

**ENVIRONMENTAL-RISK (E-RISK) LONGITUDINAL TWIN STUDY
CONCEPT PAPER FORM**

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Provisional Paper Title: Investigating genetic and environmental influences on protective factors for psychotic phenomena amongst children and adolescents exposed to poly-victimization

Date: 14 August 2017

Background:

In our recent papers, we investigated a range of individual, family and community-level characteristics associated with a reduced likelihood of psychotic symptoms emerging at age 12 or age 18 amongst poly-victimized children/adolescents.

In our first paper, we found that having a relatively high IQ, more positive atmosphere at home, and living in areas with higher levels of neighborhood social cohesion were found to be protective against childhood psychotic symptoms amongst those exposed to poly-victimization. Our second paper found that childhood mental health and social support were protective amongst those exposed to poly-victimization during adolescence.

The aim of the current paper is to build on the findings from both papers by taking advantage of the twin sample to look at the relative genetic and environmental influences on resilience to psychotic phenomena, identified protective factors and any overlap between them. Our key research questions and analyses are detailed below:

Part 1 – Focus on Resilience to Psychotic Phenomena

To what extent is resilience to psychotic phenomena influenced by environmental and genetic factors at time point 1 (age 12) and time point 2 (age 18)?

Separate univariate analyses will be conducted at each time point on the whole sample to consider the extent to which resilience to (an absence of) psychotic symptoms (at age 12) and psychotic experiences (at age 18) are genetically and environmentally influenced.

As a secondary analysis, for each time point, the univariate analyses will be re-run to include poly-victimization (either during childhood or adolescence) as a moderator to understand whether poly-victimization exposure moderates the environmental or genetic contributions to resilience to psychotic phenomena during childhood or adolescence. [Note. This approach is to be taken because there would be insufficient power to run the univariate analyses in the poly-victimized sub-group.]

To what extent is resilience to psychotic phenomena driven by overlapping genetic and/or environmental factors during childhood and adolescence?

Any shared environmental or genetic influences on resilience to psychotic outcomes across childhood and adolescence has not been considered previously in our cohort and therefore it would be interesting to understand whether there are overlapping genetic and/or environmental factors that are driving resilience to psychotic phenomena over time. This will be considered using a bivariate model.

Part 2 – Overlap between protective factors & resilience to psychotic phenomena

To what extent is the relationship between identified child-specific protective factors and resilience to psychotic phenomena due to overlapping genetic and environmental factors?

This will be tested using bivariate twin models to establish the overlap between each protective factor and resilience to psychotic phenomena either at (i) at age 12, and (ii) age 18. The analysis will include one bivariate model for childhood IQ and age-12 psychotic symptoms. In addition, two bivariate models for adolescence will be run to consider mental health at age 12 and social support with age-18 psychotic experiences.

To investigate the role of family-level protective factors including atmosphere at home and social cohesion at ages 12 on the etiology of resilience to psychotic phenomena, we will run a univariate model including these variables as measured common environmental variables similar to the model presented in the Kim-Cohen et al (2004) paper [Child Dev. 75(3):651-68].

As a secondary analysis, poly-victimization will be used as a moderator to consider whether this exposure changes the genetic or environmental contributions to resilience to psychotic phenomena, the protective factor, or the overlap between them.

Fruhling has kindly agreed to provide support on the paper for the analysis and the above research plan has been agreed with her.

Required Variables:

General Information

FAMILYID	Unique family identifier
ATWINID	Twin A ID (ex chkdg)
BTWINID	Twin B ID (ex chkdg)
RORDERP5	Random Twin Order
RISKS	Sample Groups
COHORT	Cohort
SAMPSEX	Sex of Twins: In sample
ZYGOSITY	Zygosity
SESWQ35	Social Class Composite

Individual Characteristics

IQE5	Pro-rated IQ score - Elder
IQY5	Pro-rated IQ score - Younger
SOCSUPE18	Social Support scale - P18 – Elder
SOCSUPY18	Social Support scale - P18 – Younger
ANYCDDX_ EMT512	Any CD dx from 5 to 12, mum/tchr, Elder
ANYCDDX_ YMT512	Any CD dx from 5 to 12, mum/tchr, Younger
ADHDANYE512	Any ADHD dx [incl meds] - P5-12 - Elder
ADHDANYY512	Any ADHD dx [incl meds] - P5-12 - Younger
CDICATE12	Clinically significant depression (CDI >= 20) - P12 - Elder
CDICATY12	Clinically significant depression (CDI >= 20) - P12 - Younger
MASCCATE12	Extreme anxiety (>= 95th percentile) - P12 - Elder
MASCCATY12	Extreme anxiety (>= 95th percentile) - P12 - Younger

Home & Community-Level Variables

SCOHM5	Neighbourhood Social Cohesion (age 5)
ATHOME7	Atmosphere at home - Phase 7
ATHOME10	Atmosphere at home - Phase 10

Poly-Victimization Variables

polyve512	Extent of Polyvictim, 5-12, E-Twin
polyvy512	Extent of Polyvictim, 5-12, Y-Twin
POLYVCTZE18	Poly-victimization count - P18 - Elder
POLYVCTZY18	Poly-victimization count - P18 - Younger

Age 12 Outcome

PSYSYMP01E12	Psychosis Symptom Count-Verified Coding-Elder - 0, 1+ - Elder
PSYSYMP01Y12	Psychosis Symptom Count-Verified Coding-Elder - 0, 1+ - Younger

Age 18 Outcomes

psysymp01e18	Age-18 adolescent psychotic symptoms – elder
psysymp01y18	Age-18 adolescent psychotic symptoms – younger
psyexpce18	Age-18 adolescent psychotic experiences categorical – elder
psyexpcy18	Age-18 adolescent psychotic experiences categorical – younger

Data Security Agreement

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Proposing Author	Eloise Crush
Today's Date	10/08/17

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- EC I am current on Human Subjects Training (CITI (www.citiprogram.org) or training in human subject protection through my post or courses.
- EC My project is covered by Duke or King's IRB OR I have /will obtain IRB approval from my home institution.
- EC I will treat all data as "restricted" and store in a secure fashion.
- EC I will not share the data with anyone, including students or other collaborators not specifically listed on this concept paper.
- EC I will not post data online or submit the data file to a journal for them to post.
Some journals are now requesting the data file as part of the manuscript submission process. The E-Risk Study cannot be shared because the Study Members have not given informed consent for unrestricted open access. Speak to Terrie or Avshalom for strategies for dealing with data sharing requests from Journals.
- EC Before submitting my paper to a journal, I will submit my draft manuscript and scripts for data checking, and my draft manuscript for co-author mock review, allowing three weeks.
- EC I will submit analysis scripts and new variable documentation to project data manager after manuscript gets accepted for publication.
- EC I will return all data files to the Data Manager after the project is complete. Collaborators and graduates of DPPP may not take a data file away from the DPPP office. The data remains the property of the Study and cannot be used for further analyses without express, written permission.
- EC I will ensure geographical location information, including postcodes or geographical coordinates for the E-Risk study member's homes or schools, is never combined or stored with any other E-Risk data (family or twin-level data)

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