Research Article

ON THE BROAD APPLICABILITY OF THE AFFECTIVE CIRCUMPLEX: Representations of Affective Knowledge Among Schizophrenia Patients

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Abstract—*Studies of affective experience are guided by the assumption that the structure of affect generalizes across people. Yet this assumption has not been tested among educationally and economically diverse community residents or among individuals with psychopathology. This study explicitly examined the broad applicability of the valence-arousal circumplex and whether schizophrenia patients and nonpatients have comparable knowledge structures of affective phenomena. Patients and nonpatients completed similarity ratings of 120 pairs of affect words. Similarity judgments were analyzed separately for each group using a multidimensional scaling procedure, and solutions were compared. Results revealed the same two-dimensional valence-arousal solution for schizophrenia patients and nonpatients, although there were subtle differences between the groups. These findings provide additional evidence that the circumplex model is a useful formalism for representing affective phenomena across diverse populations, and they bolster confidence in existing interpretations of schizophrenia patients' reports of affective experience.*

Human interaction with the world, whether disordered or normative, is guided by a ubiquitous system: affect. Across many domains of psychological research, investigators have utilized dimensional models of affect to ground their inquiries. Dimensional models of affect have a long history in psychology. A dimensional approach was introduced by Wundt's (1912/1924) introspections, and several dimensional models exist in modern-day accounts of affect (e.g., Cacioppo, Gardner, & Berntson, 1999; Lang, 1995; Watson & Tellegen, 1985). One of the most well-replicated models is the valence-arousal affective circumplex (Feldman Barrett & Russell, 1998; Remington, Fabrigar, & Visser, 2000; Russell, 1980; Russell & Feldman Barrett, 1999). Valence refers to the hedonic quality (pleasure or displeasure) of, and arousal (or activation) to the felt activation associated with, affect-related stimuli. The valence-arousal structures have been replicated across cultures, people of different ages, and different types of affective stimuli, and have been used to organize biological measurements related to emotion (e.g., Lang, 1995). Given this replicability, the affective circumplex has been thought of as a multipurpose, mathematical formalism for representing affective phenomena as combinations of these two independent dimensions. When they are derived from similarity ratings of affect words, valence and arousal dimensions are thought to represent the basic aspects of semantic knowledge about affect (an interpretation consistent with the semantic differential work by Osgood, Suci, & Tannenbaum, 1957). Although not all information about emotion is captured by the circumplex model, it is a useful tool for representing the core features of declarative knowledge about affect-related stimuli.

Despite the evidence supporting its broad replicability, the valence-arousal model, like so many other phenomena, has not been verified in populations often neglected in psychological research. Indeed, very little research has verified the applicability of the affective circumplex among individuals with lower educational attainment and socioeconomic realization than the college students so often used in research. It would be tempting to assume that the model is robust and generalizable across many populations, were it not for the fact that contextual and sampling variables have a profound impact on research findings, often in the most unexpected ways. Moreover, despite the burgeoning interest in affective disturbances associated with mental disorders (Kring & Bachorowski, 1999), no research has examined whether the affective circumplex applies to mentally disordered populations, even though such applicability is often assumed. This issue is particularly germane to the study of emotion disturbances in schizophrenia.

AFFECTIVE EXPERIENCE IN SCHIZOPHRENIA

Consistent with historical observations (e.g., Bleuler, 1911/1950), a number of recent studies have found that, compared with nonpatients, schizophrenia patients exhibit very few outward displays of emotion despite reporting equivalent or greater amounts of experienced emotion (e.g., Berenbaum & Oltmanns, 1992; Kring & Earnst, 1999; Kring & Neale, 1996). Further, there has been remarkable consistency across studies and laboratories with respect to self-reported affective experience; specifically, patients report experiencing more unpleasant emotion in response to emotionally evocative stimuli than do nonpatients (Kring & Earnst, 1999, in press).

Despite the consistency in findings, two fundamental issues remain unresolved. First, many researchers question whether schizophrenia patients can accurately complete a self-report measure of their affective experience, presumably because their cognitive impairments may preclude them from doing so. Second, the valence-arousal circumplex has not been explicitly identified in schizophrenia patients, although it is often assumed to apply. These two issues are intertwined, insofar as inferences about the veracity of schizophrenia patients' reports of their experience are based on the untested assumption that schizophrenia patients' representations of affective phenomena are faulty.

