PARANORMAL BELIEF, SCHIZOTYPY, AND BODY MASS INDEX

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Summary.—There are indications that subjects with schizotypal personality have a lower Body Mass Index. Also schizotypal personality is linked to a higher incidence of paranormal belief. In this study we examined whether low Body Mass Index is also linked to paranormal belief. In a pilot study 48 students of psychology (85.4% women) between the ages of 20 and 27 years were administered a questionnaire assessing weight, height, and paranormal belief. Analysis suggested an association between belief in paranormal phenomena and low Body Mass Index. In a follow-up study with 300 subjects and equal sex distribution, the relationship was examined under control of schizotypy. The results for Body Mass Index could not be confirmed; however, paranormal belief was heavily associated with the cognitive-perceptual component of schizotypy.

There has been a long tradition of attempts to correlate anthropometric variables such as body stature with schizotypy or schizophrenia variables (Kretschmer, 1921; Sheldon, 1942). Both Kretschmer and Sheldon suggested that subjects with schizophrenia or schizotypal personality have a leptomastic (Sheldon’s term was ectomorphic) body stature, but studies which controlled for the age of the subjects showed that the relationship was much smaller than originally assumed (Burchard, 1936). However, present data confirmed this small relationship at least for children and adolescents. Thus, it has been reported that schizophrenic patients are significantly underweight between the ages of 7 and 15 years (Wahlbeck, Forsén, Osmond, Parker, & Eriksson, 2001). Hebebrand, Henninghausen, Nau, Himmelmann, Schulz, Schäfer, and Remschmidt (1997) reported that adolescent patients with schizoid personality disorder had reduced BMI-percentiles. Possibly this is an effect of height only or weight only (Houston & Bloom, 1975). For instance, Wellman, Williams, Geaney, Cowen, Feldon, and Ravlins (1996) found that

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men with high schizotypy scores were shorter than their low schizotypal peers. Moreover, schizophrenic subjects have a lower birth weight (Rifkin, Lewis, Jones, & Toone, 1994; Jones, Rantakallio, Hartikainen, Ioshanni, & Sipilä, 1998), which was discussed as a cause or consequence of neurodevelopmental abnormalities (Murray, 1994; Willinger, Heiden, Meszaros, Formann, & Aschauer, 2001).

The mechanisms underlying the relationship between characteristics of body stature and schizotypy are unclear. It is possible that people with a schizotypal personality have reduced hunger, a reduced sensation of hunger, anhedonia associated with eating, or a raised activation which leads to increased energy expenditure (Hebebrand, et al., 1997). It could also be that a central regulatory mechanism influences both body composition and personality. In correspondence with this interpretation is the finding that anorectic patients have a higher incidence of personality disorders (Gillberg, Rästam, & Gillberg, 1995).

On the other hand, in contrast to these results, large databases from the 1989 National Health Interview Survey (NHIS), the National Health and Nutrition Examination Survey III, and 420 baseline data from a drug trial of the antipsychotic zipozidone supplied by Pfizer, Inc. indicated that women with schizophrenia had a significantly higher Body Mass Index than women without schizophrenia (Allison, Fontaine, Moonseong, Mentore, Cappelleri, Chandler, Weiden, & Cheskin, 1999). The Body Mass Index for men with schizophrenia was similar to those for men without schizophrenia. However, a problem with these data sets is that the current medication of the schizophrenic persons from the NHIS was not assessed, and in all three data sets the duration of prior treatment was not controlled. This is a problem because an untoward effect of many antipsychotic drugs is weight gain (Allison, et al., 1999). In sum, there are indications of a relationship between measures of body stature and schizotypy, although the evidence is somewhat mixed.

