



## Protective factors for psychotic experiences amongst adolescents exposed to multiple forms of victimization



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### ABSTRACT

Experiencing multiple types of victimization (poly-victimization) during adolescence is associated with the onset of psychotic experiences (such as hearing voices, having visions, or being extremely paranoid). However, many poly-victimized adolescents will not develop such subclinical phenomena and the factors that protect them are unknown. This study investigated whether individual, family, or community-level characteristics were associated with an absence of psychotic experiences amongst poly-victimized adolescents. Participants were from the Environmental Risk (E-Risk) Longitudinal Twin Study, a nationally-representative cohort of 2232 UK-born twins. Exposure to seven different types of victimization between ages 12–18 was ascertained using a modified version of the Juvenile Victimization Questionnaire at age 18. Adolescents were also interviewed about psychotic experiences at age 18. Protective factors were measured at ages 12 and 18. We found that exposure to poly-victimization during adolescence was associated with age-18 psychotic experiences (OR = 4.62, 95% CI 3.59–5.94,  $P < 0.001$ ), but more than a third of the poly-victimized adolescents reported having no psychotic experiences (40.1%). Greater social support was found to be protective against adolescent psychotic experiences even amongst those exposed to poly-victimization. Engaging in physical activity and greater neighborhood social cohesion were also associated with a reduced likelihood of age-18 psychotic experiences in the whole sample, with non-significant trends in the poly-victimized group. Increasing social support and promoting physical activity appear to be important areas for future research into the development of preventive interventions targeting adolescent psychotic experiences. This adds further weight to calls to increase the promotion of these factors on a public health scale.

### 1. Background

Psychotic experiences (such as hearing voices, having visions, and feeling extremely paranoid) occurring during late adolescence have been found to precede the development of psychotic disorders (Dominguez et al., 2011) and a wide range of other severe mental health problems including suicide attempts (McGrath et al., 2016). Psychotic experiences during this developmental stage have also been shown to be associated with greater psychiatric comorbidity than psychotic phenomena occurring during late childhood (Kelleher et al., 2012a). We must, therefore, develop a better understanding of how to prevent the development of psychotic experiences in adolescence.

Exposure to victimization (e.g., physical abuse, sexual abuse, bullying by peers) during adolescence has been found to be a major risk factor for the onset of psychotic experiences in this period (Kelleher et al., 2013). Moreover, experiencing two or more different types of victimization (often referred to as poly-victimization; Finkelhor et al., 2007) has been associated with the highest risk of psychotic phenomena emerging (Arseneault et al., 2011). Identifying multi-level factors that are protective against the development of psychotic experiences, particularly in this high-risk group of poly-victimized adolescents, may be especially relevant for prevention efforts.

There has been little research to date on protective factors for psychotic phenomena, with the vast majority of studies focusing on

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factors that increase rather than decrease risk. This is despite calls for a shift towards investigating what enables some victimized individuals to avoid developing psychotic experiences in the hope that such findings could inform preventive interventions (Morgan and Gayer-Anderson, 2016). In a recent study (Crush et al., 2017), we found that having a relatively high IQ, a more positive atmosphere at home, and higher levels of neighborhood social cohesion (meaning neighbors get along well and share common values) were associated with a reduced likelihood of psychotic symptoms emerging at age 12 amongst poly-victimized children. The current paper extends these findings by considering whether similar factors are protective amongst individuals exposed to poly-victimization during adolescence in relation to psychotic experiences at age 18. Moreover, the wider literature suggests that some additional factors may be protective during this period including: positive coping strategies (Jalbrzikowski et al., 2014; Kommescher et al., 2016), engagement in physical activity (Callaghan, 2004; Suetani et al., 2017), and social support in terms of both perceived practical and emotional support from others and the number of social connections (Gayer-Anderson et al., 2015; Gayer-Anderson and Morgan, 2013; Hodges et al., 1999), and therefore these putative protective factors will also be investigated in the current study.

This paper utilises data from a large, nationally-representative UK birth cohort to explore whether individual (higher IQ, positive coping strategies, higher levels of physical activity), family (positive home atmosphere), community (socially cohesive neighborhood), and cross-level (greater perceived social support) factors are associated with a reduced likelihood of developing psychotic experiences in our population sample. We considered whether any of these factors were found to be protective in the context of poly-victimization during adolescence by (i) repeating analyses in this sub-sample, and (ii) testing for interactions between poly-victimization and putative protective factors in relation to an absence of age-18 psychotic experiences in the whole sample.

