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Social anxiety in schizophrenia

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The relationship between social anxiety and positive and negative symptomatology in schizophrenia was investigated. Thirty eight inpatients with schizophrenia completed a battery of self-report measures of anxiety, a modified Stroop task, and an unstructured role play. Positive symptoms were related to fear in a number of self-report domains (i.e., social and agoraphobic). Negative symptoms were related to global observational ratings of anxiety during the role play as well as specific behaviors associated with self-reported social anxiety (i.e., speech rate and fluency). Positive symptoms generally were not associated with role play ratings. Thus, specific behaviors related to social anxiety appear to be associated with negative symptoms, while self-report is associated with positive symptoms. Problems in the assessment of social anxiety in individuals with schizophrenia and implications of these findings for social skills training in this population are discussed.

Key words: Social anxiety; Positive symptom; Negative symptom; (Schizophrenia)

INTRODUCTION

Over the past 15 years, there has been growing interest in the role of social anxiety in contributing to maladjustment. Relative to other individuals, socially anxious persons tend to disclose less information to others (Leary et al., 1987), recall less information about social interactions (Hope et al., 1990), have lower expectations regarding their ability to execute self-presentational behaviors (Maddux et al., 1988), and generate more negative self-statements (Dodge et al., 1988). Apparently, these individuals are preoccupied by excessive fear of negative evaluation (Butler, 1985), which likely contributes to their tendency to avoid or prematurely escape social situations (Leary, 1983b). Given the ubiquity of social contact, clinically severe social anxiety (i.e., social phobia) can lead

to major disruption in occupational, educational, and interpersonal functioning (Liebowitz et al., 1985).

The co-morbidity of social anxiety and social phobia with other anxiety disorders has been well documented (Barlow et al., 1986; de Ruiter et al., 1989; Sanderson et al., 1990). However, social anxiety may be a significant problem for individuals with other Axis I and Axis II disorders as well. Specifically, both clinical observation (e.g., Morrison and Bellack, 1987) and empirical findings (e.g., Fingeret et al., 1985; Monti and Fingeret, 1987), suggest that individuals with schizophrenia demonstrate more social anxiety during social interactions than non-psychiatric controls. Furthermore, patients with schizophrenia identify 'shyness' as a significant problem (Pilkonis et al., 1980).

In spite of these findings, systematic evaluation of social anxiety in schizophrenia is relatively rare (see Heinssen and Glass, 1990, for a review of the literature). For example, only 7 of the 32 studies involving social skills training for schizophrenia

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reviewed by Wallace and colleagues (1980) used anxiety as a dependent measure. More attention to the role of social anxiety may illuminate processes that have key roles in the expression and development of schizophrenia. For example, high levels of social anxiety may be a factor in social isolation, a common problem among schizophrenia patients. Social isolation after hospital discharge correlates with a lower quality of occupation (relative to admission) and a higher rehospitalization rate (Johnstone et al., 1990). Social isolation has often been attributed to deficits in social skill without consideration of the potential role of social anxiety. Thus, reduction of social anxiety may reduce social isolation, leading to better therapeutic outcome.

Within the schizophrenic population, social anxiety may be a greater problem in patients who predominantly express negative symptoms. Although patients with negative symptoms typically present with little emotional expression (reviewed by McGlashan & Fenton, 1992), flat affect doesn't necessarily correspond with blunted emotional experience (Berenbaum and Oltmanns, 1992). Thus, a patient may demonstrate flat affect but experience significant social anxiety.

Similar to individuals with severe social anxiety, patients with negative symptoms tend to be isolative (Andreason and Olson, 1982). These individuals with predominantly negative symptoms have greater impairment in social relations and quality of life relative to those predominantly expressing positive symptoms (Bellack et al., 1990; Liddle, 1987). Thus, the tendency of patients with negative symptoms to withdraw from social contact may represent attempts to cope with high levels of social anxiety (Strauss et al., 1989).

The present study is a first step in investigating social anxiety in schizophrenia. Unlike previous research, the present study utilizes multiple measures of social anxiety so that this construct can be assessed across various domains of functioning (e.g., cognitive, behavioral). Behavioral ratings in particular have shown promise in their relation to social anxiety among psychiatric patients (Monti et al., 1984). The present study had two primary purposes. First, given the lack of research on social anxiety in persons with schizophrenia, numerous measures commonly used to assess social anxiety in non-schizophrenic samples were employed to

determine the best means of measuring social anxiety in this population. Secondly, it was hypothesized that social anxiety would be positively correlated with negative symptoms and unrelated to positive symptoms.

