Schizotypy and Socioeconomic Status: A Test of the Multigenerational Drift Hypothesis

Joseph Brown Michael L. Raulin State University of New York at Buffalo

Schizophrenia and social class are negatively correlated with each other. This is one of the few consistent facts to arise from decades of schizophrenia research. Some theorists have suggested that the lowest social classes may have a stronger genetic loading for achizophrenia relative to the highest classes. Meehl hypothesized that multigenerational drift occurs which results in a larger proportion of persons predisposed to schizophrenia residing in the lower social classes as compared with the higher social classes. Since his proposal of the diathesis-stress model for schizophrenia, numerous self-report measures of traits thought to be indicative of predisposition to schizophrenia have been developed. This study utilizes five of these scales to operationally define predisposition to schizophrenia. The scales utilized are the Physical Anhedonia, Perceptual Aberration, Somatic Symptoms and two Intense Ambivalence indices. The 386 college student subjects identified as schizotypic by these scales are compared with 392 control subjects on Hollingshead's Four Factor Index of Social Position, a widely used measure of socioeconomic status. Results provide only partial support for a multigenerational drift phenomenon being active in this sample. Only the Physical Anhedonia scale identified subjects with lower mean SES scores than controls. Discussion of this result focuses on the differing hypotheses of Rado and Adamski, Raulin & Colevecchia, where the former viewed anhedonia as the central genetically-determined trait of the schizotype, and the latter group have speculated that anhedonia may serve as a reactive symptom of schizotypy. Possible biases in the study sample are also examined, and future research needs are delineated to further test the multigenerational drift hypothesis.

One of the most consistent findings within schizophrenia research is the oft-cited negative correlation between achizophrenia and social class. As first reported by Farris and Dunham (1939), the highest first admission rates for achizophrenia in Chicago, Illinois hospitals were found in the central city areas of lowest socioeconomic status (SES), as compared to higher SES peripheral areas. This general finding has been replicated in no less than 10 cities, using a variety of operational definitions for both schizophrenia and social class (Kohn, 1973). Hollingshead and Redlich (1958) studied the New Haven, Connecticut community, using a prevalence measure of schizophrenia in treatment along with the original Hollingshead Index of Social Position, and reported "age- and sex-adjusted rates per 100,000 as: 111 for social classes 1 and 2 (combined), 168 for social class 3, 300 for social

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class 4, and 895 for social class 5" (Kohn, 1973, p. 67). These figures, if they are reasonably valid measures of schizophrenia throughout all 5 classes, suggest that 60% of the diagnosed schizophrenics are located in the lowest social class, 20% in the second lowest, 11% in the middle social class, and only 4% in each of the two highest classes. Table 1 portrays these data in terms of the number of expected cases of schizophrenia for each of the five social strata.

Insert Table 1 about here

While the negative relationship between achizophrenia and socioeconomic status has been consistently confirmed, a multitude of competing explanations have been proffered. A cursory review of these explanations permits their categorization into two opposing camps. A wide variety of theories may be categorized into a "nurture" camp. For this camp, the negative schizophrenia - socioeconomic status correlation is primarily due to the streasors of lower class life.

The downward drift hypothesis, espoused by those supporting an underlying genetic component to the disorder, suggests that the higher number of schizophrenics existing within the lowest socioeconomic classes is primarily due to the downward mobility of the individual schizophrenic. While research has partially validated this hypothesis, in not a single study is the effect of downward drift strong enough to explain the magnitude of social class differences in schizophrenia.

The downward drift hypothesis has also been utilized to suggest a higher rate of genetic predisposition toward schizophrenia in the lowest socioeconomic classes. Meehl (1962) posits the possibility of such multigenerational drift. Given a polygenic model of schizophrenia, the parents and earlier ancestors of a schizophrenic may themselves have drifted to the lower socioeconomic classes by virtue of the presence of one or more polygenic traits related to schizophrenia.

