

**Developmental manifestations of Oddity:  
Content, structure and significance**

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## Dankwoord

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All living things contain a measure of madness that moves them in strange, sometimes inexplicable ways.

This madness can be saving;

it is part and parcel of the ability to adapt.

Without it, no species would survive.

*Life of Pi – Yann Martel*



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## Introduction

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The past ten years, dimensional research on adult personality pathology has increasingly pointed to the relevance of a fifth maladaptive trait domain for the most comprehensive description of personality pathology. This domain is to be considered distinct from the four established maladaptive trait factors including Negative affectivity, Detachment, Antagonism and Constraint, and has received different labels varying from “Oddity” (Watson, Clark, & Chmielewski, 2008), “Schizotypy” (Ashton & Lee, 2012), “Peculiarity” (Tackett, Silberschmidt, Krueger, & Sponheim, 2008), “Experiential permeability” (Piedmont, Sherman, & Sherman, 2009), “Psychoticism” (Krueger, Derringer, Markon, Watson, & Skodol, 2012), to “maladaptive Openness” (Ross, Lutz, & Bailey, 2002). All these different proposals have in common that they describe an area of maladaptive trait functioning characterized by “odd” cognitions, perceptions, feelings and behavior that align with schizotypal-related pathology and cognitive-perceptual distortions in general (Tackett et al., 2008). Despite the growing attention for personality pathology precursors at a young age, which has for instance led to the construction of an age-specific model for the assessment of childhood maladaptive traits (Dimensional Personality Symptom Itempool [DIPSI]; De Clercq, De Fruyt, Van Leeuwen, & Mervielde, 2006), studies specifically focusing on the assessment and significance of these odd characteristics at a young age are still scarce. This may be the result of several difficulties that are inherent to this mysterious area of personality dysfunction, with some of these

difficulties being particularly relevant in younger age groups, as outlined below.

### **Assessment of Oddity Characteristics in Childhood: Challenges and Pitfalls**

First, odd cognitions, feelings and behavior are present in a wide range of childhood disorders. Although these characteristics are the most pronounced in childhood schizophrenia spectrum pathology (APA, 2013; Esterberg, Goulding, & Walker, 2010), a closer look at the DSM-5 childhood disorders reveals that there are also other disorders with an “odd” component. For instance, children diagnosed with an autism spectrum disorder are often referred to as “odd”, with bizarre behavior as an explicit diagnostic criterion of the disorder (APA, 2013). Also other childhood disorders, including the bipolar, obsessive-compulsive disorder and dissociative disorder, show specific features that tap into the field of oddity-related characteristics (Mancebo et al., 2008; Pavuluri, Herbener, & Sweeney, 2004; Putnam, 1993). Given the long term stability and predictive validity for maladjustment of these early maladaptive Oddity features across all these disorders (Asarnow, Dompson, & Goldstein, 1994; Carballo et al., 2010; Clemmensen, Vernal, & Steinhausen, 2012; Driver et al., 2013; Fountain, Winter, & Bearman, 2012; Ogowa, Sroufe, Weinfield, Carlson, & Egeland, 1997; Remschmidt et al., 2007), it can be hypothesized that an underlying oddity-related trait component gives rise to various phenotypic manifestations that are then assigned to different disorders. This spread of odd features across disorders calls for a more overarching assessment perspective that goes beyond the level of specific diagnoses, and that enables an age-specific description of maladaptive odd manifestations from their underlying liability.



A second difficulty inherent to the study of maladaptive Oddity traits at a young age concerns their overlap with normative manifestations of childhood fantasy and imagination processes. Indeed, maladaptive odd features, including unusual perceptions and hallucinations, may be sometimes difficult to differentiate from the typical childhood fantasies, such as the presence of an imaginary companion, that have a benign nature and are not indicative for personality pathology. In this vein, previous research has already demonstrated that some psychotic-like experiences are rather common at a young age and are generally not harmful, since they gradually disappear as children grow older (Bartels-Velthuis, van de Willige, Jenner, van Os, & Wiersma, 2011; Kelleher et al., 2012). In some children, however, these symptoms show a persistent character and have been associated with future problems within and beyond the schizophrenia spectrum (Bartels-Velthuis et al., 2011; De Loore et al., 2011; Mackie, Castellanos-Ryan, & Conrod, 2011). This finding illustrates how difficult it is to find the balance between early identification of vulnerable children and avoiding overinterpretation of childhood manifestations that occur in the course of normative development. At this point, only prospective longitudinal research will be able to examine how maladaptive odd characteristics develop over time in terms of growth towards adaptation or maladaptation.

A third issue that may have contributed to the relatively poor knowledge on childhood Oddity traits relates to the lack of adequate assessment instruments that cover this area in a comprehensive and age-specific manner. One of the most recent and developmentally appropriate model for childhood personality pathology precursors, i.e. The Dimensional

Personality Symptom Itempool (DIPSI; De Clercq et al., 2006), did for instance not include the domain of oddity-related characteristics. This decision was based on the fact that the four other DIPSI maladaptive trait factors (i.e. Emotional Instability, Disagreeableness, Introversion and Compulsivity) were explicitly constructed from extreme, maladaptive variants of the childhood FFM traits Emotional Stability, Benevolence, Extraversion and Conscientiousness. At that time, the authors hypothesized that the fifth FFM domain, Openness to experience or Imagination, did not have a pathological variant in childhood. Other childhood models for personality pathology precursors (e.g. DAPP-BQ-A; Tromp & Koot, 2008, SNAP-Y; Linde, Stringer, Simms, & Clark, 2013), did include items tapping into the field of oddity-related characteristics but did not consider these items as indicators of a separate higher-order factor. From different perspectives, however, the need for a fifth higher-order factor in childhood personality pathology models has increasingly been recognized (Esterberg et al., 2010; Piedmont et al., 2009; Tackett et al., 2008), challenging developmental personality researchers to construct a taxonomy that includes a fifth oddity-like factor.

A final issue that may have complicated research on early Oddity manifestations can be attributed to the deeply rooted categorical tradition in psychopathology research, that has mainly conceived oddity-related characteristics as part of the childhood schizophrenia spectrum disorder. Within this spectrum of disorders, oddity-related characteristics make up the so-called “positive symptoms” (e.g., hallucinations and delusions), subsuming all schizophrenia spectrum symptoms that reflect aberrant mental activity (APA, 2013). Schizophrenia spectrum disorders, however,

also always embrace “negative symptoms” (e.g. social anhedonia), comprising deficits in normal emotional responses (APA, 2013). Most research on childhood schizophrenia spectrum precursors, however, has considered schizophrenia spectrum disorders as a categorical entity, without differentiating between these positive and negative symptoms. Findings on the clinical relevance of positive symptoms *per se* are hence scarce, since they are intertwined with the negative symptoms in most research (e.g. Hengartner, Müller, Rodgers, Rössler, & Ajdacic-Gross, 2014). In order to obtain a deeper understanding of early Oddity manifestations, future research should hence focus on the unique effects of these positive symptoms on several indices that are clinically relevant and differentiate them from the negative schizophrenia spectrum symptoms.

### **Developmental Manifestations of Oddity in Childhood: Content, Structure and Significance**

Against this background, the current doctoral dissertation embraces the following five objectives, each focusing on aspects of the *content, structure and/or significance* of developmental manifestations of Oddity in childhood. Focusing on *content* and *significance*, a first objective aims to elucidate whether the field of “odd symptoms at childhood” makes up a valid construct at a young age, and addresses this from both a conceptual (Chapter 1; Verbeke, De Caluwé & De Clercq, under review) and empirical (Chapter 2; Verbeke, De Clercq, De Caluwé, & Hofmans, under review) perspective. Chapter 1 reviews the presence of odd childhood characteristics across disorders, with specific attention for their long term stability, predictive validity and comorbidity. Chapter 2 further builds upon this research line from an empirical perspective and addresses the long term developmental trajectories of oddity-related characteristics, exploring

whether these characteristics have predictive validity for future schizotypal personality pathology. A second objective has a more narrow focus on the *content* of maladaptive Oddity manifestations and addresses the distinction between normative and maladaptive oddity-related characteristics, which will be conceptually elaborated in Chapter 1. This issue is also partially addressed in Chapter 2, as both the normative course as well as growth of childhood oddity-related characteristics towards maladaptation will be described. Since the first two chapters have set the stage for a potential trait perspective on odd symptoms at a young age, with findings underscoring the stability, comorbidity and predictive validity for later personality pathology of oddity-related symptoms at a young age, a third objective focuses on the construction of a dimensional and age-specific taxonomy for childhood Oddity traits that was currently lacking in childhood personality pathology models, hence entailing aspects of both the *content* and *structure* of Oddity at a young age. Chapter 3 (Verbeke & De Clercq, 2014) will present the empirical strategies that have resulted in an Oddity taxonomy and further discusses the integration of Oddity in the DIPSI model, as well as its associations with general and maladaptive personality traits and psychopathology. As we aimed to construct a solid model of personality pathology precursors, including a fifth Oddity component, a fourth objective of the current dissertation further examines the *structure* of Oddity and entails the replication of the expanded five-factor DIPSI across samples, additionally examining its factorial invariance across age, informant and clinical status (Chapter 4; Verbeke, De Caluwé, & De Clercq, in press). A fifth and final objective will be addressed in Chapter 5 (Verbeke, De Clercq, van der Heijden, Hutsebaut, & van Aken, in press) and focuses on the clinical *significance* of Oddity traits, directly comparing the relevance of Oddity versus the so-called negative symptoms of the schizotypal personality disorder (STPD) for understanding social functioning in

adolescents. Finally, Chapter 6 recapitulates and integrates the key findings stemming from the different studies and outlines several implications for theory and practice. In addition, some general strengths and limitations as well as promising directions for future research will be described.

