

Instrument	Adolescent			
	Age 14	Age 16	Age 19	Age 22
NEO Five-Factor Inventory (NEO-FFI)	X	X	X	X
Temperament and Character Inventory-Revised - Novelty Seeking Scale (TCI)	X	X		
Temperament and Character Inventory-Revised - Harm Avoidance, Reward Dependence, Persistence (TCI3) *NOTE: issues exist for German sites			X	X
Substance Use Risk Profile Scale (SURPS)	X	X	X	X
Alcohol Use Disorders Identification Test (AUDIT)	X	X	X	X
European School Survey Project on Alcohol and Drugs (ESPAD)	X	X	X	X
Fagerstrom Test for Nicotine Dependence (FTND)	X	X	X	X
Timeline-Followback Interview (TLFB)	X		X	X
Michigan Alcoholism Screening Test (MAST)			X	X
Drug Abuse Screening Test (DAST)		X	X	X
Rutgers Alcohol Problem Index (RAPI)		X	X	X
Drinking Motives Questionnaire (DMQ)		X	X	X
SCID - Substance Use Disorder (SCID-SUD)		X	X	X
Monetary-Choice Questionnaire (KIRBY)		X	X	X
Physical Development Scale (PDS)	X	X	X	

Sexual Experiences (within PDS)		X	X	X
Stimulus-Response Compatibility (SRC)	X		X	
Emotional Dot Probe	X			
Morphed Faces Task (IDENT)		X	X	
Passive Avoidance Learning Paradigm (PALP)	X		X	X
Bully Questionnaire (BULLY)	X	X	X	X
Life Events Questionnaire (LEQ) -- *NOTE: adult version for age 22	X	X	X	X
Childhood Trauma Questionnaire (CTQ)			X	
Perception of Adult Attachment Questionnaire (PAAQ)			X	
Juvenile Victimization Questionnaire - Peer victimization (JVQ)			X	
Children Somatization Inventory (CSI) -- *NOTE: shortened adult version for age 22		X	X	X
Adolescent Depression Rating Scale (ADRS)		X	X	
Interpersonal Reactivity Index (IRI)		X	X	X
Ruminating Scale (RSQ)			X	X
Video-Gaming Scale			X	X
Eating Disorder Examination Questionnaire (EDEQ)			X	X
The Three-Factor Eating Questionnaire (TFEQ)			X	X

Community Assessment of Psychic Experience (CAPE-42)			X	X
Barratt Impulsivity Scale (BIS-11)			X	X
Anxiety Screening from the Composite Interview Diagnostic Interview (CIDI-DIA-X)			X	X
Early and Current Urbanicity (URBANICITY)			X	X
Center for Epidemiologic Studies Depression Scale (CES-D): *NOTE: this replaces the ADRS				X
Perceived Stress Scale - 10 items (PSS-10)				X
World Health Organization Well-Being Index (WHO-5)				X
Brief Symptom Inventory (BSI-53)				X
Positive and Negative Affective Scale (PANAS)				X
Mobile phone usage questionnaire (SCAMP)				X
Health/Function questions from CDC Behavioural Risk Factor Surveillance System Survey (BRFSS)				X
Health-related quality of life (HRQOL)				X
Kessler-6 Psychological Distress Scale (K6+)				X
Patient Health Questionnaire - 8 (PHQ-8)				X
Composite International Diagnostic - Screener (CID-S)				X
Strengths and Difficulties Questionnaire (SDQ)	X	X	X	X

The Development and Well-Being Assessment Interview (DAWBA)	X	X	X	X
Weschler Intelligence Scale for Children, 4th. Ed (WISC-IV) -- short	X			
Weschler Adult Intelligence Scale, 4th Ed (WAIS-IV) -- short				X
Purdue Pegboard	X			
CANTAB (FULL -- Site Specific at FU2)	X		X	
CANTAB (Core -- All Sites)	X		X	
CANTAB Reduced (CGT, SWM, IED)				X
Mini-International Neuropsychiatric Interview version 5 (MINI-5)				X
Instrument	Parent			
	Age 14	Age 16	Age 19	Age 22
NEO Five-Factor Inventory (NEO-FFI); <i>self-report</i>	X	X		
Temperament and Character Inventory-Revised - Novelty Seeking Scale (TCI) – <i>self-report</i>	X	X		
Substance Use Risk Profile Scale (SURPS) – <i>self-report</i>	X	X		
Alcohol Use Disorders Identification Test (AUDIT) – <i>self-report</i>	X	X		
European School Survey Project on Alcohol and Drugs (ESPAD) – <i>self-report</i>	X	X		
Fagerstrom Test for Nicotine Dependence (FTND) – <i>self-report</i>	X	X		
Michigan Alcoholism Screening Test (MAST) – <i>self-report</i>	X	X		