Of course, between the two extremes of pure social versus pure genetic etiology lie the vast majority of serious researchers, and, most likely, the truth. The interactionists would argue that both genetic predisposition and environmental atress exist on continua and extremes of either might result in schizophrenic decompensation. Meehl's diathesis-stress model of schizophrenia (1962) may well serve as an appropriate heuristic device in conceptualizing this interaction. Meehl suggests a necessary, but not sufficient, genetic component to achizophrenia. He further hypothesizes that the presence of this genetic component will inevitably result in a particular personality organization, which he labels with a term borrowed from Rado (1956), as schizotypy. Numerous other factors, both genetic and environmental, may then contribute in either a

prophylactic or detrimental manner, to determine either continued compensated functioning or eventual achizophrenic decompensation. In concluding his first published work regarding these hypotheses, Meehl briefly outlines research to test his theory. Of first order, according to Meehl, is the objectification of ratings on the supposed components of the achizotypic personality, with such objectification preferably realized by psychometric measures. Among the components which Meehl nominates as being aspects of the schizotypic personality organization are: cognitive slippage, interpersonal aversiveness, anhedonia, and ambivalence. Of these, Rado (1956) had earlier hypothesized that anhedonia was the central, genetically-predetermined, characteristic of schizophrenia.

In the ensuing years since Meehl's first publication of this model, numerous researchers have attempted to define and develop measures of the schizotypic personality. Among these attempts have been a concerted effort to produce just such psychometrically advanced self-report instruments which Meehl had outlined as being the first step in studying his hypothesized schizotypic personality. Hence traits such as anhedonia, ambivalence, perceptual aberration, somatic symptoms, magical ideation, rage, distrust, and social fear have all become subject to measurement via self-report indices. Many of these instruments have been further examined through use of the behavioral high-risk paradigm, whereby subjects scoring highly on one or more of these scales are compared on some behavior to subjects scoring in the normal range on these This approach has resulted in significant evidence of scales. construct validity for many of the scales on such diverse behavioral domains as communication styles (Martin & Chapman, 1982), psychological test performance (Chapman, Chapman, & Miller, 1982; Edell & Chapman, 1979; Raulin, VanSlyck, & Rourke, 1983), psychotic-like experiences (Chapman, Edell & Chapman, 1980; Friedland & Raulin, 1984), social deficits (Numbers & Chapman, 1982), social functioning (Chapman et al., 1980), social perception (Adamski, Raulin, & Colavecchia, 1983; Raulin & Wee, 1984), and social skills (Haberman, Chapman, Numbers, & McFall, 1979). All of the above studies relied primarily upon college students as subjects.

The first four of the eight measures of schizotypy mentioned above are utilized in this study. The earliest published investigations for construct validity of these scales date back to Edell and Chapman (1979), who reported finding Rorschach protocols to be much more in the psychotic direction for individuals identified by the Physical Anhedonia and Perceptual Aberration scales than for control subjects chosen on the basis of their normal scores on these two scales. In the same year, Haberman et al. (1979) examined high scoring male college students on the Physical Anhedonia and Perceptual Aberration scales, comparing their social competence with that of similar control subjects scoring in the normal ranges on these two scales. They report mean social competence for both schizotypic groups to be lower than that for the control group, but only the difference between anhedonics and controls achieved statistical significance. Chapman et al. (1980) also

compared high scoring college students on the same two scales with a normal scoring control group, this time utilizing data collected via two structured interviews. They found significantly more psychotic and psychotic-like experiences to be reported by perceptual aberrators than by control subjects, while anhedonics did not differ significantly from the control group. Anhedonics, however, were found to report significantly more schizotypal characteristics than did controls, as did the perceptual aberrators. Martin and Chapman (1982) also studied communication differences of anhedonics and perceptual aberrators. Using a measure of communication effectiveness, they report that perceptual aberrators as a group, and particularly those scoring high on a nonconformity scale, exhibited significantly less effectiveness in communication than did control subjects. Anhedonics also tended to show the same deficit, but not to the degree that the difference would warrant statistical significance.