## **Method**

### **Participants and Procedure**

The data in the current doctoral dissertation were collected from 2597 children and adolescents (and their mothers) who participated in one or more of the studies. Table 1 reports the sample characteristics across studies and indicates that the data cover a large age span (7 to 24 years old). Both sexes are well-represented in each sample, with a slight overrepresentation of girls (56.2 % vs. 43.8% boys).

All community samples were collected by undergraduate psychology students of Ghent University who received course credit for collecting data, as well as by students who collected data in the course of their master's dissertation. Children and adolescents were visited at home or at school for the explanation of the study aims, procedure and ethics of the data collection. Questionnaires were filled out at a secured online assessment platform, requiring a unique log in code, or were completed on a paper format in sealed envelopes.

The procedure of data-collection for the combined sample of non-referred and referred adolescents (Chapter 2) was different compared to the other samples, as these data were collected in the course of the Personality and Affect Longitudinal Study (PALS). This is an ongoing longitudinal study that has been following children and adolescents

between 8 and 12 years from the general as well as referred population since 2003 (see De Bolle, Beyers, De Clercq, & De Fruyt, 2012 for a detailed description of the participants and procedure for wave 1, 2 and 3 and De Caluwé, De Clercq, De Bolle, & De Wolf, 2014 for detailed information on wave 4). All incarcerated adolescents (Chapter 4 – Sample 4) were visited in the youth detention center by a doctoral student or trained master student, who assisted in filling out the questionnaires. The referred adolescents of Chapter 5 were invited by their therapist at moment of admission, and filled out all questionnaires online.

The instructions were similar across all samples. Subjects were asked to fill out the questionnaires independently, and were assured that their information would be treated in a confidential way and would only serve research purposes. Written informed consent was obtained from all participating children, adolescents and mothers at the moment of assessment. The current doctoral study was approved by the Ethical Review Board of the Faculty of Psychology and Educational Sciences of Ghent University.

## **Measures**

**Dimensional Personality Symptom Itempool (DIPSI).** The DIPSI is an age-specific and dimensional measure for the assessment of children's and adolescents' maladaptive personality traits (De Clercq, De Fruyt, & Mervielde, 2003; De Clercq et al., 2006) that has a central position in the current dissertation. The DIPSI traits can be considered as the extremes of general traits (Widiger, De Clercq, & De Fruyt, 2009) and are most likely precursors of adult personality disorders. This scale contains 172 items to be rated on a 5-point Likert scale, either using the self- or observer-format. The

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DIPSI includes four higher-order domains: Emotional instability (reflecting for instance Anxious and Depressive traits), Disagreeableness (including the extreme low-end variants of Benevolence), Introversiveness (referring to the extreme low-end variants of Extraversiveness), and Compulsivity (describing the high extremes of Conscientiousness traits). This four-dimensional structure comprises 27 lower-order facets offering a more detailed description of pathological personality traits that are not fully accounted for by general trait measures (De Clercq, De Fruyt, & Widiger, 2009). The DIPSI demonstrates a robust factor structure as well as high reliability coefficients and content, concurrent and predictive validity (De Clercq et al., 2006; De Clercq, Van Leeuwen, De Fruyt, Van Hiel, & Mervielde, 2008; De Clercq et al., 2010; De Clercq, Van Leeuwen, Van den Noortgate, De Bolle, & De Fruyt, 2009; Decuyper, De Bolle, De Clercq, & De Fruyt, 2011; Decuyper, De Clercq, & Tackett, 2015; Tackett, Herzhoff, Harden, Page-Gould, & Josephs, 2014; Tackett, Herzhoff, Reardon, De Clercq, & Sharp, 2014; Tackett, Kushner, Herzhoff, Smack, & Reardon, 2014; Tackett, Kushner, Josephs, Harden, Page-Gould, & Tucker-Drob, 2014).

**Oddity taxonomy.** The construction of an additional Oddity item-set (Verbeke & De Clercq, 2014) and its integration within the fore-mentioned DIPSI entails a central part of the dissertation. This item-set was constructed based upon similar empirical strategies as those used in the DIPSI, as extreme variants of childhood Openness/Imagination items were written and supplemented with items from childhood case studies. These procedures resulted in a final item-pool of 22 items to be answered on a 5-point Likert scale, aiming to cover the range of childhood odd cognitions, behaviors and feelings that may be indicative for future (schizotypal)

personality pathology. These 22 items can be clustered in four facets, i.e. Oversensitivity to feelings, Extreme fantasy, Daydreaming and Odd thoughts and behavior.

**Hierarchical Personality Inventory for Children (HiPIC).** The HiPIC (Mervielde & De Fruyt, 1999; Mervielde & De Fruyt, 2002; Mervielde, De Fruyt, & De Clercq, 2005) assesses children's general personality traits from a Five Factor Model (FFM) perspective. This measure contains 144 items that were constructed from parental descriptions of trait differences in children and can be organized in five higher-order domains, more specifically Emotional stability, Benevolence, Extraversion, Imagination and Conscientiousness. Three of these labels differ from their adult FFM counterparts, although they are highly related in an empirical and conceptual way (i.e., Emotional stability vs. Neuroticism; Benevolence vs. Agreeableness; and Imagination vs. Openness to experience). The five FFM domains comprise 18 lower-order facets, and the items are rated on a 5-point Likert scale. The HiPIC demonstrates a robust factor structure and is a reliable measure that can be validly used in both referred and non-referred samples (De Clercq, De Fruyt, Koot, & Benoit, 2004; Mervielde & De Fruyt, 2002; Van Leeuwen, De Fruyt, & Mervielde, 2004; De Fruyt, Mervielde, Hoekstra, & Rolland, 2000; Prinzie et al., 2003) and also temporal stability across a three-year time interval was demonstrated (Van Leeuwen et al., 2004). Although the HiPIC was initially constructed as an observer rating scale, it can also be used as a self-report measure in children and adolescents (De Fruyt et al., 2000).

**NEO Personality Inventory (NEO-PI-R).** The NEO-PI-R (Costa & McCrae, 1992; Hoekstra, Ormel, & De Fruyt, 1996) represents one of the most



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frequently used inventories to assess the FFM dimensions of Neuroticism, Extraversion, Openness to Experience, Agreeableness and Conscientiousness, relying on 240 items to be rated on a 5-point Likert scale and structured in 30 facets. Although the NEO-PI-R was primarily constructed for adults, research has indicated that it can also be validly administered to adolescents from age 12 to 18 (De Fruyt et al., 2000), also when relying on parental reports (Mervielde & De Fruyt, 2002).

**Personality Inventory for DSM-5 (PID-5).** The PID-5 is the official copyrighted measure of the American Psychiatric Association (APA; 2013) that operationalizes the DSM-5 traits of adult personality pathology (Krueger et al., 2012) adopted in Section III of the DSM-5 (APA, 2013). The PID-5 consists of 220 items that have to be rated on a 4-point Likert scale. These items group together into 25 empirically-derived lower-level trait pathology facets that are hierarchically organized in five broad maladaptive trait domains including Negative affectivity, Detachment, Antagonism, Disinhibition and Psychoticism. Recent research replicated the factor structure (Wright et al., 2012) and supported the validity (De Fruyt et al., 2013; Hopwood, Thomas, Markon, Wright, & Krueger, 2012) of the PID-5 trait instrument. Moreover, also the applicability of the PID-5 in younger age groups was demonstrated (De Clercq et al., 2014).

**Child Behavior Checklist (CBCL).** The CBCL (Achenbach & Rescorla, 2001; Verhulst et al., 1996) is a widely used measure for behavioral and emotional problems in childhood and adolescence, consisting of 113 items to be scored on a 3-point Likert scale. Problem behaviors are scored on syndrome scales (Withdrawn/Depressed, Somatic complaints, Anxious/Depressed, Social problems, Attention problems, Delinquent

behavior and Aggressive behavior) and broadband dimensions, including an Internalizing, Externalizing and Total Problem dimension. The CBCL shows excellent psychometric characteristics and numerous studies have supported its reliability and validity in both community and referred populations (Achenbach & Rescorla, 2001; Verhulst & Van der Ende, 2001).

**Network of Relationships Inventory: Behavioral Systems version (NRI-BSV).** The NRI-BSV (Furman & Buhrmester, 2009) is a 24-item questionnaire that assesses eight features of close relationships. Two scales assess attachment behaviors, two scales describe caregiving behaviors and one scale assesses affiliation behaviors. Next to these positive interactions and social support scales, there are also three scales assessing negative interactions of criticism, conflict and antagonism. Participants need to rate how much each feature occurs in a specific relationship using a 5-point Likert scale. Additionally, two broadband factor scales 'Social support' (mean of all positive interactions scales) and 'Negative interactions' (mean of all negative interactions scales) can be calculated. Adequate psychometric properties of the NRI have been demonstrated, including evidence that points to its high internal consistency, replicable factor structure and convergence among different reports (Furman & Buhrmester, 2009). The NRI can be used for a wide range of close relationships, but in the current dissertation participants answered all questions three times: one time about their relationship with a mother figure, a second time about their relationship with a father figure and a last time about their relationship with someone that they considered as a 'best friend'.

**KIDSCREEN-27.** The KIDSCREEN-27 (Kidscreen Group Europe, 2006) instrument is a measure for health-related Quality of Life (HRQoL). The 27-

item questionnaire was developed as a shorter version of the KIDSCREEN-52 and measures HRQoL across five dimensions: Physical well-being (five items); Psychological well-being (seven items); Autonomy & Parents relations (seven items); Social support and Peer relations (four items); and School environment (four items). All items need to be answered on a 5-point Likert scale, with higher scores indicating a better quality of life. The KIDSCREEN instruments are not intended to be used as clinical diagnostic tools. For the current dissertation, we only selected the two KIDSCREEN dimensions referring to parental and peer relationships, i.e. Autonomy & Parents and Social support and Peer relations.

