On the relationship between paranormal belief and schizotypy among adolescents

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Abstract

The relationship between schizotypy, paranormal belief and magical ideation was investigated in a study involving 571 adolescents between the ages of 12 and 19. Structural equation modelling was used to test a model in which schizotypy has a different influence on two facets of paranormal belief. The findings give support to the hypothesis that schizotypy is a predictor of paranormal belief (i.e. belief in precognition, psi, witchcraft and spiritualism), whereas belief in traditional religious contents, superstitious thoughts (like the belief in the meaning of numbers like 13) or belief in the existence of extraordinary life forms (like Bigfoot) can be better predicted from scores in paranormal belief than from scores in the measure of schizotypy. Magical ideation was split up into two components, one indicative of schizotypy and one indicative of superstitious thinking. The present data also confirms previous studies showing stronger relations between paranormal belief and the cognitive-perceptual component of schizotypy than to the factors ‘interpersonal’ and ‘disorganized’.

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1. Introduction

In the last few years there has been growing evidence of a relationship between belief in paranormal phenomena, that is the belief in phenomena which are currently unexplained by science, such as extrasensory perception or psychokinesis, and also the belief in spirits or extraordinary life-forms (Irwin, 1999) and schizotypy. Schizotypy has been described as the prodromal phase of schizophrenia and involves cognitive, perceptual and affective symptoms. According to the model first proposed by Rado (1953), Meehl (1962, 1990), vulnerability to schizophrenia can be pre-morbidly assessed by measures of different traits which characterize the schizotypal personality. Thus, this quasi-dimensional or disease-model (Claridge, 1997) views schizotypy as a milder form of schizophrenia, according to which schizotypes exhibit the genetic vulnerability towards developing a psychosis, although only 10% actually do decompensate into psychosis (Meyer & Keller, 2001). Generally, one finds symptoms similar to schizophrenia in schizotypal personalities, like delusion-like (magical) thoughts or unusual experiences. These individuals thus have experiences similar to the positive symptoms of schizophrenia while remaining functioning members of society (Day & Peters, 1999).

Anecdotal evidence of a link between paranormal thoughts and a proneness to psychosis like schizophrenia has accompanied parapsychology since its beginnings, Windholz and Diamont (1974) first reported that higher believers in paranormal phenomena had higher scores on the Schizophrenia scale of the Minnesota Multiphasic Personality Inventory (MMPI, Hathaway & McKinley, 1983) in comparison to lower-scoring believers in paranormal phenomena (see also Early, Posner, Reiman, & Raichle, 1989). Since Meehl’s (1964) notion that magical thinking...
is one symptom of schizotypy, most of the time schizotypy was operationalised as magical thinking or ideation. Eckblad and Chapman (1983) constructed the Magical Ideation Scale, for which they also reported a relationship to the proneness to schizophrenia-like psychosis. They defined magical thinking as a “belief and reported experiences in form of causation that by conventional standards are invalid” (p. 215). As some items of the Magical Ideation Scale include items concerning paranormal phenomena, Tobacyk and Wilkinson (1990) investigated the relationship between magical thinking and paranormal belief. In their study, magical thinking was assessed using the Magical Ideation Scale of Tobacyk and Milford (1983). The correlation between the scales amounted to \( r = .47 \). From the seven subscales of the PBS, only traditional religious belief was found to be inversely related to magical thinking. The positive relationship between paranormal belief and magical ideation was further confirmed in the studies of Thalbourne (1984, 1994), Thalbourne and French (1995), Thalbourne, Dunbar, and Delin (1995), Day and Peters (1999) and Peltzer (2003).

Noteworthy, in the DSM-IV (American Psychiatric Association, 1994) magical ideation is only one of nine criteria for diagnosing schizotypy: “odd beliefs or magical thinking that influences behaviour and is inconsistent with sub-cultural norms (e.g., superstition, belief in clairvoyance, telepathy, or ‘sixth sense’; in children and adolescents, bizarre fantasies and preoccupations)” (p. 654). The examples of odd beliefs given in parentheses refer directly to paranormal belief. Thus, paranormal belief in the DSM-IV is seen as one example of magical thinking which in turn is only one facet of schizotypal personality disorder. From these definitions, the relationship between schizotypy and paranormal belief seems to be a tautology. However, even if it is clear from the definitions that there must be an overlap between these constructs, it is not clear whether schizotypy necessarily involves paranormal belief or whether believers in the paranormal simply have higher values on schizotypy measures. Williams and Irwin (1991) proposed that for some people paranormal beliefs represent a cognitive defence against the uncertainty of life, whereas for others paranormal belief is related to psychopathology, especially to schizotypy. It is also important to note that the relationship between schizotypy and paranormal belief seems to hold even if one eliminates the items referring to magical thinking and paranormal belief, respectively, thus indicating that the relationship between paranormal belief and magical ideation is not solely due to the similarity of item content in the respective scales (Thalbourne, 1998).