Drug Abuse Screening Test (DAST); <i>self-report</i>	X	X		
Social Responsiveness Scale (SRS); <i>parent-report</i>		X		
Stuttering Questionnaire (Stutter); <i>parent-report</i>		X		
ADHD Rating Scale (FBB-HKS); <i>parent-report</i>		X		
Strengths and Difficulties Questionnaire (SDQ); <i>parent-report</i>	X			
The Development and Well-Being Assessment Interview (DAWBA); <i>parent-report</i>	X	X		
Conflict Tactics Scale (CTS); <i>self-report</i>	X			
Genetic Screening and Family History of Psychiatric Disorders Interview (GEN)	X			
Pregnancy and Birth Questionnaire (PBQ); <i>self-report</i>	X	X		
Health-related quality of life (HRQOL); <i>self-report</i>			X	
Kessler-6 Psychological Distress Scale (K6+); <i>self-report</i>			X	
Patient Health Questionnaire – 8 (PHQ-8); <i>self-report</i>			X	
Composite International Diagnostic – Screener (CID-S); <i>self-report</i>			X	
Saliva Sample			X	

NEO-PI-R

The NEO-PI-R is a valid method of assessing broad dimensions of personality (De Fruyt, et al. 2000) based on the Five-Factor Model of personality (Costa and McCrea, 1997).

TCI

The novelty seeking scale of the Temperament and Character Inventory – Revised (TCI-R; Cloninger, et al. 1999), was included to assess lower order trait dimensions more specifically related to disinhibitory psychopathology.

SURPS

Assesses lower order personality traits related to psychopathology (e.g., anxiety sensitivity, thrill seeking, pessimism and impulsivity). The Substance Use Risk Profile Scale (SURPS; Conrod & Woicik, 2002) assesses levels of several personality risk factors for substance abuse/dependence and psychopathology including hopelessness, anxiety sensitivity, impulsivity and sensation seeking.

AUDIT

Substance use is assessed using the Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993), which was developed and validated by the World Health Organization to assist the brief assessment of alcohol use disorders and was specifically designed for international use. It exists in multiple languages, including German, French and English, and was validated on primary health care patients in six countries.

ESPAD

For drugs other than alcohol, sections of the “European School Survey Project on Alcohol and Other Drugs” (ESPAD; see e.g., Hibell & Andersson, 1997) are used to obtain measures of age of onset and quantity and frequency of alcohol, and illicit drug use in one’s lifetime, past 12 months, past 30 days, and past week. For the parents, sections of the ESPAD assess age of onset and quantity and frequency of alcohol, and illicit drug use in one’s lifetime, past 12 months, past 30 days, and past week. For every drug they report using, parents are asked for reports on excessive and/or problematic use, which if affirmative, will lead to additional questions on the Drug Abuse Screening Test (DAST; Skinner, 1982; Gavin et al., 1989).

FTND

The Fagerstrom Test for Nicotine Dependence (FTND; Heatherton et al., 1991) is used to assess youth and parent nicotine dependence and smoking frequency in the past 30 days. This assessment is widely used for this purpose.

TLFB

A Timeline-Followback Interview (Sobell and Sobell, 1996) is conducted with the adolescents on the day of neuroimaging for the last 30 days on use of alcohol, tobacco and various drugs to further assess the reliability of self-report. The TLFB is a method of assessing substance use using memory prompts to optimise on the reliability and accuracy of self-report. It provides rich information on current substance use patterns.

MAST

The MAST is one of the most widely accepted measures for assessing alcohol abuse, and is designed to provide a rapid and effective screening for lifetime alcohol-related problems and alcoholism.

DAST

The DAST is one of the most widely used screening tests for drug abuse and addiction. In order to assess a more specific measure for alcohol related problems in adults, the AUDIT and Michigan Alcohol Screening Test (MAST; Selzer, 1971) will be administered to all parents.

RAPI

An 18-item self-administered screening tool for assessing adolescent problem drinking. It was developed in order to create a conceptually sound, unidimensional, relatively brief, and easily administered instrument to assess problem drinking in adolescence. The advantages of this screening tool lie in its ease of administration and its standardization, which make it possible to compare problem drinking scores not only across individuals but also across groups. The index is to be used as a continuous variable which indicates the frequency of experiencing negative consequences due to alcohol use.

DMQ

The Drinking Motives Questionnaire - Revised (DMQ-R; by Cooper, 1994) breaks the motivation to use alcohol into 4 components:

- Drinking to cope with negative affect
- Drinking to enhance positive affect
- Drinking to be sociable
- Drinking to conform to a group

SCID – SUD

This section checks for drug and alcohol abuse disorder (SUD, AUD) criteria according to DSM-IV in order to not only capture substance abuse but also dependence disorders which become more and more relevant with increasing age of the adolescents. Sections of the Structured Clinical Interview for DSM-IV (modified for use with adolescents, adapted from Martin et al., 1995) have been added to the ESPAD questionnaire already asking about alcohol and substance use. Several studies have demonstrated high diagnostic reliability of both alcohol and substance use disorders SCID sections among adolescents (Martin et al., 2000; Chung et al., 2005). In order to keep the assessment short, stringent and to avoid repetition, extra questions on substances will be added to the existing questionnaire structure, only asking further detailed questions in case adolescents indicate use in prior items.