Thus, the more fundamental question of how patients represent affective knowledge is perhaps the most important question to address. An investigation of whether schizophrenia patients' affective knowledge differs significantly from nonpatients' provides a necessary platform for understanding and interpreting affect-related phenomena in schizophrenia, especially if declarative knowledge about affect influences how people represent their own affective experience and process affect-related stimuli (Feldman, 1995; Feldman Barrett, 1998, 2001;

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Russell, 1980). For example, finding that schizophrenia patients possess the same knowledge representations of affective phenomena as nonpatients would justify continued examination and comparison of patients' and nonpatients' reports of their felt experience within a common frame of reference.

Early attempts to examine semantic knowledge about affect in schizophrenia focused on the idea that affective words interfered with other types of cognitive processing, thereby exacerbating the thinking disturbance often observed in schizophrenia (e.g., Lebow & Epstein, 1963), although empirical investigations failed to support this notion (Chapman & Chapman, 1975; Chapman, Chapman, & Daut, 1974). In another line of research, two studies explicitly examined schizophrenia patients' similarity judgments of affective words (Neufeld, 1975, 1976) using an individual difference multidimensional scaling (MDS) technique (INDSCAL). Overall, patients' similarity judgments were more similar than dissimilar to nonpatients' judgments, and tended to yield valence and arousal dimensions (along with a dominance-type dimension). It is difficult to generalize broadly from these two studies, however, because of methodological considerations. First, neither study adequately sampled all combinations of valence and arousal, so the replicability and interpretability of the resulting dimensional solution is limited. Second, similarity judgments from nonpatient control participants were combined with the judgments from schizophrenia patients to produce one general solution. It would be important to analyze the judgments for each group separately to test their congruence before combining them into a single dimensional display.

OVERVIEW OF THE PRESENT STUDY

The present study addressed two questions: (a) Does the affective circumplex extend to diverse populations? (b) More specifically, do patients with schizophrenia possess the same representations of affect knowledge as do individuals without schizophrenia? To address these questions, we had schizophrenia patients and nonpatient community residents rate the similarity of affect words. We included a comprehensive and representative sample of terms from the affective circumplex, thus allowing for an unbiased analysis of the dimensional structure. Because similarity judgments are thought to be an index of mental structure, and dimensional analyses of these ratings produce dimensions that represent the underlying attributes or properties of that mental structure (Davison, 1983; Shepard, 1962, 1974, 1980), comparing solutions across groups allowed us to determine whether schizophrenia patients and nonpatients have comparable knowledge structures of affective phenomena, and whether these structures are identifiable as the valence-arousal circumplex.

METHOD

Participants

Participants included 11 patients with diagnoses of either schizophrenia ($n = 7$) or schizoaffective disorder ($n = 4$; 2 bipolar type, 2 depressive type). They were recruited from a day treatment program. In addition, 7 nonpatient control participants were recruited from the community. Diagnoses (American Psychiatric Association, 1994) were determined using the Structured Clinical Interview for Axis I DSM-IV Disorders (SCID-I/P; First, Spitzer, Gibbon, & Williams, 1994) and chart review. None of the schizoaffective patients were experiencing a current mood episode. Nonpatient control participants were interviewed to determine that they had no personal or family history of psychopathology.

Table 1 provides demographic information for all participants and additional clinical information for the patients. Both parametric and nonparametric comparisons indicated that the patient and nonpatient groups did not differ significantly in sex, age, or years of education. Control participants were more likely to be married, $\chi^2(1, N = 18) = 5.66$, $p < .017$, and to be of non-White ethnicity, $\chi^2(1, N = 18) = 2.92$, $p < .088$. All but 1 of the patients were taking neuroleptic medications, including Zyprexa ($n = 5$), Risperdal ($n = 1$), Trilafon ($n = 2$), Haldol ($n = 1$), and Navane ($n = 1$).

