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# Flat affect and social skills in schizophrenia: evidence for their independence

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**Abstract**

Although flat affect and social skills deficits are generally considered to be distinct impairments in schizophrenia, flat affect is typically assessed via an interview — an inherently social context. To the extent that emotional expressivity is an important component of socially appropriate interaction, it is possible that schizophrenic patients' diminished expressiveness in a social situation is largely a function of their concurrent social skills deficit. In the present study, we examined the relation between social skills and flat affect by measuring flat affect in two contexts: during an interview (high social demand) and while participants watched emotional film clips alone (low social demand). Results showed that social skills were not significantly correlated with flat affect in either context, suggesting that the two constructs represent independent domains of functioning in schizophrenic patients. 

*Keywords:* Emotion; Facial expression; Negative symptoms; Social context

## 1. Introduction

Both affective and social skills deficits are generally recognized to be important features of schizophrenia. Bleuler considered emotional deterioration, today known as flat affect, to be a fundamental symptom of schizophrenia, noting that 'many schizophrenics...cease to show any affect for years and even decades at a time' (Bleuler, 1911/1950, p. 40). Furthermore, in describing schizophrenics' poor social skills, Bleuler stated, 'Sometimes patients are obtrusive....At other times, they comport themselves very dis-

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dainfully, curtly, rudely' (1911/1950, p. 94). Although affective and social deficits both characterize schizophrenia, the relationship between the two remains unclear (Dworkin, 1992).

Typically, affective and social deficits are treated as separate symptom complexes, each with its own diagnostic criteria (see DSM-IV; American Psychiatric Association, 1994), and there is some evidence to support this distinction (Strauss et al., 1974; Dworkin et al., 1988; Dworkin, 1990). Perhaps the most prominent affective deficit in schizophrenia is the symptom of flat affect. Descriptively, flat affect refers to a lack of outward expression of emotion that can be manifested by diminished facial, gestural, and vocal expression. However, because flat affect is typically assessed via a clinical interview with a high demand for socially appropriate interaction, it is difficult to rule out the possibility that flat affect in this interview context is largely a function of schizophrenic patients' concurrent social skills deficits (Bellack et al., 1990; Mueser et al., 1990). Indeed, given that expressive behavior is an important component of socially skilled interactions, it is perhaps not surprising that some of the same behaviors (e.g. eye contact) appear on both flat affect and social skills rating scales. Nor is it surprising that several studies have reported moderate negative correlations between interview-rated flat affect and social skills among schizophrenic patients (e.g. Jackson et al., 1989a,b; Bellack et al., 1990; Mueser et al., 1990; Addington and Addington, 1995, 1999).

Although expressive behavior often subserves interpersonal communication, expressivity may also serve as a reflection of the subjective experience of emotion (Halberstadt, 1991). For example, emotion may be expressed in minimally social situations in which the expression serves no obvious communicative function. People often smile while watching television alone, or cry while recalling a sad memory from their past. In the schizophrenia literature, several studies have shown that schizophrenic patients also exhibit diminished facial expressiveness in situations with minimal social demand. Specifically, compared to non-patient control subjects, schizophrenic patients are less facially expressive, yet they report experiencing as much emotion while watching emotional film clips alone (e.g. Berenbaum and Oltmanns, 1992; Kring et al., 1993; Kring and Neale, 1996; Kring and Earnst, 1999). These findings are consistent with the possibility that the diminished expressivity that defines flat affect is not simply a function of poor social skills. However, given that these studies did not include measures of social skills, they do not directly address the question of whether affective and social deficits are independent or related domains of functioning among schizophrenic patients.

The present study was designed to examine the relationship between flat affect and social skills deficits in schizophrenic patients. Expressive behavior was measured in two contexts: (1) during a clinical interview; and (2) while participants watched emotional film clips in isolation. Specifically, the affective flattening subscale of the Scale for the Assessment of Negative Symptoms (SANS; Andreasen, 1984) was used to rate expressiveness during the clinical interview, and the Facial Expression Coding System (FACES; Kring and Sloan, 1991) was used to rate the frequency, intensity, and duration of facial expressiveness during the emotional films. Social skills were rated via the Assessment of Interpersonal Problem Solving Skills (AIPSS; Donahoe et al., 1990) which measures the capacity to role-play effective social problem-solving in simulated interpersonal interactions.

