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Intuition, Affect, and Peculiar Beliefs

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Abstract

Research with college students has found that intuitive thinking (e.g., using hunches to ascribe meaning to experiences) and positive affect interactively predict ideas of reference and odd/magical beliefs. We investigated whether these results would generalize to a diverse community sample of adults that included individuals with elevated levels of peculiar perceptions and beliefs. We measured positive and negative affect and intuitive thinking through questionnaires, and peculiar beliefs (i.e., ideas of reference and odd/magical beliefs) through structured clinical interviews. We found that peculiar beliefs were associated with intuitive thinking and negative affect, but not positive affect. Furthermore, in no instance did the interaction of affect and intuitive thinking predict peculiar beliefs. These results suggest that there are important differences in the factors that contribute to peculiar beliefs between college students and clinically meaningful samples.

Keywords

odd/magic beliefs; ideas of reference; peculiar beliefs; affect; intuition

Peculiar beliefs can be defined as affect-laden beliefs that are typically unfalsifiable (as opposed to patently false), deviate from the ordinary, and have less evidence and/or less convincing evidence to support their existence (Berenbaum, Kerns, & Raghavan, 2000). Magical/odd beliefs refer to peculiar beliefs regarding the existence of anomalous phenomena (e.g., ghosts), or phenomena that transcend boundaries between mental/symbolic and physical/material realities (Nemeroff & Rozin, 2000). Ideas of reference are peculiar beliefs that assert that events, objects and/or other people have a particular and unusual meaning for the holder of the belief (American Psychiatric Association [APA], 2000). These types of beliefs, which at their extreme can be delusions, are core features of schizophrenia-spectrum disorders, such as schizotypal personality disorder. Although these beliefs are often characteristic of psychopathology, they are quite common in the general population (Moore, 2005). However, the factors that account for the evolution of these beliefs are not well understood.

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Intuitive thinking (i.e., intuition) is a default mode of information processing characterized by fast, holistic, associative processing, and is akin to using one's hunches to ascribe meaning to situations and experiences (Epstein, Pacini, Denes-Raj, & Heier, 1996; Pacini & Epstein, 1999). As belief formation and change is motivated, at least in part, by the need to understand situations and experiences (Boden & Berenbaum, 2010), and peculiar beliefs help individuals to understand themselves and the world around them (Boden & Berenbaum, 2004), it is likely that intuitive thinking contributes to peculiar belief formation and change. A study finding positive associations between intuitive thinking and superstitious beliefs (Epstein et al., 1996) supports this hypothesis. Furthermore, there exists substantial evidence to support the assumption that positive affect (i.e., a stable disposition to experience positive emotional states) is associated with intuitive thinking (e.g., see Isen, 1987).

King and colleagues recently conducted a series of studies exploring relations between intuitive thinking, positive affect and peculiar beliefs in college student samples (King, Burton, Hicks, & Drigotas, 2007; King & Hicks, 2009). In a study including self-report measures of positive affect, intuition, and ideas of reference it was found that an interaction of positive affect and intuition predicted ideas of reference (King & Hicks, 2009). At high levels of positive affect, but not at low levels of positive affect, intuition was positively related to ideas of reference. These results replicated a series of experimental studies with college students in which positive affect was experimentally induced or measured through self report, intuition was measured through self-report, and magical thinking/odd beliefs were measured in several ways (e.g., verbal self-report of belief in ghosts/UFO's following presentation of a related video; King et al., 2007). These studies found positive associations between intuition and magical thinking/odd beliefs, particularly among individuals with high positive affect (induced or self-reported).

The results of King and colleagues (2007, King & Hicks, 2009) demonstrate that intuitive thinking and positive affect interact to contribute to peculiar beliefs, at least in college students. However, the college student samples used by King and colleagues (2007, King & Hicks, 2009) are likely to differ in at least two ways from clinically-relevant populations who experience peculiar beliefs. First, individuals with elevated levels of peculiar beliefs and perceptions may not experience positive affect in the intensity or manner that would promote the use of intuitive thinking to form and maintain peculiar beliefs (Horan, Blanchard, Clark, & Green, 2008), as do college students. Second, the majority of peculiar beliefs held by college students are less likely to be as longstanding, fixed, and convincing as are clinically meaningful peculiar beliefs. Thus, the interactive effect of positive affect and intuitive thinking on peculiar beliefs may be limited to the immediate formation of peculiar beliefs that are held with little conviction, such as those typically held by college students.

