



## Characterization and structure of hypomania in a British nonclinical adolescent sample



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### ABSTRACT

**Background:** This study aimed to test the validity of using the Hypomania Checklist-16 [HCL-16] to measure hypomania in a British adolescent community sample. Limited research is available concerning the characterization of hypomania among community adolescent samples, particularly in the UK, despite its potential importance for early intervention policy development.

**Method:** To explore the structure and characterization of hypomania in a British adolescent nonclinical cohort, over 1400 17 year olds (Mean=17.05 years; SD=0.88) completed the HCL-16 along with measures of different psychological and psychopathological dimensions.

**Results:** Principal components analysis revealed a 2-component solution for the HCL-16, described as active-elated and irritable/risk-taking. Hypomanic symptoms were significantly correlated with many psychopathological dimensions. There were distinct correlation patterns for the two HCL-16 subscales, with the irritability/risk-taking subscale showing significantly stronger associations with psychotic-like experiences, internalizing and externalizing problems, and reduced life satisfaction relative to the active-elated dimension. Adolescents at 'high-risk' for bipolar disorder reported more psychopathology relative to the comparison group.

**Limitations:** Absence of the clinical diagnosis of bipolar disorder in the sample means that the classification of the 'high-risk' group cannot be confirmed.

**Conclusions:** The structure of the HCL-16 in this UK adolescent sample mirrored that observed in adult and clinical cohorts. The observed links between the HCL-16 and psychopathological dimensions that have been previously associated with both hypomania and bipolar disorder lend support to the HCL-16's validity as a hypomania instrument for adolescents. Better understanding of hypomania prior to adulthood has considerable potential for informing early intervention approaches.

### 1. Introduction

The average age of onset for bipolar disorder [BD] ranges from 18 to 22 years (Merikangas et al., 2011), although up to 60% of people with BD report their illness onset occurring in childhood or adolescence (Perlis et al., 2009). There has been a rise in the clinical diagnosis of pediatric BD (Moreno et al., 2007), with a meta-analysis reporting a prevalence of 1.8% in community samples (Van Meter et al., 2011). Thus the true age of onset may occur earlier than what is documented. Subsyndromal hypomanic symptoms in youth have been linked to similar severity and impairment experienced by those with clinically diagnosed BD and have been associated with subsequent clinical hypomanic or manic episodes (Axelson et al., 2015). Therefore a better

understanding of the characterization of hypomania during adolescence may help improve accurate and timely diagnosis of BD. Furthermore, there is increased interest surrounding pediatric BD, but there is limited research in the UK with the majority of the published work conducted in the US (Skirrow et al., 2012). This means it is unclear whether the findings from US samples are generalizable to the UK and other populations.

Currently, identification of young people at 'high-risk' of developing BD (particularly in community samples) involves screening for the presence of hypomanic symptoms (Vaughn et al., 2014). Another approach is to focus on other elements of the diagnostic criteria, such as the impact on functioning and symptom duration (Meyer et al., 2007). Using German and Swedish community samples, researchers

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have found that those categorized as 'high-risk' adopting this approach report experiencing externalizing (e.g. hyperactivity/inattention) and internalizing (e.g. anxiety symptoms) problems (Holtmann et al., 2009), which mirror the common comorbidities observed in BD (Merikangas et al., 2011). Although these findings provide support for the validity of this approach of identifying individuals at 'high-risk' of developing BD, such problems are fairly common in youth (Goodman et al., 2000). Examination of whether other psychopathological and psychological dimensions known to co-occur with BD are also observed among 'high-risk' individuals, such as psychotic-like experiences (eg. paranoia) is needed. Also it would be of value if a more comprehensive method of identifying young people at risk of developing BD was developed which combines existing screening methods and which reflects all the key elements of diagnosis (i.e. the presence of symptoms, their impact and duration), especially given the challenges of diagnosing pediatric BD (Youngstrom et al., 2009). This study will explore the validity of this more comprehensive method of identifying adolescents that show vulnerability to BD, which could have implications for clinical practice.

Mania and hypomania can be divided into two sides or dimensions: the 'bright' and 'dark' (Hantouche et al., 2003). The 'bright' side is concerned with the socially advantageous aspects of hypomania (eg. elation), and is also referred to as active-elated (Brand et al., 2011) or exuberant (Stringaris et al., 2011). The 'dark' side is related to the socially negative facets of hypomania (eg. irritability) and is also referred to as irritability/risk-taking (Brand et al., 2011) or under-controlled (Stringaris et al., 2011). Research shows that these two sides of hypomania are differentially related to psychological impairment and comorbid symptomatology. For example, the 'dark' side of hypomania has been more strongly related to symptoms of depression, sleep problems and less life satisfaction compared to the 'bright' side (Brand et al., 2011), whereas the 'bright' side is associated with higher verbal IQ (Stringaris et al., 2014).

