Magical ideation and social anhedonia as predictors of psychosis proneness: A partial replication.

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Abstract:

The authors compared college students identified by high scores on the Magical Ideation Scale (M. Eckblad & L. J. Chapman, 1983) and the Revised Social Anhedonia Scale (MagSoc; n = 28; M. Eckblad, L. J. Chapman, J. P. Chapman, & M. Mishlove, 1982) with control participants (n = 20) at a 10-year follow-up assessment in an attempt to replicate L. J. Chapman, J. R Chapman, T. R. Kwapil, M. Eckblad, and M. C. Zinser's (1994) report of heightened psychosis proneness in MagSoc individuals. The MagSoc group exceeded the control group on severity of psychotic-like experiences; ratings of schizotypal, paranoid, and borderline personality disorder symptoms; and rates of mood and substance use disorders. Two of the MagSoc participants but none of the control participants developed psychosis during the follow-up period (a nonsignificant difference). Consistent with L. J. Chapman et al.'s findings, the groups did not differ on rates of personality disorders or relatives with psychosis.

Keywords:

psychology | magical ideation | social anhedonia | anhedonia | Magical Thinking | psychosis predisposition | psychosis

Article:

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The present study attempted to replicate the findings of Chapman, Chapman, Kwapil, Eckblad, and Zinser (1994) , who stated that individuals who score deviantly (at least 1.96 standard deviations above the mean) on the Magical Ideation Scale (MagicId; Eckblad & Chapman, 1983) and above the mean on the Revised Social Anhedonia Scale (SocAnh; Eckblad, Chapman, Chapman, & Mishlove, 1982; Mishlove & Chapman, 1985) are especially psychosis prone. Specifically, this study examined individuals identified by these two scales (MagicId and SocAnh; MagSoc) and control participants at a 10-year follow-up assessment by using an independent sample of participants who were not involved in Chapman et al.'s longitudinal study.

Psychosis Proneness

A widely accepted view of clinical psychosis is a diathesis-stress model, which assumes that psychotic illnesses arise from an interaction of environmental factors with a predisposition or proneness (e.g., Gottesman, 1991; Meehl, 1990). This model assumes that there are psychosis-prone individuals who have an inherited risk but who will not decompensate into clinical psychosis. In fact, the majority of psychosis-prone individuals are not expected to decompensate, but they may experience attenuated or transient psychotic symptoms. These symptoms fall on a continuum from relatively normal to full-blown clinical psychosis. Identification of psychosis-prone individuals should facilitate the study of relevant biological and environmental etiological factors and hasten the development of prophylactic interventions.

Psychosis Proneness in Individuals Identified by the MagicId and SocAnh Scales

Chapman et al. (1994) discovered in exploratory analyses that college students who scored deviantly on the MagicId Scale and who had elevated scores on the SocAnh Scale appeared especially psychosis prone at a 10-year reassessment. Seven of the 33 individuals in their MagSoc subgroup (21%) developed a psychotic illness during the 10-year follow-up period. In addition, the MagSoc participants received significantly higher ratings of psychotic-like experiences and of schizotypal symptoms and poorer ratings of overall functioning at the follow-up assessment than did either the remaining MagicId participants or the control participants. It is interesting to note that the MagSoc subgroup in the Chapman et al. study did not differ from the remaining participants on measures of psychosis proneness at the initial assessment and none of the participants were clinically psychotic at the time of selection, suggesting that this group

becomes more deviant during early adulthood. Furthermore, it indicates that the combination of the MagicId and SocAnh can identify especially psychosis-prone individuals before they begin to experience marked psychotic-like adjustment. The marked deviancy of the MagSoc subgroup in the Chapman et al. sample must be regarded as tentative and possibly due to chance, because this comparison was only one of a number of exploratory comparisons of subgroups in this study.

The combination of the MagicId and SocAnh is appealing on theoretical grounds. The MagicId and SocAnh Scales appear to map onto aspects of Meehl's (1962 , 1964) cognitive slippage and interpersonal aversiveness, which he initially identified as core symptoms of schizotypy (or schizophrenia proneness). In a more recent formulation, Meehl (1990) still identified cognitive slippage as the central feature of schizotypy, although he assigned interpersonal aversiveness the lesser role of a potentiating factor.

The present study compared a new sample of MagSoc and control participants at a 10-year follow-up. Because the participants in the present study were retrospectively selected from archival data, an initial interview from the time of the mass screening was not available for most participants.