KIRBY

The Monetary-Choice Questionnaire (KIRBY; Kirby, et al. 1999) provides a measure of preference of immediate lower over delayed higher monetary rewards. This measure asks for relative preference of one sum compared to another sum rather than asking for decisions about absolute amounts of money. T

PDS

The Puberty Development Scale (PDS; Peterson et al., 1988) provides an eight-item self-report measure of physical development based on the Tanner stages with separate forms for males and females. For this scale, there are five categories of pubertal status: (1) prepubertal, (2) beginning pubertal, (3) midpubertal, (4) advanced pubertal, (5) postpubertal. Participants answer questions about their growth in stature and pubic hair, as well as menarche in females and voice changes in males.

Sexual Experiences

An extended version of the PDS is used in FU1 and FU2 which includes risky sexual behaviour.

SRC

The SRC task was introduced by De Houwer et al. (2001). It aims to measure the affective Simon effect. This effect occurs when someone is inclined to respond in a certain way to a stimulus, i.e. faster for congruent than for incongruent responses. For example: someone that would like to drink alcohol would be more inclined to respond to an alcohol stimulus by approaching it (congruent, faster response), than by avoiding it (incongruent, slower response).

Emotional Dot Probe

The dot-probe task indexes attentional bias for emotional stimuli (MacLeod et al., 1986). This task complements attentional capture with emotional stimuli that will be administered during the neuroimaging session. Information will also be provided on attentional biases towards positive and negative facial expressions (i.e. socially reinforcing and punishing information), relative to neutral facial expressions.

Morphed Faces

The original task (Blair et al. 2001) used stimuli from the empirically valid and reliable pictures from the Facial Affect Series (Ekman and Friesen, 1976). This series contains pictures of four facial expressions conveying different emotions (happiness, fear, sadness, and anger), which have previously been demonstrated to have socially reinforcing/ punishing properties. The presentation of the expression is continued either until the end of the 20 frames, or until the participant has indicated that they are sure on five consecutive frames. Ability to recognize emotional expressions (errors and latency to detect emotion) will be recorded.

Passive Avoidance Learning Paradigm (PALP)

This Go/No Go task is an experimental method for investigating passive avoidance learning and behavioral disinhibition. Passive avoidance is defined as the ability to withhold a response that would have led to punishment. In this task subjects must learn by trial and error to respond to “good” numbers for monetary reward and withhold response to “bad” numbers to avoid punishment (loss of money) (Arnett and Newman, 2000).

Bully Questionnaire

The bullying questions have been adapted from a questionnaire used in a large international study entitled Health Behaviour in School-aged Children (HBSC). These questions were initially utilised in the revised Olweus Bully/Victim Questionnaire (Olweus, 1996), and the Youth Risky Behaviour Survey (Brener, Collins, Kann et al. 1995).

Life Events Questionnaire (LEQ)

The Life-Events Questionnaire (LEQ) is an adaptation of the Stressful Life-Event Questionnaire from Newcomb, Huber, & Bentler (1981), that was originally validated on a US sample, and was adapted to the demands of our UK/German and French sample in terms of wording. The scale uses 39 items to measure the occurrence (“ever”, “in the past year”) and the perceived desirability of events covering the following domains: Family/Parents, Accident/Illness, Sexuality, Autonomy, Deviance, Relocation, and Distress. At FU-1 the LEQ was adapted; two changes were introduced:

1. The order of the questions was changed and additionally, the question "How old were you when this happened" has been introduced. With this additional question we aim to obtain more detailed information of significant/ stressful life events during early development vs later developmental stages.

- Several individual items were reworded as they were deemed ambiguous/ vague in the original version [and largely discrepant responses indicate that adolescents may have interpreted the question in different ways]. Reworded items were only included if 2+ raters agreed upon the increased clarity of the new wording. One original item was broken into two questions, thus increasing the total number of items to 40.

At FU-2 the participants are asked only if the events have occurred since the previous assessment time point to avoid duplication of information.

Child Trauma Questionnaire (CTQ)

The Childhood Trauma Questionnaire (CTQ, Bernstein & Fink, 1997) is a 28-item self-report inventory that provides brief, reliable, and valid screening for histories of abuse and neglect. It inquires about five types of maltreatment - emotional, physical, and sexual abuse, and emotional and physical neglect. Also included is a 3 item Minimization /Denial scale for detecting false-negative trauma reports. The CTQ has been widely and successfully employed in several studies including gene-neuroimaging studies (Caspi et al., 2010). Suitable for adolescents and adults 12+ years.

