

## Predicting Stress in Chronic Schizophrenics Using Schizotypic Signs

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The relationship of ten measures of schizotypic symptoms to the level and variability of perceived stress was evaluated in a sample of 31 chronic schizophrenics. High scores on a cluster of schizotypic traits (perceptual aberration, schizotypic ambivalence, magical ideation, social fear, and cognitive slippage) was predictive of higher levels of chronic stress in these patients. Four of these schizotypic traits (all but social fear) represent mild forms of the positive symptoms of schizophrenia. Issues regarding the relationship of schizotypic traits, positive symptoms, and perceived stress were discussed.

Heterogeneity within schizophrenia has been generally accepted by most investigators from the time of Blueler (1911/1950) who first coined the term "schizophrenia" as a plural noun (schizophrenias). Identifying meaningful subgroups of schizophrenics, however, has proved a real challenge. The best known division is the process/reactive distinction (Harris, 1975; Phillips, 1953), although other subdivisions such as paranoid/nonparanoid (Magaro, 1981; Torrey, 1981) and positive/negative symptom patterns (Andreasen, 1985; Lewine, Fogg, & Meltzer, 1983; Pogue-Geile & Harrow, 1984) have shown some promise. But the search continues for other trait measures that will be even more successful in dividing this heterogeneous population into distinctive subgroups.

One approach to the task of identifying subgroups of schizophrenics is based on the diathesis/stress model of Meehl (1962, 1964). Meehl argued that a genetic factor (schizotaxia) was a necessary but not sufficient condition for the development of schizophrenia and that individuals with this predisposing factor would develop a distinctive personality organization (schizotypy). Meehl (1964) suggested that the schizotype could be identified by a series of signs -- stable characteristics of the individual which are apparent even in the fully compensated schizotype. Recently, self-report measures have been developed for many of the schizotypic signs described by Meehl including Physical and Social Anhedonia (Chapman, Chapman, & Raulin, 1976), Perceptual Aberration (Chapman, Chapman, & Raulin, 1978), Somatic Symptoms (Raulin, Chapman, & Chapman, 1978), Magical Ideation (Eckblad & Chapman, 1983), Intense Ambivalence (Raulin, 1984), Schizotypic Ambivalence (Raulin, 1986), Social Fear (Raulin & Wee, 1984), Rage (Raulin, 1982), Distrust (Raulin, 1982), and Cognitive Slippage (Miers & Raulin, 1984). Each of these scales was developed to have high reliability and minimal method variance. All of the published scales show a significantly higher mean score in schizophrenic groups when compared with a normal control group. Test-retest reliability, which is available for most of the above scales, suggests that these traits are stable in both normal and psychiatric populations (Mahler, Raulin, O'Gorman, & Furash, 1987). Furthermore, college students who scored high on one or more of these scales display mild forms of a variety of symptoms found in schizophrenic populations (Beckfield, 1985;

Chapman, Chapman, Raulin & Edell, 1978; Chapman, Edell & Chapman, 1980; DePalma & Raulin, 1982; Eckblad & Chapman, 1983; Edell & Chapman, 1979; Friedland, Raulin, & Rourke, 1984; Fujioka & Chapman, 1984; Haberman, Chapman, Numbers & McFall, 1979; Martin & Chapman, 1982; Miller & Chapman, 1983; Numbers & Chapman, 1982; Raulin, 1984; Raulin & Henderson, 1987; Raulin, Van Slyck & Rourke, 1983; Simons, 1981, 1982; Simons, MacMillan & Ireland, 1982a, 1982b).

