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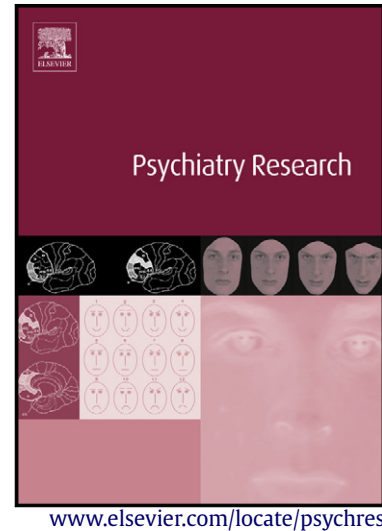
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# Author's Accepted Manuscript

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**Research article****The Janus face of Schizotypy: enhanced spiritual connection or existential despair?**

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**Abstract**

It has been asserted that schizotypy has a negative relationship with subjective well-being. By employing a multidimensional measure of spiritual well being with 400 British College students we report a more complex relationship. The Multidimensional Inventory for Religious/Spiritual Well-Being and Schizotypal Personality Questionnaire-Brief Version were used and analysis made use of Canonical Correlational Analysis. Results suggested that two distinct relationships emerged between schizotypy and spirituality. First, a positive association between cognitive/perceptual features of schizotypy and spiritual connectedness emerged. Second a more global negative relationship between feelings of spiritual isolation and despair was found for all aspects of schizotypy. These findings challenge the previous literature based on one-dimensional subjective well being measures which have found only a negative

relationship. However, the positive association between connectedness and cognitive-perceptual aspects of schizotypy raises important questions about the possible benefit of certain types of schizotypal experience.

Keywords: Early adulthood, Psychological Well-being, Schizotypy, Spirituality

## 1. Introduction

Despite the widespread interest in the relationship between religion and mental health, the relationship between spirituality and vulnerability to psychosis has been mostly confined to the religious content of delusions and hallucinations (Greenberg et al., 1992; White et al., 1995; Holm and Järvinen, 1996; Seybold and Hill, 2001; Claridge, 2010; Bennett et al., 2013). However, it is increasingly understood that psychotic experiences occur frequently in the general population (Van Os and Kapur, 2009) and differing degrees of schizotypal traits appear to be continuously distributed throughout the population. What then might be the 'normal' function of these less severe schizotypal traits?

The Cognitive/Perceptual deficits of schizotypy have been linked to negative aspects of mental functioning such as borderline, depersonalization and avoidant personality features (Raine and Benishay, 1995; Axelrod, et al., 2001). However, it remains unclear whether other schizotypal traits are associated with enhanced functioning of any kind given that these traits are widely distributed in the population (Day and Peters, 1999; McCreery and Claridge, 2002). A possible link between 'normal' schizotypy and positive aspects of religiosity/spirituality has attracted some commentary but little empirical examination.

The small number of studies which have examined this association show conflicting findings (Diduca and Joseph, 1997; Jackson, 1997; Bennett et al., 2013). Abbott and Byrne (2012a) report a negative association between schizotypal personality traits and well being in all areas except spiritual well-being, where they found no relationship (see also Abbott et al., 2012b for similar results). Notably, findings such as this are derived from a mono-dimensional measurement of religiosity/spirituality. In contrast, our previous work identified a significant positive correlation between Magical Thinking (closely linked to schizotypy) and a subscale of our multidimensional scale of religiosity/spirituality called Connectedness (a general feeling of connection or significance at a universal level). Connectedness was also found to be associated with a higher subjective well-being (Unterrainer et al., 2010) suggesting that there may be positive aspects of schizotypy not previously identified in this literature.

This study examines the relationship in greater depth by using a multidimensional approach to both schizotypy and religiosity/spirituality in order to examine the complexity of this relationship apparent in previous findings. We aim to examine whether both positive and negative associations between sub-components of both schizotypy and religiosity/spirituality can be teased apart using a more sophisticated measurement approach for both constructs, data analysis able to examine multivariate predictors of multiple dependent variables, and in a larger sample than previous studies. Finally as the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM–5; American Psychiatric Association, 2013) continues to classify schizotypy as both a personality disorder, and as part of the schizophrenia spectrum of disorders, we aim to examine whether a different pattern of associations exists in those who score in the highest decile of schizotypal traits.