Perception of Adult Attachment Questionnaire (PAAQ)

The PAAQ is based on Main and Goldwyn's (1984) system for scoring the Adult Attachment Interview (AAI; George et al., 1984, 1985) and on Bowlby's attachment theory (1988). The PAAQ was designed to assess two key aspects of attachment: (a) an individual's perceptions of his or her early childhood experiences with a primary caregiver (usually the mother), and (b) the individual's "current state of mind with respect to attachment." These two superordinate attachment dimensions are tapped with eight subscales. We included only the three subscales tapping perceptions of childhood relationship with the primary caregiver. (a) rejection/neglect (11 items; e.g., "When I was a child, my mother sometimes told me that if I was not good she would stop loving me"), (b) being loved (6 items; e.g., "In childhood I felt like I was really treasured by my mother"), (c) role-reversal/enmeshment (10 items; e.g., "I often felt responsible for my mother's welfare").

Juvenile Victimization Questionnaire – Peer victimization (JVQ)

A 34-item self-report questionnaire that allows for a comprehensive evaluation of childhood victimization. The instrument contains 34 screening questions that cover 5 general areas of victimization (referred to as "modules"): Conventional Crime, Child Maltreatment, Peer and Sibling Victimization, Sexual Assault, and Witnessing and Indirect Victimization. The JVQ has shown acceptable psychometric properties with an alpha of .80 and overall test-retest reliability Kappas averaging .59, with the average Kappa for the child self-report version being .63 and for the caregiver proxy version being .50 (Finkelhor et al., 2005). Validity has been supported by moderate correlations between victimization and trauma symptoms (Finkelhor et al., 2005).

Children Somatization Inventory (CSI)

The CSI assesses the perceived severity of 35 nonspecific somatic symptoms. The CSI includes items from the symptom criteria for somatization disorder as defined by the DSM-III-R (American Psychiatric Association, 1987), items from the Somatization factor of the Hopkins Symptom Checklist (HSCL; Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974), and an additional symptom—constipation—that is common in functional GI disorders. Examples of CSI items include headaches, low energy, dizziness, and chest pain. The stem for symptom report on the CSI is "How much were you bothered by (symptom)?" (Derogatis, Lipman, & Covi, 1973; Derogatis et al., 1974). The standard time period for symptom report on the CSI is 2 weeks. The response format is a 4-point scale ranging from "not at all" (0) to "a whole lot" (3). Total CSI scores, obtained by summing all item ratings, can range from 0 to 105.

Adolescent Depression Rating Scale (ADRS)

The ADRS is a short (10 items) self-report scale specifically developed to evaluate adolescent depression. The ADRS demonstrated good internal consistency (alpha Cronbach coefficient > .70). It also discriminated better between adolescents with and without depression than the Hamilton Depressive Rating Scale and the Beck Depression Inventory (BDI-13).

Interpersonal Reactivity Index (IRI)

The IRI is a well-validated 28-item self-report questionnaire of dispositional empathy comprising four separate but related constructs. Four seven-item subscales tap 1) perspective taking (PT), the tendency to spontaneously adopt the psychological point of view of others in everyday life; 2) empathic concern (EC), the tendency to experience feelings of sympathy and compassion for unfortunate others, 3) personal distress (PD), the tendency to experience distress and discomfort in response to extreme distress in others, and 4) fantasy (FS), the tendency to imaginatively transpose oneself into fictional situations. The IRI has been well-validated and is in itself routinely used as a validation tool routinely (e.g., Berthoz et al., 2008; Albiero et al., 2009) and widely used in both community and clinical samples, including adolescents.

Ruminating Scale (RSQ)

The RSQ contains 32 items in which subjects indicate on a 4-point scale (1 = 'Never' to 4 = 'Always') how often certain cognitions and behaviours occur during periods of depressed mood. The questionnaire contains two subscales on rumination assessing brooding and reflection consisting of 21 items and 11 items containing active and distracting coping mechanisms subjects use to deal with their negative moods. The RSQ has been extensively used and has been shown to have good internal consistency, moderate to high test-retest reliability over 1 year and most importantly considerable validity to predict depression (Just & Alloy, 1997; Kuehner & Weber, 1999; Nolan, Roberts, & Gotlib, 1998; Nolen-Hoeksema et al., 1994; Nolen-Hoeksema, 2000; Spasojevic & Alloy, 2001).

Video-gaming Scale

This assesses video gaming addiction (Wölfling, Müller & Beutel, 2010). The scale has been used in the IMAGEN assessment in Berlin at baseline. The questionnaire contains 26 items.

TCI - Persistence, Reward Dependence, Harm Avoidance

The TCI is a self-report questionnaire with 240 items for the assessment of four temperament and three character dimensions. The four dimensions of temperament measure individual differences in basic emotional drives: harm avoidance (i.e., pessimistic and anxious versus optimistic and risk-taking); novelty seeking (i.e., impulsive and irritable versus rigid and stoical); reward dependence (i.e., sociable and warm versus aloof and cold); and persistence (i.e., persevering and ambitious versus easily discouraged and lazy). The three character dimensions measure individual differences in higher cognitive processes that define a person's style of mental self government: self-directedness (i.e., responsible and resourceful versus blaming and inept), cooperativeness (i.e., helpful and principled versus hostile and opportunistic), and self-transcendence (i.e., intuitive and insightful versus concrete and conventional). For baseline and FU1, only the Novelty Seeking subscale was included in the assessment battery. This is a shortened version of the TCI of 140 items which covers all temperament and character dimensions (Cloninger & Svrakic, 1997).