Similarity Ratings

Following a procedure that has been used in other studies (Feldman, 1995; Feldman Barrett, 1998, 2001; Feldman Barrett & Laurenceau, 2001), participants rated the similarity of all possible pairs of 16 emotion terms that equally represent all octants of the affective circumplex (120 word pairs). The terms used were *excited*, *lively*, *cheerful*, *pleased*, *calm*, *relaxed*, *idle*, *still*, *dulled*, *bored*, *unhappy*, *disappointed*, *nervous*, *fearful*, *alert*, and *aroused*. Participants were asked to rate the similarity of the meanings of the words in each pair using a 7-point Likert scale (1 = *extremely dissimilar*, 4 = *unrelated*, 7 = *extremely similar*).

Valence and Arousal Ratings

Because no normative data exist for schizophrenia patients' explicit valence and arousal ratings of emotion words, the patient sample also separately rated the type of valence and degree of arousal denoted by each of the 16 affect terms included on the similarity rating form. The patients rated the pleasantness or unpleasantness of each term on a 7-point scale (1 = *extremely unpleasant*, 4 = *neutral*, 7 = *extremely pleasant*), and they rated the amount of felt activation associated with each term (1 = *extremely low key*, 4 = *neutral*, 7 = *extremely keyed up*). The mean rating for each term was computed for both valence and arousal.

Procedure

Participants first completed the similarity rating forms. Next, patients rated the valence and arousal associated with each of the 16 terms. The experimenter worked individually with each participant to ensure the participants understood the forms.

RESULTS

Similarity ratings from each sample were subjected to separate MDS procedures (Takane, Young, & DeLeeuw, 1976). Although our sample size was small, it was sufficient to permit a stable estimate of similarity judgments (according to the formula offered by Davison, 1983, p. 41). In all cases, the primary approach to ties (allowing data to become untied) was used in the analysis (Davison, 1983, p. 86). It is important to obtain MDS solutions with several different dimensionalities and choose among them to find the most suitable model to represent the similarity between stimuli (in this case, affect adjectives) by their distance in a geometric space. The dimensionality of the patient and control-sample solutions was determined by three criteria: (a) the

Table 1. *Demographic and clinical characteristics of the participants*

Characteristic	Patients	Control participants
Mean age	41.54 (9.08)	34.29 (11.67)
Mean education (years)	12.00 (2.49)	13.14 (1.87)
Sex (*n*)		
Female	5	4
Male	6	3
Ethnicity (*n*)		
Caucasian	6	1
African American	4	3
Latino	0	2
Filipino	1	1
Marital status (*n*)		
Married	0	3
Divorced, separated	2	0
Single	9	4
Mean neuroleptic dose (chlorpromazine equivalence)	658.25 (582.58)	—
Mean number of prior hospitalizations	4.20 (2.94)	—

Note. Standard deviations are in parentheses.

fit, (b) the reproducibility across samples, and (c) the interpretability of the solution (Davison, 1983).

Fit of a solution is determined by producing a fit-by-dimensionality plot in which a fit statistic (called stress) for each solution of a given dimensionality is plotted against the number of dimensions contained in each solution (see Fig. 1). The stress value indicates the extent of the solution's departure from the observed data. Identifying the "elbow" in the stress-by-dimensionality plot indicates the optimal number of dimensions needed to represent the stimulus structure (rather like using the Scree plot to identify dimensionality in an exploratory factor analysis; Gorsuch, 1983). Because we hypothesized that a two-dimensional solution would fit the data best, it was important to estimate the fit of a one-dimensional MDS solution. The INDSCAL procedure will produce only solutions with two or more dimensions, so we estimated a nonmetric group euclidean distance model first to help determine the appropriate dimensionality of the solution. After selecting the dimensionality, we performed the INDSCAL (Carroll & Chang, 1970) analysis to estimate the actual structure in the data. The INDSCAL analyses were the main analyses of interest and are discussed in greater detail than are the nonmetric group analyses.

INDSCAL computed a group space solution based on data from all participants, along with dimension weights that represent the importance each participant gave to the valence and arousal dimensions when judging the subjective similarity among the affect terms (Arabie, Carroll, & DeSarbo, 1987). A group solution represents the structure that is common to all individuals. The weights in these solutions represent how individuals varied from this group structure and represent idiographic variation in the semantic structure of affective space. A participant's personal semantic space can be derived by multiplying the interstimulus distances (representing the similarity between affect terms) from the group solution by his or her dimension weights; this calculation stretches or shrinks the group space as a function of these weights. Psychologically, the weights represent the importance of each dimension to each participant.