In summary, numerous independent investigations on a wide array of dependent variables have demonstrated that many of the current measures of schizotypy identify persons who exhibit many of the characteristics thought to indicate predisposition to schizophrenia. In particular, the Physical Anhedonia and Perceptual Aberration scales have demonstrated significant construct validity. Given the more than plausible assumption that these scales do serve as indicators of increased risk for eventual schizophrenic decompensation, an examination of the scales relationships with socioeconomic status will serve as a powerful test of Meehl's speculations regarding multigenerational drift. Another plausible assumption is that the traits quantified by these scales are the geneticallypredetermined ones of which Meehl wrote in defining his schizotypal personality organization. Acceptance of this assumption would permit examination of relative genetic loading for achizophrenia as related to socioeconomic class. More succinctly, multigenerational drift will result in lower mean SES ratings for schizotypic subjects. Such a finding would strongly suggest that the negative SES - schizophrenia relationship is due, at least in part, to a relatively higher proportion of persons predisposed to schizophrenia in the lower classes. Conversly, a failure to reject the null hypothesis of this study, (that is, the discovery of approximately equal SES among control and schizotypic subjects), would suggest that the SES - schizophrenia link is more related to differences inherent in lower status environments than to stronger genetic loading for schizoprenia within these classes. Note that neither of these alternatives represent a purely environmental etiology of schizophrenia. Rather, given the strong, almost conclusive evidence of a minimum genetic component to schizophrenia, the alternatives are at best limited to a purely genetic etiology versus an interactional etiology by which both genetic predisposition and environmental factors each play necessary roles in the eventual decompensation of the achizotype.

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METHOD

Subjects

All students taking an introductory psychology course during 5 semesters at a large public university were potential subjects. Thus, the entire potential subject pool was 2892. Subjects answering two or more items of a five item Infrequency Scale in the infrequent direction were eliminated from consideration, as were subjects failing to answer a total of three or more items from all the scales. A total of 112 subjects were lost due to these restrictions. Similarly, subjects missing either schizotypy or SES data were eliminated from the potential subject pool. Any subject scoring at least two standard deviations above the mean on any of the four measures of schizotypy were choosen as experimental subjects. Potential control subjects must not have scored higher than one-half of a standard deviation above the means of any of the four schizotypy scales. Control subjects were randomly selected from the same year and semester of the school year from amongst the pool of potential control subjects. Five hundred and forty-six schizotypic subjects were identified by this procedure. Accordingly, 546 control subjects were selected. Of these, 421 schizotypic subjects had complete SES data, while 451 control subjects had complete SES data.

Measures

Schizotypy scale scores were available for each subject on the screening versions of the Physical Anhedonia, Perceptual Aberration, Somatic Symptoms, and Intense Ambivalence scales (Raulin, VanSlyck, & Rourke, 1983). Also the Hollingshead Four Factor measure of socioeconomic status (Hollingshead, 1975) was determined for all subjects. This index is a widely used measure of social class which computes a SES score on the basis of parental educational and occupational data. The levels for parental education ranged from one (signifying parental education of less than seventh grade) through seven (signifying a parental graduate degree). The levels for parental occupation ranged from one (signifying a parental occupation of farm laborer or a menial service worker) through nine (signifying a parental occupation of higher executive, large business proprietor, or major professional). Tables 2 and 3 provide summary definitions of parental education and occupational variables, respectively.

Insert Tables 2 & 3 about here

Finally, a data confidence rating was employed during the ratings of SES parental component data. This confidence rating ranged from one to three. A rating of one, indicating

extremely low confidence in the data, was assigned where the rating of any of four parental data pieces was extremely questionable, or where any two of these four pieces of data would have individually garnered a rating of only two on the confidence scale. A rating of two on this confidence scale was assigned when an exact placement of one data piece was questionable. In particular, subjects who reported either, but not both, parents as being self-employed, or with general titles such as "businessman" or "teacher" were rated with a value of two on the confidence measure. In the case of utilization of such broad categories as described, the level assigned was in the middle of the feasible range, and where only two possible values were feasible, the lower one was chosen. The highest rating of three on the confidence measure was reserved for those subjects whose parental data could be classified with absolutely no question as to their accuracy.

