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## The relationship between personality traits and psychotic like experiences in a large non-clinical adolescent sample



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### ABSTRACT

**Objective:** The relationship between personality and psychosis is well established. It has been suggested that this relationship may be partly accounted for by higher levels of depression in individuals with certain personality traits. We explored whether the link between personality and psychotic symptoms is already apparent in adolescence, and if this association would still hold when depression was controlled for.

**Method:** 654 secondary school students were surveyed via self-report questionnaires measuring the Five-Factor model of personality (NEO-FFI), depression (CES-D) and psychotic-like experiences (CAPE).

**Results:** Positive associations were found between Neuroticism and all CAPE-subcales except Magical Thinking, which was in turn associated with all other personality traits when at high levels. Agreeableness was negatively associated with all CAPE-subcales, while Openness to Experience was only positively associated with Persecutory Ideas and Magical Thinking. After controlling for depression, many of the significant associations remained.

**Conclusion:** Our findings suggest that the chance of having psychotic like experiences is more likely for adolescents with certain personality traits. These associations are not fully explained by depression, especially when psychotic experiences are at higher levels. Future research is needed to investigate if these personality traits might put a person at risk for the development of full-blown psychosis.

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### 1. Introduction

There is longstanding interest in identifying dimensions of personality and their role in psychopathology. The most well-known model of personality is the Five Factor Model (FFM) of Personality (McCrae & Costa, 1987), also referred to as the 'Big Five' model, which distinguishes the five domains of Neuroticism, Openness to Experience, Agreeableness, Extraversion and Conscientiousness. A FFM dimension commonly associated with mental health problems is Neuroticism (Boyce, Parker, Barnett, Cooney, & Smith, 1991; Clayton, Ernst, & Angst, 1994; Ormel, Oldehinkel, &

Brilman, 2001). This personality trait is typified by the predisposition to experience anxiety, fear, self-consciousness and sadness, and is especially elevated in syndromes that entail chronic, pervasive distress, such as major depression and generalised anxiety disorder (Boyce et al., 1991; Clayton et al., 1994). People with schizophrenia show higher levels of neuroticism (Horan, Blanchard, Clark, & Green, 2008). This construct is strongly predictive of the level of positive symptoms in psychosis studies, both in non-clinical (Krabbendam et al., 2002) and clinical samples (Lysaker, Wilt, Plascak-Hallberg, Brenner, & Clements, 2003). Moreover, longitudinal data indicates that childhood neuroticism is a risk factor for the onset of psychosis in adult life (Van Os & Jones, 2001).

There is also strong evidence for an association between the FFM dimensions Extraversion, Agreeableness and Openness to

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Experience, and schizophrenia. Lower levels of both Extraversion (the tendency to be outgoing, assertive, active, and excitement seeking) and Agreeableness (tendencies to be kind, gentle, trusting and trustworthy, and warm) have been linked to higher levels of positive psychotic symptoms and relapse in samples with first-episode psychosis and chronic schizophrenia (Gleeson, Rawlings, Jackson, & McGorry, 2005; Lysaker et al., 2003). Although the link between psychosis and Openness (described as gratuitous interest in a variety of experiences in the areas of fantasy, aesthetics, feelings, actions, ideas, and values and as a recurrent need to enlarge and examine experience) is less established, it has been associated with schizotypy in non-clinical samples (Miller & Tal, 2007; Nelson & Rawlings, 2010).

Adolescence is particularly interesting with regards to personality–psychopathology relationships because it represents a period that is associated with developmental, neurological (Giedd et al., 1999) and psychosocial changes that potentially impact a person's mental health and personality (Blonigen, Carlson, Hicks, Krueger, & Lacono, 2008). The prevalence of internalizing and externalising psychological disorders peaks at this phase (Kessler et al., 2005). In particular, low-level psychotic experiences (most transitory) are more common in adolescents than in adults (Yung et al., 2009).

Biological and psychosocial changes that are distinctive in adolescence and early adulthood are also reflected in changes in personality (Klimstra, Hale, Raaijmakers, Branje, & Meeus, 2009). During the transition from adolescence to adulthood, people tend to become more agreeable, more conscientious and less neurotic and less open to experience (Branje, Van Lieshout, & Gerris, 2007). Similar to findings in adult samples, a personality–psychopathology association has been demonstrated in adolescents, with neuroticism and extraversion being related to depression and anxiety (Griffith et al., 2010). However, less is known about the association between adolescent personality traits and (subclinical) psychotic symptoms. Researching the link between personality traits and psychotic experiences [referred to as Psychotic Like Experiences (PLEs)] in the adolescent population may provide greater insight into which personality traits increase vulnerability to psychotic disorder later in life. It has been suggested that PLEs should not be considered a homogeneous entity in this regard (Yung et al., 2009). Previous research from our group, the PLE subtypes of Bizarre Experiences, Persecutory Ideas, and Perceptual Abnormalities were found to be more strongly correlated with distress and depression, whereas Magical Thinking was not (Wigman et al., 2011; Yung et al., 2009).