Because the expression of emotion is an important component of socially appropriate interaction, we predicted that poor social skills (i.e. the diminished ability to effectively role-play solutions to interpersonal problems) would be associated with affective flattening during the clinical interview, a setting in which there is a demand for socially appropriate communication. In contrast, because expressiveness in a minimally social context (i.e. while viewing emotional films alone) does not directly subserve interpersonal communication, we expected that expressiveness in this context would not be related to social skills. Previous research has found that flat affect during an interview is not related to expressiveness while

watching emotional film clips alone (e.g. Kring et al., 1994), perhaps because the former subserves social communication, whereas the latter does not. However, to the extent that expressive behavior can be construed as a characteristic style, expressivity in these two different contexts ought to be related.

## 2. Methods

### 2.1. Participants

Participants were 17 male schizophrenic inpatients who were recruited from the inpatient units of two Veterans Administration Medical Centers. All patients were taking traditional neuroleptic medication (haloperidol, $n = 8$; fluphenazine, $n = 5$; trifluoperazine, $n = 2$; thiothixene, $n = 1$; loxapine, $n = 1$) at the time of testing, and they all met DSM-IV (American Psychiatric Association, 1994) criteria for schizophrenia as determined by extensive chart review. Patients were excluded if they had a history of head trauma or neurological disease, showed signs of tardive dyskinesia or other extrapyramidal side effects, or had any Axis I diagnoses in addition to schizophrenia (with the exception of a history of substance abuse or dependence). Fifteen male non-patient control subjects with no personal history of psychopathology were recruited both from the community, via flyers and newspaper advertisements, and from the nonprofessional staff at the VA hospitals and Vanderbilt University. All participants were between the ages of 18 and 60 and were paid $25 for their participation in the study. Demographic and clinical characteristics for the schizophrenic patients and non-patient control subjects are presented in Table 1. Schizophrenic patients and control subjects did not differ on race or level of education, but the schizophrenic patients were slightly older than the control subjects ($t(30) = 2.94$, $P < 0.01$) and were more likely to be single ($\chi^2(4) = 10.50$, $P < 0.04$).

### 2.2. Apparatus

#### 2.2.1. Emotional film clips

Participants watched a videotape containing two film clips taken from contemporary movies, each approximately 5 min in length. One clip was intended to elicit happiness, and the other, disgust. These clips have been successfully used in previous studies to elicit emotions in psychiatric patients (e.g. Kring et al., 1993; Earnst et al., 1996; Kring and Neale, 1996). Following each film clip, participants completed an emotion adjective checklist by rating each of 44 emotional adjectives on a five-point Likert (1 = very slightly or not at all; 5 = extremely) scale based on the extent to which they experienced these emotions during the film clips. Ratings of emotions with positive emotional valence were summed to form a positive emotion score while items with negative emotional valence were summed to form a negative emotion score. This measure served as a manipu-

Table 1
Demographic characteristics of schizophrenic and control samples

| | Patients | | Control subjects | |
|---|---|---|---|---|
| | Mean | S.D. | Mean | S.D. |
| Age (years) | 42.24 | 6.52 | 35.07 | 7.29 |
| Education (years) | 12.06 | 1.64 | 12.60 | 1.12 |
| Medication dosage (mg in chlorpromazine equivalence) | 511.18 | 387.56 | | |
| Number of previous hospitalizations | 6.75 | 4.94 | | |
| Marital status ($n$) | | | | |
| Single | 7 | | 4 | |
| Married | 3 | | 10 | |
| Divorced/separated | 6 | | 1 | |
| Widowed | 1 | | 0 | |
| Race ($n$) | | | | |
| Caucasian | 8 | | 7 | |
| African American | 9 | | 6 | |
| Other | 0 | | 2 | |

lation check to test whether each film elicited the desired emotion valence (i.e. positive or negative).

*2.2.2. Assessment of Interpersonal Problem-Solving (AIPSS)*

The AIPSS (Donahoe et al., 1990) was developed to assess social skills among schizophrenic patients. Participants watched a videotape depicting 14 interpersonal scenes: one demonstration scene followed by 13 test scenes. Of the 13 test scenes, 10 depict interpersonal problems and were scored for social skill. The remaining three scenes are used to minimize response bias as they contain no problems and were not scored. The AIPSS breaks social skills down into three sequential abilities: Receiving Skills (i.e. the ability to correctly identify and describe the interpersonal problems depicted in the test scenes), Processing Skills (i.e. the ability to describe reasonable solutions to these problems), and Sending Skills (i.e. the ability to effectively communicate these solutions in the context of a role-play). It is this last subscale that is of particular interest for the present study. Sending Skills incorporates both the quality of the verbal content of the response (i.e. the likelihood that this response would solve the problem without negative consequences) and the non-verbal skill with which the response is executed (e.g. appropriateness of eye contact or voice tone). Although our predictions were primarily based on the hypothesized relationship between expressive behavior across the two contexts and Sending Skills, we also report the correlations for Receiving and Processing Skills.