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## References

- Achenbach, T.M., & Rescorla, L.A. (2001). *Manual for the ASEBA school-age forms and profiles*. Burlington: University of Vermont Research Center for Children, Youth, and Families.
- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5<sup>th</sup> ed.). Arlington, VA.
- Asarnow, J.R., Dompson, M.C., & Goldstein, M.J. (1994). Childhood-onset schizophrenia: A follow-up study. *Schizophrenia Bulletin*, *20*, 599–617.
- Ashton, M.C. & Lee, K.B. (2012). Oddity, Schizotypy/Dissociation and personality. *Journal of Personality*, *80*, 113-134. Doi: 10.1111/j.1467-6494.2011.00735.x
- Bartels-Velthuis, A.A., van deWillige, G., Jenner, J.A., van Os, J., & Wiersma, D. (2011). Course of auditory vocal hallucinations in childhood: 5-year follow-up study. *British Journal of Psychiatry*, *199*, 296–302.
- Carballo, J.J., Baca-Garcia, E., Blanco, C., Perez-Rodriguez, M.M., Arriero, M.A.J., Artes-Rodriguez, A., Rynn, M., Shaffer, D., & Oquendo, M.A. (2010). Stability of childhood anxiety disorder diagnoses: a follow-up naturalistic study in psychiatric care. *European Child and Adolescent Psychiatry*, *19*, 395-403. Doi: 10.1007/s00787-009-0064-1
- Clemmensen, L., Vernal, D.L., & Steinhausen, H.C. (2012). A systematic review of the long-term outcome of early onset schizophrenia. *BMC Psychiatry*, *12*, 150. Doi: 10.1186/1471-244X-12-150
- Costa, P.T., & McCrae, R.R. (1992). *Professional Manual: Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor-Inventory (NEO-FFI)*. Odessa, FL/ Psychological Assessment Resources.

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- De Bolle, M., Beyers, W., De Clercq, B., & De Fruyt, F. (2012). General personality and psychopathology in referred and nonreferred children and adolescents: an investigation of continuity, pathoplasty, and complication models. *Journal of Abnormal Psychology, 121*, 958-970. Doi: 10.1037/a0027742
- De Caluwé, E., De Clercq, B., De Bolle, M., & De Wolf, T. (2014). A General and Maladaptive Personality Perspective on Youth Obsessive-Compulsive Symptoms. *Journal of Personality Assessment, 96*, 495-502.
- De Clercq, B., Aelterman, N., De Pauw, S., De Bolle, M., Decuyper, M., & Tackett, J. (2010). Delineating autism spectrum symptoms from a maladaptive trait perspective. *Journal of Psychopathology and Behavioral Assessment, 32*, 529-536. Doi: 10.1007/s10862-010-9191-8
- De Clercq, B., De Fruyt, F., De Bolle, M., Van Hiel, A., Markon, K.E., & Krueger, R.F. (2014). The hierarchical structure and construct validity of DSM-5 personality traits in adolescence. *Journal of Personality*. Doi: 10.1111/jopy.12042
- De Clercq, B., De Fruyt, F., Koot, H. M., & Benoit, Y. (2004). Quality of life in children surviving cancer: A personality and multi-informant perspective. *Journal of Pediatric Psychology, 29*, 579-590.
- De Clercq, B., De Fruyt, F., & Mervielde, I. (2003). Construction of the Dimensional Personality Symptom Itempool in Children (DIPSI). Ghent University, Belgium.
- De Clercq, B., De Fruyt, F., Van Leeuwen, K., & Mervielde, I. (2006). The structure of maladaptive personality traits in childhood: A step toward an integrative developmental perspective for DSM-V. *Journal*

*of Abnormal Psychology*, 115, 639-657. Doi: 10.1037/0021-843X.115.4.639

De Clercq, B., De Fruyt, F. & Widiger, T. (2009). Integrating a developmental perspective in dimensional models of personality disorders. *Clinical Psychology Review*, 29, 154-162. Doi: 10.1016/j.cpr.2008.12.002

De Clercq, B., Van Leeuwen, K., De Fruyt, F., Van Hiel, A., & Mervielde, I. (2008). Maladaptive personality traits and psychopathology in childhood and adolescence: the moderating effect of parenting. *Journal of Personality*, 76, 357-383. Doi: 10.1111/j.1467-6494.2007.00489.x

De Clercq, B., Van Leeuwen, K. Van den Noortgate, W., De Bolle, M., & De Fruyt, F. (2009). Childhood personality pathology: dimensional stability and change. *Development and Psychopathology*, 21, 853-869. Doi: 10.1017/S0954579409000467

Decuyper, M., De Bolle, M., De Clercq, B., & De Fruyt, F. (2011). General and maladaptive personality dimensions and the assessment of callous-unemotional traits in adolescence. *Journal of Personality Disorders*, 25, 681-701.

Decuyper, M., De Clercq, B., & Tackett, J. (2015). Assessing maladaptive traits in youth: an English-language version of the Dimensional Personality Symptom Itempool. *Personality Disorders: Theory, Research and Treatment*.

De Fruyt, F., De Clercq, B., De Bolle, M., Wille, B., Markon, K. & Krueger, R.F. (2013). General and maladaptive traits in a five-factor framework for DSM-5 in a university student sample. *Assessment*, 20, 295-307. Doi: 10.1177/1073191113475808

- 
- De Fruyt, F., Mervielde, I., Hoekstra, H. A., & Rolland, J. P. (2000). Assessing adolescents' personality with the NEO PI-R. *Assessment, 7*, 329-345. Doi: 10.1177/107319110000700403
- De Loore, E., Gunther, N., Drukker, M., Feron, F., Sabbe, B., Deboutte, D., van Os, J., & Myin-Germeys, I. (2011). Persistence and outcome of auditory hallucinations in adolescence: a longitudinal general population study of 1800 individuals. *Schizophrenia Research, 127*, 252-256.
- Driver, D.I., Gogtay, N., & Rapoport, J. L. (2013). Childhood onset schizophrenia and early onset schizophrenia spectrum disorders. *Child and Adolescent Psychiatric Clinics of North America, 22*, 539-555. Doi: 10.1016/j.chc.2013.04.001
- Esterberg, M.L, Goulding, S.M., & Walker, E.F. (2010). A personality disorders: schizotypal, schizoid and paranoid personality disorders in childhood and adolescence. *Journal of Psychopathology and Behavioral Assessment, 32*, 515-528. Doi: 10.1007/s10862-010-9183-8
- Fountain, C., Winter, A.S., & Bearman, P.S. (2012). Six developmental trajectories characterize children with autism. *Pediatrics, 129*, 1112-1120. Doi: 10.1542/peds.2011-1601
- Furman, W., & Buhrmester, D. (2009). The network of relationships inventory: behavioral systems version. *International Journal of Behavioral Development, 33*, 470-478.
- Hengartner, M.P., Müller, M., Rodgers, S., Rössler, W., & Ajdacic-Gross, V. (2014). Interpersonal functioning deficits in association with DSM-IV personality disorder dimensions. *Social Psychiatry and Psychiatric Epidemiology, 49*, 317-325.

- Hoekstra, H.A., Ormel, J., & De Fruyt, F. (1996). *NEO-PI-R en NEO-FFI: Big 5 Persoonlijkheidsvragenlijsten [NEO-PI-R and NEO-FFI: Big 5 Personality Inventories]*. Lisse, The Netherlands: Swets & Zeitlinger.
- Hopwood, C. J., Thomas, K. M., Markon, K. E., Wright, A. G. C., & Krueger, R. F. (2012). DSM-5 personality traits and DSM-IV personality disorders. *Journal of Abnormal Psychology, 121*, 424-432. doi: 10.1037/A0026656
- Kelleher, I., Connor, D., Clarke, M.C., Devlin, N., Harley, M., & Cannon, M. (2012). Prevalence of psychotic symptoms in childhood and adolescence: a systematic review and meta-analysis of population-based studies. *Psychological Medicine, 42*, 1857-1863. Doi: 10.1017/S0033291711002960
- Kidscreen Group Europe. (2006). The Kidscreen questionnaires. Quality of life questionnaires for children and adolescents— handbook. Lengerich: Papst Science Publisher.
- Krueger, R. F, Derringer, J., Markon, K. E., Watson, D., & Skodol, A. E (2012). Initial construction of a maladaptive personality trait model and inventory for DSM-5. *Psychological Medicine, 42*, 1879-1890. Doi: 10.1017/S0033291711002674
- Linde, J.A., Stringer, D., Simms, L.J., & Clark, L.A. (2013). The Schedule for Nonadaptive and Adaptive Personality for Youth (SNAP-Y): a new measure for assessing adolescent personality and personality pathology. *Assessment, 20*, 387-404. Doi: 10.1177/1073191113489847
- Mackie, C.J., Castellanos-Ryan, N., & Conrod, P.J., (2010). Developmental trajectories of psychotic-like experiences across adolescence: impact



- of victimization and substance use. *Psychological Medicine*, *41*, 47–58.
- Mancebo, M.C., Garcia, A.M., Pinto, A., Freeman, J.B., Przeworski, A., Stout, R., Kane, J.S., Eisen, J.L., & Rasmussen, S.A. (2008). Juvenile-onset OCD: clinical features in children, adolescents and adults. *Acta Psychiatrica Scandinavica*, *118*, 149-159. Doi: 10.1111/j.1600-0447.2008.01224.x
- Mervielde, I., & De Fruyt, F. (1999). Construction of the Hierarchical Personality Inventory for Children (HiPIC). In I. Mervielde, I. Deary, F. De Fruyt & F. Ostendorf (Eds.), *Personality Psychology in Europe, Proceedings of the Eight European Conference on Personality Psychology* (pp. 107-127). Tilburg, The Netherlands: Tilburg University Press.
- Mervielde I., & De Fruyt, F. (2002). Assessing children's traits with the Hierarchical Personality Inventory for Children. In B. De Raad & M. Perugini (Eds.), *Big Five assessment* (pp. 129-146). Deattle, WA: Hogrefe & Huber.
- Mervielde I., De Fruyt, F., & De Clercq, B. (2005). *Manual of the Hierarchical Personality Inventory for Children (HiPIC)*. Unpublished manuscript. Ghent University, Ghent, Belgium.
- Ogawa, J.R., Sroufe, L.A., Weinfield, N.S., Carlson, E.A., & Egeland, B. (1997). Development and fragmented self: longitudinal study of dissociative symptomatology in a nonclinical sample. *Development and Psychopathology*, *9*, 855-879.