The aim of the current study was to investigate the association between personality, as assessed by the FFM of personality, and the four different subtypes of PLEs in a non-clinical adolescent sample. Since it is well established that Neuroticism is highly correlated with depression, we subsequently explored whether personality remain associated with PLEs after controlling for depression. Based on earlier work, we hypothesised that:

- (1) Neuroticism and Openness to Experience would be positively associated with Bizarre Experiences, Persecutory Ideas and Perceptual Abnormalities, but not Magical Thinking, and;
- (2) Agreeableness and Extraversion would be negatively associated with Bizarre Experiences, Persecutory Ideas and Perceptual Abnormalities.

## 2. Methods

### 2.1. Sample

Participants were recruited via secondary schools in the Western Metropolitan Region of Melbourne that gave their consent to

assess their Year 10 students. Of the sixty schools that were approached, 34 agreed to be part of the study.

### 2.2. Procedure

Participants were part of a large longitudinal study with assessments at baseline, 1 and 2 years (Yung et al., 2009). The current study used the data collected at the one-year follow-up, when questionnaires on both personality traits and PLEs were administered. The study was approved by Research and Ethics Committees at the University of Melbourne, Victorian Department of Education and the Catholic Education Office. All participants provided written consent and parental/guardian assent if younger than 18 years old.

### 2.3. Instruments

PLEs were assessed with the Community Assessment of Psychic Experiences (CAPE) (<http://www.cape42.homestead.com>, 02/04/2014). The CAPE consists of 42-items measuring positive, negative and depressive symptoms. For this study, PLEs were assessed using the positive scale of the CAPE [20 items, which was divided into four subscales as reported in Yung et al. (2009): Bizarre Experiences, Persecutory Ideas, Perceptual Abnormalities and Magical Thinking]. This self-report scale uses a 4-point Likert scale to indicate symptom frequency ('Never', 'Sometimes', 'Often' and 'Nearly always') and a 4-point scale to indicate the degree of distress experienced ('Not distressed', 'A bit distressed', 'Quite distressed' and 'Very distressed'). The time frame of the CAPE is 'lifetime'. Internal consistency of the CAPE frequency items was good (ordinal alpha 0.90).

Depression was measured using the Centre for Epidemiologic Studies Depression Scale (CES-D). The CES-D consists of 20 items that rate frequency of depressive symptoms from 1 (rarely) to 4 (mostly) over the past week (Radloff, 1977). A cut off score of >16 indicates depression. Internal consistency of the CES-D was good (ordinal alpha 0.94).

The NEO-Five Factor Inventory (NEO-FFI) (McCrae & Costa, 2004) was used to assess the Five Factor Model of Personality (McCrae & Costa, 2004). NEO-FFI contains 60 items, which are summed to measure the five domains that constitute the FFM: Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness. Each item consists of a statement rated on a 4-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. Internal consistency (Cronbach's alpha)  $N = .975$ ,  $E = .979$ ,  $O = .974$ ,  $A = .977$ ,  $C = .981$ .

### 2.4. Statistical analyses

Data were analysed using Stata 13.0 (Statcorp) and R Studio.

The internal consistencies of the CAPE and the CES-D (both instruments with four-point response categories) were assessed by calculating ordinal alpha in R, the conceptual equivalent to Cronbach's alpha for ordinal data (Gadermann et al., 2012), with the R packages 'psych' (Revelle, 2011), and 'GPArotation' (Bernaards & Jennrich, 2005). A value of 0.80 or higher indicated good internal consistency (Streiner, 2003).

Bivariate correlations were calculated for the CAPE, the CES-D and NEO subscales to explore associations between the three instruments. Because data of the sum scores of the CAPE positive scale, the CES-D and some subscales of the NEO were not normally distributed, Spearman correlations were calculated.

Four multivariate multinomial logistic regression analyses were run, one with each of the CAPE subscale scores as the dependent variable, predicted by the five NEO subscales. For these analyses, the sum scores of the four CAPE sum scores were divided into quartiles and treated as categorical outcome with four levels, since the

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