Interpretability of a solution is determined by identifying stimulus groupings or ordering to identify or label each dimension. This can be done subjectively, but it can also be done empirically. We determined interpretability both subjectively and empirically, by comparing the coordinates for all the affect terms with explicit ratings of those stimuli.

Reproducibility of a solution is determined by whether a solution with a given dimensionality emerges consistently across samples or subgroups. Dimensions should be retained in the final solution if they emerge consistently. We assessed consistency by computing a congruence coefficient (Davison, 1983) for solutions across the patient and control samples.

Patients

According to the fit and interpretability criteria, a two-dimensional model seemed most appropriate to describe the similarity ratings obtained from the schizophrenia and schizoaffective patients.

Fit

A stress-by-dimension plot for the MDS group solution, shown in Figure 1, revealed a clear elbow at the two-dimensional solution, suggesting the suitability of the two-dimensional MDS solution (stress = .23). The stress values for the comparable INDSCAL and group euclidean solutions were highly similar where they could be compared (the two- through five-dimension solutions), so we discuss only the INDSCAL solutions in detail (stress = .23).

The squared correlations (*RSQ*s) for the INDSCAL solutions are also presented in Figure 1. *RSQ* represents the proportion of variance accounted for in the distances between affect terms, as estimated by their similarity ratings. The *RSQ* for the two-dimensional INDSCAL solution was .69. Although there are no statistical tests to indicate whether this solution provides a good or a poor fit to the similarity ratings, it is worth noting that *RSQ* values are usually higher in solutions derived from college-student samples (typically $RSQ > .80$). The stress and *RSQ* values shown in Table 2 indicate that this two-dimensional solution fit better for some individuals than others. This variability in fit across participants likely accounts for the lower than average fit of the group INDSCAL solution.