- Pavuluri, M.N., Herbener, E.S., & Sweeney, J.A. (2004). Psychotic symptoms in pediatric bipolar disorder. *Journal of Affective Disorders, 80*, 19-28. Doi: 10.1016/S0165-0327(03)00053-3
- Piedmont, R.P., Sherman, M.F. & Sherman, N.C. (2009). Using the five-factor model to identify a new personality disorder domain: the case for experiential permeability. *Journal of Personality and Social Psychology, 96*, 1245-1258. Doi: 10.1037/a0015368
- Prinzle, P., Onghena, P., Hellinckx, W., Grietens, H., Ghesquiere, P., & Colpin, H. (2003). The additive and interactive effects of parenting and children's personality on externalizing behaviour. *European Journal of Personality, 17*, 95-117. doi: 10.1002/per.467
- Putnam, F.W. (1993). Dissociative disorders in children: behavioral profiles and problems. *Childhood Abuse and Neglect, 17*, 39-45. Doi: 10.1016/0145-2134(93)90006-Q
- Remschmidt, H., Martin, M., Fleischhaker, C., Theisen, F.M., Hennighausen, K., Gutenbrunnen, C., & Schulz, E. (2007). Forty-two years later: the outcome of childhood-onset schizophrenia. *Journal of Neural Transmission, 114*, 505-512. Doi: 10.1007/s00702-006-0553-z
- Ross, S. R., Lutz, C. J., Bailey, S. E. (2002). Positive and negative symptoms of schizotypy and the five-factor model: a domain and facet level analysis. *Journal of Personality Assessment, 79*, 53-72. Doi: 10.1207/S15327752JPA7901\_04
- Tackett, J. L., Herzhoff, K., Harden, K. P., Page-Gold, E., & Josephs, R. A. (2014). Personality x hormone interactions in adolescent externalizing psychopathology. *Personality Disorders: Theory, Research and Treatment, 5*, 235-246. Doi: 10.1037/per0000075

- 
- Tackett, J. L., Herzhoff, K., Reardon, K. W., De Clercq, B., & Sharp, C. (2014). The externalizing spectrum in youth: incorporating personality pathology. *Journal of Adolescence*, *37*, 659-668. Doi: 10.1016/j.adolescence.2013.10.009
- Tackett, J. L., Kushner, S., Herzhoff, K., Smack, A. J., & Reardon, K. W. (2014). Viewing relational aggression through multiple lenses: Temperament, personality, and personality pathology. *Development and Psychopathology*, *26*, 863-877. Doi: 10.1017/S0954579414000443
- Tackett, J. L., Kushner, S., Josephs, R. A., Harden, K. P., Page-Gould, E., & Tucker-Drob, E. M. (2011). Cortisol reactivity and recovery in the context of adolescent personality disorder. *Journal of Personality Disorders*, *28*, 25-39.
- Tackett, J. L., Silberschmidt, A. L., Krueger, R. F., & Sponheim, S. R. (2008). A dimensional model of personality disorder: Incorporating DSM Cluster A characteristics. *Journal of Abnormal Psychology*, *117*, 454-459. Doi: 10.1037/0021-843X.117.2.454
- Tromp, N.B., & Koot, H.K. (2010). Dimensions of normal and abnormal personality: elucidating DSM-IV personality disorder symptoms in adolescents. *Journal of Personality*, *78*, 839-864. Doi: 10.1111/j.1467-6494.2010.00635.x
- Van Leeuwen, K., De Fruyt, F., & Mervielde, I. (2004). A longitudinal study of the utility of the resilient, overcontrolled, and undercontrolled personality types as predictors of children's and adolescents' problem behaviour. *International Journal of Behavioral Development*, *28*, 210-220. Doi: 10.1080/01650250344000424

- Verbeke, L., De Caluwé, E., & De Clercq, B. (in press). A five-factor model of developmental personality pathology precursors. *Personality Disorders: Theory, Research and Treatment*.
- Verbeke, L., De Caluwé, E., & De Clercq, B. (under review). Oddity characteristics in childhood. *Journal of Research in Personality*.
- Verbeke, L., & De Clercq, B. (2014). Integrating oddity traits in a dimensional model for personality pathology precursors. *Journal of Abnormal Psychology, 123*, 598-612. Doi: 10.1037/a0037166F
- Verbeke, L., De Clercq, B., De Caluwé, E., & Hofmans, J. (under review). Understanding schizotypal pathology in adolescence from individual developmental trajectories of childhood oddity characteristics. *Development and Psychopathology*.
- Verbeke, L., De Clercq, B., van der Heijden, P., Hutsebaut, J., & van Aken, M.A.G. (in press). The relevance of schizotypal traits for understanding interpersonal functioning in adolescents with psychiatric problems. *Personality Disorders: Theory, Research and Treatment*.
- Verhulst, F. C., & Van der Ende, J. (2001). *Handleiding voor de CBCL/6-18, YSR en TRF [Dutch manual for CBCL/6-18, YSR, and TRF]*. Rotterdam: Erasmus Universiteit Rotterdam, Sophia Kinderziekenhuis.
- Verhulst, F.C., Van der Ende, J., & Koot, H.M. (1996). *Handleiding voor de CBCL/4-18*. [Manual of the CBCL/4-18]. Rotterdam, the Netherlands: Erasmus Universiteit, Afdeling Kinder- en Jeugdpsychiatrie.
- Widiger, T.A., De Clercq, B., & De Fruyt, F. (2009). Childhood antecedents of personality disorder: An alternative perspective. *Development and Psychopathology, 21*, 771-791.

Watson, D., Clark, L. A., & Chmielewski, M. (2008). Structures of personality and their relevance to psychopathology: II. Further articulation of a comprehensive unified trait structure. *Journal of Personality, 76*, 1545-1585. Doi: 10.1111/j.1467-6494.2008.00531.x

Wright, A. G. C., Thomas, K. M., Hopwood, C. J., Markon, K. E., Pincus, A. L., & Krueger, R. F. (2012). The hierarchical structure of DSM-5 pathological personality traits. *Journal of Abnormal Psychology, 121*, 951-957. doi: 10.1037/a0027669

Table 1  
*Sample Characteristics Across Chapters*

	Chapter 2		Chapter 3		Chapter 4		Chapter 5	
	Sample 1	Sample 1	Sample 1	Sample 1	Sample 2	Sample 3	Sample 4	Sample 1
Participants	children	adolescents	children	adolescents	adolescents	children	adolescents	adolescents
Subjects	non-referred	non-referred	non-referred	non-referred	non-referred	non-referred	referred	referred
Clinical status	+ referred							
N	485	434	105	627	500	223	223	223
% boys	45	44.7	46.7	36.04	49.2	54.7	30.2	30.2
% girls	55	55.3	53.3	63.06	50.8	45.3	69.8	69.8
Mean age	10.74	14.07	12.53	15.02	9.81	15.81	20.27	20.27
Age range	7-14	11-16	11-12	13-18	7-12	13-18	16-24	16-24
Informant of measures								
DIPS1	self	self	self	self	mother	self	self	self
Oddity taxonomy		mother	self	self	self	self	self	self
HiPIC		self	self	self	self	self	self	self
NEO-PI-R		mother	mother	mother	mother	mother	mother	mother
PID-5	self	self	self	self	self	self	self	self
CBCL	mother	mother	mother	mother	mother	mother	mother	mother
NRI								
KIDSCREEN-27								

Note. Chapter 1 is not included in this overview because it is a review study

## Chapter 1

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### Oddity characteristics in childhood<sup>1</sup>

#### Abstract

The concept of Oddity or Psychoticism is considered as a distinct domain of personality pathology in adulthood. The present review addresses the question whether such Oddity trait has its developmental precursors in childhood and adolescence. In a first objective, the current review explores what kind of disorders in childhood/adolescence include symptoms referring to odd behaviors, cognitions and feelings. Since cognitive, emotional and social odd characteristics also occur within the course of normative development, a second objective aims to describe these normative manifestations of Oddity and explores how they can be distinguished from pathological oddity-related symptoms. To conclude, a trait approach on odd characteristics is proposed in order to enable a comprehensive description of maladaptive Oddity manifestations at young age in an age-specific, dimensional and non-stigmatizing manner.

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<sup>1</sup>Verbeke, L., De Caluwé, E., & De Clercq, B. (*under review*). Oddity characteristics in childhood. *Journal of Research in Personality*.