METHODS

Subjects

Twenty-one men and 17 women hospitalized at the Lincoln Regional Center, Extended Care Unit (ECU) were participants in the study. The ECU is a psychiatric rehabilitation program from which patients are typically discharged to a less restrictive setting after 12 to 36 months of treatment. Average age of the patients was 36.2 years (range = 21–52). The average number of previous admissions was 3.8. All subjects met criteria for schizophrenia ($n = 35$) or schizo-affective disorder ($n = 3$) according to the SCID-P (Spitzer and Williams, 1985). Type and severity of symptomatology was assessed by the Positive and Negative Symptom Scale (PANSS; Kay et al., 1987). Ninety seven percent of the patients were receiving neuroleptic medications averaging 1084 mg Chlorpromazine equivalents per day. Fifty seven percent of the patients were receiving anticholinergic medications.

Measures

Role play assessment

Behavioral social anxiety ratings were derived from an unstructured role play in which patients conversed with a female research assistant. Prior to the role play, subjects were instructed that the research assistant would play a new volunteer on the ward and that they had three minutes to get to know one another. Following the role play, subjects rated their anxiety using the 0–100 Subjective Units of Discomfort Scale (SUDS; Wolpe and Lazarus, 1966). Subjects were trained on the SUDS by providing examples of what specific anchor points represented with respect to social anxiety (e.g., a rating of 100 means that you are so anxious that you want to leave the room).

Behavioral ratings of social anxiety were obtained from videotapes of the role play. Two research assistants, blind to the hypotheses of the study, made both global and specific ratings of

social anxiety. For global ratings, the research assistants were provided the following instructions: 'Make ratings based on how anxious the subject looked if you were observing the interaction taking place on the street' (Hope and Heimberg, 1988). Ratings were made on a 0–100 point scale anchored by 'not at all anxious' and 'extremely anxious.'

Specific ratings of social anxiety were made on the following behaviors: Eye contact, speech rate, shaking (in extremities), long pauses (greater than 3 s), rocking, fidgeting (e.g., touching or scratching oneself), restlessness (e.g., foot tapping), facial twitches, and speech fluency. Such behaviors are typically used to assess specific indices of social anxiety (reviewed by Glass and Arnkoff, 1989). All behaviors were rated on 1–5 point scales, with shaking, long pauses, rocking, fidgeting, restlessness, and facial twitching being anchored by 'none' and 'excessive'. The anchor points for eye contact, speech rate, and speech fluency, were 'too little'-'too much', 'too slow'-'too fast', and 'broken'-'smooth', respectively. Ratings of global social anxiety for all subjects were completed first, followed by specific ratings.

Research assistants were trained by the first author on ratings of social anxiety on the role play test. Training consisted of viewing practice tapes, discussing scoring criteria, and coming to a consensus. Training was conducted on the first 10 subjects, with inter-rater reliability being assessed for the next 28 subjects. Pearson correlation coefficients for the two raters on indices of social anxiety were as follows: Global social anxiety ($r=0.90$), eye contact ($r=0.79$), speech rate ($r=0.78$), shaking ($r=0.95$), long pauses ($r=0.90$), fidgeting ($r=0.93$), restlessness ($r=0.94$), facial twitches ($r=0.90$), and speech fluency ($r=0.72$).

Self-report assessment of anxiety

Subjects completed three self-report measures of anxiety; the brief Fear of Negative Evaluation (FNE; Leary, 1983a), the Fear Questionnaire (FQ; Marks and Mathews, 1979) and a 'ward' version of the social phobia subscale on the FQ developed for this study.

The brief FNE is comprised of 12 statements concerning feelings about being evaluated by others. The respondent is instructed to rate how characteristic each statement is of him/her on a

5-point scale (anchored by 'not at all' and 'extremely'). For the present population, two departures from standard administration were conducted. First, the brief FNE was read to subjects. This was done to reduce any ambiguity concerning comprehension of statements. Second, as a result of pilot work, three statements written as double-negatives were re-worded to facilitate patients' comprehension of the scale.