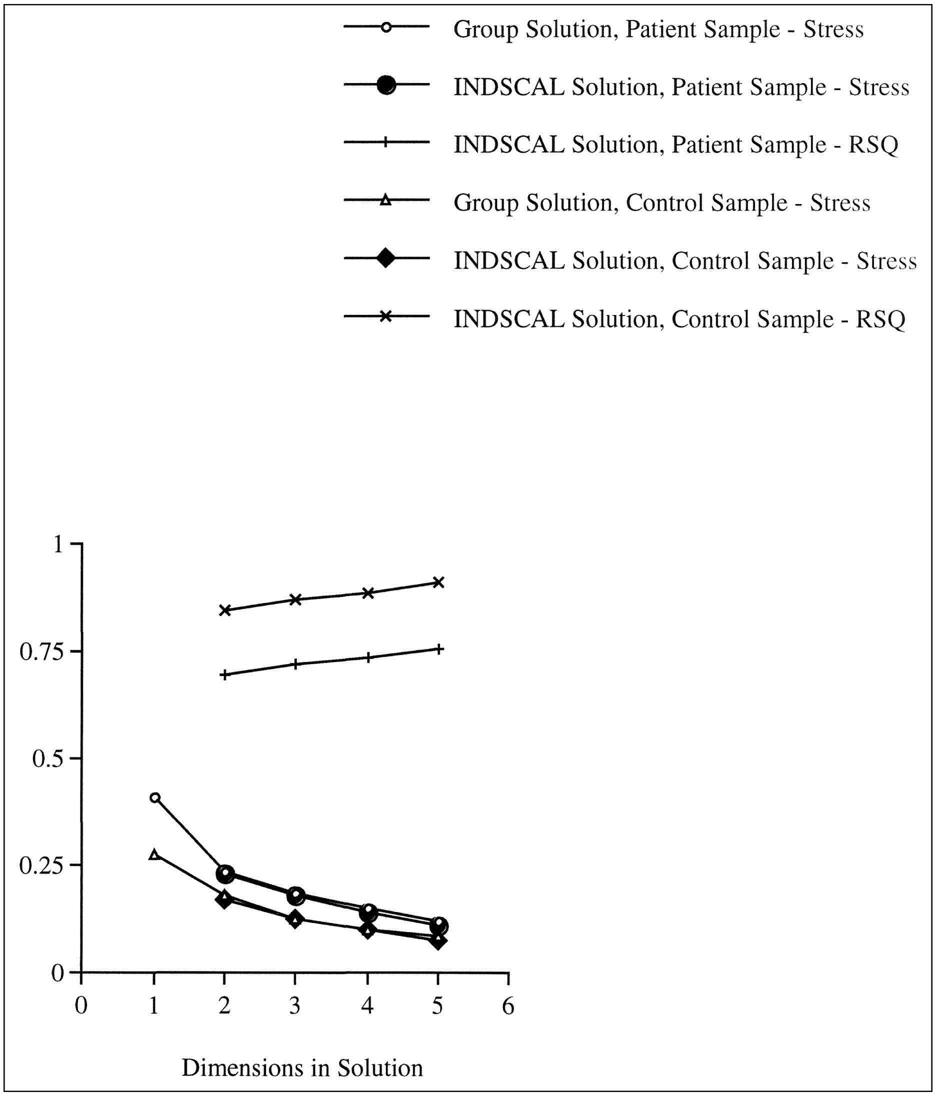

Fig. 1. Fit-by-dimension plots for both group and INDSCAL solutions for the patient and control participants. Also shown are *RSQ* values for INDSCAL solutions only.

Interpretability

For the two-dimensional INDSCAL solution, the affect terms fell, as predicted, in a circular order around two dimensions, as indicated in Figure 2a. An inspection of the group INDSCAL solution suggested that the horizontal axis represented valence denoted by the affect terms and the vertical axis corresponded to arousal.

To empirically verify that the dimensions were indeed valence and arousal, we compared dimension coordinates for the words with two sets of explicit ratings for the affect terms. First, an independent sample of 65 undergraduate psychology students at the Pennsylvania State University rated valence and arousal of the 16 affect terms included in the similarity measure, using the 7-point scales we described earlier. The mean rating for each word was computed for both valence and activation. Correlations between the mean valence and arousal ratings and the MDS dimension coordinates across the 16 affect words are presented in Table 3. A similar procedure was followed to compare the MDS dimension coordinates with the explicit valence and arousal ratings of the schizophrenia patients (see Table 3). Both sets of empirical comparisons support the subjective interpretation of the two MDS dimensions as valence and arousal.

Control Participants

As was the case for the patients, a two-dimensional model seemed most appropriate to describe the similarity ratings obtained from the nonpatient control participants.

Fit

The stress-by-dimension plot for the MDS group, presented in Figure 1, revealed a clear elbow at the two-dimensional solution, suggesting the suitability of the two-dimensional MDS solution (stress = .18). As with the patient sample, the stress values for the comparable INDSCAL and group euclidean distance MDS solutions were highly similar where they could be compared (the two- through five-dimension

Table 2. *Individual fit statistics*

Patients		Control participants	
Stress	*RSQ*	Stress	*RSQ*
.37	.22	.16	.87
(.37)	(.20)	(.15)	(.89)
.26	.62	.14	.90
(.25)	(.63)	(.14)	(.89)
.15	.87	.16	.87
(.15)	(.86)	(.15)	(.89)
.16	.84	.16	.85
(.18)	(.82)	(.18)	(.81)
.25	.63	.22	.74
(.25)	(.64)	(.21)	(.74)
.21	.75	.21	.79
(.21)	(.73)	(.21)	(.79)
.20	.77	.15	.88
(.20)	(.76)	(.16)	(.87)
.25	.63		
(.25)	(.63)		
.08	.96		
(.08)	(.97)		
.28	.54		
(.28)	(.52)		
.18	.82		
(.17)	(.84)		

Note. Statistics are presented both for separate patient and control solutions and for a single group solution (in parentheses).

solutions), so we discuss only the INDSCAL solution in detail. *RSQ*s for the INDSCAL solutions are also presented in Figure 1. The *RSQ* for the two-dimensional INDSCAL solution (.84) was in the range of what is expected from previous analyses of data from college-student participants. Although there was some variability in the fit statistics across participants, the two-dimensional solution seemed to account for the similarity ratings adequately for all control participants (fit statistics for each participant are presented in Table 2).