## Introduction

Dimensional classifications of adult personality pathology generally conceptualize four broad domains of maladaptive personality traits (Widiger & Simonsen, 2005), including Negative affectivity, Detachment, Antagonism and Constraint. Besides these four dimensions, a fifth domain has been delineated, with labels varying from “Oddity” (Watson, Clark, & Chmielewski, 2008), “Schizotypy” (Ashton & Lee, 2012), “Peculiarity” (Tackett, Silberschmidt, Krueger, & Sponheim, 2008), “Experiential permeability” (Piedmont, Sherman, & Sherman, 2009) to “maladaptive Openness” (Ross, Lutz, & Bailey, 2002). Overall, this fifth domain is considered as a distinct dimension of personality pathology, describing schizotypal related pathology and cognitive-perceptual distortions in general (Tackett et al., 2008). Based upon various sources of empirical evidence, the recently released DSM-5 trait model has specifically included odd characteristics, as represented in the fifth “Psychoticism” factor (Krueger, Derringer, Markon, Watson, & Skodol, 2012) of the DSM-5 trait measure (Personality Inventory for DSM-5 [PID-5]; Krueger et al., 2012).

From a developmental perspective on personality problems, the notion of personality pathology has been successfully broadened towards younger age groups (De Clercq & De Fruyt, 2012; Johnson, Bromley, Bornstein, & Sneed, 2006; Shiner, 2009; Tackett, Balsis, Oltmanns, & Krueger, 2009; Tromp & Koot, 2010), with empirical evidence supporting a similar underlying four-dimensional structure in youth (De Clercq, De Fruyt, Van Leeuwen, & Mervielde, 2006) as has been proposed for adults. The current review addresses from a conceptual perspective whether an



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equivalent fifth personality pathology domain of odd and peculiar characteristics has its developmental precursors in childhood and adolescence.

In a first objective, all childhood DSM-disorders that include symptoms referring to odd behaviors, cognitions or feelings will be reviewed, including an overview of shared etiological mechanisms that have been put forward as sources of their comorbidity. Across disorders, we will discuss these groups of odd symptoms in terms of similarities and differences with normative developmental manifestations of odd characteristics, in an attempt to demarcate on what basis we can differentiate maladaptation from adaptive functioning at a young age. A third objective of this review will explore whether a trait approach on both normal and abnormal odd characteristics may serve as a valid framework for conceptualizing Oddity at a young age, and will overview established and new measures for normal and abnormal manifestations of Oddity.

### **Odd Behaviors, Cognitions and Feelings in Childhood/Adolescence: A Cross-Disorder Perspective**

Based upon established literature and the recent DSM-5 criteria (American Psychiatric Association [APA], 2013), all childhood disorders that involved “odd or peculiar characteristics” were selected. In a first phase, all DSM-5 criteria (APA, 2013) for childhood disorders were screened on the following oddity-related words: “bizarre”, “odd”, “eccentric”, “unusual”, “hallucination”, “delusion” and “derealisation”. This procedure resulted in a set of disorders that were further explored in terms of content, long-term stability and outcome.

The most evident disorders can be situated along the childhood schizophrenia spectrum, and usually comprise both positive and negative symptoms (Andreasen & Olsen, 1982), with the negative symptoms reflecting a deficiency of a function that is generally present (e.g., lack of affect, social withdrawal), whereas positive symptoms include aberrant mental activity (e.g., hallucinations and delusions) that is absent within the course of normative childhood development. Although disorders of the schizophrenia spectrum are usually diagnosed during young adulthood (APA, 2013), these symptoms can already emerge during childhood or adolescence and may in some cases represent a configuration of a specific disorder such as childhood-onset schizophrenia. This disorder is defined as schizophrenia with an onset prior to age 13, and is very rare with a prevalence rate less than 0.04 % (Driver, Gogtay, & Rapoport, 2013). Between the age of 13 and 18, the prevalence rate of schizophrenia amounts to 0.54%, increasing from 0.9 per 10 000 at age 13 to 17.6 per 10 000 at age 18 (Gillberg, Wahlström, Forsman, Hellgren, & Gillberg, 1986), underscoring the more general evidence suggesting that late adolescence can be considered as a peak period of risk for a first-onset-psychotic disorder. Children with childhood-onset schizophrenia often report visual hallucinations and display developmental abnormalities in social, motor and language domains (Green, Padrongayol, Hardesty, & Bassiri, 1992; Nicolson & Rapoport, 1999; Nicolson et al., 2000). Moreover, evidence from birth cohort studies has indicated that individuals who develop schizophrenia in adulthood already demonstrate behavioral antecedents of the disorder in childhood (Welham, Isohanni, Jones, & McGrath, 2009), including odd

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behaviors, cognitions and feelings, such as thought problems (Welham et al., 2009) and self-reported psychotic symptoms (Poulton et al., 2000; Welham et al., 2009). Childhood-onset schizophrenia represents a highly severe variant of the adult schizophrenia disorder, with a high stability, poor long-term prognosis and deleterious effects across developmental domains (Asarnow, Dompson, & Goldstein, 1994; Clemmensen, Vernal, & Steinhausen, 2012; Driver et al., 2013; Remschmidt et al., 2007).

The schizotypal personality disorder (STPD) is considered as part of the schizophrenia spectrum (APA, 2013). This Cluster A personality disorder is characterized by a pattern of acute discomfort in close relationships, cognitive or perceptual distortions and eccentricities of behavior (APA, 2013). The paranoid and schizoid personality disorder are also categorized in DSM-5 Cluster A, because individuals with these disorders often appear odd or eccentric (APA, 2013). Although the official DSM-diagnosis of a Cluster A personality disorder is only applicable from the age of 18 onwards, empirical studies have demonstrated the significance of Cluster A precursors in childhood (Esterberg et al., 2010), with a recent study reporting a valid maladaptive Cluster A trait pattern in approximately 13% of the adolescents (Fonseca-Pedrero, Paino, Santaren-Rosell, & Lemos-Giraldez, 2013). In one of the first studies on this topic, Wolff (1991) described a group of children with Cluster A symptoms who were differentiated from a referred control group by their unusual fantasies and special interests. Ever since, a scarce but convincing amount of studies has shown that odd speech and suspiciousness emerge as one of the most common schizotypal symptoms at a young age (Carlson & Fisch, 2005), and

that adolescents with symptoms of the schizotypal personality disorder (SPD) have a history of larger cognitive deficits (Trotman, MacMillan, & Walker, 2006) and more movement abnormalities (Mittal, Neuman, Saczawa, & Walker, 2008) compared to healthy youth. The longitudinal outcome of children and adolescents with schizotypal symptoms appears to be rather devastating, since these symptoms are relatively stable over time (Asarnow, 2005; Esterberg et al., 2010), and result for a substantial proportion of the afflicted children and adolescents in an even more severe disorder within the schizophrenia spectrum (Miller et al., 2002; Yung et al., 2003).

A closer look at the broader array of childhood disorders reveals that there are also other disorders that cover odd characteristics. In DSM-5 (APA, 2013), odd behavior is a specific diagnostic criterion for autism spectrum disorders (ASD), as outlined in the “restricted, repetitive patterns of behavior”. Across studies, autistic disorder has a prevalence rate of approximately 0.17%, that amounts to 0.62% when including the whole autism spectrum (Elsabbagh et al., 2012). Beside social communication deficits, additional “restricted, repetitive patterns of behavior, interests or activities” have to be present to meet the criteria of an ASD diagnosis (APA, 2013). These “restricted, repetitive patterns of behavior, interests or activities” embrace odd characteristics like strong rituals, preoccupation with unusual objects and hyper-reactivity to sensory input. A recent review on the stability of ASD-related pathology reports a quite high stability for the DSM-IV “autistic disorder” diagnosis (Woolfenden, Sarkozy, Ridley, & Williams, 2012). At a more specific symptomatic level, longitudinal research

indicates that repetitive behaviors, considered as part of the “odd and peculiar” symptoms of the autism spectrum disorder, are more stable over time than the observed social and communication deficits (Fountain, Winter, & Bearman, 2012). The long term prognosis of ASD is highly variable, with some individuals showing a reasonable improvement, some with severe deterioration, but the largest part with a stable course, implying poor outcomes on several domains of functioning (Levy & Perry, 2011; Mordre et al., 2012).

Beyond these two broad spectra of schizophrenia and autism, several other childhood disorders with odd features can be identified. First, odd and peculiar characteristics are a core component of the dissociative identity disorder (DID; APA, 2013), as children with DID are often identified as being “different” from other children (Putnam, 1993). The childhood DID is primarily characterized by overlap and interference among mental states, such as alterations in consciousness, perception and cognition, leading to trance-like behavior with amnesia afterwards (APA, 2013). Intrusive imaginary companions (ICs) also emerge as a common childhood dissociative symptom, with the majority of the children with DID reporting on the presence of several ICs that may persist into adulthood (McLewin & Muller, 2006). These ICs are highly vivid, characterized by persistent impersonation, and often have a malevolent and aggressive nature (McLewin & Muller, 2006; Putnam, 1993). Dissociative symptoms, suggested to occur in 5% to 10% of the children (Ross, 1996), display a moderate long-term stability from childhood to adulthood (Ogawa, Sroufe, Weinfield,

Carlson, & Egeland, 1997) and are predictive for later dissociative and trauma-related disorders (van Ijzendoorn & Schuengel, 1996).

