



Schizotypy, self-referential thinking and the Barnum effect

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ABSTRACT

Background and Objectives: The tendency for people to endorse, as an accurate description of themselves, personality descriptions that are essentially bogus is well-attested. The study tested whether the so-called 'Barnum' effect could be predicted by individual differences in self-referential thinking, and beyond this, schizotypy more generally.

Methods: 130 Participants completed four different measures of the Barnum effect followed by measures of schizotypy and self-referential thinking.

Results: Both self-referential thinking and positive schizotypy independently predicted the degree of agreement with several Barnum measures including both favorable and unfavorable personality descriptions, as well as computer-generated and horoscope-based readings.

Limitations: The sample is heavily represented by students and is not representative of the general population. Testing at a single point in time may have reduced differences between different indices of the Barnum effect.

Conclusions: Self-referential thinking and schizotypy more generally are key contributors to the Barnum effect across a wide range of indices.

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The term 'Barnum Effect' (also Forer effect) refers to the tendency for individuals to endorse, as uniquely their own, personality descriptions that are such general statements that as P.T. Barnum observed, they have 'something for everyone'. A now highly replicated experiment by Forer (1949) had subjects first complete the Diagnostic Interest Blank, and then receive their 'own' test results (actually an identical rather 'positive' personality description). In this as in subsequent studies most thought the 'bogus' profile highly accurate. Subsequent studies have suggested that the relative proportion of positive to negative traits in the description and its perceived source seem important, as well as when they believe that it has been obtained uniquely for themselves (eg. Snyder, Larson, & Bloom, 1976).

Only one study to date (Claridge, Clark, Powney, & Hassan, 2008) has investigated whether individual differences in schizotypy relate to the size of the tendency, though other studies have reported that believers in astrology and paranormal phenomena are more susceptible (Tabacyk, Milford, Springer, & Tabacyk, 1988). Claridge et al. (2008) found the positive symptom-like experiences of schizotypy to predict the size of the Barnum effect as measured by a 'random' positive statement. Positive schizotypy is the tendency to

report anomalous, perceptual, cognitive and emotional experiences and to hold unusual beliefs, often based on these experiences (sometimes termed 'magical ideation'). Positive schizotypy, and magical ideation in particular, has been associated with an increased tendency to generate (false) hypotheses about random and illusory contingencies (Brugger et al., 1993; Fyfe, Williams, Pickup, & Mason, 2008), and it may be that the Barnum effect also benefits from this tendency. Claridge et al. (2008) used a computerized 'Brainworks' program that pretends to generate a personality profile from twenty 'cognitive style-type' questions (Synergistic Learning Incorporated, 2008). It is unknown whether this mode of delivery or its positive content had an influence on the relationship found. The present study sought to explore the relationship further by including measures that differed both in terms of how personalized they appeared, as well in how favorable a description was given. In addition to the computer-generated profile used by Claridge et al., we used both a 'horoscope-style' profile (different depending on date of birth) as well as positive and negative personality profiles (universal). Based on Claridge et al. (2008) we hypothesized positive schizotypy to predict the size of agreement with Barnum statements.

Another related phenomenon is the tendency to experience events as directly referring to one's self, often termed referential thinking – itself a part of positive schizotypy. This tendency seems

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Table 1
Sample descriptives ($N = 130$).

Measure	Mean	S.D.
Age	21.82	2.05
Unusual experiences	10.82	4.98
Cognitive disorganisation	9.82	3.97
Referential thinking scale	18.62	8.41
Brain works	3.40	1.21
Horoscope	3.28	1.22
Positive personality	3.31	1.29
Negative personality	3.41	1.25

particularly associated with schizotypal personality attributes (Meyer & Lenzenweger, 2009) and might be seen as a specific social-cognitive feature that schizotypes tend to possess more often than others. It is important to determine whether the majority of the positive schizotypy effect reported by others is in fact due to referential thinking, or whether individual differences in schizotypy can contribute to explaining differences in the Barnum effect above and beyond referential thinking style.

2. Method

2.1. Participants

64 Male and 66 female participants ($N = 130$) aged from 18 to 28 were recruited using an e-mailshot reaching the UCL university student population and their associates. While most were current students, a number were their friends and associates. At their attendance for testing they were told that the study involved an investigation of their personality by a range of methods. They completed the four Barnum effect measures in a random order (different each time) followed by the O-LIFE and REF scales. All were native English speakers and received no incentive for participation.

