Clinicopathological significance of psychotic experiences in non-psychotic young people: evidence from four population-based studies†


Background
Epidemiological research has shown that hallucinations and delusions, the classic symptoms of psychosis, are far more prevalent in the population than actual psychotic disorder. These symptoms are especially prevalent in childhood and adolescence. Longitudinal research has demonstrated that psychotic symptoms in adolescence increase the risk of psychotic disorder in adulthood. There has been a lack of research, however, on the immediate clinicopathological significance of psychotic symptoms in adolescence.

Aims
To investigate the relationship between psychotic symptoms and non-psychotic psychopathology in community samples of adolescents in terms of prevalence, co-occurring disorders, comorbid (multiple) psychopathology and variation across early v. middle adolescence.

Method
Data from four population studies were used: two early adolescence studies (ages 11–13 years) and two mid-adolescence studies (ages 13–16 years). Studies 1 and 2 involved school-based surveys of 2243 children aged 11–16 years for psychotic symptoms and for emotional and behavioural symptoms of psychopathology. Studies 3 and 4 involved in-depth diagnostic interview assessments of psychotic symptoms and lifetime psychiatric disorders in community samples of 423 children aged 11–15 years.

Results
Younger adolescents had a higher prevalence (21–23%) of psychotic symptoms than older adolescents (7%). In both age groups the majority of adolescents who reported psychotic symptoms had at least one diagnosable non-psychotic psychiatric disorder, although associations with psychopathology increased with age: nearly 80% of the mid-adolescence sample who reported psychotic symptoms had at least one diagnosis, compared with 57% of the early adolescence sample. Adolescents who reported psychotic symptoms were at particularly high risk of having multiple co-occurring diagnoses.

Conclusions
Psychotic symptoms are important risk markers for a wide range of non-psychotic psychopathological disorders, in particular for severe psychopathology characterised by multiple co-occurring diagnoses. These symptoms should be carefully assessed in all patients.

Declaration of interest
None.

Hallucinations and delusions, the classic symptoms of psychosis, have recently been documented to occur at a much higher prevalence in the general population than clinically diagnosed psychotic disorder. A meta-analysis of prevalence studies of psychotic symptoms in young people demonstrated a median prevalence of 17% in children aged 9–12 years and 7.5% in adolescents aged 13–18 years. As the term suggests, psychotic symptoms have typically been considered to relate to psychotic disorder. Indeed, research has shown that members of the general population who report psychotic symptoms share a wide range of risk factors with people with schizophrenia (see Kelleher & Cannon for review), and young people who report psychotic symptoms have been found to be at increased risk of psychotic disorder in adulthood. Individuals who report psychotic symptoms are also more likely to report non-psychotic psychopathological symptoms, especially symptoms of depression. Yung et al, for example, reported that individuals who had a diagnosed depressive disorder endorsed an increased number of psychotic symptoms on the Community Assessment of Psychic Experiences questionnaire compared with controls. Bartels-Velthuis et al found that young adolescents who disclosed psychotic symptoms were approximately 3–5 times more likely to score in the clinical psychopathology range on the parent-completed Child Behavior Checklist. 

Method
Survey studies
Study 1: Early adolescence survey study
Sixteen schools in Dublin, Ireland, and surrounding areas took part in the Adolescent Brain Development study. Participants were

†See editorial, pp. 4–6, this issue.
aged 11–13 years and were in classes 5 and 6, the two most senior classes in the Irish primary school system. This was an ‘opt in’ study, with written parental consent required for adolescents to take part. In total 2190 consent forms were distributed, 1131 (52%) of which were returned with signed parental consent for the child to complete the survey in school. A total of 88.9% of participants were Irish-born, compared with 90.3% of children aged 0–14 years in the 2006 national census.

**Study 2: Mid-adolescence survey study**

Seventeen schools in Cork and Kerry, Ireland, took part in the mid-adolescence survey study (Saving and Empowering Young Lives in Europe). Participants were aged 13–16 years and were attending secondary level education. This was an ‘opt out’ study, with pupils allowed to take part if their parents did not return the consent form to specifically opt out. In total 1602 consent forms were distributed and approximately 70% of children (n = 1112) completed the survey in school. A total of 82.2% of participants were Irish-born.