Also childhood obsessive-compulsive symptoms include odd and unusual behavior, as represented in unrealistic obsessions and compulsions of the childhood obsessive-compulsive disorder (OCD; APA, 2013). OCD is a quite prevalent disorder in childhood and adolescence, existing in 1% to 3% of the children and adolescents (Zohar, 1999). On the one hand, this disorder is characterized by intrusive and sometimes delusional obsessions, including harm and catastrophic thoughts, contamination and symmetry as most common themes, and on the other hand by compulsions such as checking, ordering and repeating (Mancebo et al., 2008). Long-term research on the stability of OCD from childhood to adulthood indicates a moderate stability over time, with a persistence rate of approximately 40% (Carballo et al., 2010; Van Grootheest et al., 2007), and with 70% receiving the diagnosis of any clinical disorder in adulthood. However, the majority of former pediatric OCD patients demonstrates only mild functional impairment at work and in social life throughout adulthood (Micali et al., 2010).

Finally, also the childhood bipolar disorder (BPD) was retained because of its oddity-related content. Bipolar disorder, diagnosed in 1% to 3% of youth (Birmaher, 2013), is characterized by recurrent episodes of (hypo)mania and depression. For a substantial proportion of youth with a BPD diagnosis, these episodes are accompanied by psychotic features. The prevalence rate of psychotic symptoms in pediatric bipolar disorder fluctuates across studies, but most studies report the presence of psychotic

features in 40% or more of these youngsters (Pavuluri, Herbener, & Sweeney, 2004). The most common odd symptoms in pediatric BPD are grandiose delusions, auditory hallucinations and thought disorder symptoms such as flight of ideas and racing thoughts. The long term clinical course of BPD youngsters with psychotic features is highly fluctuating, representing a severity continuum from subclinical BPD symptom severity to mood syndromes that fully meet the DSM-5 criteria. This enduring pattern of fluctuation in BPD symptoms deprives children and adolescents with bipolar disorder from adequate emotional, cognitive and social development (Birmaher et al., 2006).

The above-mentioned overview of selected childhood disorders underscores the presence of a clear Oddity component in each of these disorders. A significant amount of studies has also pointed towards an observed comorbidity among these disorders and has proposed several shared etiological mechanisms that may be responsible for similarities in phenotypic expressions across distinct disorders.

### **Comorbidity and Shared Etiology Across Disorders**

There is a vast amount of evidence pointing towards behavioral overlap among several of the oddity-related disorders. Several studies demonstrated for instance that individuals with either ASD or schizophrenia often share characteristics with the other disorder (Hallerbäck, Lugnégard, & Gilberg, 2012; Konstantareas & Hewitt, 2001). Schizophrenia spectrum symptoms are also often accompanied by dissociative (Goren, Philips, Chapman, & Salo, 2012), obsessive-compulsive (Bottas, Cooke, & Richter, 2005) or bipolar symptomatology (Pavuluri et al., 2004). Although a

comorbid presentation of schizophrenia and schizotypal personality disorder (STPD) in childhood has not been observed, the idea that both disorders represent different phenotypic manifestations of the same underlying disposition is widely accepted (Baron & Risch, 1987). Schizotypal personality disorder also demonstrates comorbidity with all other discussed childhood oddity-related disorders, including ASD (Barneveld et al., 2010), dissociation (Giesbrecht et al., 2007), and obsessive-compulsive symptomatology (Fonseca-Pedrero, Lemos-Giraldez, Paino-Pineiro, Villazon-Garcia, & Muniz, 2010; Norman, Davies, Malla, & Cortese, 1996). For ASD, the same pattern can be observed, with studies reporting on its overlap with dissociation (Anckarsäter, Nilsson, Saury, Rastam, & Gillberg, 2008), and both obsessive-compulsive (Ivarsson & Melin, 2008; Leyfer et al., 2006) and bipolar disorder (Chen et al., 2015). Finally, the literature demonstrates a frequent behavioral overlap between dissociative symptoms and symptoms of the obsessive-compulsive (Lochner et al., 2004; Sar, Akyüz, Kundakçi, Kiziltan, & Dogan, 2004) and bipolar disorder (Mula et al., 2009). The latter two disorders also display a frequent life-time comorbidity, with more than 20% of the bipolar patients reporting comorbid obsessive-compulsive symptoms (Amerio, Odone, Marchesi, & Ghaemi, 2014).

A wide range of possible explanations for these comorbid manifestations of childhood oddity-related disorders have been proposed. A first group of explanations hold a biological mechanism responsible for the observed behavioral overlap between Oddity disorders. For instance, several studies indicate that reduced mirror neuron activity (Enticott et al., 2008; Rizzolatti & Fabbri-Destro, 2010) and connectivity deficits (Minshew &



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Keller, 2010; Rotarska-Jagiela et al., 2010; Vercammen, Kneegtering, den Boer, Liemburg, & Aleman, 2010) may be responsible for the behavioral overlap between schizophrenia and ASD, whereas comorbidity between schizophrenia and OCD may result from morphological deficits such as thalamus surface shape deformity (Kang et al., 2008). In a similar vein, a possible neurobiological overlap between ASD and OCD has been suggested to explain this comorbidity (Abramson et al., 2005; Hollander, King, Delaney, Smith, & Silverman, 2003; Ruta, Mugno, Genitori D'Arrigo, Vitiello, & Mazzone, 2010). Biological similarities between ASD and bipolar disorder have also been reported, indicating that decreased serum melatonin levels are linked to both disorders (Kennedy, Kutcher, Ralevski, & Brown, 1996; Melke et al., 2008). The role of the mono-aminergic system has been proposed as a possible mechanism to clarify the overlap between dissociation and OCD, though more research on this topic is needed (Lochner et al., 2004). Finally, a complex interplay among various neurotransmitter systems may contribute to the overlap between bipolar disorder and OCD, since BPD and OCD are both characterized by excessive dopaminergic activity, abnormal GABAergic activity and a reduction in inositol (Freeman, Freeman, & McElroy, 2002). Beyond these biological deficits, several studies have also pointed to more functional deficits in order to explain the overlap among Oddity disorders. For example, problems with Theory of Mind seem to play a role in both schizophrenia (Mehl et al., 2010) and ASD (e.g., Williams & Happé, 2010), whereas an instable sleep-wake cycle and disturbances of sleep and circadian rhythms have been proposed in order to explain the overlap between schizotypal

symptoms and dissociative tendencies (Mahowald & Schenk, 2001), as well as between bipolar and autism disorder (Harvey, Mullin, & Hinshaw, 2006; Limoges, Mottron, Bolduc, Berthiaume, & Godbout, 2005).

Beyond potential commonalities at a neurobiological level, also shared genetic factors have been proposed as an underlying etiological hypothesis for the observed overlap. For instance, a number of studies indicate that schizophrenia and ASD share genetic risk factors (Esterberg, Goulding, & Walker, 2010; Rapoport et al., 2009). Specific copy number variants (CNVs, which are insertions, duplications, deletions or allelic rearrangements of particular genes) that are associated with schizophrenia are also connected to ASD (Owen, O'Donovan, Thapar, & Craddock, 2011). Furthermore, the bipolar disorder appears to share certain susceptibility genes with both schizophrenia (Murray, Sham, Van Os, Zanelli, Cannon, & McDonald, 2004) and ASD (Merikangas, 1990; Munesue et al., 2008).

These various explanatory hypotheses all share the assumption that overlap among these disorders occurs more frequently compared to overlap with non-oddity related disorders. It is evident that DSM-5 disorders generally present some level of comorbidity (Newman, Moffit, Caspi, & Silva, 1998). Several studies have examined more specific and recurring patterns of comorbidity, however, such as those with an oddity-related content, in order to elucidate the higher-order structure of phenotypic psychopathology (Clark, Watson, & Reynolds, 1995). From this perspective, a recent study (Caspi et al., 2014) has pointed to a third thought disorder factor beyond the two established internalizing and externalizing factors (Achenbach & Edelbrock, 1981), subsuming schizophrenia spectrum

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symptomatology, OCD and mania. Moreover, these authors suggest that also other disorders include thought problems as a symptom, such as the autism spectrum and dissociative disorders, that may be structured along this factor. This three-factor higher-order structure empirically confirms that from a structural perspective, these oddity-related disorders collapse into one structural component, thereby underscoring that these various conditions may co-occur in a single person.

### **Normative Oddity Features in Childhood and Adolescence**

Beyond these maladaptive manifestations of Oddity, also normative expressions of oddity-like features exist. They appear to be universal (McCrae et al., 2002) and represent one of the main building blocks of general personality that are already observable at a young age (Goldberg, 2001; Halverson et al., 2003). Because childhood and adolescence can be considered as the most typical developmental periods in which these normative tendencies occur, it is essential to differentiate them from potential markers of dysfunction. At this point, it is not clear to what extent these normative odd trait characteristics are linked to or flow into the abovementioned pathological Oddity symptoms. There are clear similarities in the content they cover, but also notable differences are present. First, *psychotic-like Oddity experiences* such as hallucinations and delusions may be conceptually linked to normative fantasy and imagination processes characteristic for younger age groups. For instance, cognitive development in childhood typically involves a stage of “magical thinking”, indicating that effects of real events are attributed to actions unconnected to these events (Zusne & Jones, 1989), due to the confusion of mind and reality (Astington,

1993; Piaget, 1929). Piaget situates this magical thinking in the concrete operational period that is normative for children until the age of 12, with a peak period between 2 and 6 years old (Rothbaum & Weis, 1988). These typical childhood miraculous beliefs are not to be considered as personality pathology indicators, and stand in sharp contrast with the adult variant of “magical ideation”, which is considered as a symptom of the schizotypal personality disorder in DSM-5 (APA, 2013). Also, young children frequently engage in pretend play that involves the use of fantasy and symbolism. This playing behavior peaks during the preschool years and is considered as an essential part of child development, as it is associated with positive cognitive, emotional and interpersonal outcomes (Russ, 2004; Singer & Singer, 1990). The presence of an imaginary companion (IC) can be considered as a form of pretend play that is quite common among young children (McLewin & Muller, 2006). Although sometimes difficult to differentiate, these normative ICs have other characteristics than the ICs in the course of the dissociative identity disorder (DID). Normative ICs are limited in number, disappear in late childhood and are not liable to reality confusion. Moreover, these ICs have a benevolent nature, are under a child’s control and are characterized by only occasional impersonation (McLewin & Muller, 2006). Similarly, maladaptive trance-like behavior that disconnects children from reality in the course of the dissociative identity disorder should be distinguished from more mild and normative forms of this behavior labelled as “absorption” and “daydreaming” (Butler, 2006), that are generally not related to psychopathology (Klinger, Henning, & Janssen, 2009). Both are common manifestations of everyday dissociation

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(Butler, 2006) and have shown to even contribute to adaptive functioning, such as full engagement with the attentional object in the case of absorption, and constructive problem solving in the case of daydreaming (Singer & Antrobus, 1972).