As it soon became clear that schizotypy is a multidimensional construct (Vollema & Bosch, 1995), it would be appropriate to briefly review the empirical evidence for the relationship between paranormal belief and facets of schizotypy other than magical ideation.

Irwin and Green (1998) found correlates between the belief in paranormal phenomena and several indices for schizotypy. Using the method of canonical correlation, the authors were able to show that persons who exhibit a strong belief in spiritualism and precognition have higher values on the cognitive-perceptual factor of schizotypy and are more probably female. A second pair of canonical variates suggest that especially men with schizotypal tendencies marked by disorganization are likely to endorse beliefs in extraordinary life forms and witchcraft, but will disavow belief in precognition and traditional religious views. Genovese (2005) reported high correlations between a measure of paranormal belief and the cognitive-perceptual component of schizotypy (\( r = .65 \) ) and a somewhat smaller relationship to the component of odd behaviour and mannerisms of schizotypy (\( r = .27 \) ). Wolfraad, Oubaid, Straube, Bischoff, and Mischo (1999) were able to confirm the high relationship (the reported correlations were around .50) with the cognitive-perceptual factor of schizotypy for anomalous experiences (self-reported paranormal abilities, experiences and beliefs) measured by the Anomalous Experience Inventory (Gallagher, Kumar, & Pekala, 1994).

Rust (1992) found higher schizotypy scores among members of occult sects. There are also studies showing relationships between schizotypal traits and paranormal phenomena, such as out-of-body experiences (McCleery & Claridge, 1995, 2002) or nightmare-distress (Claridge, Clark, & Davis, 1997). In a study on a sample of 18 faith healers (Hergovich & Arendasy, 2007), who were investigated by the “Austrian Committee for the Scientific Investigation of Claims of the Paranormal” concerning their alleged paranormal abilities, significantly higher mean values on the cognitive-perceptual scale were found both in comparison to the norm values and to a control-group of masseurs (\( p < .001 \)). For the faith healers, the values on the dimension Disorganized were also higher in comparison to those of the control-group.

Recently, some authors have questioned the quasi-dimensional model of schizotypy and instead suggested a full-dimensional model (Goulding, 2004, 2005; Lawrence & Peters, 2004; McCleery & Claridge, 1995). Within this model, schizotypy is described as a continuum whose traits are sources of healthy variation and also predisposition to psychosis. Whereas within the quasi-dimensional model schizotypy is seen as something negative, which is related to ill-functioning, according to the full-dimensional model schizotypy would be a neutral dimension, sometimes associated with good health and sometimes with ill health (Claridge, 1997; Kennedy & Kanthamani, 1995). In accordance with these assumptions, Goulding (2004, 2005) was able to identify a cluster of individuals scoring high on unusual experiences and sense of coherence. Positive aspects of schizotypal behaviour are also reported by the work of Brugger (2001), Brugger and Graves (1997), Mohr, Graves, Gianotti, Pizzagalli, and Bugger (2001) who assumes that schizotypal personality underlies Type I error (which is
the error of rejecting a null hypothesis when it is actually true, but in a moderate form could also be a prerequisite for creativity and even constitute an evolutionary advantage.

In line with this reasoning, Houran, Irwin, and Lange (2001) found much higher correlations for their factor New Age Philosophy than for Traditional Paranormal Belief (for the construction of the two-factor Rasch Scale cf. Lange, Irwin, & Houran, 2000). They came to the conclusion that New Age Philosophy (i.e., belief in spiritualism, psi, and precognition) contains beliefs with some basis in psychopathology or an adverse personality structure, while Traditional Paranormal Belief (traditional religiosity and witchcraft) is regarded as an example of surrogate religious beliefs with a basis in cultural heritage and social learning. These results were partially confirmed by Hergovich, Willinger, and Arendasy (2005). However, canonical correlation analysis demonstrated that both Rasch-scaled factors of the Paranormal Belief Scale, New Age Philosophy (containing the items of the dimensions spiritualism, precognition and psi) and Traditional Paranormal Belief (containing items of traditional religiosity and witchcraft) combined with the cognitive-perceptual factor of schizotypy composed one significant dimension.

