Paranoia and anxiety: A cluster analysis in a non-clinical sample and the relationship with worry processes

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ABSTRACT

Background: Worry processes are implicated in paranoia and anxiety. However, clinical studies focused on patients with co-occurring paranoia and anxiety. As both paranoia and anxiety are distributed across clinical and non-clinical groups, an investigation on worry processes among non-clinical individuals will allow us to delineate the specific worry mechanisms in paranoia and anxiety respectively.

Aims: To identify clusters of non-clinical individuals who report varied levels of paranoia and anxiety, and to compare worry processes across clusters.

Method: An online survey, consisting of self-report questionnaires on generalized anxiety, paranoia, and worry processes, was completed by 2796 undergraduate students. A multiple-step validity check procedure resulted in a subsample of 2291 students, upon which cluster analyses and multivariate analyses of variance were conducted.

Results: Four clusters of individuals were identified: (1) high paranoia/moderate anxiety, (2) average paranoia/high anxiety, (3) average paranoia/average anxiety, and (4) low paranoia/low anxiety. A unique cluster of individuals with high paranoia but low/average level of anxiety was not found. Cluster 1 reported a significantly higher intensity of day-to-day worries, a higher level of meta-worry, and more extreme meta-cognitive beliefs about worry than other clusters.

Conclusions: Individuals with high paranoia tended to report anxiety as well, but not vice versa. Our findings supported a hierarchical structure of anxiety and paranoia. All worry processes were exacerbated in individuals with paranoia and anxiety than those with anxiety alone.

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1. Introduction

Generalized anxiety has been consistently reported by patients with persecutory delusions (Freeman and Garety, 1999; Hartley et al., 2013; Startup et al., 2007). More importantly, it has been suggested that anxiety does not merely arise as a consequence of persecutory delusions, but may play a direct role in the formation and maintenance of persecutory delusions (Bird et al., 2017; Harrow et al., 2008; Thewissen et al., 2011). This has led to an increase in research interest in examining the role of anxiety-related cognitive processes, such as worry, in the development of paranoid thinking.

Worrying is a core symptom in Generalized Anxiety Disorder (GAD) and is implicated across anxiety disorders (Olatunji et al., 2010). Three distinct worry processes have been investigated, namely worrying about day-to-day events, meta-worry and meta-cognitive beliefs about worry (Wells, 1994a, 1995). While daily worries concern external or non-cognitive internal events (e.g. job/career issues, relationships, finances and health) (Tallis et al., 1992), meta-worry focuses on the worrying itself. Both are driven by one's beliefs about worry (i.e. meta-cognitive beliefs), which consist of positive beliefs about the functionality of worrying and negative beliefs about worry (e.g. that it is uncontrollable and dangerous, and should be controlled) (Wells, 1994a, 1995). It has been shown that meta-worry and beliefs about worry, rather than content of worries, distinguished patients with GAD from non-clinical worriers (Borkovec et al., 1991; Tallis et al., 1994; Wells and Carter, 2002).

More recently, worry in general has been suggested as a proximal risk factor for paranoia (Freeman and Garety, 2014), leading to suggestions of applying interventions that target worry processes on treating paranoia (Foster et al., 2010; Freeman et al., 2015). Among patients with persecutory delusions, level of worry is positively associated with persecutory thinking (Freeman and Garety, 1999; Startup et al., 2007). More specifically, Freeman and Garety (1999) reported similar patterns

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of meta-worry and beliefs about worry between patients with persecutory delusions and patients with GAD. In a sample of 150 patients with persecutory delusions, Startup et al. (2016) found that negative meta-cognitive beliefs about the need to control thoughts were more closely linked to level of paranoia than level of generalized anxiety, whereas negative meta-cognitive beliefs about the uncontrollability and danger of worry were more closely linked to level of generalized anxiety than level of paranoia. Although this preliminary evidence suggests the possibility that some worry processes are differentially linked to paranoia and anxiety, as patients with established paranoid experiences tend to suffer from anxiety as well (Hartley et al., 2013), it is difficult to determine the extent to which specific worry processes were attributed to paranoia, the co-occurring anxiety, or their combination.

There is robust evidence that both paranoia and anxiety are experienced by patients as well as individuals in the general population (Freeman et al., 2005; Löwe et al., 2008). This has provided an opportunity for us to investigate the occurrence of paranoia and anxiety without complications of an established illness. If both paranoia and anxiety exist in a continuum in the general population, are these two separate continua or is it possible that the two fall on the same continuum given their shared components such as worry? Freeman et al. (2005) postulated that paranoia exists as a hierarchy in the general population, with persecutory beliefs building upon ideas of reference, which in turn build upon common social evaluation concerns. Focusing on worry mechanisms rather than social evaluation concerns, the present study aimed to examine the paranoia continuum and the generalized anxiety continuum in a large non-clinical sample. Given that patients with persecutory delusions typically report generalized anxiety as well, it is likely that individuals who have non-clinical paranoid experiences also tend to be anxious, whereas anxious individuals may not necessarily have paranoid experiences. A cluster analysis (Dillon and Goldstein, 1984) would allow us to identify typologies of individuals who experience a range of combination of paranoia and anxiety, hence addressing the relation between the paranoia continuum and the anxiety continuum.