The AIPSS was administered and scored by a trained clinical psychology doctoral candidate. An additional rater scored the problems for a subset of the participants ($n = 10$) and was in agreement with the experimenter for over 90% of the items, which is similar to rates of agreement reported by others using the AIPSS (e.g. Addington and Addington, 1999). Raters were trained in the use of the AIPSS by following the manual and rating several practice participants prior to the beginning of the study. In scoring the AIPSS, scores for individual items on each of the three scales are determined using a five-point scale (ranging from completely inappropriate to very appropriate), and separate percentage scores are computed for each scale. Specifically, the number of points the individual obtains on a given scale is converted to a percentage of the total possible points for that scale. Donahue and colleagues suggest two scoring methods. The original method requires a correct response at the Receiving Skills stage in order to receive points on the Processing and Sending Skills for a particular problem. With this method, scores are the percentage of total possible points on a given scale *assuming* all problems have been correctly identified. For example, if a participant only correctly identified five out of 10 problems, the maximum possible score he could obtain on Processing or Sending Skills would be 50% because he received zeroes on these scales for half of the items. The Sending and Processing Skill scores are computed by adding points obtained for the five correctly identified problems and dividing by 10 (the total number of problems). In essence, participants' Sending (and Processing) Skills are confounded with Receiving Skills. The alternative method, referred to as the specific scoring method, does not require correct identification at the Receiving Skills stage, but rather computes Sending and Processing Skills scores as a function of those problems correctly identified at the Receiving Skills stage. Using the specific scoring method, the Sending Skills score is computed by adding the Sending Skills points obtained for correctly identified problems, dividing by the number of correctly identified problems, and then multiplying this score by 100 to convert to a percentage score. In the example above, a participant who correctly identified five of 10 problems would receive a score of 100% on Sending Skills if he received the maximum number of points for those five problems. In this study, we adopted the specific scoring method in order to examine the linkage between sending skills irrespective of receiving skills ability. It should be noted, however, that the results reported below were identical for both scoring procedures.

*2.3. Procedure*

After obtaining participants' informed consent, the experimenter conducted and videotaped a

semi-structured interview containing questions about demographic information and personal background.[1] In addition, patients were asked about the history of their illness. Interviews were later rated for flat affect by two trained raters using the SANS (Andreasen, 1984). Following the interview, instructions for the film-viewing task were given. Specifically, participants were told that they should sit back and relax while watching the movie clips, and that they would subsequently be asked to answer some questions about the clip. Participants were videotaped while watching each film clip on a 13-inch color television. The experimenter left the room while the film clips were shown and returned when each clip ended. Participants answered a few brief questions designed to assess attention and understanding, and were then instructed to fill out the emotion adjective checklist based on how they felt while they watched the film clip. The videotapes were later coded by two trained coders using the Facial Expression Coding System (FACES; Kring and Sloan, 1991) which assesses the frequency, intensity, and duration of positive and negative facial expressions. Coders were blind to the hypotheses of this study, the nature of the film clips, and the results of the SANS flat affect ratings.

After the film-viewing task, participants were given the instructions for the role-playing task, the AIPSS. Specifically, participants were told that they would be watching a videotape containing brief scenes depicting two people talking to each other. Further, they were told that at some point during the scene, a problem may or may not arise. They were instructed that following each scene, they would be asked whether there was a problem and, if so, to explain it. They would then be asked to identify with one of the characters in the scene, and explain what they would say or do in the situation. Finally, they would be asked to show the experimenter what they would say or do in the situation. Following these instructions, the experimenter administered the demonstration scene and answered participants' questions before administering the test scenes.

[1] Veterans Administration Hospital rules prohibited hidden videotaping, however, videotaping was done as unobtrusively as possible; The video camera was positioned behind a 4-foot bookshelf such that only the lens was visible through a hole in the back panel of the bookshelf. No lights indicated when the video camera was running, and the power switch was hidden from view so that participants did not know which portions of the procedure were being videotaped.