A second group of childhood Oddity symptoms include *ritualistic behavior and obsessions/compulsions* around common themes such as symmetry, as described in the course of the autism spectrum and obsessive-compulsive disorder (APA, 2013; Mancebo et al., 2008). Again, these symptoms can also be part of normative development, as early childhood is characterized by frequently occurring compulsive-like “odd” ritualistic behaviors such as strong preferences for repetitive behavior and certain tasks, with the purpose of fulfilling some subjective, sensory perceptual criteria of “Just Right” (Leckman, Walker, Goodman, Pauls & Cohen, 1994; Zohar & Felz, 2001). These behaviors peak in the age from 2 to 4 and are believed to be adaptive, as they represent a mechanism to regulate intrusive thoughts and fears (Evans et al., 1997). After the age of 4, they generally decline and eventually disappear for the majority of children (Evans et al., 1997).

Finally, our overview of oddity-related disorder has delineated *odd and eccentric behavior* as a major Oddity symptom, considered as common to all Cluster A personality disorders. However, the age of puberty is characterized by behavioral changes that can also be interpreted as “odd” or “eccentric”. As peer group identification becomes more important when adolescents grow older, they sometimes connect with peer crowds that have very unusual or even shocking appearances (e.g., Punks, Goths; Besic &

Kerr, 2009). In these cases, eccentric appearance is a way to demonstrate a disrespect for conformity, rather than it is a symptom of a Cluster A personality disorder (Dobbert, 2007). Throughout normative adolescent development, these behaviors generally decline as adolescents begin to perceive themselves in terms of personal beliefs and standards, and less in terms of social comparisons (Harter, 1998), and start to develop more vocational identities as young adults.

Across these three descriptive subgroups of oddity-like characteristics, normative and maladaptive manifestations are at first sight connected with regard to the content or developmental area they cover. They do differ, however, in terms of course, intrusiveness or reality loss. Regarding their course, normative odd manifestations are generally characterized by a specific peak period, that is for most characteristics situated in preschool age (Evans et al., 1997; Rothbaum & Weis, 1988; Singer & Singer, 1990). Only the group of normative eccentric manifestations knows a different behavioral climax, as these behaviors culminate in adolescence (Besic & Kerr, 2009). After their peak period, normative odd manifestations have in general a declining course, whereas continuity of odd behavior may signify a more maladaptive character. Kelleher et al. (2012) for instance demonstrated in an extensive meta-analysis that psychotic symptoms are relatively common in childhood and may be part of normal childhood development, but become increasingly maladaptive with age as normative odd characteristics decrease. This idea has recently been elaborated by Durbin and Hicks (2014), accentuating the importance of knowledge on normative developmental processes such as

population-based mean-level changes in traits for a deeper understanding of abnormal development. More specifically, children who fail in terms of maturation and do not show a decrease in psychotic-like symptoms over time, may be particularly at risk for maladjustment. In a similar way, interpreting psychotic-like symptoms in young childhood without taking account of the relatively high prevalence of these symptoms during this early developmental phase, may harm the validity of clinical decision-making processes.

Beyond these differences in course, normative and maladaptive odd manifestations can also be differentiated from each other by their level of intrusiveness or reality loss. In contrast with normative odd manifestations, all maladaptive odd manifestations share their intrusive and uncontrollable character, and sometimes also a certain reality loss (McLewin & Muller, 2006), that is generally accompanied by impairment (De Clercq & De Fruyt, 2012). Normative odd manifestations usually do not interfere with general functioning and sometimes even have an adaptive function, such as with regard to emotion regulation (Evans, 1997) or problem solving strategies (Singer & Antrobus, 1972).

### **Evidence For a Common Underlying Trait Component?**

Although normative for all children, there are of course individual differences between children in their tendency to fantasize, be creative and approach the world with open-mindedness. It is widely accepted that individual differences in these normative “odd” manifestations have a trait character. Proponents of the Five-Factor Model have proposed the Openness to experience domain (Costa & McCrae, 1992) to represent these

characteristics, with a wealth of research demonstrating its significance for a comprehensive description of child (Goldberg, 2001; John, Caspi, Robins, Moffitt, & Stouthamer-Loeber, 1994; Mervielde, Buyst, & De Fruyt, 1995; Mervielde & De Fruyt, 2002) and adult personality (McCrae, 1994). Indeed, childhood Openness to experience appears to be involved in most normative odd manifestations, including childhood fantasy and imagination (Mervielde & De Fruyt, 1999), daydreaming (Klinger, Henning, & Janssen, 2009) and an eccentric appearance (Nathanson, Paulhus, & Williams, 2006; Tate & Shelton, 2008), suggesting that this trait is valid to describe individual differences in normative odd manifestations.

Similarly, such trait perspective appears also valid for the description of maladaptive odd symptoms. The above-described conceptual analysis of oddity-related disorders in terms of content, stability, predictive validity, comorbidity and shared etiology, indicates a number of specific findings. First, although several follow-up studies have found a decline in severity for some of the maladaptive odd symptoms, such as for OCD (Wewetzer et al., 2001), the majority of these Oddity symptoms across diagnoses appear to be relatively stable over time (e.g., Birmaher et al., 2006; Esterberg et al., 2010; Remschmidt et al., 2007). Second, and beyond this stability, the majority of maladaptive childhood Oddity features are also associated with long-term maladjustment (e.g., Levy & Perry, 2011; Miller et al., 2002). Third, childhood oddity-related disorders display a remarkable comorbidity. Several studies have explained this comorbidity from shared etiological mechanisms among these disorders (e.g., Kang et al., 2008, Rapoport et al., 2009; Ruta et al., 2010), both at the genetic and neurobiological level.



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Although the DSM-tradition (DSM-5; APA, 2013) assigns manifestations of odd behaviors, cognitions and feelings in childhood/adolescence to different disorders, these comorbidity and stability findings may suggest that this variety of odd manifestations can be conceptualized along an underlying childhood trait liability (e.g., Khan, Jacobson, Gardner, Prescott, & Kendler, 2005; Krueger et al., 2002) that may explain the similarities in biological underpinnings, phenotypic expression, course and outcome of the distinct disorders. This joint perspective on mental disorders and pathological traits was recently also supported by the results of Wright and Simms (2015), demonstrating that broad dimensions, including a psychoticism/thought disorder dimension, account for patterns of covariation across mental disorders and personality disorders traits. Such joint perspective can enhance our understanding of the chronicity of clinical disorders and their tendency to be associated with long-term maladjustment (Krueger & Tackett, 2005), given the established knowledge on the relative stability (Terracciano, McCrae, & Costa, 2010) and significant predictive validity (Kotov, Gamez, Schmidt, & Watson, 2010) of traits. An age-specific trait approach on Oddity may further also explain the underlying mechanisms through which the specific Oddity behaviors are shaped towards a specific disorder as a result of an interactive process with environmental factors (De Clercq & De Fruyt, 2014). Clear evidence for the schizophrenia spectrum in this regard has been extensively reviewed elsewhere, with developmental trauma, minority group position, urbanization and cannabis use as most cited factors that may evoke psychosis in individuals with a genetic vulnerability (Van Os, Kenis, & Rutten,

2010). Moreover, the impact of these environmental factors is particularly important in sensitive periods such as childhood and adolescence, and involves the whole psychosis continuum ranging from subclinical psychotic-like experiences over more severe schizotypal traits, to a full-blown psychotic disorder (Van Os, Linscott, Myin-Germeys, Delespaul & Krabbendam, 2009). Also for all other oddity-related disorders, previous studies have indicated that environmental stressors (e.g., traumatic experiences for dissociation, environmental toxicants for ASD, psychosocial stress for OCD and bipolar disorder) interact with an underlying oddity-related vulnerability (Alloy et al., 2005; Grisham, Anderson, Sachdev, 2008; Rossignol, Genuis, & Frye, 2014; Steel, Mahmood, & Holmes, 2008) that may eventually result in a maladaptive outcome. The validity of such trait-like dimensions for describing these complex interactions with environmental factors has been advocated previously (Tackett et al., 2009), and a recently proposed model in this regard has more specifically pointed to the relevance of these trait-environment interactions for a better understanding of the development of personality pathology at a young age (De Fruyt & De Clercq, 2014). This conceptual framework has accentuated the importance of three developmental contexts (school, social and family) that may function as trait-activators that trigger specific underlying trait vulnerabilities. From these various sources of evidence on the etiology, (interactional) course, and outcome of childhood Oddity features, it can be advocated that a trait operationalization of these Oddity characteristics is valid. It further connects with the trait hypothesis on normal manifestations

of Oddity (Goldberg, 2001; Halverson et al., 2003), with various trait models incorporating a factor that represents normative tendencies of Oddity.