The FQ is comprised of fifteen situations which are subdivided into subscales of social phobia, agoraphobia, and blood-injury phobia. A total index of phobia is obtained by summing all items. The subject is instructed to rate avoidance for each situation on a 8-point scale. As with the brief FNE, all situations were read to the subject. Because inpatients may be limited in their access to certain situations (e.g., speaking or acting to an audience), subjects were asked to rate each situation on an 8-point scale for 'how nervous does ... make you?', rather than rating their avoidance. The scale was anchored by 'not at all nervous' and 'extremely nervous.' The range on the FQ is 0 to 120 for the total index of phobia, and 0–40 for each of the subscales.

The authors developed a 6-item scale similar in format to the revised FQ as described above. This scale, which we entitled the 'Ward Fear Scale', assesses social anxiety in 6 situations the patient is likely to encounter while living on an inpatient psychiatric ward. The items comprising the scale were: (1) Meeting a new patient for the first time; (2) Having someone watch you learn a new task in a group, such as occupational therapy; (3) Having to talk in a new therapy group in front of other people for the first time; (4) Meeting a new psychiatrist/psychologist for the first time; (5) Doing a role play in front of other patients while in a group; (6) Talking with the psychiatric technician on the way to the canteen or another part of the regional center. The range on the Ward Fear scale is 0 to 48 and it was highly correlated ($r=0.80$) with the social phobia subscale on the FQ.

Information processing assessment of anxiety

A Stroop task, adapted from Hope et al. (1990; and Mattia et al., in press) and modified for computer presentation, was used as an information processing measure of anxiety. Subjects were

instructed to name the ink color of words related to social threat (e.g., 'foolish'), physical threat (e.g., 'hospital'), in addition to the original Stroop task using color names. As described in Hope et al. (1990), social and physical threat words were matched to their respective control words on number of letters, syllables, and frequency of occurrence in language. Color names were matched with groups of five X's for the color control task. Words and colors utilized in the current study may be found in Mattia et al. (in press).

Subjects were seated in front of an IBM-compatible personal computer. The words/letters were presented on a video monitor, nine per line for eleven lines. The eleven lines of a particular word/stimulus type constitute a set. Thus, each subject received six stimulus sets (social threat, social control, physical threat, physical control, color words, group of X's). These stimulus sets were randomly ordered for each subject. Prior to each stimulus set, subjects were asked to rate current feelings of anger, anxiety, and happiness on 8-point Likert scales. The dependent measure on the modified Stroop task is the index of interference, which is calculated as the difference (in seconds) between naming the color of threat and respective control words. Interference to social threat words is increased for social phobics, while individuals with panic disorder demonstrate the most interference to physical threat words (Hope et al., 1990). Successfully treated social phobics have lower social threat interference indices than social phobics who failed to improve in treatment (Mattia et al., in press).

Procedure

No more than one month after SCID-P and PANSS assessment, subjects were invited to participate in the present study. All subjects first completed the unstructured role-play, followed by the self report questionnaires (FQ, Wardfear, and FNE), and ending with the modified Stroop task.

RESULTS

Correlational analyses

Prior to analysis, distributions of all variables were examined for presence of outliers and deviation from assumptions of normality. Data were

TABLE 1

Means and standard deviations on the fear questionnaire social phobia subscale from people with schizophrenia and social phobia

<i>Clinical group</i>	<i>Pre-treatment</i>		<i>Post-treatment</i>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Schizophrenia	18.2	8.4	—	— ¹
Social phobia ²	20.8	6.6	12.9	7.5
Social phobia ³	19.5	8.3	14.8	8.9
	21.4	11.1	14.8	8.9 ⁴

¹The schizophrenia group was assessed before engagement in a comprehensive cognitive/social remediation program. No post-treatment data are available.

²Heimberg et al. (1990).

³Mattick and Peters (1988).

⁴Two groups were studied in Mattick and Peters (1988).

removed from analyses based upon standard criteria¹.

To assess the absolute level of social anxiety present in the current sample, mean self-reported social anxiety on the FQ-Social Phobia subscale was compared to that previously reported in social phobic samples of comparable age and sample size (Heimberg et al., 1990; Mattick and Peters, 1988). The brief FNE was not used for comparison as it has not been as widely used in social phobia research as the FQ. As illustrated in Table 1, social anxiety in the current sample is within the clinical range reported by pre-treatment social phobics and elevated relative to the same subjects post-treatment. Thus, the current sample appears to be experiencing an elevated level of social anxiety.