Procedure

The means and standard deviations utilized to calculate cut-off points for schizotypy on each scale, and for determining potential as a control subject, were calculated from the equivalent of four and one half years of mass testing data. As such, these statistics for the Physical Anhedonia, Perceptual Aberration and Somatic Symptom measures were based upon 3710 (1966 women and 1744 men) student respondents. The statistics for the Ambivalence scale were based upon 2417 (men = 1151; women = 1266) students. The cut-off points and statistics upon which they were based were determined sex apecifically. Table 4 portrays these statistics and their resultant cut-off points for both sexes on all five schizotypy acales.

Insert Table 4 about here

Following the determination of the cut-off points for each scale, the scores of all potential subjects were reviewed and all subjects scoring above the upper cutoff on any schizotypy scale were chosen as experimental subjects. Following a review of all data from any semester, the number of schizotypic subjects was determined, and an equal number of control subjects were selected from that semester.

All SES component data were coded by the author. The coding of the face sheet data was done completely independently of that of the achizotypy data. Thus, coding of face sheet data was blind to subject type.

Results

Of the 872 subjects with complete data, 454 (52%) were women. Most (626, or 72%) of the subjects reported being in their freshmen year. One hundred and sixty-eight were sophomores, 49 were juniors, 19 were seniors and 10 did not respond or reported themselves as "other" to this query. The mean age of subjects was 19.08 (SD=1.95). Subject age computed to the month ranged from 15.17 to 38.67 years, with a median age 18.53.

Some subjects with particularly questionable SES component data were eliminated from study based upon coder rating of confidence in the SES component data. Table 5 portrays the frequency for the confidence level measure on the SES component

Insert Table 5 about here

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data. Just over half (\underline{N} = 453, 52%) of the subjects data were rated to be in the highest confidence level. An additional 325 (37%) were rated as being in the middle confidence level, with only 94 (11%) being rated as being in the lowest data confidence level. In light of the questionable veracity of SES scores based upon the lowest confidence data all subsequent analyses related to the schizotypy - SES relationship were conducted only upon the 778 subjects in the two highest confidence levels.

The mean SES score was 45.23, (\underline{SD} = 12.05), which translates to the second highest class defined by Hollingshead. Table 6 portrays the frequency distribution of SES scores collapsed into the five strata as defined by Hollingshead.

Insert Table 6 about here

These statistics compare favorably with the mean SES reported by Klein (1980) who studied a similar sample and reported a mean SES of 46.83. Table 6 indicates the negative skew expected from a sample of undergraduates, with only 1.5% of the sample coming from the lowest social class, where approximately 60% of diagnosed schizophrenics are reported to reside. Regarding the primary hypothesis under study in this work, a one-way analysis of variance using SES as the dependent variable and subject type (schizotypic vs. control) as the independent variable proved nonsignificant, F(1, 776) = 1.72, p > 0.05. Four one-way analyses of variance were conducted using SES as the dependent variable, with subject type determined on each scale as the independent variables. The only statistically significant difference was on the Physical Anhedonia scale. Anhedonic subjects had a mean SES of 42.78 as compared with the mean SES of 45.69 for the control subjects, \underline{F} (1,731) = 5.30, p <= .05.

Yet another possible definition of schizotypy may be examined by considering the number of scales elevated. If all of the schizotypy scales are measuring independent aspects of the underlying schizotypic personality, as hypothesized by Meehl, then it would seem logical to assume that the searched for negative SES - schizotypic relationship might be discovered by comparing subjects based upon the number of schizotypy scales thay appear elevated upon. Table 7 contains the frequency data regarding such elevated scales. The 407

Insert Table 7 about here

subjects exhibiting no scale elevations are, by definition, the control subjects. A total of 280 subjects had only one scale elevated, while 91 subjects showed two or more scales elevated. A one-way ANOVA on SES with subjects grouped by number of elevated scales (None, One, Two or more) also proved nonsignificant, F (2, 775) = 0.68, p > 0.05.

DISCUSSION

Meehl's multigenerational drift speculation receives little support from this study. The most simple analysis to explore this question failed to show any significant differences in mean SES as attributable to subject type. That is, subjects defined as schizotypic by scoring high on one or more of the four schizotypy scales showed no statistically significant lower SES rating than did the control group.