The overall aim of this study was to test the validity of using the Hypomania Checklist-16 [HCL-16] (Forty et al., 2010) to measure hypomania in a British adolescent community sample. This aim was achieved through the investigation of four specific objectives. First, the component structure of hypomania in a nonclinical sample of British adolescents was explored. The second objective was to assess the construct validity of the HCL-16 through the assessment of the extent to which the HCL-16 scores were associated with other dimensions of psychopathology that are known to be related to clinical levels of hypomania and BD. These included psychotic-like experiences as well as internalizing (e.g. depression) and externalizing (e.g. hyperactivity/inattention) problems. In addition, the relationships between hypomania, personality, life satisfaction and sleep problems were investigated. Exploration of these relationships was undertaken since there is evidence of links between sleep disturbance and reduced life satisfaction with clinical levels of hypomania (Harvey, 2008; Michalak et al., 2005). Previous research also shows that BD is associated with extraversion, openness to experience, and neuroticism (Tackett et al., 2008). Third, differences between the two hypomania dimensions ('bright': active-elated and 'dark': irritable/risk-taking) were examined in terms of their psychological and psychopathological correlates. The final objective was to explore whether dimensions of the hypomania measure could identify, using cross-sectional data, a group of adolescents that show signs of vulnerability to BD.

## 2. Method

### 2.1. Participants

This study consisted of 1440 adolescent individuals, 58% (N=830) females, with a mean age of 17.05 years (SD=0.88; range: 15–19 years) who took part in the second phase of the Longitudinal Experiences And Perceptions [LEAP] project (Ronald et al., 2014). Some of the data

**Table 1**  
Sample characteristics and key frequencies.

Characteristic	N=1440 N (%)
Female	830 (58%)
Age (mean, SD)	17.05 years (0.88)
White ethnicity	1331 (92%)
Family history of BD	82 (6%)
Hypomania score (mean, SD)	7.12 (2.60)
HCL-16 score of 8 or more (cut-off for hypomania)	673 (47%)
Any type of negative impact or reaction to periods of high mood <sup>a</sup>	535 (37%)
Highs <sup>a</sup> with a duration of 2 days or more	471 (33%)
Score above HCL-16 cut-off with 'highs' <sup>a</sup> lasting at least 2 days and any type of negative impact or reaction	124 (9%)

<sup>a</sup> Periods of high mood were operationalized in the HCL-16 as phases when the individual experienced increases in their energy, activity and mood.

analysed in this study was originally collected at the first phase of the LEAP study, which occurred on average 9 months earlier. For more details of the sample used in the present study see Table 1. The LEAP sample consists of twin pairs and their parents drawn from the Twins Early Development Study (Haworth et al., 2013). For the purposes of the current investigation only one twin from each pair was included. LEAP received full ethical approval and informed consent was provided by all participants, for further details on the study see (Ronald et al., 2014).

### 2.2. Materials

**Lifetime hypomanic symptoms** were measured using the self-report Hypomania Checklist-16 [HCL-16] (Forty et al., 2010). The HCL-16 instructs participants to recall a period at any point in their lives when they were in a 'high' state or their mood was more 'up' than usual. 'Highs' were operationalized as increases in energy, activity and mood. Participants then indicate the presence of 16 behaviours, thoughts and emotions related to hypomania during these 'high' phases using statements such as 'I need less sleep'. A yes/no response is given for each statement, providing a minimum score of 0 and a maximum score of 16 for the instrument. In the current study one item was removed ('I feel more flirtatious and/or am more sexually active') to avoid offending participants of this longitudinal study.

The HCL-16 also includes items enquiring about the duration and impairment of the 'high' periods (overall not individual symptoms). Participants recorded the duration of the 'high' periods using six options ranging from '1 day' to 'longer than a month'. The specific impact of the 'high' phases on four life domains (ie. social, family, leisure and school/work/college) was rated using four options: no impact, negative, positive, negative and positive. Participants also reported on other people's reactions to their 'high' periods using five responses: positively, neutral, negatively, positively and negatively and no reactions.

The HCL-16 is based on the longer HCL-32 version originally designed to distinguish between major depression and BD in clinical samples (Forty et al., 2010). Both versions have been shown to have good psychometric properties in adults (Angst et al., 2005; Forty et al., 2010) and have been used previously in adolescent cohorts (Holtmann et al., 2009). For instance, the HCL-32 has good specificity (0.79) and sensitivity (0.85) in distinguishing people with BD from healthy controls or those with major depression (Vieta et al., 2007). The HCL-16 was completed at phase 2 of the Leap Project.

### 2.3. Questionnaires completed at phase 2 of the Leap Study (including HCL-16)

**Depressed mood** over the past 2 weeks was measured using the

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