## 2. Methods

### 2.1. Participants

Students were registered at London Heythrop College or were registered at other London Universities and were invited to participate in an online survey. The students were invited via an e-mail sent out by the student union to take part in the study and were also provided a link to the survey platform. The inclusion criterion was that the participants spoke English and were excluded if they reported a history of severe psychiatric disorder or current psychiatric/psychological treatment.

### 2.2. Measures

2.2.1. The *Schizotypal Personality Questionnaire-Brief Version* (SPQ-B) was developed by Raine and Benaishy (1995) as a self-report measure of schizotypy and comprises three sub-scales for Cognitive-Perceptual, Interpersonal, and Disorganized domains (see also [Axelrod et al, 2001](#)). As reported by [Raine et al. \(1995\)](#), there is adequate internal consistency for the three subscales (Cronbach  $\alpha=0.72$  to 0.78).

2.2.2. Religious/spiritual well-being was assessed by administering the *Multidimensional Inventory for Religious/Spiritual Well-Being* (MI-RSWB) (Unterrainer et al., 2010). The total RSWB score comprises six dimensions: Hope Immanent, Forgiveness, Experience of Sense and Meaning, Hope Transcendent, General Religiosity and Connectedness. Marker items illustrate the meaning of the different dimensions. General Religiosity: “My faith gives me a feeling of security”; Connectedness: “I have experienced the feeling of being absorbed into something greater”; Forgiveness: “There are things which I

cannot forgive” (coded reversely); Experiences of Sense and Meaning: “I have experienced true (authentic) feelings”; Hope Immanent: “I view the future with optimism”; Hope Transcendent: “I often think about the fact that I will have to leave behind my loved ones”. The original version of the MI-RSWB was developed using several clinical and non-clinical samples in Austria. Translations in five other languages have been validated. The factor structure and psychometric have been repeatedly found to be robust. Norm values for the Austrian population have been published (Unterrainer and Fink, 2013) where 77% of the sample (N=1500) were Christians. This parallels the proportion reporting Christian affiliations in the current UK student sample. The English version of the scale displays similar psychometric properties as the Austrian-German original (Cronbach  $\alpha=0.89$  for the total score and  $\alpha$  for all the subscales  $>0.7$ ; [Unterrainer et al., 2012](#)) and was correlated ( $r=0.71$ ;  $p<.001$ ) with the well established Spiritual Well-being scale ([Ellison, 1983](#)). The RSWB dimensions have been repeatedly shown to predict various aspects of mental health (see review in [Unterrainer et al., 2012b](#)). Sociodemographic data was assessed by means of a purpose designed set of questions.

### 2.3 Data Analysis

The main study hypothesis is tested using Canonical Correlation Analysis (CCA), which is a multivariate technique suitable for analyses involving more than one dependent variable ([Sherry and Henson, 2005](#); [Tabacnick and Fidell, 2005](#)). CCA is the highest level of the Generalised Linear Model and as a multivariate technique has the advantage of being able to examine the relationships between two sets of variables- schizotypy and religious/spiritual well-being - in one statistical test, thereby reducing Type 1 error. CCA has some similarities with factor analysis and multiple regression. It produces a model derived from predictor and criteria variables showing the canonical correlation between a number of synthetic variables, herein referred to as functions. These are analogous to latent variables. The overall fit of the model is determined by Wilks's  $\lambda$  which represents the variance unexplained by the model, and  $1-\lambda$  yields the full model effect size in an  $r^2$  metric representing variance explained ([Sherry and Henson, 2005](#)). The model is interpreted on the basis of the relative contribution and direction of prediction of criterion and predictor variables to the functions created.