**Exposure and outcome measures**

Both survey studies used the same exposure and outcome measures. Using the Adolescent Psychotic Symptom Screener (APSS), we have previously shown that a question on auditory hallucinations (‘Have you ever heard voices or sounds that no one else can hear?’) demonstrates very good positive and negative predictive validity not just for clinical interview-verifiable auditory hallucinations but for psychotic symptoms in general. This question was used in both survey studies to assess for psychotic symptoms (exposure measure). The Strengths and Difficulties Questionnaire (SDQ) was used as the measure of general psychopathology in both samples. This is a well-validated brief screening instrument, which asks about 25 attributes divided into subscales. The emotional disorders section assesses for anxiety, depressive and obsessive–compulsive disorders, the conduct disorders section assesses for conduct and oppositional defiant disorders, and the hyperkinetic disorders section assesses for attention-deficit hyperactivity disorder (ADHD). A total difficulties score is also generated by summing the psychopathology subscales, which predicts the presence of any psychiatric disorder. The SDQ has been validated both in terms of its ability to detect children at risk of mental health problems, and also to predict psychopathology in both samples. This question was used in both survey studies to assess for psychotic symptoms (exposure measure). The interview instrument used was the Schedule for Affective Disorders and Schizophrenia for School-aged Children, Present and Lifetime versions (K-SADS-PL). This is a well-validated semi-structured research diagnostic interview for the assessment of all Axis I psychiatric disorders in children and adolescents. Children and parents were interviewed separately, both answering the same questions about the child. In the early adolescence study interviews were conducted by two psychiatrists and four psychologists, and in the mid-adolescence study interviews were conducted by one psychiatrist and two psychologists, all trained in the use of the K-SADS-PL. Interrater reliability exceeded 90% for both studies, with κ-values of 0.83 (study 3) and 0.85 (study 4). The psychosis section of the K-SADS-PL was used to assess the participants’ psychotic symptoms (hallucinations and delusions). All interviewers recorded extensive notes of potential psychotic phenomena in this section of the interview and a clinical consensus meeting was held following the interviews to classify these phenomena as psychotic symptoms or not, masked to diagnoses and all other information on the participants. The exposure measure was the presence or absence of psychotic symptoms and the outcome measure was a diagnosable lifetime affective, anxiety or behavioural disorder.

**Ethical approval for studies 1 and 3 was received from the Beaumont Hospital medical ethics committee, for study 2 from the Cork Teaching Hospitals and for study 4 from the Mater Misericordiae University Hospital medical ethics committee.**

**Statistical analysis**

Statistical analyses were conducted using Stata version 11.0 for Windows.

**Survey studies**

First, we used analysis of variance to test the association between auditory hallucinations and the SDQ ‘total difficulties’ score. Second, we divided the samples into quartiles based on their SDQ total difficulties scores and used logistic regression to test the odds of reporting psychotic symptoms in each quartile of (increasing) psychopathology. To test for a statistically significant increase (or decrease) in the prevalence of psychotic symptoms...
across the quartiles of SDQ-rated psychopathology, we used the Stata command `nptrend`, which is an extension of the Wilcoxon rank sum test and performs a non-parametric test for trend across ordered groups. We also used logistic regression to compare the prevalence of auditory hallucinations among the 5% who scored highest on SDQ total difficulties, which is often taken as a ‘severe’ psychopathology group, with the 5% who scored lowest on this measure. Finally, we stratified by the number of SDQ-rated disorder domains (emotional, conduct and hyperkinetic disorders) and used logistic regression to determine whether psychotic symptoms predicted comorbidity across these domains and, therein, more severe psychopathology.

### Survey studies

**Association between psychotic symptoms and psychopathology**

Psychotic symptoms were reported by 21% \((n = 239)\) of the early adolescence sample (study 1) and 7% \((n = 77)\) of the mid-adolescence sample (study 2). Increasing ‘total difficulties’ scores on the SDQ were associated with increasing odds of reporting psychotic symptoms (study 1: \(F = 94.72, P < 0.001\); study 2: \(F = 104.81, P < 0.001\)). Adolescents who scored within the top quartile for SDQ-measured psychopathology in the early adolescence study were 6.5 times more likely to report psychotic symptoms compared with those in the lowest quartile (test for trend, \(Z = 8.60, P < 0.001\)). Adolescents who scored within the top quartile for SDQ-measured psychopathology in the mid-adolescence study were nearly 16 times more likely to report psychotic symptoms compared with those in the lowest quartile (test for trend, \(Z = 7.32, P < 0.001\)) (Table 1). In fact, in study 1, among adolescents with the top 5% SDQ total difficulties scores 48.1% reported psychotic symptoms, in contrast to just 2.9% of adolescents with the lowest 5% total difficulties score (OR = 31.10, 95% CI 6.91–140.02, \(P < 0.001\)). In study 2, among adolescents with the top 5% SDQ total difficulties scores 35% reported psychotic symptoms, in contrast to just 1.4% of adolescents with the lowest 5% scores on this measure (OR = 38.78, 95% CI 4.95–304.02, \(P < 0.001\)). Psychotic symptoms were not confined to any one disorder; rather, they were reported at an increased prevalence across each of the SDQ-rated emotional, conduct and hyperkinetic disorders (Table 2).