The first goal of this research was to test whether the association between intuitive thinking and peculiar beliefs suggested by theory (Boden & Berenbaum, 2010) and found in at least one study with a college student sample (Epstein et al., 1996) would replicate in a community sample in which many participants had clinically meaningful levels of peculiar beliefs. The second goal was to test whether the relation between intuition and peculiar beliefs would be moderated by affect, as in studies by King and colleagues (2007, King & Hicks, 2009). We measured intuitive thinking and affect in the same manner as King and colleagues (2007), and increased the validity of our assessment of odd/magical beliefs and ideas of reference through the use of a structured clinical interview. Similar to King and Hicks (2009), we also measured depression and included it as a covariate in our analyses.

Method

Participants

Participants were 303 (53.1% female; $M_{age} = 43.2$, $SD_{age} = 17.6$ $Range_{age} = 18 - 89$) community members, oversampled for those who reported elevated levels of peculiar beliefs and perceptions. Participants were recruited to take part in a larger project examining pathways to disturbed emotions, perceptions, and beliefs (see Berenbaum et al., 2006; Berenbaum, Thompson, Milanak, Boden, & Bredemeier, 2008). We intentionally oversampled, in two ways, for those who reported elevated levels of peculiar beliefs and perceptions. First, participants were obtained from a larger study that included telephone interviews concerning life experiences and symptoms of Schizotypal Personality Disorder (SPD). Random-digit dialing was used to obtain as close to a random, representative sample of the general adult population as possible. We invited 214 of the 1,501 participants who completed the phone interview to participate in a second study (reported in Berenbaum et al., 2006; Berenbaum et al., 2008) if they: (a) agreed to be contacted to participate in an additional study, and (b) had scores in the highest decile on the Schizotypal Personality Questionnaire (Raine, 1991) Odd Beliefs subscale, No Close Friends subscale, or total score, or (c) were randomly selected from among the remaining participants (to allow for comparisons of participants high versus low in constructs of interest). We recruited a further 89 participants by placing advertisements in newspapers and public locations seeking individuals who reported signs of SPD. Most of the participants were European American (77.9%), followed by African American (9.2), Asian/Asian-American (5.3%), Latino/a/Hispanic (2.6%), and Native American (1.3%). Most participants graduated from high school (98.7%).

An additional 15 individuals began participating in the study but were excluded from analyses because they: (a) met criteria for Criterion A of schizophrenia ($N = 7$) as determined using the psychotic disorders module of Structured Clinical Interview for the *Diagnostic and Statistical Manual of Mental Disorders – 4th edition* (SCID; First, Spitzer, Gibbon & Williams, 1996), (b) did not complete the protocol ($N = 6$), (c) had poor English language skills that led us to question the validity of their answers ($N = 1$), or (d) appeared to be fabricating responses ($N = 1$).

Measures

Odd/Magical Beliefs & Ideas of Reference—Odd/magical beliefs and ideas of reference were each measured using the Schizotypal Personality Disorder module of the Personality Disorder Interview IV (PDI-IV; Widiger, Mangle, Corbitt, Ellis, & Thomas, 1995). Participants were asked a series of questions designed to assess the odd belief/magical thinking and ideas of reference criteria of schizotypal personality disorder as specified by the *Diagnostic and Statistical Manual of Mental Disorders – 4th edition* (DSM-IV; American Psychiatric Association, 1994). Participant responses were followed up as needed for clarification, and trained interviewers made dimensional ratings of each item (0 = absent; 1 = subthreshold; 2 = present; 3 = severe). A second *trained* member of the research team listened to recorded PDI-IV interviews and independently rated the same criteria. Disagreements were resolved through discussion to reach consensus (i.e., when raters disagreed about whether a criterion was above or below threshold, or disagreed by more than one point), or by taking the mean of the two raters (e.g., one rater assigned a score of 2, and the second rater assigned a score of 3). As expected, a large portion of the sample was at or above threshold for the odd/magical belief criterion (28.4%) and many more had subthreshold levels (22.4%), indicating the clinically relevant nature of this sample. Five % of the sample was at or above threshold for the ideas of reference criterion, and another

16.8% were at subthreshold levels. Descriptive statistics and inter-rater reliability are reported in Table 1.

Intuitive Thinking—Intuitive processing style was measured by the 20-item (e.g., “I believe in trusting my hunches”) Faith in Intuition subscale from the Rational Experiential Inventory (Pacini & Epstein, 1999). Participants rated all items on a 5-point scale (1 = “definitely not true of myself”; 5 = “definitely true of myself”), and the mean was obtained. Previous research on this scale has shown excellent convergent and discriminant validity (e.g., Pacini & Epstein, 1999).