Method

Participants

The MagicId and SocAnh Scales were administered annually to approximately 2, 000 undergraduate students at the University of Wisconsin—Madison during the early 1980s. Through an archival review of our data, we randomly selected a sample of 34 individuals from among those who received a standard score of at least 1.96 on the MagicId and who scored above the mean on the SocAnh. In addition, 20 control participants were randomly selected among those individuals who scored less than 0.5 standard deviations above the mean on both scales. Groups were not formally matched but did not differ on gender, age, or year in college. The study was limited to Caucasian individuals, because norms on the scales are not presently available for other ethnic groups. A larger sample of control participants would have been desirable but were not included because the focus of the study was on the MagSoc participants and because of the expense of locating and interviewing participants. Subsequent analyses revealed that our control group was similar in every respect to Chapman et al.'s (1994) control sample.

We were able to interview all 20 control participants and 28 of 34 (82%) of the MagSoc participants (the remaining 6 MagSoc individuals refused to participate). The difference in refusal rate between the groups fell short of statistical significance (Fisher's exact test, p = .052). The groups did not differ statistically on mean age at the follow-up evaluation (MagSoc M = 30.1, SD = 2.2; control M = 30.0, SD = 1.3), interval between initial screening and the assessment (MagSoc M = 10.8, SD = 0.9; control M = 10.6, SD = 1.0), proportion of female participants (MagSoc = 47%, control = 40%), or father's social position at the time of the initial

screening (MagSoc M = 26.9, SD = 13.9; control M = 28.0, SD = 14.7), using Hollingshead's (1957) index of social position (these values fall in the middle- to upper-middle-class range). The 6 MagSoc individuals lost to attrition did not differ from the MagSoc participants on father's social position or on MagicId or SocAnh Scale scores.

Materials and Procedures

The follow-up interview consisted of a modified version of the Schedule for Affective Disorders and Schizophrenia–Lifetime version (SADS-L; Spitzer & Endicott, 1977) structured diagnostic interview and those portions of Loranger's (1988) Personality Disorder Exam (PDE) that assess schizotypal, schizoid, paranoid, and borderline personality disorders. The PDE provides diagnoses of personality disorders, as well as trait ratings of the disorders. The SADS-L was modified to obtain additional information about psychotic-like experiences. The diagnostic interview assessed psychopathology that occurred between the time of the initial testing and the follow-up interview, although the PDE assessed longstanding character pathology that was present at the time of the interview. Overall functioning at the time of the follow-up interview was measured with the Global Adjustment Scale (GAS; Endicott, Spitzer, Fleiss, & Cohen, 1976), which ranges from marked psychopathology at the low end to superior functioning at the high end. Participants were also questioned concerning family history of psychopathology.

Chapman and Chapman's (1980) interview-based rating manual was used to assess the degree of deviancy of psychotic-like experiences. The manual provides criteria for rating six classes of experiences on a continuum from normal (or subculturally supported) to markedly psychotic. The classes of experiences include the following: (a) transmission of thoughts, (b) passivity experiences, (c) auditory experiences, (d) thought withdrawal, (e) aberrant beliefs, and (f) visual experiences. Kwapil, Chapman, Chapman, and Miller's (1996) analogous rating scale for assessing olfactory experiences was also used.

The diagnostic interviews lasted approximately 2 hr and were tape-recorded. The interviews, scoring, and diagnoses were conducted by two psychologists and an advanced graduate student with extensive clinical experience. The interviewers and raters were unaware of participants' group membership. All diagnoses were made according to Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM–IV;American Psychiatric Association, 1994) criteria.

Results

Measures of Psychosis Proneness

Clinical psychosis

Table 1 summarizes several comparisons between the MagSoc and control groups, including measures regarded as indicative of psychosis proneness. Two participants, both in the MagSoc group, developed DSM–IV psychotic illnesses by the time of the assessment. One participant

met criteria for schizophrenia, paranoid type, and the other met criteria for Bipolar I disorder with mood-congruent psychotic features. The rates of psychosis in the two groups did not differ statistically. The rate of psychosis for the MagSoc group (7%) was less than, but did not differ statistically from, the rate of 21% reported by Chapman et al. (1994) for their MagSoc subgroup.

Table 1
Measures of Psychopathology and Achievement at the Follow-Up Interview

Measure	MagSoc			Control		
	%	M	SD	%	M	SD
Psychosis	7			0		
Highest psychotic-like experience		2.43**	2.32		0.40	1.04
Dimensional score						
Schizotypal		2.36**	2.34		0.37	2.90
Borderline		2.42**	3.80		0.45	0.88
Paranoid		1.08*	2.18		0.21	2.03
Schizoid		0.48	2.45		0.45	1.39
Global adjustment		65.1**	12.8		78.3	12.1
Years of education		16.0*	1.3		16.8	1.4
Single (never married)	68*			30		
Relatives with psychosis	11			10		

Note. *n* = 28 for MagSoc; *n* = 20 for control. MagSoc = Magical Ideation Scale and the Revised Social Anhedonia Scale.
*p < .05. **p < .001.