### Results

#### Survey studies

**Results**

Univariate and multivariate regression analyses were used to measure the relationship between psychopathology and psychotic symptoms. First, we recorded the prevalence of psychotic symptoms in diagnosable affective, behavioural and anxiety disorders together with odds ratios and 95% confidence intervals. Second, we stratified by comorbidity/multiple pathology (i.e. having two or more Axis I diagnoses) in order to determine the prevalence of psychotic symptoms in increasingly severe (comorbid) disorders, and calculated odds ratios and 95% confidence intervals for the association with psychotic symptoms. To test for a statistically significant increase (or decrease) in the prevalence of auditory hallucinations in line with the number of diagnosable psychiatric disorders, we used the Stata command `nptrend`.

### Table 1

**Odds of experiencing psychotic symptoms among adolescents with emotional, hyperkinetic and conduct disorders in the early adolescence survey study (study 1) and the mid-adolescence survey study (study 2)**

<table>
<thead>
<tr>
<th>Quartile</th>
<th>n</th>
<th>%</th>
<th>Unadjusted</th>
<th>Adjusted(a)</th>
<th>n</th>
<th>%</th>
<th>Unadjusted</th>
<th>Adjusted(a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>313</td>
<td>7.7</td>
<td>1.0</td>
<td>1.0</td>
<td>278</td>
<td>1.4</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>2</td>
<td>322</td>
<td>18.0</td>
<td>2.31 (1.42–3.76)</td>
<td>1.91 (1.10–3.32)</td>
<td>234</td>
<td>3.4</td>
<td>2.40 (0.71–8.07)</td>
<td>2.35 (0.69–7.90)</td>
</tr>
<tr>
<td>3</td>
<td>221</td>
<td>22.2</td>
<td>3.00 (1.81–4.97)</td>
<td>2.59 (1.45–4.60)</td>
<td>250</td>
<td>5.7</td>
<td>4.07 (1.32–12.55)</td>
<td>4.08 (1.32–12.59)</td>
</tr>
<tr>
<td>4</td>
<td>276</td>
<td>38.2</td>
<td>6.50 (4.09–10.33)</td>
<td>5.50 (3.25–9.30)</td>
<td>235</td>
<td>19.0</td>
<td>15.80 (5.58–44.71)</td>
<td>15.82 (5.57–44.94)</td>
</tr>
</tbody>
</table>

Test for trend across quartiles \(Z = 8.60, P < 0.001\). (Table 1).

### Table 2

**Odds of experiencing psychotic symptoms among adolescents with emotional, hyperkinetic and conduct disorders in the early adolescence survey study (study 1) and the mid-adolescence survey study (study 2)**

<table>
<thead>
<tr>
<th>Disorder(a)</th>
<th>Study 1</th>
<th>Study 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children with psychotic symptoms</td>
<td>Unadjusted</td>
<td>Adjusted(b)</td>
</tr>
<tr>
<td>Emotional disorders</td>
<td>44</td>
<td>3.44 (2.33–5.10)</td>
</tr>
<tr>
<td>Hyperkinetic disorders</td>
<td>35</td>
<td>2.34 (1.62–3.37)</td>
</tr>
<tr>
<td>Conduct disorders</td>
<td>36</td>
<td>2.38 (1.63–3.48)</td>
</tr>
</tbody>
</table>

\(a\). Rated according to the Strengths and Difficulties Questionnaire. 
\(b\). Adjusted for gender.
Multiple psychopathology