A schizotypal personality possibly entails a deficit in cognitive inhibition (Williams & Beech, 1997). This deficit may not only lead to heightened activation and, as a consequence, to lower Body Mass Index but may also be manifest in particular on a cognitive level. That is, people with schizotypic personality have not the same ability as do healthy people to monitor their own cognitive processes (Williams, 1996). This central monitoring can be applied especially to positive symptoms of schizotypal personality such as delusions, hallucinations, ideas of reference, or magical thinking. In line with this reasoning, there is growing evidence of a relationship between schizotypy and belief in paranormal phenomena (Eckblad & Chapman, 1983; Early, Posner, Reiman, & Raichele, 1989; Williams & Irwin, 1991; Thalbourne & Delin, 1994; Wolfradt, 1997; Irwin & Green, 1998; Thalbourne, 1998). This is the belief in phenomena which are currently unexplained by science, such as telepathy or psychokinesis, but also the belief in spirits or extraterrestrial life-forms (Irwin, 1999).

In sum, there are some indications of a relationship between low Body Mass Index and schizotypal personality and between schizotypal personality and paranormal belief, as well. From these observations the exploratory hypothesis is derived that there also is a relationship between Body Mass Index and paranormal belief. If such a relationship could be established, this would be an impetus to further investigate the biological mechanism behind it.

In Study 1, an initial attempt was made to examine the relationship between paranormal belief and Body Mass Index.

**STUDY 1**

**Method**

**Participants.**—Participants comprised 41 (85.4%) female and 7 (14.6%) male students from psychology, who wished to participate in a course on parapsychology. Their mean age was 21.8 yr., ranging from 19 to 27 (with a SD of 2.5).

**Measures.**—The questionnaire asked about age, sex, weight, and height. The Body Mass Index (kg/m²) was calculated from self-reported weight and height. Body Mass Index is an adequate estimate of body composition in epidemiological studies (Kuczmarski, Caroll, Flegal, & Troiano, 1997). In addition, the questionnaire included the Paranormal Belief Scale from Tobacyk and Milford (1983), which probably represents the most widely used scale to assess paranormal belief across different fields.

**Procedure.**—In registering for the seminar, the students had to submit the certificates they had already completed. While the certificates were being checked, the students filled out the questionnaire.

**Results**

The reliability coefficients for the Paranormal Belief Scale (Cronbach alpha = .92) was rather high. The range of Body Mass Index in the current sample was between 16.9 and 26.7 (M Body Mass Index was 20.28 with a SD of 2.08). To examine the hypothesis that this measure of body composition correlates with belief in paranormal phenomena, partial correlations (controlling for age) were computed. As a result, a weak relationship (r = -22, p < .10) was found between Body Mass Index and belief in paranormal phenomena. The partial correlations between Body Mass Index and the subscales of the Paranormal Belief Scale were all negative and between -0.6 and -0.24 (spiritualism). In an additional analysis, we compared the extreme qualities of the Paranormal Belief Scale with respect
to the Body Mass Index. The difference between the lower and the higher quartile of the Paranormal Belief Scale in the Body Mass Index was not significant. High believers in paranormal phenomena (n = 12, Paranormal Belief Scale score > 84.8) had a similar mean Body Mass Index (20.41) as low believers in paranormal phenomena (n = 12, Paranormal Belief Scale score < 58.8), with a mean Body Mass Index of 20.91 (t(22) = .50, p > .05, two-sided).

Discussion

The results from Study 1 provide limited indications of a negative relationship between low Body Mass Index and belief in paranormal phenomena. Given the small sample, the correlation between Body Mass Index and paranormal belief fell short of significance but the magnitude of the correlation (r = .22) was encouraging enough for further investigation. One clear limitation of Study 1 was that no measure was assessed of schizotypal personality as a possible mediating variable between Body Mass Index and paranormal belief. Another obvious limitation is the fact that the data on weight and height were self-reports. However, because the correlation between weight and height in the data was rather high (r = .76), the error in incorrect self-reporting should be small (Homel, Casey, & Allison, 2002). Eventually the sample size was very small with an unequal proportion of men and women. Thus, in Study 2 the aims were to examine a larger sample with approximately equal distribution by sex, to also assess schizotypy and to measure height and weight exactly.