In our study, we were interested in the relationship between paranormal belief and schizotypy and magical ideation respectively among adolescents. Straube, Wolfraht and Hellmeister (1998), Wolfraht and Straube (1998) already investigated the relationship between schizotypy and paranormal belief on a sample of 1330 pupils between 13 and 19 years of age and found correlations of around .50 between the factor magical thinking of the STA (Schizotypal Personality Scale of Claridge & Broks, 1984) and paranormal belief scores. Interestingly, Wolfraht and Straube (1998), in their analysis found that magical ideation as one subscale of the Schizotypal Personality Scale (STA, Claridge & Broks, 1984) and the scale unusual experiences formed a single strong factor in contrast to the factor structure of adults. Their results were recently confirmed by a study done by Sanchez-Bernardos and Avia (2006). We wanted to examine the structure of the relationship further. We were especially interested in finding out whether there really do exist components of paranormal belief underlying schizotypal personality and belief-contents unrelated to schizotypy (Houran et al., 2001) in adolescents.

2. Method
2.1. Participants

The pool of participants comprised 571 subjects. 338 subjects were female (59.2%) and 233 (40.8%) male. The ages ranged between 12 and 19 years with a mean age of 13.56 (SD = 1.21). However, only 5 (1.1%) of the subjects were older than 16. The pupils were recruited from several schools in Lower Austria. 41.2% (n = 235) of the subjects attended a lower-level educational institute ("Hauptschule"), while 58.8% (n = 336) attended the "Gymnasium". With respect to religious affiliation, 542 participants (95%) were Catholic.

2.2. Measures

A short questionnaire was used to collect socio-demographic variables such as age and sex. Afterwards, the subjects completed the Paranormal Belief Scale (Tobacyk & Milford, 1983) in revised form (RPBS; Tobacyk, 1988), the Schizotypal Personality Questionnaire-Brief (SPQ-B; Raine & Benishay, 1995) in German (Klein, Andresen, & Jahn, 1997) and the Magical Ideation Scale (MIS; Eckblad & Chapman, 1983).

The RPBS assesses paranormal belief across a wide spectrum, including the subscales Traditional Religious Belief ("There is a devil.", "There is a heaven and hell."). Psi ("A person’s thoughts can influence the movement of a physical object."). Witchcraft ("Black magic really does exist." "There are actual cases of Voodoo death."). Superstition ("Black cats can bring bad luck.", "If you break a mirror, you will have bad luck."). Spiritualism ("It is possible to communicate with the dead.", "Reincarnation does occur."). Extraordinary Life Forms ("The Loch Ness monster of Scotland exists.", "Big Foot exists.") and Precognition (Some people have the ability to predict the future."). Schizotypal traits were indexed by Raine and Benishay’s (1995) Schizotypal Personality Questionnaire-Brief (SPQ-B) in German (Klein et al., 1997). This questionnaire consists of 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 positive symptoms (Mason, Claridge, & Williams, 1997) such as magical thinking, ideas of reference or unusual perceptual experiences (e.g. "Do you often pick up hidden threats or put-downs from what people say or do?"). The Interpersonal subscale surveys lack of relationships and social anxiety (e.g. "People sometimes find me aloof and distant"), whereas the disorganized subscale addresses odd behaviour and speech (e.g. "I find it hard to communicate clearly what I want to say to people"). The Magical Ideation Scale comprises 30 items, which tap uncommon experiences and deviations in information processing and logical reasoning (Eckblad & Chapman, 1983).

2.3. Statistical analyses

All statistical analyses were conducted using SPSS (Norusis, 1993). First, Reliabilities (Cronbach Alpha coefficients) were calculated for all scales. Alpha was .88 for the RPBS, .68 for the SPQ-B (.40 for the subscale Cognitive-Perceptual, .59 for the subscale Interpersonal and .59 for the subscale Disorganized) and .74 for the MIS. For the subscales of the RPBS, the reliabilities were as follows:
.58 for Traditional Religiosity, .62 for Precognition, .70 for Psi, .80 for Witchcraft, .69 for Spiritualism, .73 for Superstition and .55 for Extraordinary Life Forms.

In the next stage, we used structural equation modelling to examine our model assumptions with regard to the relationship between schizotypy, magical ideation and paranormal belief. The structural equation modelling analyses (SEM) were conducted using Analyses of Moment Structures (AMOS 5; Arbuckle & Wothke 2003).