In order to investigate whether psychotic symptoms were more prevalent in adolescents with more severe psychopathology, we calculated the prevalence of psychotic symptoms among adolescents who scored positively for psychopathology on one, two or all three of the disorder domains compared with adolescents with no disorder. In the early adolescence sample (study 1), 15% of participants with no SDQ-rated disorder reported psychotic symptoms, compared with 33% of adolescents who were abnormal on one SDQ disorder domain (OR = 2.71, 95% CI 1.85–3.98, \( P < 0.001 \)), 43% of adolescents who were abnormal on two SDQ disorder domains (OR = 4.85, 95% CI 2.69–8.74, \( P < 0.001 \)) and 54% of adolescents who were abnormal on all three SDQ disorder domains (OR = 8.59, 95% CI 2.00–36.92, \( P < 0.001 \)) (test for trend; \( Z = 7.83, P < 0.001 \)). Among the mid-adolescence sample (study 2) the prevalence of psychotic symptoms among those who were not abnormal on any of the three SDQ disorder domains was less than 4%, but for psychopathology in one domain the prevalence of hallucinations was 11% (OR = 3.33, 95% CI 1.91–5.80, \( P < 0.001 \)), for psychopathology in two domains the prevalence of hallucinations was 24% (OR = 8.00, 95% CI 4.02–15.92, \( P < 0.001 \)) and for psychopathology in all three domains the prevalence of hallucinations was 33% (OR = 12.96, 95% CI 4.53–37.08, \( P < 0.001 \)) (test for trend, \( Z = 7.33, P < 0.001 \)).

**Table 3** Odds of experiencing psychotic symptoms among adolescents with lifetime DSM-IV Axis I diagnoses diagnosed by clinical interview in the early adolescence interview study (study 3) and the mid-adolescence interview study (study 4).

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Study 3</th>
<th>Study 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>Unadjusted</td>
</tr>
<tr>
<td>Any lifetime Axis I disorder</td>
<td>40</td>
<td>3.73 (1.97–7.07)</td>
</tr>
<tr>
<td>Behavioural disorder</td>
<td>50</td>
<td>3.95 (1.55–10.10)</td>
</tr>
<tr>
<td>Anxiety disorder</td>
<td>23</td>
<td>0.99 (0.48–2.06)</td>
</tr>
</tbody>
</table>

a. Adjusted for gender.

Psychotic symptoms and association with psychopathology

In the study 3 (early adolescence) sample 22.6% (n = 53) reported psychotic symptoms, primarily auditory hallucinations (>90%). The prevalence of psychotic symptoms was higher among boys (\( \chi^2 = 7.03, P < 0.01 \)). Although participants were asked about lifetime psychotic symptoms, in almost all cases adolescents who reported psychotic symptoms had experienced these symptoms within the past year – only 3 participants from the entire sample who reported lifetime psychotic symptoms did not report experiencing these symptoms within the past year, indicating that a report of lifetime symptoms in reality almost always indicates recent symptoms. Of all adolescents who reported psychotic symptoms, 57% had a lifetime diagnosable Axis I disorder (OR = 3.73, 95% CI 1.97–7.07, \( P < 0.001 \)) and 30.2% had a current diagnosable Axis I disorder (OR = 3.46, 95% CI 1.64–7.31, \( P < 0.01 \)). Adolescents with a lifetime diagnosable affective disorder were 5 times more likely to report psychotic symptoms compared with the rest of the sample, whereas adolescents with a lifetime diagnosable behavioural disorder were 3 times more likely to report psychotic symptoms (Table 3).

In the study 4 (mid-adolescence) sample 7% of participants reported psychotic symptoms, primarily auditory hallucinations (90%). There was a trend for psychotic symptoms to be more prevalent among boys (\( \chi^2 = 3.62, P = 0.057 \)). Of all adolescents who reported psychotic symptoms, 79% had a lifetime diagnosable Axis I disorder (OR = 11.94, 95% CI 3.14–45.41, \( P < 0.01 \)) and 43% had a current diagnosable Axis I disorder (OR = 4.27, 95% CI 1.38–13.21, \( P = 0.01 \)). Adolescents with a lifetime diagnosable affective disorder were more than 10 times more likely to report psychotic symptoms compared with the rest of the sample, whereas adolescents with a lifetime diagnosable behavioural disorder were more than 10 times more likely to report psychotic symptoms compared with the rest of the sample.
disorder were 5 times more likely to report psychotic symptoms (Table 3).

Multiple psychopathology

More than one diagnosable psychopathological disorder was present in 15% (n = 35) of the early adolescence sample (study 3) and in 10% (n = 21) of the mid-adolescence sample (study 4). We observed a dose–response relationship between the number of diagnoses the participants had and their risk of reporting psychotic symptoms (Table 4, Fig. 1).