These measures of schizotypic signs show promise in a search for subtypes of schizophrenia. They are short, highly reliable measures which are stable in a schizophrenic population. Most are characteristic of a portion of schizophrenics but not all schizophrenics. The intercorrelations of these signs range from very low to very high with some patterns or syndromes beginning to emerge from the data (DePalma & Raulin, 1982; Fujioka & Chapman, 1984; Propper, Raulin, Lowrie, Trigoboff, Henderson, & Watson, 1987; Raulin & Henderson, 1987). As work continues in the efforts to identify clusters within these schizotypic signs that might indicate homogeneous subgroups of schizophrenics, it becomes even more important to understand the predictive relationships of each of the signs. For example, it would be very valuable to know the relationship of each of these signs to variables which have already shown some promise in differentiating subgroups. The pattern of life stress is one such variable.

The role of stressors in the development of schizophrenia has been debated for decades. Most models of schizophrenia implicitly assume that stress plays a central role in creating and/or triggering the psychosis. But empirical data dating back more than three decades suggests that there is heterogeneity among schizophrenics in the degree to which stress seems to play a role in the development of schizophrenia (Phillips, 1953). Significant stressors are more likely in good premorbid social-history schizophrenics (reactive schizophrenics) and may play a greater role in the breakdown of those patients than for the poor premorbid social-history schizophrenics (process schizophrenics). This finding has been replicated several times (see Chapman, Day, & Burstein, 1961).

In the current study, the relationship of screening versions (Raulin, Van Slyck, & Rourke, 1983) of these schizotypy scales to stress as measured by the Hassles and Uplifts Scale (Kanner, Coyne, Schaefer, & Lazarus, 1981) was evaluated in a schizophrenic population. This study continues the process of attempting to identify subgroups of schizophrenics on the basis of symptom patterns and validating those subtypes against other independent clinical criteria.

### *Method*

#### *Subjects*

Fifty-five outpatients with a hospital diagnosis of schizophrenia or schizoaffective disorder were sampled randomly from a partial hospitalization program at a VA Medical Center. Eighteen subjects refused to participate and six subjects were dropped from the study because they were unable to complete the scales or were hospitalized during the course of the study, leaving a sample of 31 patients. The average age of this sample was 39.42 ( $s=11.51$ ); the average education level was 12.29 ( $s=1.97$ ); the average number of years since the first diagnosis of psychosis was 16.71 ( $s=10.79$ ). All patients were male; 26 were caucasian and 5 were black; only 3 were married.

#### *Measures*

Each patient was initially interviewed using the *Schedule for Affective Disorders and Schizophrenia - Lifetime Version (SADS-L; Spitzer & Endicott, 1977)* to verify the

hospital diagnosis. Each patient completed a test protocol containing screening versions of ten schizotypy scales with items intermixed (physical anhedonia, perceptual aberration, somatic symptoms, intense ambivalence, schizotypic ambivalence, distrust, social fear, rage, magical ideation, and cognitive slippage). Table 1 provides a brief description of each of these scales.

*Table 1*  
*Brief Descriptions of the Schizotypy Scales*

*Physical Anhedonia* - inability to experience physical pleasure

*Perceptual Aberration* - perceptual distortions especially of body image

*Intense Ambivalence* - strong simultaneous or rapidly fluctuating positive and negative feelings

*Somatic Symptoms* - a collection of symptoms thought to be indicative of subtle neurological dysfunction

*Social Fear* - strong fear of people and/or social interactions

*Magical Ideation* - a general belief in causal connections between behavior and events which are objectively unrelated

*Cognitive Slippage* - a subtle form of thought disorder

*Distrust* - a strong distrust of the motives of other people

*Rage* - characterized by strong, periodic, uncontrolled, angry outbursts

At monthly intervals for five months, patients completed a Hassles and Uplifts Scale. Longitudinal data were gathered on this stress measure since it was felt that both average intensity of stress and the variability of intensity were meaningful constructs that might help differentiate patterns of schizophrenic pathology. According to the directions of Kanner et al. (1981), four scores were computed on the Hassles and Uplifts Scale from each testing: Frequency and intensity measures were computed separately for the Hassles Scale and the Uplifts Scale. The frequency measure is an index of the total number of hassling or uplifting experiences over the last month. The intensity measure is a weighted frequency count which reflects the average psychological impact of the experiences.