Eating Disorder Examination Questionnaire (EDEQ)

The EDEQ is a widely used 28-item self-report questionnaire. Reliability and validity of the measure are well established. It measures eating disorder behaviours (e.g. bingeing, vomiting, purging) and attitudinal aspects (Restraint, Eating Concern, Weight Concern and Shape Concern) over the previous 28 days.

The Three-Factor Eating Questionnaire (TFEQ)

The Three-Factor Eating Questionnaire – TFEQ: The TFEQ is a short version (18 items) of one of the most widely used measures in the field of eating behaviour research. It measures cognitive restraint, uncontrolled eating and emotional eating. It has good psychometric properties and has been used in different European populations (Karlsson et al., 2000; Anglé et al., 2009).

Community Assessment of Psychic Experience (CAPE-42)

CAPE Community Assessment of Psychic Experience – CAPE-42: Various terms have been used to refer to the sub-clinical manifestations of the psychosis phenotype, including psychosis proneness, psychotic-like experiences (PLEs) and schizotypy. PLEs appear to be common in the general population and people with PLE have some common characteristics with schizophrenia patients. This observation gives rise to the hypothesis that PLE and psychotic disorders could have a common genetic basis and consequently sharing similar neuroanatomical and neurocognitive features. CAPE42 is a self-report tool which can be used to measure the subclinical psychosis phenotype with good reliability and validity. It can capture not only positive psychotic experiences but also attenuated negative symptoms.

Barratt Impulsivity Scale (BIS-11)

The Barratt Impulsivity Scale (**BIS**; Patton et al., 1995) is a 30-item self-report questionnaire. The BIS has three subscales labelled attentional, non-planning and motor (Stanford et al., 2009). Participants are asked to rate how often a particular statement would apply to them using a Likert scale ranging from 1 (rarely/never) to 4 (almost always/always), an example item is “I plan tasks carefully”. Since no timeframe is specified it is considered to be a measure of trait impulsivity (Moeller et al., 2002). A total response score of 72 or higher classifies an individual as highly impulsive (Stanford et al., 2009).

Anxiety Screening from the Composite International Diagnostic Interview (CIDI-DIA-X).

Anxiety Screening from the Composite International Diagnostic Interview (CIDI-DIA-X) has been added in conjunction with the BIS to provide a more in-depth measure of intermediate phenotypes of anxiety sensitivity. The scale has been taken from the CID Interview. It is a self-report questionnaire that assesses the participant’s anxiety over the past month, e.g. “During THE PAST MONTH, I have... felt anxious, worried, or nervous” and also the occurrence of significant anxiety events during the lifetime, e.g. “Have you ever had a period of a month or more when most of the time you felt worried, tense, or anxious about everyday problems?”

Early and Current Urbanicity (URBANICITY)

A short questionnaire assessing current and early urbanicity has been added in order to assess the link between urbanicity, social stress sensitivity and mental disorders in the IMAGEN sample. Participants are asked about where they lived up until age 15 in terms of population size in order to determine the urbanicity of their upbringing. Several articles have shown an association between urbanicity and symptoms of psychosis, depression and anxiety (van Os et al., 2004; Peen et al., 2010). Urban upbringing and city living have impacts on social evaluative stress processing in humans, resulting in specific effects on regional brain activation (Lederbogen et al., 2011).

CES-D

To assess depression in the IMAGEN sample the Adolescent Depression Rating Scale was previously used. This will be replaced with the Center for Epidemiological Studies Depression Scale (CES-D; LS Radloff 1977). It is a short (20-item) self-report scaled used to measure depression symptoms in a general population and has been used extensively in research.

PSS-10:

The Perceived Stress Scale (PSS) is a widely used self-report instrument to measure nonspecific stress (S Cohen et al. 1983). The original version contained 14 items but a shorter version will be used this study. It consists of 10 questions asking how often in the last month has their life been difficult/stressful. The item responses are on a 5-point Likert scale ranging from "Never" to "Very Often". Measuring non-specific stress, compared to only measuring specific stressors, is important as it accounts for the subjective interpretation of stressors. This subjective interpretation may influence how a person experiences and manages a particular stressor.

WHO-5:

The WHO-5 Well-Being Index is a 5-item questionnaire that measures current emotional well-being. It is a short, self-administered questionnaire covering 5 positively worded items, related to positive mood (good spirits, relaxation), vitality (being active and waking up fresh and rested), and general interests (being interested in things). It has shown to be a reliable measure of emotional functioning and a good screener for depression. Administering the WHO-5 Well-being Index only takes a couple of minutes (www.dawnstudy.com).