Interpretability

As in the case of the solution for the patients, for the control sample the affect terms were represented in a circular order around the two dimensions (see Fig. 2b). An inspection of the group INDSCAL solution suggested that one axis represented valence denoted by the affect terms and the other corresponded to arousal. In this solution, however, the arousal dimension was represented by the horizontal axis, and the valence dimension by the vertical axis. This configuration is more similar to that which has been observed previously in college-student samples (e.g., Feldman, 1995). The solution is represented with valence as the horizontal dimension in Figure 2b to aid comparisons between the patient and control solutions.

To empirically verify that the dimensions were indeed valence and arousal, we compared dimension coordinates for the words with the mean ratings of valence and arousal for the affect terms obtained from both the Pennsylvania State and the patient samples. The results are presented in Table 4. As predicted, both sets of empirical comparisons support the subjective interpretation of the two MDS dimensions as valence and arousal.

Reproducibility: Comparing the Two Solutions

The congruence coefficient for the two dimensions in each MDS solution indicated a strong degree of replicability for both the valence and arousal dimensions. The coordinates for the valence dimensions in the patient and control solutions were highly correlated (r = .97, $p < .001$), as were the coordinates for the arousal dimensions (r = .99, $p < .001$). The cross-dimension correlations were not significantly different from zero (both rs = .19). Taken together, these correlations indicate an excellent match between the patient and control semantic structures. The two solutions, presented together for comparison in Figure 2c, indicated that both groups of participants structured the affect words in terms of their valence-based and arousal-based meaning.

Given that the solutions for the patient and control groups were highly similar, we conducted a final INDSCAL analysis using the similarity judgments from both groups to allow an empirical comparison between the two. The two-dimensional solution fit the data adequately, stress = .21, *RSQ* = .75. The fit statistics for each participant (presented in parentheses in Table 2) were virtually identical to those obtained when the patient and control data were analyzed separately. Patient and control participants did not differ in their stress levels, $M_{\text{patient}} = .22$, $M_{\text{control}} = .18$, $t(16) = 1.51$, $p < .15$, but differed in their *RSQ*, $M_{\text{patient}} = .69$, $M_{\text{control}} = .84$, $t(12.4) = 2.20$, $p < .05$, suggesting that the scaling solution accounted for more variance in the similarity ratings of the control participants than of the patients. The decrement in the degrees of freedom reflected the fact that patients displayed marginally larger variation in their *RSQ* values ($SD = .21$) than control participants did ($SD = .06$), $F(1, 15) = 3.83$, $p < .07$.

Analysis of the dimension weights indicated that the patient and control participants differentially weighted valence and arousal knowledge when rating the similarity of affect word pairs. On average, the patients weighed the valence dimension more than the control participants, $M_{\text{patient}} = .53$, $M_{\text{control}} = .42$, $t(16) = 2.31$, $p < .05$, whereas the control participants placed greater emphasis on the arousal dimension than did the patients, $M_{\text{patient}} = .62$, $M_{\text{control}} = .81$, $t(16) = 3.28$, $p < .005$. Finally, we computed the ratio of valence weight to arousal weight to determine whether the groups differed in the relative weight they gave to the two types of knowledge (a value of 1 indicates equal weighting, a value greater than 1 indicates an emphasis on valence, and a value less than 1 indicates an emphasis on arousal). On average, the schizophrenia patients were close to weighing the valence and arousal dimensions equally ($M = 0.89$), whereas the control participants put greater emphasis on the arousal dimension, relative to valence ($M = 0.53$), $t(16) = 3.51$, $p < .003$.

DISCUSSION

In this study, we sought to examine the broad applicability of the affective circumplex to diverse populations. Prior work has convincingly demonstrated that valence and arousal are basic semantic attributes of affective knowledge (Bush, 1973; Feldman, 1995; Feldman Barrett, 2001; Feldman Barrett & Fossum, 2001; Russell, 1980). Findings from this study reveal the same two-dimensional solution for patients with schizophrenia and schizoaffective disorder, as well as for a sample of nonpatient community residents. These findings further