### 3.Results

The sample of 400 British college students ( $n=318$  females) were between the ages of 18 and 46 years ( $M= 25.32$ ,  $SD= 6.93$ ). The sample consisted of 327 (81.8%) who identified as Christians, 29 (7.2%) were affiliated to another non-Christian religious community, 12 (3%) seceded from a recognized church and 32 (8%) were never affiliated with a religious community. This is higher than the British population as a whole where about 60% identify as Christians (Office for National Statistics, 2011). However it has to be noted that when asked the follow up question “Are you religious?” 65% said “No”. Further, in a national study only 44% of 4000 UK students stated their religious affiliation as Christian (Weller et al., 2011). Participants rated the intensity of their spirituality within the range of 0 to 100% ( $M=60.65$ ,  $SD=34.87$ ) as far higher than the intensity of their religiosity ( $M=39.83$ ,  $SD=35.92$ ). Neither religious nor spiritual intensity was correlated with total Schizotypy score ( $r =-0.05$ ,  $p=0.33$ ,  $r=0.02$ ,  $p=0.70$  respectively). The RSWB total score was strongly correlated with both the intensity of religiosity ( $r=0.53$ ;  $p<0.001$ ) and the intensity of spirituality score ( $r=0.61$ ;  $p<0.001$ ). Both parameters of intensity of religiosity and spirituality were overlapping ( $r=0.65$ ;  $p<0.001$ ). In initial descriptive analysis the mean scores are comparable to that of previous studies using the SPQ-B and MI-RSWB in community samples (Unterrainer et al., 2012). The overall correlation between RSWB and SPQ-B total scores was  $r =-0.23$ ,  $p<0.01$ . There were also negative associations between RSWB subscales and the SPQ-B total score. However, there were also some significant positive correlations between Cognitive/Perceptual Deficits and Connectedness ( $r=0.37$ ,  $p<0.01$ ) and a small but statistically relevant correlation with General Religiosity ( $r=0.13$ ,  $p<0.01$ ; see Table 1).

==Insert Table 1 about here ==

To further explore the relationships in greater depth a Canonical Correlation Analysis was performed using the six RSWB variables as predictors of the three schizotypal personality variables with a view to evaluating the multivariate shared relationship between these two variable sets. Assumptions regarding multivariate normality were adequately met. The analysis produced three functions with squared canonical correlations ( $R^2_c$ ) of 0.31, 0.23, 0.42 for each successive function. Overall, the full model across all functions was statistically significant by Wilks’s  $\lambda = 0.51$ ,  $F_{(18, 1106.4)} = 16.52$ ,  $p < 0.001$ . For the set of three canonical functions in the full model 49% of the shared variance between the variable sets was

explained. The dimension reduction analysis tests the hierarchical arrangement of functions for statistical significance. The full model (Functions 1 to 3) was statistically significant. Functions 2 to 3 were also statistically significant,  $F= 13.05$ ,  $p < 0.001$ . Function 3 however only explained around 4% of the shared variance between the variable sets and so was removed from further consideration and only the first two functions were considered interpretable in the context of this study (30.6% and 23.2% of shared variance, respectively). Therefore Table 2 presents the standardized canonical function coefficients (Coef) and structure coefficients ( $r_s$ ) for Functions 1 and 2. In order to estimate the variance accounted for by the variables within the variable sets, the squared structure coefficients ( $r_s^2$ ) converted to a % of variance accounted for, as well as the communalities ( $h^2$ ) across the two functions for each variable. According to Sherry and Henson (2005), structural coefficients above 0.45 are generally regarded as variables making important contributions to the canonical solution (and are therefore bolded in Table 2).

**==Insert Table 2 about here ==**

Examining Function 1 coefficients, it is apparent that the criterion variable Hope Immanent and to a lesser extent Forgiveness and Hope Transcendent make major contributions to the synthetic criterion variable. This is also apparent in examination of the squared structure coefficients and the larger canonical function coefficients. Furthermore, all of these variables' structure coefficients had the same sign, indicating that they were all positively related to the synthetic variable for Function 1. Regarding the predictor variable set in Function 1, Interpersonal and Disorganized aspects of Schizotypy were the primary contributors to the predictor synthetic variable, with a secondary contribution by Cognitive-perceptual aspects. Because the structure coefficient for all three variables was positive, this indicates that they were negatively related to all of the major RSWB contributors. The direction of this relationship was consistent with the expected relationships between RSWB and Schizotypy, although offering considerably greater precision. We labelled Function 1 as "Hopeless-Guilty Schizotypy" which is a concept elaborated in the discussion.

In terms of Function 2, quite a different and novel pattern emerged. The coefficients in Table 2 suggest that three criterion variables emerged as relevant, namely Connectedness, with additional but lesser contributions from General Religiosity and Experiences of Sense and Meaning. However, for this second function, these aspects of RSWB were positively related on this function. As for Schizotypy, the Cognitive-Perceptual variable was the single



and dominant predictor. Looking at the structure coefficients for the entire function, we see that Connectedness, General Religiosity and Experiences of Sense and Meaning were each positively related to Cognitive-Perceptual deficits. Given the nature of these variables, we labelled this function as “Meaningfully Connected Schizotypy” which is again discussed in detail below.