Positive & Negative Affect—Positive and negative affect were assessed using respective scales from the Positive and Negative Affect Schedule (PANAS, Watson, Clark, & Tellegen, 1988). Because, as pointed out by Larsen and Diener (1992), the original 10-item negative affect and positive affect scales from the PANAS measure only the high activation end points of two of the eight octants of the affective circumplex, we supplemented them with some lower arousal NA and PA terms. Positive affect was assessed by taking the mean of ten positive affect words from the PANAS, supplemented by adding three words (pleased, cheerful, happy). Negative affect was assessed by taking the mean of ten negative affect words from the PANAS, supplemented by adding five words (frustrated, down, anxious, grouchy, sad). Participants were asked to indicate the extent to which they experience each item in the previous month on a 5-point scale (1 = “very slightly or not at all; 5 = “extremely”). Previous research on this instrument has shown excellent discriminant validity and sensitivity to mood fluctuations (Watson et al., 1988).

Depression—We assessed whether participants met DSM-IV criteria for either a current or lifetime episode of major depression using the SCID (First et al., 1996). A second trained member of the research team listened to recorded SCID interviews and made independent diagnoses. Interrater reliability was excellent for lifetime major depression diagnoses ($\kappa = .99$), and current major depressive episodes ($\kappa = .90$). Disagreements were resolved by consensus. More than half of the sample (56.1%) met current criteria for at least one lifetime episode of major depression, and 9.2% of the sample met criteria for a current episode of major depression.

Results

As shown in Table 1, both ideas of reference and odd/magical beliefs were positively correlated with intuition and negative affect, but were not associated with positive affect.

We investigated whether intuition and affect interactively predicted odd/magical beliefs or ideas of reference by conducting four hierarchical multiple regression (HMR) analyses in which centered affect (positive or negative) and intuition scores were entered in Step 1, and the interaction of these variables were entered in Step 2. As shown in Table 2, the interaction of affect and intuition scores did not significantly improve the prediction of ideas of reference or odd/magical beliefs (all Δr^2 for Step 2 = .00, all p 's > .26).

To enable comparisons with the results of King and Hicks (2009), we conducted two additional HMR analyses in which we predicted ideas of reference and odd/magical beliefs. These HMR analyses were similar in all respects to those just reported, except that we accounted for shared variance with current depression, lifetime depression, and negative affect (by entering these variables as covariates in Step 1) when including positive affect and intuition as predictors. In neither of the HMR's did the interaction of positive affect and intuition significantly improve the prediction of peculiar beliefs (range Δr^2 for Step 2 = .001 to .002, all p 's > .42).

Discussion

In a diverse adult community sample including individuals with elevated levels of peculiar perceptions and beliefs, we found that odd/magical beliefs and ideas of reference were associated with intuitive thinking and negative but not positive affect. These results are consistent with studies finding associations between negative affect and peculiar beliefs (Berenbaum et al., 2006; Boden & Berenbaum, 2004), and with a study finding positive associations between intuitive thinking and superstitious beliefs (Epstein et al., 1996). In contrast to King and colleagues (2007, King & Hicks, 2009), we did not find evidence of an interaction between intuition and affect (positive or negative) predicting peculiar beliefs, whether controlling for depression or not.

It is not surprising that both intuitive thinking and negative affect were associated with peculiar beliefs. Intuitive thinking is characterized by fast, holistic, generalizations. When coupled with unexplained, anomalous events, intuitive thinking may predispose an individual to interpret these events in peculiar ways. Furthermore, we hypothesize that the peculiar beliefs we measured were formed in part to make sense of anomalous events that were difficult to understand, and hence increased negative affect. By explaining these events through the formation of a peculiar belief, participants were able to reduce the accompanying negative affect. This idea is consistent with prominent frameworks of delusions, which characterize the formation of delusions as an adaptive process that functions to protect the believer from the potential impact of unpleasant thoughts and emotions (e.g., Bentall, Corcoran, Howard, Blackwood, & Kinderman, 2001; Maher, 1974).

