.e., palm sweating), to assess emotion. This new, multidisciplinary approach has yielded a number of important findings on which components of emotion are disrupted in schizophrenia.

## EMOTIONAL EXPRESSION IN SCHIZOPHRENIA

One of the most robust findings to emerge from empirical research on emotion in schizophrenia is that compared with nonpatients, schizophrenia patients display fewer observable positive and negative facial expressions of emotion in response to a variety of emotion-eliciting stimuli. This dearth of facial expression does not appear to be specific to particular facial expressions, but rather appears to cut across a number of positive and negative emotions.

In our laboratory, my colleagues and I have investigated the nature of diminished facial expression among schizophrenia patients in a number of studies. We first considered whether diminished facial expression might be due to a side effect of medication.<sup>2</sup> In order to discern whether observations of fewer facial expressions reflect such a side effect, it was important to observe the same patients both on and off their medication. In our

longitudinal study, we found that schizophrenia patients displayed fewer positive and negative facial expressions in response to emotional films when they were both on and off medication (Kring & Earnst, in press). This finding suggests that diminished facial expression in schizophrenia cannot be entirely accounted for by medication side effects. We also included a nonpatient control group, and found that schizophrenia patients were less expressive than nonpatients at both assessments.

We also became interested in exploring the extent to which patients with schizophrenia are unexpressive. On the basis of other recent evidence, we hypothesized that schizophrenia patients who appear outwardly unexpressive may actually be displaying facial activity that is subthreshold (Earnst et al., 1996). Facial expressions are observable only to the extent that facial muscle contraction leads to movement of various skin and connective tissues. Facial muscle activity can and does occur, however, without these corresponding movements, thus rendering the activity unobservable. Surface electromyographic (EMG) recording of facial muscle activity is a noninvasive method for measuring such unobservable facial muscle activity. Converging evidence from studies using EMG in nonpatient populations indicates that EMG activity over the brow region increases and EMG activity over the cheek region decreases during the presentation of unpleasant stimuli. By contrast, EMG activity over the cheek region increases and activity over the brow region decreases during the presentation of pleasant stimuli.

Using a variety of emotional stimuli, we have shown that schizophrenia patients do not differ markedly from nonpatients in subtle facial muscle activity. Both patients and nonpatients contract their facial muscles in a predictable

manner in response to these stimuli. In one study (Kring, Kerr, & Earnst, 1999), patients contracted the cheek muscle more strongly in response to viewing pictures of happy faces than in response to viewing pictures of angry, sad, or fearful faces. By contrast, they contracted the brow muscle more strongly when viewing the angry, sad, or fearful faces than when viewing the happy faces. These data indicate that schizophrenia patients are expressing emotion, albeit at an unobservable level. We have suggested that they may have a different threshold of emotional experience at which facial expressions might become observable. In other words, schizophrenia patients may exhibit observable facial expressions only when experiencing very intense emotional experiences.

#### EMOTIONAL EXPERIENCE IN SCHIZOPHRENIA

Consistent with the early theorists' observations, several laboratory studies have found that schizophrenia patients report experiencing the same amount of emotion as nonpatients, and in some cases even more emotion, in response to emotional stimuli. Thus, although schizophrenia patients exhibit few observable facial expressions of emotion, they report experiencing strong emotions, and they do so reliably.

We have used measures of emotional experience that assess the broad emotion dimensions of valence (pleasant, unpleasant) and activation (high and low; Larsen & Diener, 1992)<sup>3</sup> to assess schizophrenia patients' reports of experienced emotion in response to emotional stimuli. Using this approach, we are able to assess the extent to which participants report feeling pleasant, unpleasant, high-activation, and low-activation emotions, as well as

emotions that reflect both valence and activation. In our earlier studies, we found that compared with nonpatients, schizophrenia patients reported greater activated unpleasant emotions. However, we later used a measure that distinguished activation from valence and found that patients reported experiencing more unpleasant emotions but not more activated emotions. Across three different samples, we have found that schizophrenia patients do not differ from nonpatients in their reports of pleasant emotions. In short, schizophrenia patients report experiencing similar amounts of pleasant and high- and low-activation emotions as do nonpatients, and they report greater amounts of unpleasant emotions in response to emotionally evocative stimuli.

Although our laboratory-based studies of emotion in schizophrenia afford a good deal of experimental control, they suffer from limited generalizability. Fortunately, other researchers have begun to assess schizophrenia patients' experience of emotion in daily life, and these findings are generally consistent with findings from laboratory studies. DeVries and Delespaul have examined a number of aspects of daily life among schizophrenia patients, including symptoms, social interactions, activities, thoughts, and emotions (e.g., deVries, 1992; deVries & Delespaul, 1989). Findings from their research indicate that compared with nonpatients, schizophrenia patients report feeling more unpleasant emotions and fewer pleasant emotions on a daily basis, particularly when around large groups of people. In addition, schizophrenia patients report participating in fewer activities than nonpatients, particularly activities that are likely to elicit pleasant emotions.

This finding of diminished pleasant emotional experience is at the center of an apparent discrepancy observed in studies of experienced emotion in schizophrenia.