Measures of Psychopathology and Achievement at the Follow-Up Interview

Psychotic-like experiences

The MagSoc group exceeded the control group on the mean rating of each participant's most deviant psychotic-like experience. We reanalyzed the data, omitting the 2 participants with psychotic disorders to ensure that this finding was not attributable to participants with clinical psychosis in the MagSoc group. The result was substantially unchanged, MagSoc group, M = 2.19, SD = 2.23; control group, M = 0.40, SD = 1.05; separate variance t (37) = 3.62, p < .001. The mean for the MagSoc group on highest psychotic-like experience did not differ significantly from the mean found by Chapman et al. (1994) for their MagSoc subgroup (M = 3.30 with psychotic individuals included; M = 1.89 with psychotic individuals omitted). Eighty-five percent of the participants reporting scorable psychotic-like experiences described events that were ongoing or had occurred within the previous 2 years (ruling out the possibility that participants were simply reporting transient disturbances during college).

The highest (most deviant) ratings for each of the seven classes of psychotic-like experiences were summed for each participant to produce a measure that reflected both deviancy and variety of psychotic-like features. As expected, the MagSoc group (M = 4.89, SD = 7.13) exceeded the control group (M = 0.75, SD = 2.17), separate variance, t (34) = 2.89, p < .01. We examined the distributions of the sum of psychotic-like ratings to determine the cutpoint that best identified

members of the two groups. By using a cutpoint of below 1 and 1 and above, it yielded a sensitivity of 64% and a specificity of 85% in the identification of group membership. These values are consistent with a sensitivity of 64% and a specificity of 83% found by using this cutoff for Chapman et al.'s (1994) MagSoc and control participants.

Schizophrenia-spectrum personality traits

The groups were compared on PDE dimensional scores with the individuals qualifying for a diagnosis of the specific personality disorders omitted. The MagSoc group exceeded the control group on schizotypal ($p < .001$), borderline ($p < .001$), and paranoid ($p < .05$) dimensional scores. The groups did not differ on schizoid dimensional score. Chapman et al. (1994) likewise found that their MagSoc group exceeded control participants on schizotypal and paranoid, but not schizoid, dimensional score (they did not assess borderline personality symptoms). Consistent with findings from Chapman et al., the groups did not differ on the rate of personality disorder diagnoses.

Additional measures associated with psychosis proneness

Consistent with findings from Chapman et al. (1994) , the MagSoc group did not differ from the control group on proportion of participants reporting first- or second-degree relatives with clinical psychosis. The MagSoc group was rated significantly lower than the control group on the GAS measure of overall functioning and reported significantly fewer years of education. In addition, 68% of the MagSoc group reported that they were single (never married), compared with 30% of the control group (Fisher's exact test, $p < .05$). Among participants who had ever been married, 44% of the MagSoc individuals had divorced, whereas none of the control participants had done so (Fisher's exact test, $p < .05$).

Mood Disorder

Consistent with the findings of Chapman et al. (1994) , the MagSoc group exceeded the control group on the proportion of group members who suffered from Major Depressive Disorder (MagSoc = 32%, control = 5%, $p < .05$). The MagSoc group also exceeded the control participants on the combined rates of Bipolar I, Bipolar II, Cyclothymic, and Bipolar not otherwise specified disorders (MagSoc = 29%, control = 5%, $p < .05$) during the follow-up period.

Substance Abuse

Forty-six percent of the MagSoc group and 15% of the control group reported DSM–IV substance use disorders during the follow-up period (Fisher's exact test, $p < .05$). This is consistent with the substance use disorder rate of 49% for MagSoc participants and 18% for control participants at the 10-year follow-up found by Kwapil (1996) by using data from

Chapman et al.'s (1994) original longitudinal study. The MagSoc group also exceeded the control group on ratings of alcohol use, $t(38) = 2.53$, $p < .05$; and drug use, $t(37) = 3.33$, $p < .01$.

Potentiation of Psychosis Proneness by Social Anhedonia

Chapman et al. (1994) examined MagicId individuals who scored above the mean on the SocAnh Scale to investigate the potentiating effect of social anhedonia. However, within their MagicId subgroup, there was a positive association ($r = .22$, $p < .05$) between SocAnh scores and ratings of highest psychotic-like experience at the follow-up assessment, indicating that a higher cutoff for SocAnh score identified more markedly psychosis-prone individuals. The correlation between SocAnh score 10 years earlier and psychotic-like experiences in the MagSoc group in the present study was .41 ($p < .05$), despite the markedly restricted range of SocAnh scores. Analogously, the correlation between SocAnh score and schizotypal dimensional score was .40 ($p < .05$) for the MagSoc group.