## 3. Results

### 3.1. Preliminary analyses

Intraclass correlations (Shrout and Fleiss, 1979) were computed across all participants for the frequency, intensity, and duration FACES variables for the happy and disgust films. Interrater reliability was high for all FACES variables for both films, with an average $r$ of 0.96. Similar to other studies using FACES (e.g. Earnst et al., 1996; Kring and Neale, 1996; Kring and Gordon, 1998), the frequency, intensity, and duration variables were highly intercorrelated ($r$ values ranging from 0.45 to 0.89). We chose to use frequency of expressions for all subsequent analyses for ease of interpretation. Thus, from this point, FACES ratings of facial expressiveness will refer to the number of expressions during a given film.

For the SANS, six of the items which make up the Affective Flattening subscale (unchanging facial expression, decreased spontaneous movements, paucity of expressive gestures, poor eye contact, affective non-responsivity, and lack of vocal inflections) were rated on a 1 (not at all) to 5 (severe) Likert scale by two trained raters. Raters established a consensus score if they disagreed by two or more points on the rating for any given item. Interrater reliability as assessed with intraclass correlations was high ($r = 0.83$) for overall flat affect scores, which consisted of the sum of the non-consensus ratings.

To examine whether the film clips produced the desired effects on reported, 2 (Group: patient, control) $\times$ 2 (Film: happy, disgust) repeated measures ANOVAS were computed separately for positive and negative emotional experience. Descriptive statistics for the emotional experience measures are shown in Table 2. For negative emotional experience, the Group $\times$ Film interaction was not significant ($F_{1,29} = 0.00$, n.s.), but the film main effect was significant ($F_{1,29} = 17.90$,

$P < 0.001$) indicating that all participants reported experiencing more negative emotion following the disgust film than the happy film. Similarly, for positive emotion, the film main effect was significant ($F_{1,29} = 29.07$, $P < 0.001$) indicating that participants reported experiencing more positive emotion following the happy film than the disgust film. However, because the Group × Film interaction was significant ($F_{1,29} = 7.94$, $P < 0.01$), follow-up paired, one-tailed $t$-tests were conducted separately for patients and control subjects. After adjustment of alpha to 0.025 with the Bonferroni correction, both patients ($t(15) = 2.21$, $P < 0.025$) and control subjects ($t(14) = 4.97$, $P < 0.001$) reported significantly more positive emotion following the happy film than the disgust film.

Table 2
Descriptive statistics for emotional experience scales[a]

| | Scale | | | |
|---|---|---|---|---|
| | Positive | | Negative | |
| | S | C | S | C |
| *Happy film* | | | | |
| Mean | 2.36 | 2.91 | 2.36 | 1.57 |
| S.D. | 0.65 | 1.08 | 0.94 | 0.89 |
| Reliability | 0.80 | 0.96 | 0.90 | 0.96 |
| *Disgust film* | | | | |
| Mean | 2.00 | 1.64 | 2.76 | 2.01 |
| S.D. | 0.65 | 0.49 | 0.79 | 0.76 |
| Reliability | 0.82 | 0.84 | 0.85 | 0.91 |

[a]Tabled means represent participants' average ratings for each item on the scale. Tabled reliabilities are Cronbach's alphas. S = schizophrenic patients; C = non-patient control subjects.

### 3.2. Between group comparisons

Descriptive statistics for SANS ratings of flat affect, FACES ratings of facial expressiveness, and AIPSS ratings of social skills are shown in Table 3. Although our primary interest is in the relationship between expressive behavior and social skills, it is nonetheless important to consider the patients' performance on the various tasks relevant to the non-patient control subjects. Indeed, our findings replicate the results from a number of previous studies (e.g. Kring et al., 1994; Kring and Neale, 1996). Compared to non-patient control subjects, schizophrenic patients had higher SANS ratings of flat affect ($t(30) = 7.08$, $P < 0.001$), and showed less overall facial expressiveness in response to the emotional film clips ($F_{1,29} = 14.95$; $P < 0.002$) despite reporting experiencing as much positive emotion as control subjects across films ($F_{1,29} = 0.11$, n.s.) and more negative emotion than control subjects across films ($F_{1,29} = 6.81$, $P < 0.02$). To assess group differences in social skills, a 2 (Group: patient, control) × 3 (Skill: Receiving, Processing, Social Skills) repeated measures MANOVA was conducted. In this analysis, the group ($F_{1,30} = 44$, $P < 0.001$) and skill ($F_{2,29} = 41.6$, $P < 0.01$) main effects were significant as was the Group × Skill interaction ($F_{2,29} = 7.97$, $P < 0.01$). Thus, patients had poorer social skills across all domains, and all participants scored lower on the Processing Skills than on either Receiving or Sending Skills.