In order to explore the relationship between the group with more severe schizotypy and a more 'healthy' type we repeated the canonical correlation analysis restricted to the 42 participants scoring in the top 10% of total schizotypy. Interestingly, a very different pattern emerged for this group who score over 17 on the SPQ-B wherein the relationship with general religiosity, interpersonal and disorganisation was reversed and became positive for function 1, suggesting those with a more severe or pathological level of symptomatology show a very different pattern of associations to that of healthy schizotypes.

#### 4. Discussion

There is an ongoing debate about schizotypal elements in spiritual experiences (Claridge, 2010). In line with our hypotheses and recent research ([Abbott et al., 2012 a, b](#)), our findings show that overall there is a small negative correlation between schizotypy and spirituality. However, as we also predicted, a more fine-grained analysis using Canonical Correlational Analysis showed that two distinct functions emerged.

The first function, which we labeled as “Hopeless Guilty Schizotypy” can be understood as representing the familiar negative relationship between spirituality and schizotypy. Hope for the immanent and for the transcendent area of perception as well as Forgiveness were found to be negatively associated with all three dimensions of schizotypy. Accordingly this function stands for feelings of despair and isolation, which is consistent with the conclusions drawn by [Abbott et al. \(2012a,b\)](#). While these authors argued that the negative association between subjective well-being and schizotypy might be due to a lack of confidence in social interactions, our correlational findings suggest the interpersonal and disorganized dimensions of schizotypy in particular show a consistent pattern of negative associations with spirituality. Conceptually, these features consisting of lack of hope and forgiveness represent a profound sense of isolation and seem to be analogous to what has been described in the philosophical literature as a state of existential despair (Kierkegaard, 1989;

Jaspers, 1998; Hunt, 2007) and in a religious context as the ‘Dark night of the Soul’ (c.f. [Unterrainer et al., 2012c](#)).

On the other hand we detected a second distinct function that we called “Meaningfully Connected Schizotypy” since Connectedness, General Religiosity and Experiences of Sense and Meaning were positively related to this second function of our canonical correlation. This relationship is also apparent in the strong positive correlation between Connectedness and specifically cognitive-perceptual disturbances in schizotypy as presented in the correlation matrix. We suggest that this could be understood as referring to the more positive or productive side of schizotypy and the personal meaning created by some unusual cognitive-perceptual experiences. This would be consistent with studies showing that those who tend to join new religious movements tend to show higher levels of schizotypy as compared to the non-religious and also to mainstream Christians (Jackson, 1997; Day et al., 1999; Wolfradt et al., 1999). People high in schizotypy, and particularly the cognitive-perceptual features, may find some comfort in the perception of being connected with a higher entity or that their experiences provide them with a sense of being significant in some ‘higher’ sense ([Diduca et al., 1997](#)). This finding would be consistent with Ross’s report of a high amount of Openness to Experience as a personality factor as predictive of positive symptoms in schizotypy ([Ross et al, 2002](#)). Furthermore schizotypes also described a higher intensity of enjoyable dreaming as well as nightmare distress ([Claridge et al., 1997](#)). At the high end of the schizotypy continuum these experiences might transform into full-blown psychotic symptoms, such as for instance the absolute confidence to be the ‘chosen one’ or to be ‘enlightened’ (Greenberg et al., 1992; Claridge, 2010). This would be consistent with our finding for the extreme schizotypy group. General Religiosity may serve an important function here of providing a socially sanctioned framework in which to place unusual or spiritual experiences, a mechanism presumably more available to individuals who have a greater of personality organization ([Schofield et al., 2007](#)). Finally our finding of a meaningfully connected schizotype appears to be consistent with the concept of a “healthy schizotypy” ([Goulding, 2004](#)).

In conclusion, in this study we illustrate the complexity of the relationship between schizotypy and spirituality within a predominately Christian sample. Accordingly, our results refer predominantly to Christian or at least monotheistic faith traditions. This is exacerbated by the fact that our sample comprises mainly students exhibiting a reasonably high religious affinity (certainly above that of other UK college students) suggesting that a more diverse sample may be required before we can generalize these findings. Furthermore, as pointed out

by [Maltby et al. \(2000\)](#) the relationship between spirituality and schizotypy might be also gender-specific. The aspect might be also considered in future studies. As most of the current research has been conducted with university students showing mild levels of schizotypy ([Bennett et al., 2013](#)), research in clinical settings (for instance with individuals diagnosed with schizotypal personality disorder or schizophrenia) is required to further illuminate the role of religiosity and spirituality.