Positive affect and intuition did not interact to predict peculiar beliefs, as in the studies by King and colleagues' (2007, King & Hicks, 2009). However, we found that individuals with elevated levels of peculiar beliefs and perceptions reported level of positive affect consistent with non-psychiatric populations (Watson et al., 1988). These results contradict the hypothesis that individuals with elevated levels of peculiar beliefs and perceptions may not experience positive affect in the intensity that would promote the use of intuitive thinking to form and maintain peculiar beliefs. Two hypotheses that better account for differences between our findings are those of King and colleagues (2007, King & Hicks, 2009) are that the interactive effect of positive affect and intuition on peculiar beliefs may be: (1) limited to the immediate formation of peculiar beliefs or to peculiar beliefs that are not very convincing; and/or (2) more pronounced when state positive affect is high. King and colleagues (2007; King & Hicks, 2009) measured spontaneously formed odd/magical beliefs, and ideas of references held with an extremely low level of conviction (i.e., mean score was 5.0 [$SD=4.3$] on a scale ranging from 0 to 34). In contrast, we measured peculiar beliefs that were likely to be long-standing and relatively fixed. In addition, King and colleagues (2007) induced a positive mood in three of their studies, and measured individual differences in state positive affect in another. In contrast, we measured individual differences in trait positive affect.

Our results add to the large literature on peculiar and delusional beliefs and cognitive processes (e.g., cognitive biases; see Garety & Freeman, 1999). This literature has generally been limited in its focus on how cognitive biases (e.g., jumping-to-conclusions bias) contribute to the development and maintenance of peculiar beliefs and delusions. Of course, cognitive biases are not the only type of cognitive process that contributes to delusions and peculiar beliefs, as many individuals who hold such beliefs do not demonstrate such biases. Therefore, it is important to identify other cognitive factors that are associated with peculiar beliefs and delusions, as in this study. Our results also add to the small but growing body of literature on peculiar/delusional beliefs and emotions and emotional processes (e.g., Berenbaum et al., 2006). Our findings on affect and peculiar beliefs differed from those of

King and colleagues (2007, King & Hicks, 2009), which suggest notable differences in the factors that contribute to spontaneously formed peculiar belief that are held with low levels of conviction and those that are long-standing and relatively fixed. Research testing related hypotheses (e.g., the factors that contribute to peculiar beliefs in individuals with high and low levels of psychopathology differ) has the potential to further inform our understanding of why peculiar beliefs are quite common in the general population (Moore, 2005) but also associated with distressing types of psychopathology (American Psychiatric Association, 2000). Such information is important as the field moves towards dimensional models of psychopathology that account for variation in signs and symptoms of psychopathology in otherwise healthy individuals (e.g., Krueger & Markon, 2006). Studies that longitudinally measure and/or manipulate both affect and cognition, such as in analog experiments including non-clinical samples, are needed to understand how and when emotional and cognitive factors work together to contribute to peculiar beliefs in individuals with and without psychopathology.

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1. Intuitive thinking and positive affect interactively predict peculiar beliefs in college students
2. We investigated whether results would generalize to clinically relevant sample
3. Peculiar beliefs were associated with intuitive thinking and negative affect
4. Peculiar beliefs were not associated with positive affect
5. The interaction of affect and intuitive thinking did not predict peculiar beliefs

Zero-order Correlations, Descriptive Statistics, and Reliability (Depicted on Diagonal) for Predictor and Criterion Variables.

Table 1

	1	2	3	4	5
1) Odd/magical beliefs	.80				
2) Ideas of reference	.40**	.92			
3) Intuitive thinking	.37**	.23**	.93		
4) Positive affect	-.05	-.08	.10	.91	
5) Negative affect	.24**	.26**	.07	-.42**	.94
<i>Mean</i>	1.1	0.4	3.5	3.3	2.1
<i>Standard Deviation</i>	.9	.6	.7	.7	.8
<i>Range</i>	0.0 – 3.0	0.0 – 3.0	1.0 – 5.0	1.2 – 5.0	1.0 – 4.9

Notes:

* $p < .05$,

** $p < .01$.

Intraclass reliability for ideas of reference and odd/magical beliefs were measured using the intraclass correlation coefficient, treating raters as random effects and the mean of the raters as the unit of reliability. Internal reliability for intuitive thinking, and positive and negative affect was measured using Cronbach's α .

Table 2

Results of Four Hierarchical Multiple Regression Analyses (HMR).

	Predicting Ideas of Reference				Predicting Odd/Peculiar Beliefs			
	HMR 1		HMR 2		HMR 3		HMR 4	
	Beta	r ²	Beta	r ²	Beta	r ²	Beta	r ²
1								
Positive Affect	-.11	.06**		.11**	-.09	.15**		.18**
Negative Affect			.24**				.22**	
Intuition	.24**		.22**		.38**		.36**	
2								
Affect × Intuition	.03	.07**	-.01	.11**	.02	.15**	.19**	.00
							-.06	

Note.

* : p < .05;

** : p < .01.

“r²”= Multiple r². HMR 1 and 3 include positive affect, intuition, and positive affect × intuition as predictors. HMR 2 and 4 include negative affect, intuition, and negative affect × intuition as predictors.