Following Startup et al. (2016), this study aimed to examine the relationship between worry processes, paranoia and anxiety. Comparing worry processes (namely worry about daily events, meta-worry and beliefs about worry) across clusters of individuals who exhibit varied levels of paranoia and anxiety proneness will help to unravel specific worry processes that are more closely associated with paranoia and anxiety respectively. We also explored group comparisons on content of worries. As paranoia is characterized by the theme of interpersonal threat (Rietdijk et al., 2009) and is consistently related to heightened interpersonal sensitivity (Bell and Freeman, 2014), it is possible that individuals with paranoia are distinguished by more heightened worries around social and interpersonal issues than individuals with anxiety only.

Study hypotheses were as follows:

(1). At least three typologies of individuals will be identified: a group characterized by elevated levels of paranoia and anxiety; a group characterized by low levels of paranoia and anxiety; and a group with elevated anxiety but low paranoia.

(2). Meta-worry and negative meta-cognitive beliefs about the uncontrollability and danger of worry will be greater in clusters of individuals with high anxiety, whereas negative meta-cognitive beliefs about the need to control thoughts will be greater in the high-paranoia cluster.

(3). Social and relationship worries will be greater in the high-paranoia cluster than other clusters.

2. Methods

Ethics approval for this study was granted by the Survey and Behavioural Research Ethics Committee (SBREC) of the Chinese University of Hong Kong. Written consent was obtained from all participants.

2.1. Participants

We included full-time undergraduate students from tertiary institutions in Hong Kong, who were 18 to 25 years old. As this study focused on paranoia and anxiety proneness in a non-clinical population, students who reported a current or previous psychiatric diagnosis were excluded.

2.2. Procedure

Recruitment was carried out through means including university mass mailing, university subject pool, distribution of leaflets in campuses, promotion on a social media site (i.e. Facebook) and snowball sampling. Consented participants completed an online survey individually. Only part of the survey (i.e. 6 out of 13 questionnaires)[1] was included for the current purpose.

Data validity was thoroughly checked by a two-fold procedure. First, to validate the identity of the responders, participants were contacted individually after completing the survey. Only those who provided valid contact information and confirmed their undergraduate student status were included. Second, we evaluated the responses based on completion time, long-string responses, and odd-even consistencies of responses within scales (Jackson, 1977; Niessen et al., 2016), which were applied to the whole survey (13 questionnaires). Specific thresholds for these methods are listed in Fig. 1. Only valid data (i.e. responses that passed all the above validity criteria) were entered into analysis. The data collection process lasted for four months (from March 2016 through June 2016).

2.3. Measures

2.3.1. Clustering variables

The Green et al. Paranoid Thought Scales (GPTS; Green et al., 2008) is a 32-item scale assessing the presence of paranoia over the past month. Each item is rated on a 5-point scale. Higher scores indicate a greater magnitude of paranoid thinking. Good internal consistencies ($\alpha s = 0.69$–0.92) and test-retest reliability ($rs = 0.81$–0.88) were established (Green et al., 2008). The GPTS has been translated into Chinese for the current study (unpublished).

The Generalized Anxiety Disorder Scale (GAD-7; Spitzer et al., 2006) assesses severity of seven core symptoms of GAD on a 4-point scale over the last 2 weeks. The total score ranges from 0 to 21, with scores of ≥5, ≥10, and ≥15 representing mild, moderate and severe anxiety symptom levels respectively. A score of 10 is a sensitive cut-off point for identifying GAD cases (Spitzer et al., 2006). The Chinese version of GAD-7 yielded good test-retest reliability ($\alpha = 0.86$) and convergent validity ($rs = 0.66$–0.84) (He et al., 2010).

2.3.2. Worry processes (worry about daily events, meta-worry and meta-cognitive beliefs about worry)

The Worry Domain Questionnaire (WDQ; Tallis et al., 1992) is a 25-item questionnaire for worries about daily events including relationships, lack of confidence, aimless future, work incompetence and finances. Items are scored on a 5-point scale measuring intensity of worrying. The WDQ has an acceptable level of internal consistency and good construct validity (Tallis et al., 1992).

The Anxious Thought Inventory (AnTI; Wells, 1994b) is a 22-item questionnaire comprising social worry, health worry and meta-worry

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[1] The whole survey includes: the 9-item Patient Health Questionnaire (PHQ-9), the Generalized Anxiety Disorder Screener (GAD-7), the World Health Organization Disability Assessment Schedule 2.0 (WHO-DAS 2.0), the Green et al. Paranoid Thought Scales (GPTS), the Cardiff Anomalous Perception Scale (CAPS), the Schizotypal Personality Questionnaire-Brief (SPQ-B), the Penn State Worry Questionnaire (PSWQ), the Worry Domain Questionnaire (WDQ), the Anxious Thought Inventory (AnTI), the Metacognitions Questionnaire-Short Form (MCQ-30), the Ruminative Response Scale (RRS), the Interpersonal Sensitivity Measure (IPSM), the Attributional Style Questionnaire (ASQ).