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Creative Personality and Creative Products

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Abstract

Positive implications of schizotypal personality have been discussed in the literature in the last few years, higher creativity being one of them. Specifically, positive and negative schizotypy dimensions have been respectively related to higher and lower creativity levels. However, a considerable amount of null associations between these two constructs have also been reported. This heterogeneity could be due to the multidimensionality of both constructs. The aim of this study is to go deeper into the general relationship between creativity and schizotypy, disentangling the associations between specific dimensions of these two constructs. We assessed schizotypy in a sample of 154 volunteers. They also filled out creative personality and creative products questionnaires. Regression analyses showed no effect of scores in the positive dimension of schizotypy over either of the two creativity measures. Interestingly, lower scores in the negative dimension were associated with more creative products, whereas lower scores in the disorganized dimension were associated with a more creative personality. Our results point toward the need to use assessment tools tapping into the different aspects of creativity and to take into account the multidimensional nature of schizotypal personality in order to clarify the relationship between these two complex constructs.

Keywords: schizotypy; creativity; disorganized thought; anhedonia; dimensional approach

Differential Effects of Schizotypy Dimensions on Creative Personality and Creative Products

Schizotypy is a multidimensional personality construct that consists of, at least, three factors: a positive dimension, described as magical thinking as well as unusual experiences and suspiciousness; a negative dimension, which comprises social or physical anhedonia; and a cognitive disorganization dimension, which includes social impairment and derailed thought, as well as attentional problems and anxiety (Claridge et al., 1996; Raine et al., 1994; Stefanis et al., 2002, 2004; Vollema & van den Bosch, 1995). Schizotypy has been proposed as the critical construct to understand the association between creativity and psychopathology, on the basis of the common relationship between these two constructs and the motivational approach and avoidance neurobiological systems (Baas et al., 2016).

Creativity involves many different characteristics (e.g., intelligence, personality...) and behaviors (e.g., writing a poem, designing a scientific experiment, inventing a new recipe...), usually based on the assumption that, to be considered creative, a given idea or product must be both novel and useful (Batey, 2012). Previous reviews regarding the assessment of creativity have pointed out the necessity to include multiple creativity measures to successfully capture the multidimensional nature of this construct, taking into account process-based, person-based, product-based and press-based views of creativity (Said-Metwaly et al., 2017; Silvia et al., 2012). Additionally, in his three-dimensional heuristic framework for the measurement of creativity, Batey (2012) identified 48 different possibilities resulting from the combination of three dimensions, namely the level of measurement, the facet or aspect measured, and the measurement approach. From a different perspective, one could, at a minimum,

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distinguish between eminent creativity, related to the achievements of creative genius or renowned creative individuals, and everyday creativity, related to the creative accomplishments of average individuals (Kaufman & Beghetto, 2009).

If we focus on the more frequent distinction between person-based and product-based views, previous studies have widely applied self-reports to capture both constructs (see review Batey & Furnham, 2006; Silvia et al., 2012). From the person-based perspective, a consistent pattern has been observed in relation to art and science, with more creative individuals presenting a higher level of autonomy, being more introverted, open to experiences and norm-doubting, as well as more self-confident, self-accepting, driven, ambitious, dominant, hostile and impulsive. Artists, moreover, appear to be more emotionally unstable (Feist, 1998). With respect to measurement tools, the creative personality has been captured by means of the traditional personality frameworks of 3-, 5-, or 16-factor models. Nevertheless, tools specifically designed to assess the creative self-concept such as the Adjective Check List (ACL) designed by Gough (1979) have also been widely applied. Regarding the product-based perspective, creative achievement has been defined as the sum of creative products generated by an individual during his or her lifetime (Carson et al., 2005). Creative products have been captured applying different criteria: from publication counts, prizes awarded or social recognition-based criteria, to experts ratings (Mumford & Gustafson, 1988). Many of the assessment tools consist of self-reports including a wide checklist of achievements in different domains such as literature, music, art, sciences, etc. (Said-Metwaly et al., 2017b)