In similarly examining the four schizotypy scales individually, three resulted in statistically nonsignificant differences in mean SES ratings as compared with control subjects. Of these three nonsignificant findings, two were in the direction which would be predicted by the existence of a multigenerational phenomenon. Only the Perceptual Aberration scale showed a positive association with SES, albeit a nonsignificant one. The one statistically significant result is supportive of multigenerational drift. Subjects scoring high on the Physical Anhedonia scale have significantly lower mean SES ratings than subjects acoring within the control range on this scale. The interpretation of this finding as supportive of multigenerational drift may be further bolstered given Rado's early hypothesis that anhedonia is the central, genetically determined trait of those genetically predisposed to schizophrenia. However, it must be noted that this statistically significant difference accounts for less than one percent of the variance in SES acores.

In opposition to Rado, Adamski et al. have speculated that anhedonia may actually serve as a reactive, even defensive

symptom which may diffectively decrease the probability of future severe disability. Citing many of the somewhat contradictory findings regarding anhedonics of past studies, Adamski et al. note: "The Anhedonics withdrawal and unresponsiveness isn't limited to just the voluntary responses involved in social interaction. Anhedonics have demonstrated decreased responsiveness to external stimuli on at least three psychophysiological measures (Simons, 1981, 1982, Simons, MacMillan & Ireland, 1982). Their MMPI profile is almost too flat at the same time that their Rorschach profile is distinctly psychotic in nature" (p. 8). Adamski et al. also cite the surprisingly small amount of covariation between anhedonia and perceptual aberration, suggesting that anhedonia might "preclude(s) the possibility of showing some of the other schizotypic signs" (p. 8).

Specific to this study, it could be argued that reliance on college students as subjects served to increase the visibility of anhedonics from the lower social classes. Given the undeniable fact that there are significant environmental pressures which tend to decrease the likelihood of higher education in lower social classes, one might expect that more overtly schizotypic subjects from the lowest classes would be less likely to attend college than the higher class overt schizotypes identified by the Perceptual Aberration scale. That is, the higher proportion of anhedonics from the lower classes might be due to the fact lower class schizotypes scoring high on the other schizotypy scales never make it to college. Yet, in terms of the central question to this study, even the acceptance of anhedonia as a reactive rather than a primary symptom of schizotypy does not in itself offer a strong argument against the multigenerational drift hypothesis. While nullifying the support of the only statistically significant result reported here, acceptance of this reconceptualization of anhedonia merely leaves the question of multigenerational drift left unexplored.

Thus, as with most other studies regarding the etiology of schizophrenia, this study raises more questions than it proposed to answer. Among these questions there lie numerous topics for future research. In any future efforts to further delineate the effects, if any, of multigenerational drift, samples more representative of the general population in regards to socioeconomic status will need to be employed. While more representative samples might best be obtained from the general public, it is possible that such samples may be more readily obtained in educational institutions such as junior college or high school environments.

Future attempts to "pull ourselves up by our bootstraps" will necessitate a better understanding of the schizotypy scales interrelationships. Of particular importance is the determination of whether schizotypy is best conceptualized as a homogeneous entity or a collection of more or less loosely related groups, all of which carry different likelihoods of risk for possibly different forms of psychopathology. One consistent finding suggesting the possible heterogeneity of schizotypy is the extreme lack of covariation between the

Physical Anhedonia and Perceptual Aberration scales. While the Adamski et al. speculations of anhedonia as a reactive symptom are plausible, an equally plausible alternative explanation would be the existence of two subtypes of schizotypy: A primarily negative anhedonic subtype and a primarily positive aberrational subtype. Such an explanation would be congruent with at least two hypothesized distinctions in recent schizophrenia research: 1) the existence of positive and negative symptoms in schizophrenia, and 2) the process vs. reactive categorization. Of the former, the lack of a mixed type in those predisposed to schizophrenia may be explained by biopsychological evidence that negative symptoms in some diagnosed schizophrenics are side effects of current psychopharmacologic interventions. Of the latter, poor premorbid adjustment, characterized by social withdrawal, may be viewed as an extension of the negative-anhedonic continuum, while reactive schizophrenia may be the decompensated form of the Perceptual Aberrator. Future research to explore these apeculations would include the prospective study of high scorers on both measures, focusing upon clinical course and outcome in those found to decompensate. These speculations would suggest that perceptual abberrators prior to decompensation might evidence better response to current interventions and an overall better prognosis than the decompensated anhedonic.