STUDY 2

Method

Participants and procedure.—For Study 2, 300 subjects (50.3% female) were contacted in open-air swimming pools in Vienna. Besides sex, we made sure to include only younger people in the study (with more advanced age, body stature is confounded with age to a greater extent), and subjects from all predefined body statures (leptosome, pygmy, and athletic). This procedure ensured that the participants were undressed (with the exception of a bathing suit) and also enabled the experimenter to assess body stature (every subject was assigned to one of three categories: leptosome, pygmy, or athletic). The sample consisted of 91 leptosome subjects (45.5% male), 131 pygmy subjects (51.9% male), and 78 athletes (53.8% male). All subjects were weighed using a digital horizontal scale. The height was measured using a 2-m long rod on which a measuring tape was fixed. To ensure measurement in a straight line, a short horizontal base was attached to the rod. The mean age of participants was 21.8 yr.; ages ranged from 19 to 27 years (with a SD of 2.5). Height, weight and Body Mass Index for both sexes and the total sample can be seen in Table 1 below. The Spearman-rank correlation between Body Mass Index and experimenter-assessed body stature was .89, emphasizing that Body Mass Index is a valid indicator of body composition. Given the high intercorrelation between Body Mass Index and body measures, our results for Body Mass Index are reported here.

Measures.—All subjects answered the Paranormal Belief Scale from Tobacyk and Milford (1983), in revised form (Tobacyk, 1988). The scores on the Paranormal Belief Scale were recorded according to the suggestions of Lange, Irwin, and Houran (2000), who applied Rasch scaling to Tobacyk's revised scale which yielded two scales, "New Age Philosophy" and "Traditional Paranormal Belief." According to Houran, Irwin, and Lange (2001), New Age Philosophy (belief in psi, reincarnation, astrology) has the function of control over external events for individuals, whereas Traditional Paranormal Belief (belief in witchcraft, traditional religiosity) instills control over external events socially or culturally. These scales are population-free measures on an interval level which are not susceptible to differential item functioning, meaning that extraneous factors such as age or sex have no differential association on the responses on the paranormal belief items. Also, schizotypal traits were indexed by Raine and Benishay's (1993) Schizotypal Personality Questionnaire—Brief in German (Klein, Andrensen, & Jahn, 1997). This questionnaire has three subscales, the Cognitive-Perceptual subscale (8 items), the Interpersonal subscale (8 items) and the Disorganized subscale (6 items). The Cognitive-Perceptual subscale encompasses schizophrenia-like cognitive and perceptual symptoms such as magical thinking, ideas of reference, or unusual perceptual experiences. The Interpersonal subscale surveys lack of relationships and social anxiety, whereas the Disorganized subscale addresses odd behavior and speech.

Results

First, reliability analyses were conducted. The reliability coefficients (Cronbach alpha) for the measures were .93 for the Paranormal Belief Scale and .72 for the Schizotypal Personality Questionnaire—Brief.

No substantial correlations with schizotypy or paranormal belief were noted for Body Mass Index, weight, or height (see Table 1). Separate analyses for both sexes also yielded no association. However, both factors of Paranormal Belief, New Age Philosophy and Traditional Paranormal Belief, correlated above .40 with ratings on the Cognitive-Perceptual subscale from the Schizotypal Personality Questionnaire—Brief. The correlations between ratings on Paranormal Belief and on the Interpersonal and Disorganized scales were significant as well, although the magnitudes of the coefficients were below .20. Post hoc power analyses using the program GPOWER (Faul & Erdfelder, 1992) indicated that for α = .05 and sample size n = 300 the power values of correlational analysis are high enough (.60) to detect even small
TABLE 1

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
<th>Total Sample</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Height</td>
<td>1.8</td>
<td>0.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Weight</td>
<td>70.0</td>
<td>8.9</td>
<td>61.3</td>
</tr>
<tr>
<td>Body Mass Index</td>
<td>22.6</td>
<td>2.5</td>
<td>20.8</td>
</tr>
</tbody>
</table>

Effects such as the relationship between paranormal belief and the Interpersonal and Disorganized domain of the Schizotypal Personality Questionnaire–Brief (Table 2).