With few exceptions, studies that present emotionally evocative stimuli to schizophrenia patients find that patients report experiencing the same amount of pleasant emotion as nonpatients. Yet other studies find that schizophrenia patients score higher than nonpatients on measures of anhedonia (i.e., the diminished capacity to experience pleasure; see, e.g., Blanchard, Bellack, & Mueser, 1994) and report experiencing fewer pleasant emotions on a daily basis. We have suggested that although schizophrenia patients may not report experiencing less pleasant emotion when presented with pleasurable stimuli, they may be less able to anticipate that certain activities and experiences will elicit pleasant emotions. Models of anhedonia typically distinguish between appetitive pleasure (i.e., pleasure derived from anticipating that something will bring pleasure) and consummatory pleasure (i.e., pleasure derived from participating in a pleasurable activity). When schizophrenia patients are presented with pleasurable stimuli, they can and do derive pleasure from these experiences. However, on a daily basis, schizophrenia patients seem less likely to seek out pleasurable experiences, perhaps because they may not anticipate that these activities will bring pleasure. It is equally plausible, however, that some activities typically associated with pleasure, particularly in the domain of social interaction, may not be as pleasurable for schizophrenia patients as for other people. Moreover, it remains unclear whether patients' limited participation in pleasurable activities is a cause or a consequence of experiencing less pleasant emotion.

### EMOTION PHYSIOLOGY IN SCHIZOPHRENIA

Few studies have examined the psychophysiological component of

emotion in schizophrenia. This lack of research is in sharp contrast to a long tradition of research that has established other psychophysiological deficits in schizophrenia. For example, some schizophrenia patients show heightened skin conductance responding to innocuous tones, whereas other patients fail to show much skin conductance responding to these tones. We found that schizophrenia patients exhibited greater skin conductance reactivity than nonpatients in response to emotional film clips (Kring & Neale, 1996). In a follow-up study, we found that heightened reactivity to the film clips was specific to only a subgroup of patients with schizophrenia (Kring, Earnst, & Germans, 1999). Specifically, only those patients who demonstrated heightened skin conductance responding to innocuous tones also showed heightened reactivity to the emotional films. Thus, heightened skin conductance reactivity to emotional stimuli may be confined to a particular subgroup of patients with schizophrenia.

### IMPLICATIONS

Drawing upon methods used in basic research on emotion, psychopathology researchers have learned a good deal about emotional disturbances in schizophrenia, and these findings have important implications for research and treatment.

#### Social Functioning

Emotions help to coordinate social interactions and are important to the formation and maintenance of social relationships. Not surprisingly, then, disturbances in emotion have important social consequences (Keltner & Kring, 1998). For example, facial expressions provide important information

about the status of a relationship; they evoke emotional responses in other people, and they serve as incentives for others' behavior. It is likely that the social benefits of facial displays are not fully realized for patients who are relatively unexpressive. An inability to convey emotion, as well as an inability for an interaction partner to perceive emotion, likely sets the stage for a number of misunderstandings and miscommunications. Indeed, there is some evidence that schizophrenia patients who are unexpressive have more marital problems than patients who are more expressive and elicit a number of negative emotions from interaction partners.

#### Treatment

The research findings on emotion in schizophrenia suggest that a number of currently effective interventions, such as social skills training, could be strengthened by including components that specifically target emotional disturbances (e.g., expressing emotion at the right time in the appropriate contexts). There is also reason to believe that new pharmacological interventions (e.g., clozapine, olanzapine) may actually help to increase patients' expressive behavior. Perhaps most important, these findings send an important message to all people who interact with schizophrenia patients: Schizophrenia patients' outward displays are not an accurate reflection of their internal emotional experiences.

### CONCLUSIONS AND DIRECTIONS

Patients with schizophrenia experience a wide range of emotions, yet they do not readily display these feelings. They do, however, exhibit subtle microexpressions. Despite these advancements in un-

derstanding of emotion in schizophrenia, a number of important questions remain unanswered. For example, it remains unclear whether the observed emotion deficits in schizophrenia are an antecedent, concomitant, or consequence of the disorder. If these disturbances predate the onset of schizophrenia or persist beyond symptomatic remission, claims about their causal importance can be made with more certainty. Unfortunately, very few studies have addressed this important issue. Walker and her colleagues coded facial expressions from home movies of preschizophrenic boys and girls and found that the girls displayed fewer joy expressions and that both the boys and the girls displayed more negative facial expressions compared with their healthy siblings (Walker, Grimes, Davis, & Smith, 1993). In our longitudinal study of emotional responding in schizophrenia (Kring & Earnst, in press), diminished emotional expression was stable across 5 months. However, our study did not specifically include assessments during and following a symptomatic episode. Other studies of flat affect indicate that this symptom is stable across time and episodes. Taken together, these findings suggest that emotional disturbances may predate the development of schizophrenia and persist even after other symptoms have been treated successfully. However, additional research, particularly longitudinal studies, needs to be conducted before firm conclusions about the status (e.g., as a risk factor, marker, or correlated feature) of emotional disturbances in schizophrenia can be made.

A number of other unresolved issues can be readily addressed in future research. For example, most of the research on emotion in schizophrenia has been conducted with male patients. Given that there are differences in men's and women's expressive behavior (Kring & Gordon, 1998), it remains unclear whether women with schizophrenia display the same pattern of emotional responding as men with schizophrenia. Moreover, it will be important to study schizophrenia patients' emotions in the context of meaningful social relationships. Finally, some researchers have argued that a neuromuscular problem may contribute to schizophrenia patients' dampened facial expressions; this hypothesis remains to be fully tested. In short, although research has come a long way since Sullivan's urgent plea, more work needs to be done to more fully elucidate emotion in schizophrenia.

### Recommended Reading

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### Notes

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California, Berkeley, Berkeley, CA 94720; e-mail: kring@socrates.berkeley.edu.

2. For example, diminished facial expression is one of the manifestations of a medication side effect called akinesia.

3. Examples of high-activation emotions include aroused, surprised, and astonished; examples of low-activation emotions include passive, tranquil, and inactive.

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