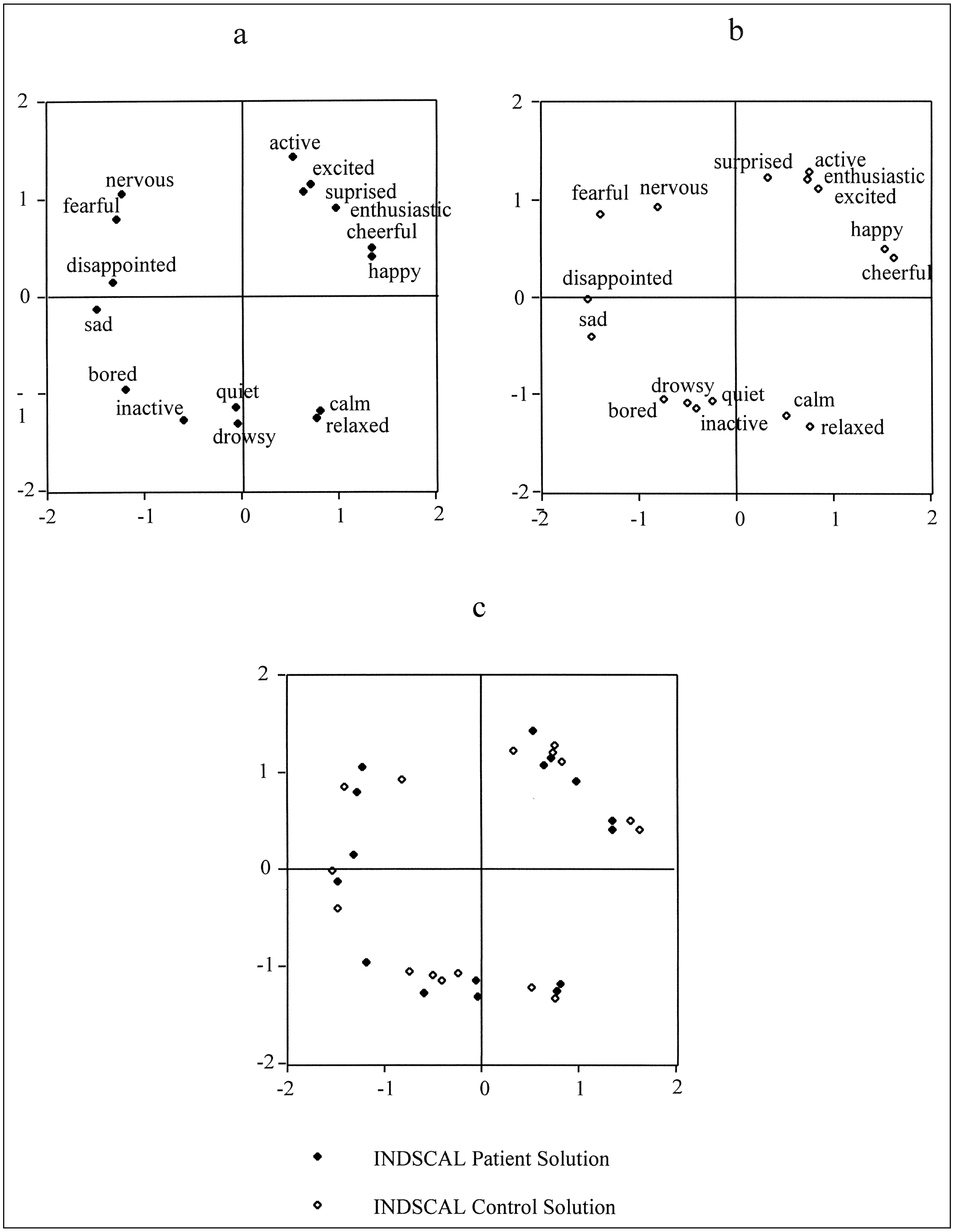

Fig. 2. Multidimensional scaling for the patient and control two-dimensional solutions. In all plots, valence is the horizontal dimension and activation is the vertical dimension. The three plots show the solution for patients (a), the solution for control participants (b), and the two solutions superimposed for visual comparison (c).

support the validity of the affective circumplex model by demonstrating its applicability to populations not typically included in studies of the structure of affective experience.