### *Results*

The longitudinal stress data were converted to two sets of indices. One set was the average score on each of the four measures discussed above (hassles frequency; hassles intensity; uplifts frequency; uplifts intensity). These measures represented the mean stress levels. The second set was the variability (standard deviation) on each of the four measures. These measures provided an index of how volatile the stress levels were. Table

2 presents the product-moment correlations of the schizotypy scores with the average stress measures while Table 3 presents the correlations of the schizotypy scores with the variability of stress measures. A number of significant relationships emerged, many of which fit very nicely with existing data and current speculation about these schizotypic signs.

*Table 2*  
*Relationship of Schizotypic Signs to the*  
*Average Level of Hassles and Uplifts*

Scale	HASSLES		UPLIFTS	
	FREQ	INTEN	FREQ	INTEN
Physical Anhedonia	-.21	-.23	-.34*	-.42*
Perceptual Aberration	.61***	.62***	.44**	.39*
Somatic Symptoms	.14	.21	-.04	-.05
Intense Ambivalence	.14	.26	.02	.02
Schizotypic Ambivalence	.27	.39*	.04	.04
Distrust	.14	.18	.00	-.06
Social Fear	.22	.32*	.07	.11
Rage	.25	.15	.06	-.04
Magical Ideation	.26	.44**	.04	.16
Cognitive Slippage	.25	.35*	.07	.04

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ; one-tail tests

*Table 3*  
*Relationship of Schizotypic Signs to the*  
*Variability in the Level of Hassles and Uplifts*

Scale	HASSLES		UPLIFTS	
	FREQ	INTEN	FREQ	INTEN
Physical Anhedonia	-.11	-.11	.15	.02
Perceptual Aberration	.08	.38*	-.03	.12
Somatic Symptoms	-.10	.18	-.08	-.13
Intense Ambivalence	.05	.31	.15	.07
Schizotypic Ambivalence	-.05	.31	.04	-.02
Distrust	.09	.29	.20	.08
Social Fear	.14	.35*	.13	.07
Rage	.36*	.29	.28	.20
Magical Ideation	-.17	.13	-.10	-.09
Cognitive Slippage	.03	.34*	.07	-.01

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ; one-tail tests

*Discussion*

Several theoretically interesting findings emerged. First, hassles were more related to schizotypy scores than uplifts. Of particular interest is the fact that four of the five schizotypy measures which show the greatest relationship to hassles (perceptual aberration, schizotypic ambivalence, magical ideation, and cognitive slippage) have been found in a recent study (Propper et al., 1987) to form a strong cluster which seems to represent mild forms of the positive symptoms of schizophrenia. The intensity (not just the frequency) of hassles showed the strongest relationship to these scales. The strongest predictor in this set of schizotypy scales is the Perceptual Aberration Scale which has consistently predicted psychotic-like features in normal subjects who score high on the scale (Chapman, Chapman, Raulin, & Edell, 1978; Chapman, Edell, & Chapman, 1980). High scorers on the Perceptual Aberration Scale are likely to report more hassles in their lives than people who score within the normal range on this scale.

The Uplifts Scale produced some interesting findings that deserve further study. Anhedonia showed a negative correlation with uplifts as expected (see below). Scores on most of the other scales were unrelated to the reported frequency or intensity of uplifts. A notable exception was the Perceptual Aberration Scale. A moderate (and statistically significant) relationship between perceptual aberration scores and both the frequency and intensity of uplifts was noted. What makes this finding striking is the near zero correlations of all the other schizotypy scales (except for Physical Anhedonia) with uplifts -- this, in spite of the fact that perceptual aberration is highly correlated with many of the other schizotypy scales. [This finding was so striking that it was assumed to be a computational error until every aspect of the data and the computations had been checked twice.] These data suggest a unique relationship of this scale to life events (both hassles and uplifts). Perceptual aberrators would seem to be either more sensitive to the emotional aspects of daily events (consequently, viewing those events in terms of hassles and uplifts) or have a lifestyle that increases their exposure to emotional experiences. This is the opposite of what is traditionally found for anhedonics. If this finding is confirmed in further studies, it might suggest that perceptual aberrators, not only have a tendency to distort perceptions (sometimes to the point of psychotic-like symptoms), but also have a tendency to experience greater emotional turmoil. These two factors might well feed on one another, increasing the likelihood of breakdown. On the other hand, from a treatment perspective, if this speculation were true, it would give us two points at which to direct an intervention.