BSI-53:

The Brief Symptom Inventory (BSI) is the shortened version of the Symptoms Checklist-90. The BSI is a 53-item questionnaire covering nine psychological symptoms:

- 1) Somatization,
- 2) Obsession-compulsion,
- 3) Interpersonal sensitivity,
- 4) Depression,
- 5) Anxiety,
- 6) Hostility,
- 7) Phobic anxiety,
- 8) Paranoid ideation, and
- 9) Psychoticism.

The BSI is one of the most widely accepted psychometric screening tools of general psychopathology in both research and clinical practice (Derogatis, 1975; Derogatis & Melisaratos, 1983; Derogatis & Spencer, 1982).

PANAS:

The Positive and Negative Affect Schedule (PANAS) is a 20-item self-report measure of positive and negative affect developed by Watson, Clark, and Tellegen (1988b). It asks participants to rate the extent to which they experienced each feeling/emotion on a 5-point [Likert Scale](#) ranging from "very slightly" to "very much". The PANAS is believed to provide independent measures of Positive Affect (PA) and Negative Affect (NA). Since its development the measure has been employed in research for diverse purposes. Its popularity is attributed to its

brevity and its close association with an influential conceptualization of anxiety and depression: the tripartite model (Clark & Watson, 1991b; Crawford & Henry, 2004).

Strengths and Difficulties Questionnaire (SDQ)

The self-report and parental report versions of the Strengths and Difficulties Questionnaire (SDQ) will be used to assess 5 dimensions of youth pro-social and antisocial behaviour: emotional symptoms, conduct problems, hyperactivity/ inattention, peer relationship problems, and prosocial behaviour (Goodman, 1997). The SDQ is a reliable and valid measure of youth emotional and behaviour symptoms, on which extreme scores are predictive of increased probability of clinician-rated psychiatric disorders and retest stability over 4-6 months (Goodman 2001). German and French versions of the SDQ exist and preliminary research suggests that these translated versions have similar internal structure to the English version (Woerner et al. 2002). Cross-national normative data are available for various countries including Germany and Great Britain, no norms are available for France yet (see <http://www.sdqinfo.com/b8.html> for reference).

The Development and Well-Being Assessment Interview (DAWBA)

The Development and Well-Being Assessment (DAWBA, Goodman et al., 2000) is a computer-based package of questionnaires, interviews, and rating techniques designed to generate ICD-10 and DSM-IV psychiatric diagnoses on 5-16-year-olds. Non-clinical interviewers will conduct a structured interview to parents regarding psychiatric symptoms and resultant impact. But this can also be delivered by computers with close experimenter supervision if parents interviewees prefer that mode of assessment.

If definite symptoms are identified through the structured questions, interviewers will then use open-ended questions and supplementary prompts to encourage parents to describe the problems in their own words. These descriptions will be transcribed verbatim by the interviewers but will not be rated by them. Supplementary modules of the DAWBA interview will be administered to the adolescent. The different types of information will be brought together by a computer program which also predicts the likelihood of diagnosis. These computer-generated summary sheets and diagnoses form a convenient starting point for experienced clinical raters, who will then decide to either accept or overturn the computer diagnosis (or lack of diagnosis) upon reviewing all of the data, including transcripts. This instrument has been validated in various languages including English and German, the French version has recently been developed for the IMAGEN by Jean-Luc Martinot and his research team at CEA-INSERM, Orsay, France in cooperation with the author Robert Goodman.

At FU1 the DAWBA is administered to both child and Parent on a computer as an online interview. At FU2, only the participant will be assessed using the DAWBA. No informant (parent) data will be acquired at this stage. The DAWBA version used at FU2 will not be the version used during baseline and FU1, but the Adult DAWBA version aimed to young adults. The Adult DAWBA questionnaire is very similar but is adjusted to life stage (wording and psychopathologies). The following modules have been added to the questionnaire: (1) Antisocial personality disorder; (2) Alcohol and substance use; (3) Psychosis. The following modules have been removed from the questionnaire: (1) Separation anxiety, (2) Oppositional / Conduct Disorder, (3) Autistic spectrum; (4) Strengths and difficulties questionnaire.