2.4. Model

Based on past studies (Goulding, 2005; Hergovich et al., 2005; Irwin & Green, 1998) we hypothesized a model with three latent variables, schizotypy and two factors of paranormal belief. One factor of paranormal belief corresponds closely to the factor New Age Philosophy of Houran et al. (2001) with the manifest indicators spiritualism, psi, witchcraft and precognition. This factor, which was labelled Paranormal Belief in our model, because it represents very typical items for belief in paranormal phenomena, showed a high relationship to schizotypy in the analyses of Houran et al. (2001). Our second manifest factor corresponds to the factor Traditional Paranormal Belief of Houran et al. (2001) for whom they report nearly no correlations to facets of schizotypy. This second latent factor of paranormal belief in our model was labelled Superstition and encompassed the manifest indicators superstition, extraordinary life forms and traditional religious belief. One may question our decision to label the factor which includes the indicator traditional religiosity Superstition, but if one looks of the items of the scale traditional religiosity (e.g. “There is a devil”), one can argue that the scale measures not religiosity per se, but rather whether religious statements are meant literally or not (indicating some form of superstition). Regarding the variable Magical Ideation, we were uncertain as to whether it should be conceptualized as one indicator of Schizotypy (which would be in line with the literature) or Paranormal Belief. Thus, Meyer and Keller (2001) proposed that Magical Ideation indicates a heightened risk of psychosis among a certain subgroup of people, while it characterizes a transient interest in occultism and esoteric topics in others. In the model it was assumed that Schizotypy is a stronger predictor of Paranormal Belief than of Superstition and that Paranormal Belief predicts Superstition (because the items with regard to superstition contain more statements regarding the person’s behaviour, it was assumed that belief predicts behaviour, rather than the reverse) (Fig. 1).

As preliminary analyses showed that it was not possible to regard Magical Ideation as an indicator of any of these two latent variables, we took a close look at the content of the items of the scale and decided to separate the scale into two subscales. One scale which was labelled Magical-Superstition encompasses items with reference to superstitious or magical thinking (e.g. “Numbers such as 13 or 7 have no special meaning” or “I conduct certain rituals to avert negative influences”), the other scale which was labelled “Magical-Reference” includes items with thoughts of reference, i.e. feelings that others take notice of him or her and that they observe things about him or her that the subject would prefer not to be seen (e.g. “I sometimes have the feeling of losing energy when certain people look at me” or “Sometimes I think that strangers are reading my thoughts”; see Lenzenweger, Bennett, & Lilenfeld, 1997). The reliabilities (Cronbach’s Alpha) of Magical-Superstition amounted to .49 and that of Magical-Reference to .53. Because of the resemblance in its contents to the manifest variable Superstition, Magical-Superstition was seen as one indicator of Superstition and Magical-Reference as one indicator of Schizotypy.

3. Results

Testing our conceptual model in structural equation modelling first required demonstrating the fit of our measurement model or, more specifically, the adequacy of our specification of patterns of relations among manifest and latent variables.

Fig. 2 presents the standardized coefficients (betas and correlations) among manifest (in rectangles) and latent variables estimated in this analysis. Factor indicators and error terms were omitted to enhance clarity. All indicators loaded significantly on their hypothesized latent factors (p < .001), with standardized loadings ranging from .22 to .85.

No correlated errors between manifest variables of different latent variables were allowed. However, correlated errors between manifest indicators of the corresponding latent variable were allowed because of the substantial correlations shown in Table 1. Dropping the correlated errors had little influence on the relationship between latent and manifest variables but substantially reduced model fit.

The hypothesized structural model we used allowed direct paths between the latent variables Schizotypy and both Paranormal Belief and Superstition as well as between Paranormal Belief and Superstition. The structural model, shown in Fig. 2, provides an acceptable fit to the data, \( \chi^2 (df = 43, N = 571) = 173.75, \ p < .001 \); \( \chi^2/df = 4.04 \); RMSEA (Root-Mean-Square-Error-of-Approximation) = 0.073 (Confidence-Interval = 0.062–0.085); SRMR (Stan-
standardized-Root-Mean-Square-Residual) = 0.046; CFI (Comparative-Fit-Index) = 0.926. Coefficients are standardized; all paths are positive and significant at \(p < .001\). As predicted, the path between schizotypy and paranormal belief was somewhat stronger than that from schizotypy to superstition, although there clearly also exists a path between schizotypy and superstition. The path from paranormal belief (Beta = .74) was quite strong, indicating that subjects believing in precognition, psi and spiritualism tend to be superstitious to a greater extent.