The correlations of the Physical Anhedonia Scale with the stress measures are consistent with past findings and speculations (Chapman, Chapman, Raulin, & Edell, 1978; Chapman, Edell, & Chapman, 1980; Raulin & Henderson, 1987). Anhedonia correlates negatively with the average level of both hassles and uplifts (significant for uplifts). No other schizotypy scale showed this pattern. The Physical Anhedonia Scale has typically been predictive of social withdrawal and a blunting of affect but few other psychotic-like features. The symptom pattern resembles the negative symptoms of schizophrenia. The speculation is that this general blunting of affect is a response of some subjects to more disorganizing symptoms (Raulin & Henderson, 1987; Raulin et al., 1983).

Questions still remain to be answered. This exploratory study only shows that there is a positive relationship between reported level of stress and scores on the schizotypy scales that represent more positive-like symptoms of schizophrenia. The effect is too large and the schizotypy measures much too different from the Hassles and Uplifts measure to attribute this observed relationship to a response set bias alone. It also seems unlikely that those patients who score high on the relevant schizotypy scales are simply more unlucky and experience more stressful situations by chance alone. More reasonable

explanations are that the subjects (1) create more stress in their lives through their own action, (2) are more sensitive to the normal stressors of life, and/or (3) are unable to cope with normal stress.

It is always dangerous to draw causal inferences from a simple correlation. The correlational data from this study do not allow us to choose between two or more hypothesized causal chains. But, of course, our ultimate goal is to understand the causal chain that leads to the development of schizophrenia. Do the schizotypic signs measured by the scales used in this study create stresses in some direct, causal manner? Could the factor(s) that lead to the schizotypic symptoms also account for the increased level of stress? Could high levels of stressful experiences and/or a vulnerability to stress be causing the schizotypic symptoms? Finally, could the true causal chain include several of these speculations with feedback loops that might explain rapid increases in symptomatology once a certain threshold is crossed? These would not be easy questions to address. An intensive longitudinal study would be needed. In addition, a new set of schizotypy measures would need to be developed -- one that measures the schizotypic characteristics in terms of current level or state. The current schizotypy measures were designed to measure traits, and research indicates that the measures do show the stability expected of traits (Mahler et al., 1987). The presumed heterogeneity of the disorder of schizophrenia would further complicate the research. Still, these questions are critical if we are to understand schizophrenia.

Although the study reported here was intended to be exploratory, it incorporated several strong design features. Its greatest strength is that the construct of stress was dimensionalized. Positive and negative life experiences were measured separately. A distinction was made between frequency (how often the events occurred) and intensity (how strong a psychological impact the events had on the subject). Finally, repeated measures of stress levels were obtained which (1) increased the reliability of the composite measure of stress and (2) allowed the computation of separate indices of "typical level" and "variability in the level" of stress. It was expected that the variability in the stress levels would be as important an indicator of negative impact on the subjects as the typical levels of stress. In general, however, variability in stress scores were less predictive of schizotypy scores than the actual levels of stress.

It is important to note that all of the patients in this study were schizophrenic, but it was only certain patients that reported increases in stressors in their life. Furthermore, certain schizotypic symptoms are predictive of which subjects will report the greatest intensity of stress. This finding, coupled with other recent findings (Propper et al., 1987), suggests that it may be possible to identify homogeneous subgroups of schizophrenics, subgroups which show distinctive symptom patterns and may have different etiologies.

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