2.2. Barnum effect measures

Four different 'personality' profiles were rated by participants using a 5-point Likert scale in each case to indicate the extent to which the profile validly depicted their personality (1-"completely unlike me" to 5-"completely like me").

2.2.1. Brain works

This 'self-assessment' program was downloaded from the Synergistic Learning Incorporated (2008) website. Participants answer 20 questions by choosing one from several options, and are then presented with a personality profile supposedly based on how their brain functions. This was administered according to the method of Claridge et al. (2008).

Table 2
Hierarchical regression analyses predicting each Barnum measure.

DV	Adj. R^2	ES (f^2)	F	IVs	Beta, T , p value
Horoscope	0.44	0.79	35.0 ($p < .001$)	REF CogDis	0.30, 3.52, <0.001
				ImpNon	0.30, 3.78, <0.001
Brainworks	0.47	0.89	37.5 ($p < .001$)	REF CogDis	0.23, 2.88, <0.01
				UnEx	0.37, 4.36, <0.001
Positive personality	0.41	0.69	31.3 ($p < .001$)	REF	0.22, 2.79, <0.01
				UnEx	0.22, 2.61, <0.01
Negative personality	0.56	1.27	57.1 ($p < .001$)	REF	0.21, 2.23, <0.05
				ImpNon	0.35, 4.33, <0.001
				UnEx	0.25, 3.00, <0.01
				REF	0.28, 3.37, <0.001
				ImpNon	0.33, 4.77, <0.001
				UnEx	0.32, 4.35, <0.001

REF – referential thinking, UnEx – unusual experiences.

CogDis – cognitive disorganisation, ImpNon – impulsive nonconformity.

2.2.2. Horoscope profile

Participants received a pack of horoscope profiles, with one profile corresponding to each of the twelve signs of the zodiac, extracted from an astrological website (Horoscope Profiles, 2008). Participants were instructed to identify their corresponding profile, to read and then rate it.

2.2.3. Personality profiles

In addition, participants received both a positive (favorable) and a negative (unfavorable) personality profile, each generated for the purposes of the present study (available from the authors). Both profiles contained a series of Barnum statements with either a positive (eg. 'people enjoy you because you have a good sense of humour') or negative (eg. 'although assertive, you have a tendency to be stubborn') orientation.

2.3. Self-report schizotypy measures

2.3.1. Oxford–Liverpool inventory of feelings and experiences (O-LIFE)

The O-LIFE contains four subscales: Unusual Experiences, Cognitive Disorganisation, Introvertive Anhedonia and Impulsive Nonconformity. High levels of internal consistency have been established, with reported alpha coefficients in the region of 0.72–0.89, (Mason, Claridge, & Jackson, 1995) in addition to numerous validation studies (eg. Steel, Hemsley, & Pickering, 2007).

2.3.2. Referential thinking scale (REF)

Lenzenweger, Bennett, and Lilienfeld's (1997) 34-item REF scale assesses a wide range of referential thoughts and experiences, including both 'simple' and 'guilty' ideas of reference. The total numbers of 'true' items were summed in order to provide a comparable degree of schizotypic referential thinking with other participants. Evidence suggests that the REF possesses good internal consistency reliability, test–retest reliability (Lenzenweger et al., 1997) and criterion validity (Meyer & Lenzenweger, 2009), as it discriminates those with delusional ideas of reference (Startup et al., 2010).

2.4. Procedure

Following informed consent participants completed basic demographic information and the seven self-report measures, the order of which was counter-balanced in a Latin-square design. Debriefing information was supplied at the conclusion explaining the purpose of the experiment. Relevant university research protocols were observed.

3. Results

Table 1 presents the means, standard deviations and ranges for scores yielded from each of the self-report measures. The REF scale correlated moderately with several schizotypy scales (UnEx $r = .60$, CogDis $r = .52$; $p < 0.01$, ImpNon $r = 0.54$, $p, 0.01$). Interestingly, the size and distribution of the four Barnum effect indices were highly similar, with means falling between 3.28 and 3.41 on a five point scale. There were no significant differences in extent of agreement across the indices. The four Barnum indices were also moderately to highly inter-correlated with all falling in the range of 0.50–0.66 (all $p < .01$). Age and gender were unrelated to Barnum indices, though the age range here is highly restricted.