Despite the overall consistency of solutions across patients and control participants, some aspects of the solutions varied between the two groups. First, the two-dimensional configuration described the data from nonpatients somewhat better than the data from schizophrenia patients. As prior studies have found, on average, there was more variance in the schizophrenia patients' judgments than in the nonpatients' judgments that was not captured by the two-dimensional solution. This variability does not suggest that there were additional attributes important to patients' representation of affect knowledge, because independent criteria

Table 3. *Interpretability coefficients for the patient multidimensional scaling (MDS) solution*

	Valence			Activation		
	Independent ratings	Patient ratings	INDSCAL coordinates	Independent ratings	Patient ratings	INDSCAL coordinates
Valence						
Independent ratings	—					
Patient ratings	.96**	—				
INDSCAL coordinates	.96**	.96**	—			
Activation						
Independent ratings	.52*	.33	.41	—		
Patient ratings	.53*	.38	.41	.85**	—	
INDSCAL coordinates	.27	.05	.13	.95**	.78**	—

Note. $N = 16$ affect words. The means of the explicit ratings of valence and activation were computed within each sample and used in computing the correlations with MDS dimension coordinates.
$^{*}p < .05$. $^{**}p < .01$.

(fit and interpretability) suggested that a two-dimensional solution was optimal. Rather, there was more unreliable variance in schizophrenia patients' than in nonpatients' similarity judgments. Despite this variability, however, the structure was stable and like that of the nonpatients, thereby indicating that valence and arousal are core features of affect knowledge in schizophrenia patients.

Second, patients and nonpatients differed somewhat in their average weighting of the dimensions. Valence and arousal were equally important as attributes in the patients' mental representation of affect concepts. By contrast, the nonpatients weighted the arousal dimension more heavily than the valence dimension, as is often found in studies of the semantic structure of affect. This finding suggests that even though valence and arousal are basic attributes of affective knowledge for schizophrenia patients, the relative importance of those semantic components may differ for patients and nonpatients.

Failure to find dramatic differences between the patients' and nonpatients' representations cannot be attributed to the small sample size. MDS analyses are generally robust to small sample sizes, and in addition, we had adequate power to find differences between the samples where they existed. Of course, replication of these findings with additional samples would reinforce our conclusions.

These findings have two important implications. First, they contribute to an increasing body of results that support the notion that the affective circumplex is a flexible methodological tool for describing the affective features contained in a range of stimuli. Specifically, our results provide additional evidence that the affective circumplex is nomothetic. Not only can the valence and arousal dimensions represent core semantic features of affect across a range of samples, cultures, and item sets, but these dimensions can also represent core semantic features of affect in patient populations and community residents who are comparable on social and demographic variables. The nomothetic nature of the circumplex, combined with its ability to represent meaningful individual differences in the weight given to pleasure-displeasure and arousal or activation (Feldman, 1995; Feldman Barrett, 1998, 2001) and its sensitivity to intraindividual differences across contexts or situations (Feldman Barrett & Laurenceau, 2001), suggests that the valence-arousal model has the potential to be a powerful mathematical formalism in the study of affect.

Table 4. *Interpretability coefficients for the control multidimensional scaling (MDS) solution*

	Valence			Activation		
	Independent ratings	Patient ratings	INDSCAL coordinates	Independent ratings	Patient ratings	INDSCAL coordinates
Valence						
Independent ratings	—					
Patient ratings	.96**	—				
INDSCAL coordinates	.96**	.94**	—			
Activation						
Independent ratings	.52*	.33	.46	—		
Patient ratings	.53*	.38	.53*	.85**	—	
INDSCAL coordinates	.31	.10	.23	.97**	.77**	—

Note. $N = 16$ affect words. The means of the explicit ratings of valence and activation were computed within each sample and used in computing the correlations with MDS dimension coordinates.
$^{*}p < .05$. $^{**}p < .01$.

Second, these findings inspire confidence in comparisons of affective experience between schizophrenia patients and nonpatients. In most studies of schizophrenia, an appropriately matched nonpatient group is included as a point of reference for interpreting schizophrenia patients' performance on the phenomenon of interest. If patients' performance diverges from that of the comparison group, the reason for the divergence is presumed to be due to the disease process. However, for some phenomena, including affective experience, the reasons for observed differences could be due not only to the disease process, but also to divergent representations of affect. The present findings indicate that when representing their affective experience, patients with schizophrenia or schizoaffective disorder and comparably matched nonpatient community residents are influenced by the same valence-arousal structure. In short, these findings enable us to more readily "trust" schizophrenia patients' reports of affective experience, insofar as they are represented in a manner that is virtually identical to the manner in which nonpatients' reports are represented.

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