Even if only individual-level creativity for everyday activities is taken into account, the multidimensional character of both creativity and schizotypy hampers the

study of the association between these two constructs. In their meta-analysis, Acar and Sen (2013) distinguished between two main measures of creativity: general performance tests and creative personality self-reports. The former rely on the study of the responses to specific creativity-related tasks such as divergent thinking (Guilford & Hoepfner, 1971), verbal fluency or visual creativity (Miller & Tal, 2007), remote association tests (Mednick & Mednick, 1967), or insight problems (Metcalf, 1986). The latter include, among others, personality adjective checklists (Gough, 1979) as well as creative behavior inventories (Anderson et al., 2008).

Empirical support associating creativity and subclinical conditions such as schizotypy has been reported in previous studies, crucially pointing out a differential role of the positive and negative schizotypy dimensions in this association. Thus, considerable evidence has been gathered that higher levels of creativity are related with higher scores on the positive dimension (Batey & Furnham, 2008; Claridge & Blakey, 2009; LeBoutillier et al., 2014; Nelson & Rawlings, 2010). In contrast, other studies have suggested a negative relationship between creativity and the negative dimension (Claridge & Blakey, 2009; Nettle, 2006). Interestingly, a recent study analyzing creativity from process-based and product-based perspectives, replicated this negative association between the negative dimension and creative products (Carter et al., 2019).

The assessment of possible effects of disorganized schizotypy over creativity is of special interest because, although there is conceptual support for it, evidence regarding the relationship between this dimension and creativity has been sparse and contradictory. On the one hand, disorganized schizotypy could be positively associated to creativity, because cognitive disorganization implies overinclusive thinking, which has been proposed as a mediator between schizotypy and creativity (Wang et al., 2018).

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In consonance with this hypothesis, visual artists have been shown to present higher disorganization scores than non-artists (Burch et al., 2006). In this vein, Carter et al., (2019) observed that scores in the disorganized dimension predicted creative products as measured by a creative achievement questionnaire, as well as process-based creativity measured by means of an alternative uses task. On the other hand, cognitive disorganization could hamper creativity, as it is linked to sensitivity to the avoidance neurobiological system (Baas et al., 2016) and it has been negatively associated to creativity in previous research (Batey & Furnham, 2008). Specifically, Batey and Furnham (2008) observed a negative relationship between disorganized schizotypy and creative personality, but not in relation to creative products.

In their meta-analytic review, Acar and Sen (2013) (see also Baas et al., 2016), reported a small but significant positive correlation between positive schizotypy and creativity as well as an (also small) significant negative association between the negative dimension and creativity. As has already been mentioned, Acar and Sen (2013) reduced very different ways of measuring creativity to just two categories: general performance tests and creative personality self-reports. Similarly, they also reduced the dimensionality of schizotypal personality in their study collapsing two of the three schizotypy dimensions, negative and disorganized, into only one “negative” factor in their analysis. This approach was methodologically justified in the meta-analysis, however, it is possible that the use of one factor collapsing the negative and disorganized dimensions, and the reduction to only two ways of measuring creativity proposed by Acar and Sen (2013) may have concealed part of the heterogeneity inherent to these multidimensional constructs. Hence, further studies are needed to elucidate how the use of different measures of creativity and schizotypal dimensions could explain, at

least, some of the inconsistencies observed among previous findings, especially with regards to the relation between disorganized schizotypy and creativity.

The aim of this study is to explore the link between schizotypy and different measures of creativity concerning both creative products-based measures, as well as personality-based tests. Following previous results (Acar & Sen, 2013; Baas et al., 2016), volunteers with higher scores in the positive dimension were expected to present more creativity-related personality traits and/or more creative products. In contrast, high scores in the negative or disorganized dimensions were expected to be negatively related to creativity scores. Crucially, these two dimensions were considered separately to enable the detection of possible differences in their role in the association between schizotypal personality and creativity.