### Discussion

Using two large population-based survey studies and two in-depth clinical interview studies, we have shown a number of important findings. First, psychotic symptoms are prevalent in a wide range of non-psychotic psychopathologies. Second, although psychotic symptoms are not pathognomonic of illness, the majority of young people in the community who report psychotic symptoms do have a diagnosable psychiatric disorder. Third, psychotic symptoms index a particularly high risk of multiple pathology (having more than one DSM diagnosis). Fourth, psychotic symptoms are reported more commonly in early than in middle adolescence. Fifth, psychotic symptoms become increasingly predictive of diagnosable psychopathology with increasing age.

Although some research has shown that the majority of psychotic symptoms in childhood are transient, with symptoms that persist over time thought to be of more clinical significance, a new study found that auditory hallucinations were associated with only 15% of the early adolescence sample (study 3) and in 10% (n = 21) of the mid-adolescence sample (study 4). We observed a dose–response relationship between the number of diagnoses the participants had and their risk of reporting psychotic symptoms (Table 4, Fig. 1).

#### Table 4

<table>
<thead>
<tr>
<th>Test for trend</th>
<th>Z = 3.67, P &lt; 0.001</th>
<th>Z = 4.29, P &lt; 0.001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis</td>
<td>%</td>
<td>OR (95% CI)</td>
</tr>
<tr>
<td>One disorder only</td>
<td>29</td>
<td>2.25 (1.06–4.75)</td>
</tr>
<tr>
<td>Two disorders only</td>
<td>38</td>
<td>3.23 (1.27–8.27)</td>
</tr>
<tr>
<td>Three or more disorders</td>
<td>55</td>
<td>6.47 (1.82–22.98)</td>
</tr>
</tbody>
</table>

a. Adjusted for gender.
inhibition tasks and overall reduced integrity of fronto-temporal pathways in adolescents with psychotic symptoms, supporting a profile of a relative disinhibition/pro-impulsivity phenotype. These neurobiological findings mirror our clinical findings of increased affective and behavioural disorders. From a psychological perspective, psychotic symptoms in young people have been linked to poorer theory of mind and an externalised locus of control, both of which have been shown to predict poorer mental health outcomes.

The relevance of our findings extends beyond adolescent mental health; the finding that psychotic symptoms are highly prevalent in a range of (non-psychotic) disorders raises questions about traditional diagnostic boundaries. Although psychosis has conventionally been considered as separate from ‘neurotic’ disorders, a number of researchers have questioned the independence of the psychoses and non-psychotic psychopathology. The high prevalence of psychotic symptoms in a wide variety of non-psychotic disorders as demonstrated in the present research suggests that divisions between the neuroses and psychoses are not clear-cut.

Strengths of this research most notably include the use of four studies, each of which shows the same pattern of results. Although the larger survey studies allowed us to test for relationships between psychotic symptoms and psychopathology in terms of a symptomatic continuum, the downside of this approach is that clinical implications, in the absence of actual diagnoses, can be hard to draw. However, the inclusion of two clinical interview studies allows us to draw clear clinical implications by exploring the relationship between psychotic symptoms and actual psychiatric diagnoses. The use of multiple studies also allowed us to examine the relationship between psychotic symptoms and psychopathology from early through middle adolescence. In addition, the use of community samples is particularly valuable because findings are generalisable to the population. A limitation is that the issue of temporality cannot be resolved in the current study; which came first, psychotic symptoms or psychopathology, or indeed did both arise together? However, this does not detract from the clinical usefulness of understanding the contemporaneous relationship between psychotic symptoms and non-psychotic psychopathology. Subgroup analysis within studies means that group sizes are small, and confidence intervals as a result are wide in some cases. However, the same pattern of results was found across all four studies, showing that the findings are robust.

Implications of the study

Hallucinations and delusions, although classically known as symptoms of psychosis, are common in a wide range of non-psychotic psychiatric disorders in young people. These symptoms become increasingly associated with diagnosable psychopathology with age. Psychotic symptoms demonstrated a particularly strong relationship with more severe psychopathology, indexing high risk for multiple disorders (i.e. the presence of two or more co-occurring diagnoses). These findings have a number of important clinical implications. First, psychotic symptoms, which are to a large extent seen as an ‘adult psychiatry’ issue, are in fact very prevalent in childhood and adolescence and should be carefully assessed in child and adolescent psychiatric clinics. Second, when psychotic symptoms are present they index risk for severe psychopathology in terms of the patient having more than one diagnosable disorder and, following from this, should prompt the clinician to consider the potential importance of multiple therapeutic targets and/or approaches. For researchers, these findings highlight psychotic symptoms as a complex novel aspect in the study of the aetiology of severe mental illness, of which schizophrenia is only one. Research has only recently begun on neurogenetics, imaging, electrophysiology and cognition among individuals with psychotic symptoms. Much more work will be necessary to explore the role of psychotic symptoms which role symptoms which have been largely considered features of psychotic illness – in the aetiology of a broad range of non-psychotic psychiatric disorders.