Pearson correlational analyses were conducted to determine the relationship between anxiety measures and symptomatology type. As summarized in Table 2, positive symptoms were associated with higher levels of fear to agoraphobic and ward situations, and less eye contact during the unstruc-

¹ Consistent with previous research (Mattia et al., in press), subject data were deleted for those information processing indices of interference which had values ± 2.00 standard deviations. For all other variables, data were removed based on the following equation: The difference between data values at the 75th and 25th percentiles of the distribution was calculated. The difference was then multiplied by 1.5, and added to the 75th percentile value, and subtracted from the 25th percentile value. This method tends to be less sensitive than the method used with the Stroop task to instability of mean values resulting from extreme outlier cases. These procedures led to the removal of four subjects data.

TABLE 2
Inter-correlations among anxiety measures and symptomatology

Anxiety measure	Positive symptoms	Negative symptoms
FNE	0.15	-0.09
FQ-agoraphobia	0.34*	0.22
FQ-blood and injury	0.27**	0.05
FQ-social phobia	0.20	0.11
Ward Fear	0.33*	0.06
SUDS	-0.02	-0.03
Global Anxiety	0.01	0.28*
Specific behaviors		
Eye contact	-0.48*	0.16
Speech rate	0.08	-0.29*
Shaking	0.19	-0.19
Long pauses	0.02	0.20
Rocking	-0.01	0.31*
Fidgeting	0.14	-0.01
Restlessness	0.13	0.13
Facial twitches	0.07	0.14
Speech fluency	-0.10	-0.37*
Stroop task indices		
Physical threat	0.13	-0.07
Social threat	-0.09	-0.11
Color names	0.02	-0.09

* $p < 0.05$.

** $p < 0.06$.

tured role play. Negative symptoms were associated only with behavioral indices of social anxiety. More negative symptoms were associated with greater global social anxiety, more rocking, slower speech rate and less fluent speech during the unstructured role play. The other measures of social anxiety (i.e., FQ-Social Phobia, Ward Fear, Brief FNE, SUDS, and the social threat interference index) were unrelated to negative symptoms.

The hypothesis that social anxiety is associated with negative symptoms was further explored by focusing on the relationship between specific behavior ratings and symptomatology. To reduce the number of variables, only those specific behaviors significantly correlated with the FQ-Social Phobia or Ward Fear scales were included in the analyses. These specific behaviors share variance with highly related self-report measures which assess social anxiety. Thus, if these behaviors show a stronger correlation with negative than with positive symptoms, then the hypothesized association between negative symptoms and social anxiety would receive some support.

Specific behaviors significantly correlated with the FQ-Social Phobia subscale were number of long pauses ($r = 0.32$, $p < 0.05$). Long pauses ($r = 0.43$, $p < 0.01$) and speech fluency ($r = -0.37$, $p < 0.05$) were the specific behaviors significantly correlated with the Ward-Fear Scale. As observed in Table 2, correlations were consistently higher between these specific behaviors and negative symptoms than with positive symptoms.

To determine the best combination of specific behaviors which contribute to negative symptoms, the two variables having significant bivariate correlations with the Ward-fear and FQ-Social Phobia scales were entered into backward stepwise multiple regression analyses. Table 3 summarizes the steps of the analysis. Negative symptoms were significantly associated with less speech fluency (or broken speech) which accounted for 14% of the variance. When applied to positive symptoms, none of the predictor variables remained in the model.

DISCUSSION

The results of this study suggest that specific behaviors related to social anxiety are associated with negative symptoms in schizophrenia, while self report is associated with positive symptoms. The best predictive model of negative symptoms from specific behaviors (i.e., Speech Fluency), accounted for 14% more variance than when the same predictors were applied to positive symptoms. Thus, there appears to be specificity between certain anxiety-related behaviors and negative symptomatology. This would be consistent with the hypothesis that fear of social situations may be related to the social isolation associated with negative symptoms.

TABLE 3

Backward multiple regression model predicting negative symptoms from specific behaviours

Step	Predictor variable(s)	Beta	R ²	F
1	Long pauses	0.01		
	Speech fluency	-0.36	0.14	2.65
2	Speech fluency	-0.37	0.14	5.31*

* $p < 0.05$.