Method

Participants

Participants were 154 students of psychology from the University of Barcelona (23 men and 101 women; 30 participants did not facilitate sociodemographic information) with a mean age of 23.1 years ($SD=3.1$, range 21-42) who took part in the experiment in exchange for course credits. This sample size was calculated to be sufficient for detection of a medium effect size with 80% power for a regression model with up to five predictors (Soper, 2019). They were non-clinical individuals who voluntarily agreed to participate by signing written informed consent agreements. This study was approved by the Committee on Ethics of the University of Barcelona.

Procedure

Computerized versions of the questionnaires were presented to the volunteers. All the participants were in the same room but each of them completed the task individually

using a different cloned desktop computer. The order of presentation of the three questionnaires was randomized for each participant.

Measures

- **Creative Personality Scale for the Adjective Check List** (ACL, Gough, 1979). This scale assesses creative personality and consists of a checklist of 30 personality adjectives, 18 of which are identified as adjectives related with creative personality. The total score was derived from adding 1 point each time one of the 18 creative items was checked and subtracting 1 point each time one of the 12 non-creative items was checked. This scale is a reliable (α coefficients range from .77 to .88) and valid test for the identification of creative personality (Carson et al., 2005; Gough, 1979; Kaduson & Schaefer, 1991).

- **Creative Behavior Inventory** (CBI, Hocesvar, 1980). Creative products were assessed by means of this inventory which consists of a self-reported checklist of behaviors and/or accomplishments commonly considered to be creative in each of six areas: mathematics and science, music, arts, performing arts, literature and a miscellaneous category. A good reliability index ($\alpha=.88$) (Dollinger et al., 2007) and strong evidence for validity (Dollinger et al., 2005; Silvia et al., 2012) have been reported for this questionnaire.

- **The Oviedo Schizotypy Assessment Questionnaire-Abbreviated** (ESQUIZO-Q, Fonseca-Pedrero et al., 2012). This self-report questionnaire is aimed at assessing schizotypal personality in the Spanish non-clinical population. The abbreviated version of this test consists of 23 items presented in a five-point Likert-like format, and provides separate measures for the three dimensions. On the one hand,

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Distortion of Reality (Positive dimension) refers to positive symptoms such as distorted perceptive experiences, paranoid ideation and magical thinking. On the other hand, the Negative dimension refers to physical and social anhedonia. Finally, Interpersonal Disorganization (Disorganized dimension) refers to disorganized language and thinking, social anxiety and lack of close friends or odd behaviour. Scores on these scales have been shown to significantly correlate (Fonseca-Pedrero et al., 2009) with scores on the corresponding scales of English-validated tests like SPQ-B (Raine & Benishaw, 1995). Cronbach's alpha internal reliability values of the three scales in the original validation study ranged from $\alpha = .67$ to $\alpha = .71$.

Results

The results of the creativity scales indicated good reliability values (ACL: $\omega = .82$; CBI = $\alpha = .82$), compared to lower values obtained with the schizotypy questionnaire (Negative: $\alpha = .55$; Disorganized $\alpha = .62$; Positive $\alpha = .68$). No significant correlations were found between the positive dimension and either of the two creativity measures available. Regarding the negative dimension there was a significant negative correlation with only the CBI measure, as shown in Table 1. Finally, a significant negative correlation between the disorganized dimension and the ACL measure was also observed. No significant correlation was found between the CBI results and this schizotypy dimension (see Table 1).

[Table 1 near here]

A multiple regression analysis was conducted in order to identify significant predictors for each creativity measures assessed. All the assumptions for multiple regression analyses were satisfied including independence of errors, homoscedasticity,

and absence of multicollinearity between the predictors. Scores in the disorganized dimension significantly predicted scores in the creative personality checklist (see Table 2). Specifically, the disorganized dimension was negatively related to ACL scores. In the regression to predict CBI scores, the negative dimension significantly predicted the scores in this inventory. This relationship was also negative, as participants with higher negative scores obtained lower scores in the creative behavior inventory.