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Social Class [*]	Typical Charact- eristics*	Rate of Schizophrenia per 100000**	Percent in General Population	Expected Number of Schizophrenics****
I	Major Business for Profession		9.2	 10626
11	Medium Business Minor Profession or Technician	 56	19.4	 22814
111	Craftsmen Clerical or Sales	1 1 1 168 1	36.3	1 128066 1
IV	Machine operators or Semi-skilled	1 300 I	22.0	1 138600 1
v	, Unskilled or Menial	 895	13.1	 246214

Table 1. Social Class by Expected Rates of Schizophrenia

- * Adapted from Hollingshead, 1975. Social Class are numbered from upper to lower classes.
- ** Figures from Kohn, 1973, p. 67.
- *** Computed from 1980 US Census Data Summary 1-273.
- **** Based upon US population of 210,000,000.

Table 2. Description of SES Component Data: Parental Education Ratings*

Level of Education Completed	Rating
Less than seventh grade	1
Junior high school (9 th grade)	2
Partial high school (10 th or 11 th grade)	3
High school graduate	4
Partial college or specialized training	5
College or university graduation	6
Graduate professional training	7

*Adapted from Hollingshead (1975).

Table 3. Description of SES Component Data: Parental Occupation*

Types of Occupations	Ratings
Farm laborers/menial service workers	1
Unskilled workers	2
Machine operators and semiskilled workers	3
Smaller business owners, skilled manual workers,	
craftsmen, and tenant farmers	4
Clerical and sales workers, small farm and	
business owners	5
Technicians, semiprofessionals, and small	
business owners	6
Business owners, farm owners, managers, and	
minor professionals	7
Administrators, lesser professionals, and	
medium-sized business owners	8
Higher executives, major professionals, and	
large business owners	9
	-

*Adapted from Hollingshead (1975)

Table 4.

Data on Schizotypy Scales and Calculated Cut-Points To Define Schizotypic and Control Subjects

Schizotypy Scales

	1	Physical	Perceptual I	Somatic I	Intense I
M		Annedonia 	Aderration	Symptoms 	Amdivalence
L	N 	1744	1744	1744	1151
S	Nean	4.727	1.638	2.254	1 2.362 1
	Standard I Deviation	2.459	2.023	2.155	2.199
S	chizotypic If >=	10 I	6 I	7	7
C(A1:	ontrol If Scales <= 	6 1 1	3	3	3
F					
e M	N	1966	1966	1966	1266
	Nean	3.470	1.722	2.727	2.553 I
S	Standard Deviation	2.025	2.022	2.463	
S	chizotypic If >= 	8 1	6 1	8	
Cc A1:	ontrol If 1 Scales <=	4 1	3	4	4

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Table 5.

Frequency Distribution of Confidence Level Ratings in Socioeconomic Status Component Data

Level of Confidence	l I Frequency	Adjusted Percentage	Cumulative Percentage
Lowest Confidence In Data	 94 	 10.8 	10.8
Middle Confidence In Data	325	37.3	48.1
Highest Confidence In Data	453 . 	52.0	100.1*
Column Totals	 872	1 100.1*	

*Rounding Error

Frequency Distribution of SES Scores Collapsed into Hollingshead's Five Social Strata				
	Strata*	Frequency	Percentage	Cumulative Percentage
	I	198	25.5	25.5
	II	323	41.5	67.0
	III	. 177	22.8	89.8
	ĪV	68	8.7	98.5
	v 	12	1.5	100.0
otals		778		

Table 6.

Totals

* Strata are numbered from highest to lowest social class.

Number of Elevated Schizotypy Scales	Frequency	Percentage	Cumulative Percentage
None	407	52.3	
Оле	280) 36.0	88.4
Тио	72	1 9. 3	97.6 I
Three	1 18	2.3	1 99.9 1
Four	1 1	0.1	1 100.0 1
Column Totals	 784	 100.00	

	Table 7.	
Frequenc	y Distribution	Depicting
Number of 1	Elevated Schize	typy Scales