## 2. Materials and methods

### 2.1. Study cohort

Participants were members of the Environmental Risk (E-Risk) Longitudinal Twin Study, which tracks the development of a nationally-representative birth cohort of 2232 British twin children born in England and Wales in 1994–1995. Full details about the sample are reported elsewhere (Moffitt and The E-Risk Team, 2002), and in the Supplementary Materials. Briefly, the E-Risk sample was constructed in 1999–2000, when 1116 families with same-sex 5-year-old twins (93% of those eligible) participated in home-visit assessments. Families were recruited to represent the UK population of families with newborns in the 1990s, based on residential location throughout England and Wales and mothers' age. E-Risk families are representative of UK households across the spectrum of neighborhood-level deprivation (see Supplementary Materials). The sample comprised 56% monozygotic and 44% dizygotic twin pairs, and sex was evenly distributed within zygosity (49% male). Follow-up home-visits were conducted when children were aged 7, 10, 12, and 18 years (participation rates were 98%, 96%, 96%, and 93% respectively). The Joint South London and Maudsley and the Institute of Psychiatry Research Ethics Committee approved each phase of the study. Parents gave informed consent and twins gave assent between 5 and 12 years and then informed consent at age 18.

### 2.2. Measures

#### 2.2.1. Individual-level protective factors

**2.2.1.1. IQ.** The Wechsler Intelligence Scale for Children (WISC) (Wechsler, 2003) was used to assess IQ at age 12. Children were administered 3 tasks: matrix reasoning, information and digit span. The three scores were combined to create an overall scale and then standardized with a mean of 100 and standard deviation of 15.

**2.2.1.2. Coping strategies.** Coping was assessed at age 18 by asking participants about which strategies they used when experiencing stress in relation to finances, relationships, college or work. Four positively-coded items (“talk with other people about it”, “talk with a therapist or counsellor”, “exercise” and “take steps to solve the problem”) were combined to create a scale with higher scores reflecting more positive coping strategies.

**2.2.1.3. Physical activity.** At age 18, participants completed the Stanford Brief Activity Survey (SBAS; Stanford University, 2001). The SBAS contains 2 items, the first item relates to the extent of physical activity engaged in at work, school or college and the second refers to physical activity during leisure time. Both questions were rated on a 5-point scale: inactive, low intensity, moderate intensity, hard intensity and very hard intensity. The scales were then combined to derive an overall activity measure (Taylor-Piliae et al., 2010). For the current study, we used a binary variable for the analysis which compared those who were inactive (rating of 1) to those who were active (rating of 2–5).

#### 2.2.2. Family-level protective factors

**2.2.2.1. Atmosphere at home.** The creation of the atmosphere at home measure has been previously documented (Kim-Cohen et al., 2006). Briefly, it was derived from the Coder's Impression Inventory, which is based on the Home Observation for Measurement of the Environment (HOME) (Bradley and Caldwell, 1977) and the University of Washington Parenting Clinic Questionnaire (Parent–Child Observations) (Webster-Stratton, 1998). The Coder's Impression Inventory was rated by interviewers, who had undergone four-day training, immediately following the study visit with mothers when the twins were aged 12. This measure comprised items representing the state of the home (e.g., ‘Are visible rooms of the house clean?’), stimulation (e.g., ‘Is the children's art displayed in the home?’), happiness (e.g., ‘Is this a happy home?’), and chaos (e.g., ‘Is the house chaotic or overly noisy?’). The internal consistency between items was  $\alpha = 0.76$ .

#### 2.2.3. Community-level protective factors

**2.2.3.1. Social cohesion.** Social cohesion was estimated via a postal survey sent to residents living alongside E-Risk families when participants were aged 13–14 (Odgers et al., 2009, 2012). Survey respondents, who were typically living on the same street or within the same apartment block as the participants in our study, reported on various characteristics of their immediate neighborhood. Five items (each coded 0–4) were assessed including the questions: “is this a close-knit neighborhood”, “do you think people in this neighborhood can be trusted”, “do you share the same values”, etc. We derived a total scale by summing the answers to all 5 questions with higher scores indicative of greater social cohesion.

#### 2.2.4. Cross-level protective factors

**2.2.4.1. Social support.** Social support was assessed using the Multidimensional Scale of Perceived Social Support (MSPSS), which assesses individuals' access to supportive relationships with family, friends and significant others (Zimet et al., 1988). The 12 items in the MSPSS consist of statements such as “There is a special person who is around when I am in need” and “I can count on my friends when things go wrong”. Participants rated these statements as “not true” (0), “somewhat true” (1) or “very true” (2). We summed scores to produce an overall social support scale with higher scores reflecting greater social support (internal consistency:  $\alpha = 0.88$ ). In addition, each of the three sub-scales was utilized separately to examine whether social support from either family, friends or significant others was found to be specifically protective.

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