[Table 2 near here]

Further regression analyses were carried out with the subsample of volunteers for whom we had available sociodemographic data ($n = 124$) including gender and age as independent variables. The results were similar to those obtained with the full sample, as the Disorganized dimension remained as a significant predictor of ACL scores, $St. \beta = -.22; t = -2.27; p = .025$, whereas the Negative dimension significantly predicted CBI scores, $St. \beta = -.25; t = -2.82; p = .006$. Gender appeared to play a significant role in the ACL regression model, $St. \beta = -.29; t = -3.43; p = .001$, as men obtained higher scores than women in this creative personality test. Note that the gender imbalance in our sample (82% females) prevents drawing strong conclusions in relation to this result. In contrast to the significant effect of gender, age remained non-significant in both regression models. Again, we should be cautious with regards to these results due to the low age variability ($SD=3.1$) in this sample.

Discussion

This study investigated the putative distinct relationship between schizotypy dimensions and two different creativity measures: creative products and creative personality. Our results partially support the hypotheses proposed.

Positive schizotypy was not related with creative personality or with creative products in our study. This result did not concur with previous findings that pointed out an overall positive relationship between this schizotypy dimension and creativity (Batey & Furnham, 2008; Claridge & Blakey, 2009; LeBoutillier, Barry, & Westley, 2014; Nelson & Rawlings, 2010; Acar & Sen, 2013). The discrepancy found between our results and previous findings could be partially explained in the way positive schizotypy has been measured. For example, Acar and Sen (2013) categorized for their meta-analysis positive and impulsive schizotypy in one category. It is interesting that, in a recent study (LeBoutillier et al., 2016), only the impulsive nonconformity dimension positively correlated with creativity, whereas unusual experiences, one of the main symptoms of positive schizotypy, did not predict creative performance (see also Batey & Furnham, 2008). The differences between these studies are rooted in the use of different measurement tools. Thus, the Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE; Mason & Claridge, 2006) used by LeBoutillier et al. (2016) captures unusual experiences and impulsive nonconformity as two distinct factors in schizotypy. However, other schizotypy measures like ESQUIZO-Q, the one used in this study, or the Schizotypal Personality Questionnaire (SPQ; Raine, 1991), do not retain impulsivity as a separate factor. Both ESQUIZO-Q and SPQ were designed to represent DSM criteria for Schizotypal Personality Disorder. In contrast, Mason and Claridge (2006) maintain that O-LIFE extends the schizotypal features beyond those outlined in the DSM criteria. This broader perspective reflects, according to the authors, a

continuum between psychosis and bipolar disorder. In our study, we chose to use the ESQUIZO-Q test, because it is, to our knowledge, the only questionnaire specifically designed to assess non-clinical Spanish participants. Nevertheless, both three-factor (positive, negative, disorganized) and four-factor (including also impulsive non-conformity) solutions fit well to the schizotypy data (Cella et al., 2013), so possible differences due to the use of three- or four-factor structures should be taken into account in future research in relation to creativity measures.

The negative dimension, which refers to physical and social anhedonia, was negatively related with creative products in our data. In other words, volunteers with higher levels of physical and social anhedonia presented less creative behaviors compared to those with low scores in this dimension. In contrast, we observed no significant association between negative schizotypy and creative personality. This observation confirms the existence of a general negative relationship between negative schizotypy and creativity (Acar & Sen, 2013; Baas et al., 2016). Nevertheless, it also points out the need to apply specific measurement tools to capture more precisely the nature of this association. In a previous study similar to ours, Batey and Furnham (2008) failed to observe a significant relationship between negative schizotypy and creative products. The differences between the two studies could be related to the kind of products evaluated in each of them. The participants assessed by Batey and Furnham (2008) reported their engagement in creative activities by means of The Biographical Inventory of Creative Behaviors (Anderson et al., 2008) which focuses more on individual creative behaviors (i. e. “Composed a poem”, “Made a collage”, “Produced your own website”...) as opposed to social creative activities (i. e. “Worked as an editor for a newspaper or similar organization”, “Gave a music recital”, “Received an award

for acting”...), which are more present in the questionnaire we used (Hocevar, 1980). It could be the case that negative schizotypy specifically affects socially oriented creative accomplishments and not individual behaviors (Batey & Furnham, 2008).