WISC-IV

The Wechsler Intelligence Scale for Children – Fourth Edition (WISC-IV) is designed to test intelligence (cognitive ability) in children and adolescents ages 6 years and 0 months to 16 years and 11 months in five composite areas:

1. Verbal Comprehension

2. Perceptual Reasoning
3. Working Memory
4. Processing Speed
5. Full Scale IQ

The short form was used, which involves the following 4 subtests:

- a) **Similarities:** (1) Verbal abstract reasoning; (2) Abstract reasoning, verbal categories and concepts; (3) This measures the child's ability to think abstractly. The child decides how things are different or alike (e.g., horse and cow) or concepts (e.g., hope and fear). Scoring is 2-1-0, according to the quality of the responses.
- b) **Vocabulary:** Vocabulary - (1) Knowledge of word meanings; (2) Language development, word knowledge, verbal fluency; (3) The child explains what a word means by defining or describing what it does. The dictionary definition is not the only acceptable answer.
- c) **Matrix Reasoning:** Measures fluid reasoning; child is presented with a partially filled grid and asked to select the item that properly completes the matrix.
- d) **Block Design:** (1) Visual abstract ability; (2) Spatial analysis, abstract visual problemsolving; (3) This test measures the child's ability to look at the whole first, then break it into parts, and finally to reconstruct the whole. It provides blocks and pictures, and the child must put the blocks together to re-create what's in the picture of the blocks.

Additionally the subset digit span was administered:

- e) **Digit Span:** repeating dictated series of digits (e.g., 4 1 7 9) forwards and other series backwards. Series begin with two digits and keep increasing in length, with two trials at each length.

Purdue Pegboard

The Purdue Pegboard is designed to test hand dexterity. Specifically, it tests gross hand movement and fingertip dexterity. Purdue Pegboard is made up of Acrylic board. Its length is 23" & breadth is 11.5". It consists of a pegboard and a collection of pins, washers and collars. The subject manipulates the pins and collars and inserts them into the board's holes.

CANTAB (FULL)

1. Pattern recognition memory (PRM) → Memory

This is a test of visual pattern recognition memory in a 2-choice forced discrimination paradigm. The subject is presented with a series of 12 visual patterns, one at a time, in the centre of the screen. These patterns are designed so that they cannot easily be given verbal labels. In the recognition phase, the subject is required to choose between a pattern they have already seen and a novel pattern. In this phase, the test patterns are presented in the reverse order to the original order of presentation. This is then repeated, with 12 new patterns. The second recognition phase is given after a 20 minute delay. This test has three outcome measures, including the number and percentage of correct trials and latency (speed of subject's response).

2. Affective Go-No Go (AGN) → Decision-making

The AGN test assesses information processing biases for positive and negative stimuli. It was complemented by anxiety-related and depression-related words. Affective cognitive functions are thought to be related to the ventral and medial-prefrontal cortex areas of the brain because of the limbic connections with this region. As such, the new AGN test represents a powerful research assessment tool for current studies on the neural substrates of depression, bipolar disorder, Post-Traumatic Stress Disorder (PTSD) and many other affective conditions.

The test consists of several blocks, each of which presents a series of words from two of three different Affective categories: Positive (for

example, joyful), Anxiety-related (for example, attack), Depression-related (for example, useless) and Neutral (for example, element). The subject is given a target category, and is asked to press the press pad (button, which is NOT near the plug) when they see a word matching this category. The modified IMAGEN version of the AGN lasts around 8 minutes.

3. **Spatial working memory (SWM) → Executive function**

SWM is a test of the subject's ability to retain spatial information and to manipulate remembered items in working memory. It is a self-ordered task, which also assesses heuristic strategy. This test is a sensitive measure of frontal lobe and 'executive' dysfunction.

The test begins with a number of coloured squares (boxes) being shown on the screen. The aim of this test is that, by touching the boxes and using a process of elimination, the subject should find one blue 'token' in each of a number of boxes and use them to fill up an empty column on the right hand side of the screen. The number of boxes is gradually increased, until it is necessary to search a total of eight boxes. The colour and position of the boxes used are changed from trial to trial to discourage the use of stereotyped search strategies.

The twenty-four outcome measures for SWM include errors (touching boxes that have been found to be empty and revisiting boxes which have already been found to contain a token), a measure of strategy, and latency measures.

4. **Cambridge guessing task (CGT) → Decision-making**

This task was renamed for Imagen, from the Cambridge gambling task, due to ethical concerns. The Cambridge Guessing Task was developed to assess decision-making and risk-taking behaviour outside a learning context. Relevant information is presented to the subjects 'upfront' and there is no need to learn or retrieve information over consecutive trials.

On each trial, the subject is presented with a row of ten boxes across the top of the screen, some of which are red and some of which are blue. At the bottom of the screen are rectangles containing the words 'Red' and 'Blue'. The subject must guess whether a yellow token is hidden in a red box or a blue box. In the gambling stages, subjects start with a number of points, displayed on the screen, and can select a proportion of these points, displayed in either rising or falling order, in a second box on the screen, to gamble on their confidence in this judgement. A stake box on the screen displays the current amount of the bet. The subject must try to accumulate as many points as possible. For Imagen, a modified version is used, in which the time between stakes is reduced from 5s to 2s to make the task shorter and more interesting for adolescents. Stakes are displayed in ascending order first, and then in descending order.

5. **Rapid visual information processing (RVP) → Attention**

Rapid visual information processing (RVP) is a test of visual sustained attention. It is sensitive to dysfunction in the parietal and frontal lobe areas of the brain and is also a sensitive measure of general performance.