The hypotheses were tested using hierarchical linear regression with each of the Barnum effect indices as the dependent variable in four separate analyses. The REF scale was entered in the first block, followed by a second block of schizotypy scales selected stepwise using the relatively stringent criterion of F to enter at $p < .05$ (see Table 2). According to Cohen's (1992) conventions all effect sizes were large suggesting positive schizotypy makes a substantial contribution to predicting responses to Barnum statements regardless of the format or degree of positivity of statements. In every case the REF scale was a significant predictor in the first block. However, the schizotypy scales of Unusual Experiences, Cognitive Disorganisation, and Impulsive Nonconformity explained additional variance in every case.

4. Discussion

Although it is perhaps unsurprising that referential thinking is highly relevant to the Barnum effect, we found repeated convincing evidence that this is so across a variety of methods. At the very least, this certainly serves to help validate the construct and scale. It is of note that those profiles (from Brainworks and horoscope readings) that contain a method by which the 'reading' is more specifically directed to the respondent had the strongest relationships with the REF scale. As much of the REF scale content concerns *negative* self-referential perception and thinking (so can discriminate often paranoid delusional patients well, see Startup, Sakrouge, & Mason, 2010), one might also expect greater agreement with negative than positive self-statements, and indeed the better prediction was for the negative profile, though the differences were modest with positive descriptions also producing significant results. Given that grandiosity and paranoia co-occur in the clinic, this may not be so surprising.

If we consider referential thinking a key element of positive schizotypy though previous studies have not measured this, the results are very largely in line with those of Claridge et al. (2008) in that various combinations of the indices of positive schizotypy (REF scale, Unusual Experiences and Cognitive Disorganisation) predicted the size of the Barnum effect to a very substantial extent. Importantly, this pattern of results was very largely repeated across a range of Barnum indices, strongly suggesting that it is not dependent on a particular Barnum methodology. Our results demonstrate clearly that schizotypy is of relevance to the Barnum effect above and beyond the contribution of a self-referential thinking style.

Entering the REF scale prior to considering other schizotypy scales is likely to have diminished the variance available for those scales that have an overlapping relationship with both the REF scale and the Barnum effect. Nevertheless, Unusual Experiences was a significant additional predictor in three of the four regression analysis suggesting that it has a broad relevance beyond the one aspect of referential thinking. In other contexts, Unusual Experiences has been associated with seeing illusory contingencies (Brugger et al., 1993; Fyfe et al., 2008), and the present results are clearly supportive of this occurring here. Greater salience

regardless of the relevance or otherwise of personality descriptors in the statements seems to have been operating relatively indiscriminately as it was seen for both positive and negative statements, and when statements were not presented as personalized to the individual ('based' on personality questions or astrological sign). Seeing illusory contingencies in this way may well form part of a stable cognitive style of 'aberrant salience' recently proposed by Kristin and Roiser (2010) based on the clinical concept of the same name (Kapur, 2003). Psychosis-prone individuals, as well as those on the spectrum, seen in clinic are therefore much more likely to 'read into' statements, including by clinicians, in ways that were not intended. Our results suggest that this may be the case not simply for those who already exhibit ideas of reference, but are prone to positive symptoms more generally. If Kristin and Roiser are correct, they may do so, not because of a relatively superficial 'yea-saying' or other social psychological reason, but because of fundamental cognitive processes allocating personal significance and meaning to a wide range of stimuli.

As for Claridge et al. (2008), Cognitive Disorganisation contributed significant additional variance. As this schizotypal factor explicitly contains both social anxiety and cognitive errors, it is plausible that this finding relates to other psychosis-relevant reasoning styles – 'jumping to conclusions' and poor 'tolerance of ambiguity' (eg. Colbert & Peters, 2002). The relative inability to tolerate ambiguity and thus to tend to reach a conclusion on insufficient evidence has been shown to contribute to the formation of delusions (Broome et al., 2007). Finally, although Impulsive Nonconformity is relatively rarely studied it contributed to three out of the four regression analysis. This factor is sometimes considered as being of greater relevance to bipolar disorder: a disorder not immune from excessive self-focus and referential thinking.

Limitations include that the sample was a highly educated one, and is not representative of the general population, and that the serial presentations of Barnum measures may have led to 'cross-contamination' by one another. Though too preliminary for strong clinical implications to be drawn, the results nevertheless suggest that psychosis-proneness measures are highly relevant to the perception of self-relevant information in the social world as tapped by the Barnum effect.

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