Interestingly, the disorganized dimension, which refers to symptoms like derailed language and thinking or odd behaviour, was also negatively associated with creativity. Nevertheless, in this case volunteers with higher disorganized schizotypy checked less creative personality adjectives compared to those with lower scores. These data replicated those of Batey and Furnham (2008), who also observed a specific negative association between disorganized schizotypy and scores in a creative personality self-report. In contrast, they are in conflict with previous observations that visual artists present more disorganized traits than non-artists (Burch et al., 2006). Taking Burch et al.’s data into account, one could argue that a certain degree of thought flexibility could favor creative cognition, at least in the art world. Nevertheless, our results suggest that, in the case of non-artistic contexts (i.e., everyday creativity of average individuals like those who took part in our study) cognitive disorganization appears to hamper the creative process.

All in all, this study contributes to the understanding of the complex relationship between schizotypy and creativity. On the one hand, our data suggest that negative schizotypy decreases creative productivity. According to our data and those of previous research (Batey & Furnham, 2008), it could be the case that negative schizotypy (i.e. anhedonia) hinders the accomplishment of socially oriented creative goals. In contrast, we observed a negative association between disorganized schizotypy and creative personality. This could be due to a negative influence of disorganized symptoms, such

as anxiety and diminished attention, which could be specifically affecting self-perceived personality.

This study has some limitations. Gender imbalance in our sample, low variability in the age distribution as well as the inclusion of only Spanish participants could reduce the generalizability of our results. Further studies could benefit from the inclusion of more heterogeneous samples. For instance, future studies could investigate not only healthy volunteers but also participants with clinical conditions commonly associated with creativity such as bipolar disorder or schizophrenia. Additionally, it could be interesting to assess not only average individuals, like those in our sample, but also eminent creative volunteers in the fields of arts and sciences. However, the fact that the general results regarding the differential influence of the negative and disorganized dimensions over two creativity measures remained unchanged when gender and age were entered into our analyses reinforces the confidence in the conclusions. On the other hand, including further creativity measures and other schizotypy dimensions such as the impulsive nonconformity factor could help to capture other sources of variability related with both constructs analysed in the present study.

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EFFECTS OF SCHIZOTYPY ON CREATIVITY

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Tables**Table 1.**

Schizotypy Dimensions and Creativity Measures: Descriptive Statistics and Non-Parametric Spearman Correlations (n=154)

	Mean (SD)	Positive	Negative	Disorganized	ACL	CBI
Positive	9.19 (2.93)	-	.098	.472**	-.083	.025
Negative	11.53 (2.36)		-	.038	.010	-.202*
Disorganized	24.47 (5.11)			-	-.180*	-.073
ACL	3.83 (3.65)				-	.158*
CBI	45.44 (17.86)					-

ACL, Adjective Check List; CBI, Creative Behavior Inventory

* $p \geq 0.05$; ** $p \geq 0.01$

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Table 2.*Multiple Regression: Influences of Schizotypy Dimensions on Creativity Measures*

	ACL		CBI	
	St. β	t	St. β	t
Positive	.083	.897	.134	1.466
Negative	-.058	-.716	-.230	-2.884**
Disorganized	-.222	-2.406*	-.127	-1.394
	R ² =.041		R ² =.065	

ACL, Adjective Check List; CBI, Creative Behavior Inventory

* $p \geq 0.05$; ** $p \geq 0.01$