Table 3
Descriptive statistics for measures of flat affect, facial expression, and social skills[a]

| | Group | | | |
|---|---|---|---|---|
| | Patients | | Control subjects | |
| | Mean | S.D. | Mean | S.D. |
| SANS affective flattening | 11.56 | 4.74 | 2.13 | 2.13 |
| Number of facial expressions | 1.91 | 2.56 | 12.27 | 7.15 |
| AIPSS Sending subscale (%) | 43.91 | 19.79 | 83.47 | 8.30 |
| AIPSS Receiving subscale (%) | 67.71 | 16.59 | 90.21 | 6.56 |
| AIPSS Processing subscale (%) | 39.78 | 20.40 | 75.78 | 16.21 |

[a]SANS, Scale for the Assessment of Negative Symptoms; AIPSS, Assessment of Interpersonal Problem Solving Skills.

### 3.3. Correlational analyses

Our major hypotheses concerned the relationships between the expressive behavior and social skills among schizophrenic patients, but we nonetheless report correlations for both patients and control subjects in Table 4. Contrary to our prediction, the SANS flat affect scores were not significantly correlated with AIPSS Sending Skills ($r = -0.10$, n.s.). However, consistent with our prediction, AIPSS Sending Skills were not related to expressiveness during the emotional films ($r = -0.07$, n.s.). Finally, flat affect ratings during the interview were significantly correlated with expressiveness during films ($r = -0.48$, $P < 0.03$), suggesting that expressivity was consistent across these two contexts. Although we did not generate predictions for the Processing and Receiving subscales, neither subscale was related to SANS flat affect scores nor facial expressions during the film clips.

## 4. Discussion

The present study sought to determine whether poor social skills were associated with flat affect among schizophrenic patients. Results were consistent with the view that emotional expressiveness and social skills are independent domains of functioning among schizophrenic patients. Specifically, expressiveness in two contexts, both in the presence and in the absence of others, was not related to social skills. These findings provide support for the current diagnostic distinction between affective and social deficits in schizophrenia. That is, flat affect and social skills deficits appear to be independent domains of functioning in schizophrenia.

However, because the present study used a role-play measure of social skills, we cannot rule out the possibility that our failure to find a correlation between interview-based ratings of flat affect and role-play-based ratings of social skills reflects the independence of non-verbal affective behavior in spontaneous vs. posed contexts. That is, the affective behavior elicited in a posed, role-play situation may not be predictive of similar behavior in a spontaneous interview setting. Thus, it is important for future research in this area to replicate and extend these findings by examining the relationship between spontaneous expressiveness and spontaneous, rather than posed, social skills. It is also important to acknowledge that the present study is limited by its relatively small sample size and the use of only male participants.

Although the etiology of affective and social deficits in schizophrenia remains unclear, the evidence that flat affect and social skills are independent domains of functioning in schizophrenia raises the question of whether these symptom clusters are caused by distinct etiological mechanisms. Clearly, the ability to reliably discriminate flat affect and social skills is essential for research investigating the etiology of these symptom clus-

Table 4
Correlations between measures of flat affect, facial expression, and social skills[a]

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1. SANS | – | −0.51* | −0.12 | 0.19 | 0.01 |
| 2. Facial Expressions | **−0.48*** | – | 0.10 | −0.22 | −0.18 |
| 3. Sending Skills | **−0.10** | **−0.07** | – | 0.41 | 0.65** |
| 4. Receiving Skills | **−0.12** | **0.20** | **0.68**** | – | 0.62** |
| 5. Processing Skills | **−0.21** | **0.04** | **0.76**** | **0.72**** | – |

[a] Correlations in bold type are for schizophrenic patients; correlations in normal type are for non-patient control subjects.
* Indicates $P < 0.05$.
** Indicates $P < 0.01$.

ters. Thus, future research examining the relationship between affective and social deficits in schizophrenia would benefit from the use of measures that minimize the overlap between these two domains of functioning. Moreover, it is unclear whether some specific non-verbal behaviors (e.g. poor eye contact, lack of vocal inflection) reflect affective or social deficits (Dworkin, 1992). Research examining the relation between individual symptoms and the larger symptom clusters could help researchers to categorize these individual behaviors as either components of flat affect or social skills, which would in turn have implications for how these symptoms are treated. Finally, longitudinal studies of flat affect and social skills among high-risk samples could inform researchers about the role of these symptoms in the development and course of schizophrenia.

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