TABLE 2

<table>
<thead>
<tr>
<th></th>
<th>NAPa</th>
<th>TPAb</th>
<th>Body Mass Index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
<td>Power</td>
<td>r</td>
</tr>
<tr>
<td>Body Mass Index</td>
<td>.06</td>
<td>.16</td>
<td>.02</td>
</tr>
<tr>
<td>Cognitive-Perceptual</td>
<td>.485</td>
<td>.99</td>
<td>.44</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>.171</td>
<td>.84</td>
<td>.13</td>
</tr>
<tr>
<td>Disorganized</td>
<td>.20</td>
<td>.94</td>
<td>.15</td>
</tr>
</tbody>
</table>

aNew Age Philosophy. bTraditional Paranormal Belief. *p < .05, **p < .01 (two-tailed).

Following analyses of Irvin and Green (1998) and Houran, et al. (2001), canonical correlation analysis was performed using the variates, Paranormal Belief and Schizotypy (Table 2). Canonical correlation allows the analysis of the relationship between two sets of variables. The two scales from Paranormal Belief composed the dependent variable set and the subscales from the Schizotypal Personality Questionnaire–Brief the predictor variable set. Two canonical correlations were identified. The first had a coefficient of .52 (27% explained variance, Wilks Lambda = .73; F = 8.38, p < .001); the second correlation was only .08 and not significant (Wilks Lambda = .99; F = .41, p = .08). Therefore, only the first canonical correlation is interpreted. As can be seen in Table 3, the canonical variate is made up mainly of New Age Philosophy and the Cognitive-Perceptual factor of schizotypy. New Age Philosophy is also related to this variate, although to a smaller extent. Sex and Body Mass Index have standardized coefficients around .20, which are too low to justify interpretation (in any case, this would only mean that congruent with earlier research, women who naturally have a lower Body Mass Index have a somewhat higher inclination to paranoid belief and the cognitive perceptual component of schizotypy).

GENERAL DISCUSSION

The results of Study 2 do not confirm the relationship between Body Mass Index and paranoid belief of Study 1. The body masses (height, weight, and Body Mass Index) correlated neither with paranoid belief nor with schizotypy. One reason for this lack of association may lie in the differences between the two samples. Sample 1 consisted of students in psychology who were especially interested in paranoid phenomena. Thus, their belief scores were much higher than those of Sample 2 (mean Paranormal Belief Scale score of 72.0 vs 53.52 in Sample 2, this analysis undertaken without Item 26, the only new item in the revised version). It is possible that in Study 1, subjects with lower Body Mass Index and schizotypal tendencies exaggerated their belief in paranoid phenomena in the hope of having greater chances of getting a place in the course on parapsychology. However, as schizotypy was not assessed in Study 1, this post hoc thesis cannot be verified. In Study 2, the sample was comparable in age to persons in Study 1. But the sample was not restricted to students of psychology, and the proportion of sexes was very similar. In this sample, not a single body index correlated either with schizotypy or with paranoid belief. As a consequence, the hypothesis of relations with body indices, especially the Body Mass Index, clearly could not be verified.

As a side effect, the clinical relevance of the Revised Paranormal Belief Scale was substantiated once again in our study. As with previous data, schizotypy was related to paranoid belief. Thus, the canonical correlation analysis confirmed the results of Houran, et al. (2001) for one significant dimension was also found. Diverging from the results of Houran, et al. (2001), in our study schizotypy was related to both components of paranoid belief, New Age Philosophy and Traditional Paranormal Belief, although the
contribution of Traditional Paranormal Belief was much smaller. Accordingly, it seems to still be open whether scores on only New Age Philosophy but not on Traditional Paranormal Belief have a partial basis in cognitive-perceptual aberrations related to schizotypy. In line with Houran, et al. (2001), and also with Irwin and Green (1998), paranoid belief was strongly predicted from only one component of schizotypy, namely, the Cognitive-Perceptual component.

REFERENCES