We evaluated an alternative cutpoint for the SocAnh Scale by comparing MagSoc participants in the present study who scored at or above a standard score of 1.5 on the SocAnh Scale ($n = 10$) on measures of psychosis proneness with the remaining MagSoc participants ($n = 18$), whose standard scores fell between 0 and 1.5 on the SocAnh Scale. The higher SocAnh subgroup exceeded their counterparts on highest psychotic-like experience, Ms $= 4.00$ ($SD = 2.49$) and 1.56 ($SD = 1.72$), respectively, $t(26) = 3.06$, $p < .01$; and schizotypal dimensional score, Ms $= 3.90$ ($SD = 2.73$) and 1.50 ($SD = 1.62$), $t(13) = 2.55$, $p < .05$, despite the small sample size and the fact that the comparisons were not made against a normal control group but against other putatively high-risk individuals. Both subgroups contained 1 psychotic individual. The subgroups did not differ on rates of major depressive disorder, bipolar disorders, or rates of substance abuse.

Discussion

The present study provides a partial replication of Chapman et al.'s (1994) findings of heightened psychosis proneness in MagSoc individuals. The heightened psychosis proneness of the MagSoc group is supported by their psychotic-like experiences, schizotypal symptoms, and poorer overall functioning. The finding of heightened psychotic-like experiences is especially relevant because of Chapman et al.'s finding that psychotic-like experiences predict the development of psychosis. Thus, it seems possible that the MagSoc group may be especially useful in studies of the biological correlates of psychosis proneness and the environmental stresses that precipitate psychosis in these individuals.

In the present study, the 2 participants who developed psychotic disorders during the 10-year follow-up period were both MagSoc. The finding (consistent with Chapman et al., 1994) that MagSoc participants did not differ from the control group on rates of psychosis in relatives indicates the possibility that the use of trait-based questionnaires identifies a different sample of at-risk individuals than genetic high-risk strategies.

We infer psychosis proneness from symptoms and patterns of adjustment that appear to be milder forms of those seen in individuals with psychotic illnesses. Of course, not all psychosis-prone individuals will become psychotic, but we expect that they will experience a psychotic-like adjustment that falls on a continuum from reasonably stable adjustment to overt psychosis. Unfortunately, we cannot precisely determine who is psychosis prone because a "gold standard" does not exist that allows us to determine whether a high-risk individual is psychosis prone or a false positive. The use of clinical psychosis is not an acceptable standard, because it is merely an extreme end of the continuum of psychotic-like adjustment, not a necessary outcome of psychosis proneness.

Role of Social Anhedonia as a Potentiator of Psychosis Proneness

Our findings support Chapman et al.'s (1994) report that the use of the SocAnh Scale potentiates the predictive power of the MagicId Scale for identifying psychosis-prone individuals. Selection of MagicId individuals who have markedly deviant, rather than simply above average, scores on the SocAnh Scale further enhances the power to predict psychosis proneness.

It is interesting that MagicId participants who were especially deviant on SocAnh did not differ from the remaining MagicId participants on rates of major depressive disorder or bipolar disorders. Thus, social anhedonia does not appear to potentiate the power of the MagicId Scale for predicting mood disorder, unlike its relationship to psychosis proneness.

One possible explanation for the finding that Chapman et al.'s (1994) MagSoc subgroup showed marked evidence of psychosis proneness at the 10-year follow-up, but not at the initial assessment in late adolescence, is that the effects of social anhedonia may compound as the individual experiences an ongoing lack of social support. SocAnh might be expected to result in a lack of sustained close relationships that would likely deprive these individuals of emotional support and comfort. At the initial assessment, undergraduate participants in Chapman et al.'s study generally had left their families of origin only recently. Therefore, at the time of the initial assessment, the MagSoc individuals may not yet have experienced the potentiating effects of a lack of social support.

According to Slater and Cowie's (1971) data on age of initial psychotic episode, our participants still have approximately 50% of their risk remaining for developing schizophrenia and even greater risk for developing mood psychoses. Furthermore, we would expect that individuals in our sample would tend to have a relatively late age of initial psychotic episode, because they were functioning well enough during their adolescence to enroll in a major university. Thus, we expect that more of our participants will experience clinical psychosis.

Conclusion

The combination of the MagicId and SocAnh Scales appears to present a promising method for identifying psychosis-prone individuals. In this respect, the results support the earlier findings of

Chapman et al. (1994). The present findings also support Meehl's (1990) recent formulation that social anhedonia plays a potentiating role in the development of clinical psychosis.

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