

## Concept Paper Template 2019

**Provisional Paper Title:** How does autism relate to general psychopathology 'p' factor? An exploration of autistic traits and p in the Dunedin longitudinal cohort.

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Other authors and author order tbc in discussion with Temi and Avshalom

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**P.I. Sponsor:** Temi Moffitt

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**Objective of the study:**

Neurodevelopmental conditions and psychiatric disorders

Traditionally, neurodevelopmental disorders are conceived as falling under a different etiological model to common psychiatric disorders. This distinction is also apparent in the organization of the diagnostic manuals.

In terms of the neurodevelopmental disorder autism, it is considered to be a lifelong condition that always has its onset in early childhood, has a genetic cause, and does not cycle into other diagnoses, or abate, or be brought on by common environmental stressors such as stressful life events. In contrast, the common understanding of most psychiatric disorders is that they are caused by a combination of genetic and environmental risk factors, they usually have wide individual differences in age of onset e.g. spanning adolescence up to age 40+, and individuals can cycle from one disorder into another over time.

It has long been recognized that autism involves a spectrum of symptoms which bring strengths and weaknesses: again this is not a typically held view for psychiatric disorders which are generally viewed as impairing.

Autism and the p factor

Much of the empirical work that has emerged on the psychopathology p factor has focused on data from adults and on psychiatric disorders. The

psychopathology p factor is derived from bifactor confirmatory factor analysis structural equation models. For example, Caspi et al (2014) reported on the structure of symptoms of mental disorders in the Dunedin study in adults. Lahey et al (2017) have also reported evidence supporting a general factor of psychopathology, with a general focus on internalizing and externalizing domains without consideration of autism.

Autism is known to show high co-occurrence with many psychiatric disorders (Lai et al 2019). We know relatively little about how autism is related to the p factor. A new study shows that autistic traits in children and adolescence do load onto a p factor model which also includes peer problems, emotional problems, hyperactivity, conduct problems, antisocial behavior and psychopathic tendencies (Allegrini et al in press).

In terms of genetic influences and p, one study found evidence for a general genetic factor, again on largely adult onset conditions (and not including autism). Pettersson et al (2016) reported evidence for a general genetic factor across schizophrenia, schizoaffective disorder, bipolar disorder, depression, anxiety, attention-deficit/hyperactivity disorder, alcohol use disorder and drug abuse.

## Autism and Autistic Traits

There is growing support for the study of autistic traits as valid constructs that are on an etiological continuum with autism. Twin and LD score regression analyses both provide evidence that autism and autistic traits have overlapping genetic causes (e.g., Lundstrom et al., 2012; Ronald et al., 2006; Robinson et al 2011; 2015). Autistic traits bring specific benefits including that they provide quantitative dimensional measurement and they can be cost effectively collected in large samples and cohorts.

## Fractionating Autism

The social and nonsocial domains within autism/ autistic traits have not been found to fall into a single principle component (reviewed by Happé & Ronald, 2008; Mandy & Skuse, 2008). Moreover they associate with different cognitive constructs and show only modest genetic overlap (Happé & Ronald, 2008; Robinson et al., 2012; Ronald et al., 2006, 2010). These lines of evidence support the exploration of social and nonsocial autistic traits separately.

## Aims and Objectives

The aim of this report is to explore the nature of the association between autistic traits as measured by the AQ-10 and the general psychopathology p factor.

- A. Objectives for validating the measure of autistic traits. *This is a pre-stage of the project which will be completed in conjunction with Prof Francesca Happé and Jasmin Wertz and prior to the concept paper being finalized.*
- B. Objectives for characterising p in autism
  1. To document the magnitude of the association between autistic traits and the general psychopathology p factor cross-sectionally.
  2. To identify where high AQ scorers fall on p at age 45 compared to the whole sample
  3. To rank AQ items in terms of the strength of their association with p
  4. To test which aspects of the AQ most strongly associated with p: the social subscale, the nonsocial subscale, functional impairments or wanting to/actually seeking help
  5. To assess whether the AQ is associated with p independent of functional impairments or wanting to/actually seeking help
  6. To identify characteristics (individual or family-wide) that distinguish high AQ + high p scorers from high AQ + low p scorers

Repeat above with social and nonsocial AQ quantitative scores/ High scoring social/nonsocial groups (as applicable).

Repeat with the externalizing and internalizing and thought factor scores

### **Data analysis methods:**

Standard quantitative parametric analysis methods such as Pearson correlations, ANOVA group differences, regression.

Skew will either be handled by employing non-parametric tests or by transforming the variable prior to analyses.

Sex and age will be covariates.

*These Analysis methods are preliminary and to be discussed with Dunedin team who will be more familiar with the data and any issues such as group/cohort effects and other factors to consider.*

### **Variables needed at which ages:**

The 10 AQ items and total scale at age 45  
AQ11 and AQ 12 (Functional impairment and seeking help items)

Cross-age 'p' score

Externalizing and internalizing and thought factor scores from correlated model

Correlates/ variables (inc for objective B6)

Age

Sex

ACEs

IQ

Childhood SES

Occupations list for top AQ scorers from Jasmin

Adult Relationships (0-4 waves with a partner variable from Kyle)

Big 5 Agreeableness and openness

Childhood temperament

A measure capturing stable/supportive family?

Any standard exclusion variables or cohort/testing/'batch' variables to control for.

**Significance of the Study (for theory, research methods or clinical practice):**

1. Provide a new perspective on autism and its link to mental health by reporting on how p relates to autistic traits in older adult life
2. Feed into the theoretical conceptualisation of autism within neurodevelopmental versus psychiatric fields
3. Implications for clinical practice in terms of exploring what factors protect individuals with high autistic traits from also having high rates of general psychopathology (as measured by p).

## Data Security Agreement

Provisional Paper Title	Do autistic traits in adults associate with underlying vulnerability for the general psychopathology p factor?
Proposing Author	Angelica Ronald
Today's Date	October 2019

**Please keep one copy for your records and return one to the PI Sponsor**

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	I am current on Human Subjects Training [CITI <a href="http://www.citiprogram.org">www.citiprogram.org</a> ] or equivalent.
AR	My project is covered by the Dunedin Study's ethics approval OR I have /will obtain ethical approval from my home institution (please specify).  I will obtain ethical approval from Birkbeck Psychological Sciences ethics committee for secondary data analysis for this project.
AR	I will treat all data as "restricted" and store in a secure fashion. My computer or laptop is: <ul style="list-style-type: none"> <li>• encrypted (recommended programs are FileVault2 for Macs, and Bitlocker for Windows machines)</li> <li>• password-protected</li> <li>• configured to lock-out after 15 minutes of inactivity AND</li> <li>• has an antivirus client installed as well as being patched regularly.</li> </ul>
AR	I will not "sync" the data to a mobile device.
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AR	I will not post data online or submit the data file to a journal for them to post.  <i>Some journals are now requesting the data file as part of the manuscript submission process. The Dunedin Study Members have not given informed consent for unrestricted open access, so we have a managed-access process. Speak to your PI Sponsor or Richie Poulton for strategies for achieving compliance with data-sharing policies of journals.</i>
AR	I will delete all data files from my computer after the project is complete. Collaborators and trainees may not take a data file away from the office.  The data remains the property of the Study and cannot be used for further analyses without an approved concept paper for new analyses.

Signature: \_\_\_\_\_ *Angelica Ronald* \_\_\_\_\_