Funding

The Adolescent Brain Development Study was supported by an Essel NARSAD/Bain and Behavior Research Foundation Independent Investigator award and a Clinician Scientist Award (CSA/2004/1) from the Health Research Board (Ireland) to MC. The research leading to these results has received funding from the European Community’s Seventh Framework Programme under grant agreement HEALTH-F2-2010-241959 (Project EU-GEI). EU-GEI is the acronym of the project European Network of National Schizophrenia Networks Studying Gene-Environment Interactions. The Challenging Times study was supported by Friends of the Children’s University Hospital (Dublin), the American Foundation for Suicide Prevention, the Health Service Executive (HSE) Northern Area and the Mater Misericordiae University Hospital, Dublin. The Saving and Empowering Young Lives in Europe (SEYLE) project was supported through Coordination Theme 1 (Health) of the European Union Seventh Framework Program (FP7), grant agreement HEALTH-F2-2009-222691. The SEYLE project in Ireland was also supported by funding from the HSE National Office for Suicide Prevention. The project leader and coordinator of SEYLE is Professor Danuta Wasserman, head of the National Swedish Prevention of Mental Ill-Health and Suicide (NASP), Karolinska Institute, Stockholm, Sweden. Other members of the Executive Committee are Professor Marco Sarchiapone, Department of Health Sciences, University of Molise, Campobasso, Italy; Vladimir Carli, NASP, Karolinska Institute, Stockholm, Sweden; Professor Christina Hoven and Camilla Wasserman, Department of Child and Adolescent Psychiatry, New York State Psychiatric Institute, Columbia University, New York, USA.

Acknowledgements

We thank the Clinical Research Centre at Beaumont Hospital for use of research rooms. The Saving and Empowering Young Lives in Europe (SEYLE) Consortium comprises centres in 12 European countries. Site leaders for each respective centre are: Professor Danuta Wasserman (Karolinska Institute, Sweden), Christian Haring (University for Medical Information Technology, Austria), Arin Varnik (Estonian-Swedish Mental Health and Suicide Prevention Institute, Estonia), Jean-Pierre Kahn (University, France), Romuald Brunner (University of Heidelberg, Germany), Judit Balazs (Vadaskert Child and Adolescent Psychiatric Hospital, Hungary), Paul Corcoran (National Suicide Research Foundation, Ireland), Alan Azpi (Schneider Children’s Medical Centre of Israel, Israel), Marco Sarchiapone (University of Molise, Italy), Dino Cosman (Baku Hatajani University of Medicine and Pharmacy, Romania), Dragom Maresic (University of Primorska, Slovenia) and Julio Robes (University of Oviedo, Spain).

References

Kelleher et al


Clinicopathological significance of psychotic experiences in non-psychotic young people: evidence from four population-based studies
Ian Kelleher, Helen Keeley, Paul Corcoran, Fionnuala Lynch, Carol Fitzpatrick, Nina Devlin, Charlene Molloy, Sarah Roddy, Mary C. Clarke, Michelle Harley, Louise Arseneault, Camilla Wasserman, Vladimir Carli, Marco Sarchiapone, Christina Hoven, Danuta Wasserman and Mary Cannon
Access the most recent version at DOI: 10.1192/bjp.bp.111.101543

References
This article cites 41 articles, 11 of which you can access for free at: http://bjp.rcpsych.org/content/201/1/26#BIBL

Reprints/permissions
To obtain reprints or permission to reproduce material from this paper, please write to permissions@rcpsych.ac.uk

You can respond to this article at
/letters/submit/bjprcpsych;201/1/26

Downloaded from
http://bjp.rcpsych.org/ on June 23, 2017
Published by The Royal College of Psychiatrists

To subscribe to The British Journal of Psychiatry go to:
http://bjp.rcpsych.org/site/subscriptions/