The findings suggest that self-report evaluation of social anxiety is related to positive symptomatology. In general, patients reported anxiety across multiple domains (i.e., social and agoraphobic) suggesting the presence of numerous specific fears (e.g., 'Walking alone in busy streets;' 'Talking to people in authority'). This finding is consistent with previous research which has revealed a relationship between positive symptoms and anxiety-depression (or distress) (Mueser et al., 1991). Perhaps the high rate of self-reported social and agoraphobic fears may be related to certain aspects of the schizophrenic disorder such as paranoid delusions. The behavioral manifestations of social anxiety may relate to the skill deficits of negative-symptom patients who are unaccustomed to interacting with others. Future research needs to explore these hypotheses in greater detail.

A number of other dimensions and subgroupings should be expected to be relevant to social anxiety. For example, although there are some important differences between schizophrenic and schizoaffective patients, there are many similarities which could be relevant to social anxiety (Mattes and Nayak, 1984; Levinson and Levitt, 1987; Levinson and Mowry, 1991; Kraemer et al., 1989). In view of the current findings, further study of diagnostic differences should proceed carefully, because such differences could be secondary to group differences in levels of positive and negative symptoms.

A number of secondary findings from this study warrant brief discussion. First, behavioral ratings produced relatively robust correlations with negative symptoms. However, the question is raised as to the extent to which these relationships are confounded by neuroleptic side effects. For example, Global Social Anxiety was significantly correlated with negative symptoms, but not with the Ward-Fear and FQ-Social Phobia Scales. Thus, Global Social Anxiety may be more indicative of akathisia than social anxiety, although subsequent analyses suggest that this might not be the case for specific behaviors². However, since ratings of

extra-pyramidal side effects were unavailable, this conclusion is only tentative. Therefore, subsequent research in this area should more directly measure the role of neuroleptic side effects in artificially augmenting the social anxiety-negative symptom relationship.

Individuals with schizophrenia demonstrated no selective impairment on any of the Stroop indices of interference. It is likely that pervasive deficits in early information processing (reviewed by Nuechterlein and Dawson, 1984), eclipse the interference effects shown on this task by other groups. These findings strongly suggest that the construct validity of assessment instruments utilized in one clinical population (i.e., social phobics) may change when applied to schizophrenia. Further, it underscores the importance of utilizing a multi-level approach that includes observational ratings in assessing a given clinical construct in schizophrenia.

These findings have important implications for social skills training. For example, as pointed out by Heinssen and Glass (1990), differential levels of social anxiety among individuals with schizophrenia may account for the uneven treatment gains observed in the social skills literature. Thus, social skills training may be most effective for patients with a skills deficit as opposed to those with social impairment associated with social anxiety. For the latter group of patients, social skills training may have to incorporate interventions modeled on treatment for social phobics that are centered around therapeutic exposure to feared situations (e.g., Heimberg et al., 1990). This approach reduces the social anxiety that potentially may prevent the patient from practicing newly trained behaviors in social situations.

A number of caveats should be noted about findings from the present study. First, self-report measures were either developed (i.e., the Ward Fear Scale) or modified (i.e., FQ and brief FNE) for this population. This reflects both the lack of attention given by previous research to validating self-report measures of social anxiety in schizophrenia and the special needs of this particular clinical group. Thus, future research needs to more rigorously evaluate the validity of self-report as a means of assessing social anxiety in this population. Second, an important question is whether what was measured during the role play was indeed

² To address this issue, correlational analyses were conducted between CPZ-equivalent neuroleptic levels and positive and negative symptoms. Correlations for both positive ($r=0.13$) and negative symptoms ($r=0.15$) were not significant. Further, correlations between CPZ level and specific behaviors comprising the best predictive model (i.e., fluency) for negative symptoms were also not significant.

social anxiety. Besides neuroleptic side-effects, role play behavior may also be indicative of *general* anxiety, rather than *social* anxiety. This issue needs to be addressed in future research, perhaps by assessing the relationship between role play behavior and behavior in non-social situations.

In closing, this study represents a first step in understanding how social anxiety affects symptomatology among individuals with schizophrenia. Results suggest that social anxiety should be considered when treatment strategies are formulated. Future research should explore the hypothesis that a subgroup of individuals with schizophrenia may benefit most from social skills training combined with techniques that directly address social anxiety.