A white box appears in the centre of the computer screen, inside which digits, from 2 to 9, appear in a pseudo-random order, at the rate of 100 digits per minute. Subjects are requested to detect target sequences of digits (for example, 2-4-6, 3-5-7, 4-6-8) and to register responses using the press pad (button, which is NOT near the plug).

CANTAB (Core – Site specific)

The core tasks out of the CANTAB (full), above, are: the 'Affective Go-No Go (AGN)' and the 'Cambridge gambling task (CGT)'. The other tasks are optional, so which ones are used depends on each site.

FU3 changes:

Life Events Questionnaire:

The Life Events Questionnaire approved for use at all previous study time points had a large percentage of questions related to life as an adolescent (e.g., found a new group of friends, face broke out with pimples, decided about college/university, got in trouble at school, started driving). This questionnaire will be replaced with an adult-appropriate version from the American Institute for Preventive Medicine's Systematic Stress Management (see included Supporting Document). Note that we will exclude items 1, 10, 21, and 23 as they are geared for older adults.

CSI-24:

A shortened version of the Children's Somatization Inventory Revised Form (CSI-24; LS Walker 2009) will be used in place of the 35-item CSI questionnaire used in previous study time points. This questionnaire is also suitable for use in adults (AL Sherman 2012). The assessment of different somatic symptoms including pain allows IMAGEN researchers to examine the association of symptom experience with behavioural, neural and genetic mechanisms of risk taking and emotional processing in adolescents. The CSI includes items from the symptom criteria for somatization disorder as defined by the DSM-III-R, items from the Somatization factor of the Hopkins Symptom Checklist (HSCL; Derogatis et al., 1974). The standard time period for symptom report on the CSI is 2 weeks. The response format is a 5-point scale ranging from "not at all" (0) to "a whole lot" (4).

Mobile phone usage:

We will add a 13-item questionnaire modified from the SCAMP study (Imperial College London; PI Prof Mireille Toledano). It asks about the mobile phone usage (i.e., frequency of phone calls, texting/messaging behavior, internet/App usage).

Questions on general health and function:

The Centers for Disease Control and Prevention (CDC) Behavioral Risk Factor Surveillance System (BRFSS) is a survey used to ask US residents about health risks and chronic conditions (<http://www.cdc.gov/brfss/questionnaires/index.htm>). Psychopathology, such as depression, often presents itself with somatic comorbidities (i.e., cardiovascular disease, cancer, diabetes). Therefore, 18 questions have been selected asking about their general physical health, if their health has affected their usual activities, sleep frequency/quality, and whether or not they've been diagnosed with chronic conditions (i.e., heart problems, stroke, cancer, kidney disease, diabetes).

Weschler Adult Intelligence Scale – Fourth Edition (WAIS-IV):

The last time intelligence was measured in the IMAGEN study was at age 14, using the Weschler Intelligence Scale for Children (WISC). We would like to introduce an adult intelligence and cognitive ability measure at age 22. The Weschler Adult Intelligence Scale is the most widely used IQ test for adults. The four subtests of intelligence we will administer (for consistency with age 14) are: Vocabulary, Similarities (tests abstract verbal reasoning and semantic knowledge), Block Design (tests visual spatial processing and problem solving), and Matrix Reasoning (tests nonverbal abstract problem solving and inductive reasoning).

CANTAB:

The Pattern Recognition Memory (PRM), Affective Go/No-go (AGN), Pattern Recognition Memory Delayed (PRM D) and Rapid Visual Information Processing (RVP) will be removed from the previously approved CANTAB test. In addition to the already approved CANTAB test measures (Spatial Working Memory and Cambridge Gambling Task), we would like to include the Intra-Extra Dimensional Set Shift (IED). The IED is a test of rule acquisition and reversal. It features visual discrimination and attentional set formation maintenance, shifting and flexibility of attention. This test is primarily sensitive to changes to the fronto-striatal areas of the brain. This test is a computerised analogue of the Wisconsin Card Sorting test, and is sensitive to cognitive changes associated with schizophrenia, Parkinson's disease, and dopaminergic dependent processes.

MINI:

We would like to administer a face-to-face psychopathological assessment using the **Mini-International Neuropsychiatric Interview version 5.0 (MINI; Amorim *et al.*, 1998)** during the Institute assessment. The MINI is a structured diagnostic interview designed to assess the presence of current *DSM-IV* and *ICD-10* psychiatric disorders, which will be evaluated for its relationship with neuroimaging, substance use and psychiatric comorbidity. The sub-diagnoses covered in the MINI are Major Depressive Episode, Dysthymia, Suicidality, Manic/Hypomanic Episode, Panic Disorder, Agoraphobia, Social Phobia, Obsessive-Compulsive Disorder, Alcohol Dependence/Abuse, Substance Dependence/Abuse, Psychotic Disorders, Anorexia Nervosa and Bulimia Nervosa.