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Table 1. Pearson's correlation matrix for schizotypy and spirituality ( $n=400$ )

|                      | <i>M</i> | <i>SD</i> | Schizotypy<br>(total) | Cognitive-<br>Perceptual | Interpersonal | Disorganized |
|----------------------|----------|-----------|-----------------------|--------------------------|---------------|--------------|
| RSWB (total)         | 200.29   | 36.87     | -0.23**               | 0.07                     | -0.33**       | -0.29**      |
| General Religiosity  | 29.12    | 14.31     | -0.08                 | 0.13**                   | -0.14**       | -0.20**      |
| Forgiveness          | 35.47    | 8.68      | -0.28**               | -0.12*                   | -0.28**       | -0.28**      |
| Hope Immanent        | 34.37    | 7.46      | -0.41**               | -0.11*                   | -0.45**       | -0.42**      |
| Connectedness        | 30.19    | 9.51      | 0.09                  | 0.37**                   | -0.10         | -0.01        |
| Hope Transcendent    | 32.60    | 8.19      | -0.27**               | -0.18                    | -0.28**       | -0.19**      |
| Sense and Meaning    | 39.00    | 6.73      | -0.16**               | 0.04                     | -0.25**       | -0.18**      |
| Schizotypy (total)   | 8.55     | 5.36      | 1                     | 0.76**                   | 0.86**        | 0.84**       |
| Cognitive-Perceptual | 2.93     | 2.05      |                       | 1                        | 0.43**        | 0.49**       |
| Interpersonal        | 3.34     | 2.51      |                       |                          | 1             | 0.61**       |
| Disorganized         | 2.29     | 1.95      |                       |                          |               | 1            |

Note. \*  $p < 0.05$ ; \*\*  $p < 0.01$  (two tailed)

Table 2 Canonical Solution for Religious-Spiritual Well-being predicting Schizotypal Personality for Functions 1 and 2 ( $n=400$ ).

| Variable             | Function 1 |              |             | Function 2 |             |             | $h^2$ (%) |
|----------------------|------------|--------------|-------------|------------|-------------|-------------|-----------|
|                      | Coef       | $r_s$        | $r_s^2$ (%) | Coef       | $r_s$       | $r_s^2$ (%) |           |
| General religiosity  | -0.24      | -0.31        | 9.30        | -0.16      | <b>0.55</b> | 30.36       | 39.66     |
| Forgiveness          | -0.16      | <b>-0.56</b> | 30.91       | 0.05       | 0.13        | 1.71        | 32.62     |
| Hope Immanent        | -0.82      | <b>-0.85</b> | 72.42       | 0.07       | 0.41        | 16.64       | 89.06     |
| Connectedness        | 0.53       | -0.04        | 8.20        | 1.09       | <b>0.99</b> | 97.02       | 105.22    |
| Hope transcendent    | -0.26      | <b>-0.47</b> | 22.18       | -0.14      | -0.04       | 0.14        | 22.32     |
| Meaning              | -1.10      | -0.40        | 15.84       | -0.05      | <b>0.45</b> | 19.98       | 35.82     |
| $R_c^2$              |            |              | 30.62       |            |             | 23.26       |           |
| Cognitive-Perceptual | 0.08       | <b>0.57</b>  | 32.71       | 1.14       | <b>0.81</b> | 65.28       | 97.99     |
| Interpersonal        | 0.51       | <b>0.89</b>  | 78.32       | -0.54      | -0.16       | 2.68        | 81.00     |
| Disorganized         | 0.56       | <b>0.91</b>  | 82.26       | -0.19      | .030        | 0.10        | 82.36     |

*Notes.*

Structural coefficients ( $r_s$ ) greater than +/-0.45 are bolded. Coef= standardized canonical function coefficient;  $r_s$ = structure coefficient  $r_s^2$ = squared structure coefficient;  $h^2$ = communality coefficient.

**Highlights (maximum of 85 characters, including spaces, per highlight)**

- Spirituality and schizotypy display two distinct patterns of relationship
- Hopelessness and guilt are negatively associated with schizotypy
- Cognitive-perceptual features of schizotypy are linked to spiritual connectedness