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REFERENCES

- Andreason, N.C. and Olson, S. (1982) Negative vs. positive schizophrenia: Definition and validation. *Arch. Gen. Psychiatry* 39, 789–794.
- Barlow, D.H., DiNardo, P.A., Vermilyea, B.B., Vermilyea, J.A. and Blanchard, E.B. (1986) Co-morbidity and depression among the anxiety disorders: Issues in classification and diagnosis. *J. Nerv. Ment. Dis.* 174, 63–72.
- Bellack, A.S., Morrison, R.L., Wixted, J.T. and Mueser, K.T. (1990) An analysis of social competence in schizophrenia. *Br. J. Psychiatry* 156, 809–818.
- Berenbaum, H. and Oltmanns, T.F. (1992) Emotional experience and expression in schizophrenia and depression. *J. Abnor. Psychol.* 101, 37–44.
- Butler, G. (1985) Exposure as a treatment for social phobia: Some instructive difficulties. *Behav. Res. Ther.* 23, 651–657.
- de Ruiter, C., Ruken, H., Garssen, B., van Schaik, A. and Kraaimaat, E. (1989) Comorbidity among the anxiety disorders. *J. Anx. Disorders* 3, 57–68.
- Dodge, C.S., Hope, D.A., Heimberg, R.G. and Becker, R.E. (1988) Evaluation of the social interaction self-statement test with a social phobic population. *Cog. Ther. Res.* 12, 211–222.
- Fingeret, A.L., Monti, P.M. and Paxson, M.A. (1985) Social perception, social performance, and self-perception: A study with psychiatric and nonpsychiatric groups. *Behav. Modif.* 9, 345–356.
- Glass, C.R. and Arnkoff, D.B. (1989) Behavioral assessment of social and social phobia. *Clin. Psych. Rev.* 9, 75–90.
- Heimberg, R.G., Dodge, C.S., Hope, D.A., Kennedy, C.R., Zollo, L.J. and Becker, R.E. (1990) Cognitive behavioral group treatment for social phobia: Comparison with a credible placebo control. *Cog. Ther. Res.* 14, 1–23.
- Heinssen, R.K., Jr. and Glass, C.R. (1990) Social skills, social anxiety, and cognitive factors in schizophrenia. In H. Leitenberg (Ed.), *Handbook of Social and Evaluation Anxiety*. New York: Plenum Press.
- Hope, D.A. and Heimberg, R.G. (1988) Public and private self-consciousness, and social phobia. *J. Pers. Assess.* 52, 626–639.
- Hope, D.A., Heimberg, R.G. and Klein, J.F. (1990) Social anxiety and the recall of interpersonal information. *J. Cog. Psych. Ther. Internat. Quart.* 4, 185–195.
- Hope, D.A., Rapee, R.M., Heimberg, R.G. and Dombeck, M.J. (1990) Representations of self in social phobia: Vulnerability to social threat. *Cog. Ther. Res.* 14, 177–189.
- Johnstone, E.C., MacMillan, J.F., Frith, C.D., Benn, D.K. and Crow, T.J. (1990) Further investigation of the predictors of outcome following first schizophrenic episodes. *Br. J. Psychiatry* 157, 182–189.
- Kay, S., Fiszbein, A. and Opler, L. (1987) The positive and negative syndrome scale (PANSS) for schizophrenia. *Schizophr. Bull.* 13, 261–276.
- Knight, R.A. (1984) Converging models of cognitive deficits in schizophrenia. In W.D. Spaulding and J.K. Cole (Eds.), *Nebraska Symposium on Motivation: Theories of Schizophrenia and Psychosis*, (Vol. 31). Lincoln: University of Nebraska Press.
- Kraemer, M.S., Vogel, V.H., DiJohnson, C., Dewey, D.A., Sheves, P., Cavicchia, S., Little, P., Schmidt, R. and Kimes, I. (1989) Antidepressants in 'depressed' schizophrenic inpatients. *Arch. Gen. Psychiat* 46, 922–928.
- Leary, M.R. (1983a) A brief version of the fear of negative evaluation scale. *Pers. Soc. Psychol. Bull.* 9, 371–375.
- Leary, M.R. (1983b) *Understanding social anxiety: Social, personality and clinical perspectives*. Beverly Hills, CA: Sage.
- Leary, M.R., Knight, P.D. and Johnson, K.A. (1987) Social anxiety and dyadic conversation: A verbal response analysis. *J. Soc. Clin. Psychol.* 5, 34–50.

