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Associations among perceptual anomalies, social anxiety, and paranoia in a college student sample

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ABSTRACT

Recent evidence suggests that normal-range paranoid ideation may be particularly likely to develop in individuals disposed to both social anxiety and perceptual anomalies. This study was designed to test the hypothesis that among college students in an unselected sample, social anxiety and experience of perceptual anomalies would not only each independently predict the experience of self-reported paranoid ideation, but would also interact to predict paranoid patterns of thought. A diverse sample of 644 students completed a large battery of self-report measures, as well as the five-factor Paranoia/Suspiciousness Questionnaire (PSQ). We conducted hierarchical multiple regression analyses predicting scores on each PSQ factor from responses on measures of social anxiety, perceptual aberration, and the interaction between the two constructs. Current general negative affect was covaried in all analyses. We found that both social anxiety and perceptual aberrations, along with negative affect, predicted multiple dimensions of paranoia as measured by the PSQ; the two constructs did not, however, interact significantly to predict any dimensions. Our findings suggest that perceptual aberration and anxiety may contribute to normal-range paranoid ideation in an additive rather than an interactive manner.

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1. Introduction

Social anxiety and paranoia are psychological phenomena whose cardinal features include expectations of negative responses from others. The nature of the anticipated negative response, however, differs subtly between the two states. Whereas excessive fear that others will evaluate one critically is at the core of social anxiety (Hofmann et al., 2004), excessive and unfounded fear of harm or maltreatment from others characterizes paranoia (Freeman, 2007). Partially underlying both types of fear are proclivities to referential patterns of thinking, or irrational, potentially delusional, beliefs that one is consistently the object of others' notice, criticism, or blame (Fenigstein and Vanable, 1992; Meyer and Lenzenweger, 2009), as well as a limited capacity to evaluate the accuracy of those beliefs (Langdon and Coltheart, 2000). However, whereas socially anxious individuals might believe that their own actions or characteristics are the root causes of the negative responses that they anticipate, paranoid individuals might instead attribute expected negative responses to active malice from others. Although both social anxiety and paranoid thinking manifest as clinically significant extremes in small proportions of the population, considerable evidence suggests that milder experiences of the two phenomena are common in the broader community (Pollard and Henderson, 1988; Fenigstein and Vanable, 1992).

Given their similarities it is not surprising that, although social anxiety and paranoia are typically defined as distinct constructs, recent research has found evidence of overlap between them in both psychiatric samples (Fornells-Ambrojo and Garety, 2009) and the general population (Lincoln et al., 2009). Findings from one study suggest that sub-clinical paranoid ideation may be appropriately categorized as a form of anxiety in some individuals (Freeman et al., 2008a); other research similarly links paranoid thoughts more broadly with different types of negative affect (NA; Combs et al., 2007). Why only a subset of individuals with social anxiety specifically, and elevated negative affect more generally, might also demonstrate paranoid patterns of thinking, however, remains unclear. This question has provoked recent research interest and merits further investigation.

1.1. Social anxiety, perceptual anomalies, and paranoia

Freeman and colleagues have recently conducted several studies examining factors that might lead some individuals, but not others, to develop paranoid patterns of thinking in the context of anxiety or broader negative affective states (Freeman et al., 2005a,b, 2008a).

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Their findings converge to suggest that when individuals experience perceptual anomalies, such as sensory hypersensitivity or bodily discontinuities (i.e., feeling as if body parts are disconnected or misshapen), in the context of preexisting negative beliefs about themselves and others, they are more likely to interpret them as signs of persecution than they would in the absence of a negative cognitive framework.

These findings map onto a well-researched cognitive model of social anxiety (Clark and Wells, 1995). This model postulates that socially anxious people closely monitor not only interpersonal cues, but also their own internal cues (e.g., feelings of shakiness) and use their observations to fuel negative expectations about how others will view them (Clark and Wells, 1995; Beard and Amir, 2009). For example, a socially anxious individual who feels shaky in a feared social situation may believe erroneously that the shakiness is strikingly and embarrassingly visible to others and likely to elicit negative evaluations. It is thus plausible that socially anxious individuals who also experience perceptual anomalies have an additional, and particularly disturbing or embarrassing, set of interoceptive cues that they are vulnerable to believe others will detect and judge them for. If these individuals also exhibit biased reasoning processes (Garety and Freeman, 1999), low or unstable self-esteem (Martin and Penn, 2001; Ellett et al., 2003; Thewissen et al., 2007), and a proclivity to evaluate others negatively (Chadwick and Trower, 1997), paranoid ideation may be particularly likely to emerge.

These findings are also consistent with theories about delusional thinking and how it emerges. Maher (1974), for example, defined delusions as "hypothes[e]s designed to explain unusual perceptual phenomena" (p. 103). The irrational negative cognitive framework associated with social anxiety may lead affected individuals who also experience perceptual anomalies to develop subclinical, quasi-delusional beliefs that serve a similar explanatory function. Further, socially anxious individuals are prone to engage in extensive post-event processing that is colored heavily by their negative self-perceptions and that omits or downplays cues that might contradict beliefs that others evaluated them critically (Clark and Wells, 1995). This tendency is suggestive of a limited or impaired capacity among socially anxious people to evaluate their own beliefs, a characteristic that Langdon and Coltheart (2000) proposed as an additional factor underlying the development of delusional thought.

Thus, findings from several literatures converge to suggest that the negative belief framework associated with social anxiety provides a context in which perceptual anomalies are likely to be misinterpreted as visible cues that are particularly likely to elicit, or even manifest as consequences of, harsh judgment or mistreatment by others. Further, inadequate monitoring and evaluation of beliefs among the socially anxious may perpetuate such misinterpretations and associated cognitions and emotions. Social anxiety and perceptual anomalies are thus both plausible components of mechanisms underlying the development of paranoid thought in members of the general population.