4. Discussion

In the study a path-model was tested where the influence of schizotypy on superstition (corresponding to the factor Traditional Paranormal Belief of Houran et al., 2001) was mediated by paranormal belief (corresponding to the factor New Age Philosophy of Houran et al., 2001), whereas the direct influence from schizotypy on superstition was much smaller. The results were in line with our assumptions and the results of Houran et al. (2001). We were also interested whether magical ideation rather indicates schizotypy or paranormal belief. In the model magical ideation was composed of two factors, magical-superstition and magical-reference. Magical superstition encompassed items with reference to superstitious or magical thinking and magical-reference included items with thoughts of reference.

Currently there are many studies showing that paranormal belief is related to positive schizotypy. There is also good data regarding the underlying cognitive and neurological basis of this relationship (Brugger & Graves, 1997;
Mohr et al., 2001). What is to some extent unclear however, is whether schizotypy and paranormal belief are at all different concepts or whether paranormal belief represents only one facet of schizotypy. The situation is complicated as one popular measure of schizotypy, the magical ideation scale, is also used as a measure of paranormal belief by some authors.

The present findings yield further evidence that schizotypy is heavily associated with paranormal belief. In line with the findings of Houran et al. (2001) the results of structural equation modelling showed that some particular aspects of paranormal belief, i.e. belief in precognition, psi, witchcraft and spiritualism could be predicted very well by schizotypy, whereas for other factors like superstition, belief in extraordinary life forms and traditional religiosity this is not the case. Thus it seems to make sense to differentiate between components of paranormal belief which are more strongly associated with schizotypy and components which are not. In our opinion, this finding has important implications for persons (teachers, parents) who are involved in the education of adolescents. As Houran et al. (2001) postulated, belief in the components of paranormal belief strongly associated with schizotypy brings with itself the potential danger of a larger delusional system and the involvement of a partial psychotic component, if individuals have high scores on the respective scales.

Against the findings of Houran et al. (2001), the remaining aspects which are dealt with in the paranormal belief scale also had a substantial relationship to schizotypy, although the association was much weaker (as in the study of Hergovich et al., 2005). In addition, our results show that the influence from schizotypy to superstition is mediated by paranormal belief. Whereas the direct path from schizotypy has only a moderate though significant influence on superstition the path from schizotypy controlling for paranormal belief is stronger.

The results of this study further indicate that at least some caution must be exercised when administering the Magical Ideation Scale to adolescents as a measure of paranormal belief. In our study it was not possible to subsume the complete Magical Ideation Scale either under schizotypy or under paranormal belief. Instead we had to split the scale into two components, one which measures thoughts of reference and one which measures superstitious thoughts in line with the findings of Meyer and Hautzinger (1999), that the Magical Ideation scale proved to be the least stable schizotypy measure over a 2-year period. Meyer and Keller (2001) also considered the possibility that Magical Ideation might indicate a high risk of psychosis only among a certain subgroup of persons, while it is an indication of interest in occultism and esoteric topics for others. According to our results the component which addresses thoughts of reference has important loadings on schizotypy, which in turn allows the prediction of possible less common paranormal beliefs (belief in witchcraft, spiritualism, precognition and psi). The other component of Magical Ideation, which taps superstitious thoughts, seems to be related to a greater extent to paranormal belief facets than to schizotypy.

The present data also confirms previous studies showing stronger relations between paranormal belief and the cognitive-perceptual component of schizotypy (Genovesi, 2005; Hergovich & Arendasy, 2007; Wolfradt et al., 1999). The relationship to the factors ‘interpersonal’ and ‘disorganized’ were low. However, both variables showed small loadings on the latent variable schizotypy in the structural equation model and did not explain much of the variance of the schizotypy scores.

It must be pointed out that there are some limitations to this study. First, results can only be generalized to adolescents, and there are some indications that the factor structure underlying the beliefs of adolescents differs from that of adults (Wolfradt & Straube, 1998). Second, schizotypy was only assessed using the Magical Ideation Scale and a short version of the Schizotypal Personality Questionnaire (Raine, 1991). Future studies should include more full-length measurements of schizotypy and also provide a cross-validation of the examined model to further clarify the question of the relationship between schizotypy and paranormal belief.

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References