- Levinson, D. and Levitt, M. (1987) Schizoaffective mania reconsidered. *Am. J. Psych.* 144, 415–425.
- Levinson, D.F. and Mowry, B.J. (1991) Defining the schizophrenia spectrum: Issues for genetic linkage studies. *Schizophr. Bull.* 17, 491–514.
- Liddle, P.F. (1987) The symptoms of chronic schizophrenia: A re-examination of the positive-negative dichotomy. *Br. J. Psychiatry* 151, 145–151.
- Liebowitz, M.R., Gorman, J.M., Fyer, A.J. and Klein, D.F. (1985) Social phobia: Review of a neglected anxiety disorder. *Arch. Gen. Psychiatry* 42, 729–736.
- Maddux, J.E., Norton, L.W. and Leary, M.R. (1988) Cognitive components of social anxiety: An investigation of the integration of self-presentation theory and self-efficacy theory. *J. Soc. Clin. Psychol.* 6, 180–190.
- Marks, I.M. and Mathews, A.M. (1979) Brief standard self-rating scale for phobic patients. *Behav. Res. Ther.* 17, 263–267.
- Mattes, J.A. and Nayak, D. (1984) Lithium versus fluphenazine for prophylaxis in mainly schizophrenic schizoaffectives. *Biol. Psychiat* 19, 445–449.
- Mattia, J.I., Heimberg, R.G. and Hope, D.A. (in press) The revised Stroop color-naming task in social phobics: Diagnostic and treatment outcome implications. *Behav. Res. Ther.*
- Mattick, R.P. and Peters, L. (1988) Treatment of severe social phobia: Effects of guided exposure with and without cognitive restructuring. *J. Consul. Clin. Psychol.* 56, 251–260.
- McGlashan, T.H. and Fenton, W.S. (1992) The positive-negative distinction in schizophrenia: Review of natural history validators. *Arch. Gen. Psychiatry.* 49, 63–72.
- Monti, P.M., Boice, R., Fingeret, A.L., Zwick, W.R., Kolko, D., Munroe, S. and Grunberger, A. (1984) Midi-level measurement of social anxiety in psychiatric and non-psychiatric samples. *Behav. Res. Ther.* 22, 651–660.
- Monti, P.M. and Fingeret, A.L. (1987) Social perception and communication skills among schizophrenics and nonschizophrenics. *J. Clin. Psychol.* 43, 197–205.
- Morrison, R.L. and Bellack, A.S. (1987) Social functioning of schizophrenic patients: Clinical and research issues. *Schizophr. Bull.* 13, 715–725.
- Mueser, K.T., Douglas, M.S., Bellack, A.S. and Morrison, R.L. (1991) Assessment of enduring deficit and negative symptom subtypes in schizophrenia. *Schizophr. Bull.* 17, 565–582.
- Nuechterlein, K. and Dawson, M. (1984) Information processing and attentional functioning in the developmental course of schizophrenic disorders. *Schizophr. Bull.* 10, 160–203.
- Pilkonis, P.A., Feldman, H., Himmelhoch, J. and Cornes, C. (1980) Social anxiety and psychiatric diagnosis. *J. Nerv. Ment. Dis.* 168, 13–18.
- Sanderson, W.C., DiNardo, P.A., Rapee, R.M. and Barlow, D.H. (1990) Syndrome comorbidity in patients diagnosed with a DSM-III-R anxiety disorder. *J. Abnorm. Psychol.* 99, 308–312.
- Spitzer, R. and Williams, J. (1985). Structured clinical interview for DSM-III-R-Patient version. New York: New York State Psychiatric Institute.
- Strauss, J.S., Rakfeldt, J., Harding, C.M. and Lieberman, P. (1989) Psychological and social aspects of negative symptoms. *Br. J. Psychiatry* 155 (supplement), 128–132.
- Wallace, C.J., Nelson, C.J., Liberman, R.P., Aitchison, R.A., Lukoff, D., Elder, J.P. and Ferris, C. (1980) A review and critique of social skills training with schizophrenic patients. *Schizophr. Bull.* 6, 42–63.
- Wolpe, J. and Lazarus, A.A. (1966) Behavior therapy techniques: A guide to the treatment of neuroses. Oxford: Pergamon.