In keeping with this idea, the present study was designed to test the hypothesis that among college students in an unselected sample, social anxiety and experience of perceptual anomalies would not only each independently predict the experience of self-reported paranoid ideation, but would also interact to predict paranoid patterns of thought. Unlike prior research focused on anxiety, perceptual anomalies, and paranoia, which has typically treated paranoia as a unidimensional construct (Freeman et al., 2005a,b, 2008b; Martin and Penn, 2001), we examined associations among social anxiety, perceptual abnormalities, and Rawlings and Freeman's (1996) five proposed factors for subclinical paranoia, which they based on a factor analysis of a large item set drawn from established, theoretically-driven measures of paranoia and related constructs. We elected to use Rawlings and Freeman's (1996) model for two primary reasons. First, the Paranoia and Suspiciousness Scale (PSQ) permits separate examination of the experience of suspicion or mistrust (Suspiciousness/Hostility, Mistrust/Wariness, and Perceived Hardship/Resentment factors), which we expected to be associated with social anxiety and perceptual anomalies, as well as their interaction, and of negative emotional experiences that are not specific to paranoia (Negative Mood/Withdrawal and Anger/Impulsiveness factors). We expected Negative Mood/Withdrawal to be more strongly associated with self-reported social anxiety than with perceptual anomalies; and we anticipated that neither social anxiety nor perceptual anomalies would contribute significantly to the variance in Anger/Impulsiveness when general negative affect was covaried. Second, the measure was normed on an unselected college student sample ($n=561$) that resembled our sampling population in both age and gender.

To test our hypotheses, we conducted hierarchical multiple regression analyses, in which responses on measures of social anxiety and perceptual aberration, as well as their interaction, were entered as predictors of scores on the five factor analysis-derived subscale scores from the Paranoia/Suspiciousness Questionnaire (PSQ; Rawlings and Freeman, 1996). Scores on a measure of general negative affect in the preceding week (Depression Anxiety Stress Scales; DASS; Lovibond and Lovibond, 1995) were entered at the first step of each model as a covariate to permit examination of the specificity of associations between social anxiety and PSQ subscale scores.

2. Methods

2.1. Subjects and procedures

Students enrolled in introductory psychology courses at an urban public university in the southeastern United States were invited to participate in an online survey study for course research credit. After reviewing an online informed consent form, approved by the university's Institutional Review Board, 880 students completed a series of web-based questionnaires, which were administered in randomized order across participants and typically required 30 to 60 min to complete ($M=51.1$ min, S.D. $=24.1$ min). Participants who completed the assessment in <20 min ($n=50$) or skipped too many items to permit calculation of total or subscale scores on any of the four study measures ($n=186$) were excluded, yielding a sample of 644 (as shown in Table 1, the original and final samples did not differ along any demographic variables). Participants were largely female and represented diverse racial/ethnic backgrounds. Roughly half of the participants reported that they were currently dating, engaged, or married. Past mental health treatment was endorsed by roughly a quarter of participants; depression and/or anxiety were the most commonly reported reasons (72 participants declined to report why they had received treatment).

2.2. Measures

Perceptual Aberration Scale (PAS; Chapman et al., 1978): This extensively researched true/false, self-report measure consists of 35 items that focus on experience of body-image distortions and perceptual anomalies. The measure has demonstrated reliability and validity in varied samples, including college undergraduates (Lenzenweger, 1994; Chapman et al., 1995; Kwapil et al., 2008). The Cronbach's internal consistency coefficient for the PAS in the present sample was $\alpha=0.91$; the Kwapil et al. (2008) study yielded $\alpha=0.88$ in an undergraduate sample.

Fear of Negative Evaluation Scale (FNE; Watson and Friend, 1969): The 30-item FNE is a broadly validated and carefully-studied self-report measure designed to evaluate apprehension about being negatively evaluated by others, a core feature of social anxiety (Orsillo, 2001; Rodebaugh et al., 2004). In prior research, estimates of internal consistency reliability have been high ($KR\text{-}20=0.83$–0.93) (Rodebaugh et al., 2004). The Cronbach's internal consistency coefficient for the FNE total score in the present sample was $\alpha=0.92$.

The 47-item *Paranoia/Suspiciousness Questionnaire* (PSQ; Rawlings et al., 1996) is a self-report scale for use in non-clinical populations that combines items from a variety of well-established measures of paranoia and related constructs, such as hostility. The PSQ is divided into five subscales based on factor analytic findings; these subscales are labeled as Interpersonal Suspiciousness/Hostility, Negative Mood/Withdrawal, Anger/Impulsiveness, Mistrust/Wariness, and Perceived Hardship/Resentment (Rawlings et al., 1996). The PSQ subscales have demonstrated adequate internal consistency (subscale alphas range from 0.65 to 0.77) and evidence suggests validity in non-clinical populations (Gudjonsson et al., 2002; Green et al., 2008). Cronbach's internal consistency coefficients for the PSQ subscales in the present sample were: Interpersonal Suspiciousness/Hostility (12 items) $\alpha=0.82$, Negative Mood/Withdrawal (7 items) $\alpha=0.58$, Anger/Impulsiveness (9 items) $\alpha=0.70$, Mistrust/Wariness (6 items) $\alpha=0.74$, and Perceived Hardship/Resentment (13 items) $\alpha=0.78$.

The 42-item *Depression, Anxiety, and Stress Scale* (Lovibond and Lovibond, 1995) elicits ratings of depressive and anxious symptoms, as well as subjective stress, experienced during the past week. Scores on this scale correlate highly with those on widely used measures of depression and anxiety, such as the Beck Depression

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