### **Conceptualizing and Assessing Normative and Maladaptive Oddity From an Age-Specific Trait Perspective**

Openness to experience is generally considered as one of the building blocks to describe individual differences in normative “odd” manifestations between children. This domain is included in widely established childhood personality measures such as the Hierarchical Personality Inventory for Children (HiPIC; Mervielde & De Fruyt, 1999) and the Inventory of Child Individual Differences (ICID; Halverson et al., 2003), assessing normative individual childhood differences in fantasy, creativity, and intellect.

Similarly, a fifth maladaptive trait factor has been proposed by a series of authors for adulthood (Ashton & Lee, 2012; Krueger et al., 2012; Piedmont et al., 2009; Tackett et al., 2008; Watson et al., 2008; Widiger & Mullins-Sweatt, 2009) in order to comprehensively describe the area of pathological odd characteristics. Although receiving different labels across models, this fifth maladaptive factor is assumed to describe schizotypal characteristics and cognitive-perceptual distortions in general. Such Oddity trait factor that assesses developmental manifestations of maladaptive Oddity is, nevertheless, generally lacking in childhood trait models. Several maladaptive personality characteristics models in younger age groups, however, do include lower or higher-order traits that describe maladaptive odd characteristics (e.g., the Schedule for Nonadaptive and Adaptive Personality for Youth [SNAP-Y], Linde, Stringer, Simms, & Clark, 2013; Shedler-Westen Assessment Procedure for Adolescents [SWAP-200-

A], Westen, Shedler, Durrett, Glass, & Martens, 2003), but these resulted from a top-down approach in which adult personality disorder taxonomies were tuned to more juvenile populations. The only bottom-up and age-specific model for personality pathology precursors, i.e. the Dimensional Personality Symptom Itempool (DIPSI; De Clercq et al., 2006), lacked until recently such fifth maladaptive trait domain, and only consisted of the four higher-order domains of Emotional instability, Disagreeableness, Introversion and Compulsivity. These trait factors are clearly rooted in the Five-Factor Model (FFM; Costa & Mc Crae, 1992) of general personality, each representing an extreme, maladaptive pole of their FFM equivalent (De Clercq et al., 2006; De Clercq & De Fruyt, 2012). The absence of a maladaptive pole of the childhood Openness to experience domain in the DIPSI was originally motivated by the assumption that extreme behavior in terms of fantasy, creativity and curiosity did not have a pathological character. However, corroborating recent evidence suggesting the significance of Cluster A precursors in younger age groups (Esterberg et al., 2010) and the call for a Cluster A-related maladaptive trait domain to get a broader coverage of personality pathology (Tackett et al., 2008), a fifth higher-order Oddity factor (Verbeke & De Clercq, 2014) has been recently added to the DIPSI-Model, with empirically support for the reliability and validity of its facets.

A closer look at this fifth DIPSI factor from a measurement perspective reveals its age-specific character, since it was specifically derived from robust childhood Openness markers (e.g., “I have original ideas”) that were given a more extreme and maladaptive content (e.g., “My

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creativity is sometimes difficult to follow for other people”). To obtain the most comprehensive description of maladaptive childhood odd features, also items from childhood case studies with an Oddity content were added (e.g., “I sometimes hear or see things that others don’t perceive”), resulting in an Oddity trait factor that consists of four underlying facets “Oversensitivity to feelings”, “Extreme fantasy”, “Daydreaming” and “Odd thoughts and behavior”. The addition of this DIPS I Oddity factor creates the opportunity to comprehensively identify and describe early odd characteristics with a maladaptive character, beyond normative odd manifestations that can generally be framed within the childhood Openness trait domain.

Given their conceptual relatedness, it is pertinent to address the empirical alignment of both normative and maladaptive constructs of Oddity and to explore whether Oddity can be considered as the extreme high end of Openness, parallel to previous findings on the four other childhood adaptive and maladaptive trait components (De Clercq & De Fruyt, 2012). It has been hypothesized that the association between Openness to experience and its maladaptive counterpart is less linear than it is for the other basic personality dimensions (De Young, Grazioplene, & Peterson, 2012; Verbeke & De Clercq, 2014), indicating that a high Openness to experience score does not automatically imply an increased Oddity score and vice versa. Also recent results from item-response analyses confirmed that the pathological PID-5 Psychoticism trait (Krueger et al., 2012) and normative Openness did not comfortably fit onto a common factor (Suzuki, Samuel, Pahlen, & Krueger, 2015). This non-linearity

between Openness and Oddity can be understood from the multidimensionality of Openness to experience that can to a large extent be attributed to the different traditions in its conceptualization, making this trait domain still the least understood FFM dimension (Chmielewski, Bagby, Markon, Ring, & Ryder, 2014). Openness to experience measures indeed largely differ in their conceptualization of the trait, with the traditional FFM measures (e.g., NEO Personality Inventory [NEO-PI-R]; Costa & McCrae, 1992) focusing most explicitly on an appreciation for aesthetics and an interest in new activities or experiences (McCrae, 1994). Recent evidence indicated that this core component of Openness to experience, however, is not significantly related to Cluster A personality pathology manifestations (Chmielewski et al., 2014), hence disproving the one-dimensional nature of the Openness-Oddity spectrum. Parallel to this, it appears unlikely that children with strong artistic and cultural interests are at risk for developing oddity-related symptomatology. In a related vein, the domain of intellect (Goldberg, 1993) is considered as a core component of Openness to experience, especially in childhood (Mervielde & De Fruyt, 1999), but has no maladaptive personality associations and is even inversely associated with Cluster A personality pathology traits (Chmielewski et al., 2014). A high intellect score in childhood is generally considered as a strength in a trait profile, instead of being a vulnerability for dysfunction (Herzhoff & Tackett, 2012). Beyond these two Openness facets that are not related to psychopathology, the broad domain of Openness to experience does, however, include content that may be particularly related to Oddity symptomatology. Several adult studies for instance indicated that Openness

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demonstrates important links to the STPD, especially in the prediction of cognitive-perceptual distortions (Chmielewski et al., 2014; DeYoung et al., 2012; Kwapil, Barrantas-Vidal, & Silvia, 2008), indicating that Openness to experience might include trait aspects that are related to psychopathology within the oddity-related spectrum. The specific Openness content that is most closely related to Cluster A pathology appears to be more explicitly present in measures outside the FFM tradition (Widiger, 2010), such as the HEXACO-Personality Inventory (HEXACO-PI; Lee & Ashton, 2004), the Multidimensional Personality Questionnaire (MPQ; Tellegen & Waller, 2008) and the 5-Dimensional Personality Test (5DPT; Van Kampen, 2009). These measures include scales such as “unconventionality” or “absorption” that correspond both conceptually and empirically with FFM Openness, but have a larger focus on more imaginative states of Openness (e.g., MPQ Absorption scale) or on the disposition to be eccentric or peculiar (e.g., HEXACO-PI unconventionality).

From an age-specific perspective on Openness and Oddity, preliminary empirical research with the DIPSI Oddity taxonomy in younger age groups has also underscored the complex alignment between Oddity and childhood Openness (HiPIC Imagination; Mervielde & De Fruyt, 1999). Although the DIPSI oddity trait and the HiPIC Imagination trait clearly loaded on the same factor, the intercorrelations of their respective facets were substantially lower than those observed for the other maladaptive trait factors and their general trait counterparts (De Clercq et al., 2006; Verbeke & De Clercq, 2014). More specifically, Oddity appeared rather unrelated to Openness facets that assess Intellect or Curiosity, thereby underscoring

previous studies (Chmielewski et al., 2014), but did show a moderate association with the general Openness facets assessing creativity and fantasy. These findings suggest that both Openness and Oddity share a common ground, explaining the joint Openness/Oddity factor that is observed across studies (De Fruyt et al., 2013; Gore & Widiger, 2013; Thomas et al., 2013) and suggesting that especially the subcomponents of creativity and fantasy are related to maladaptation in case of extreme scores.

### **General Discussion**

The current review has proposed a trait approach to describe both normative and maladaptive odd manifestations in youth. Although this approach is well established for the assessment of normative odd features, a trait perspective on maladaptive childhood odd manifestations was only recently proposed, adding a fifth Oddity factor to the Dimensional Personality Symptom Itempool (DIPSI; De Clercq et al., 2006). This expansion provides a promising avenue to address odd characteristics across different disorders from a trait perspective. Whereas this review has supported such Oddity trait approach from a conceptual perspective, future research will now have to explore the usefulness and validity of this trait approach with more empirical strategies.

#### **A Personality-Psychopathology Perspective**

In this review, a trait perspective on odd symptoms was proposed based on several characteristics of these symptoms across disorders, including their relative long-term stability and significant mutual comorbidity. By assuming an underlying Oddity trait liability, we enter the



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field of the various paradigms in the current personality-psychopathology literature, including the spectrum/continuity, common cause and pathoplasty models, that all premise several predictions with regard to trait-disorder associations. In this vein, it is crucial to state that the above-described characteristics of maladaptive odd manifestations are considered as necessary but not sufficient conditions to meet the criteria of these paradigms. For instance, the common cause model postulates that the interrelationship between traits and disorders emerges from the fact that they share at least some of their causal factors. As demonstrated above, there is indeed some evidence that comorbidity between oddity-related disorders can be understood from shared etiological mechanisms, including neuro-biological substrates and genetic underpinnings (e.g., Abramson et al., 2005; Enticott et al., 2008; Owen et al., 2011), hence confirming this prediction of the common cause model. However, the elucidation of which theoretical model most closely applies to the field of oddity-related symptomatology requires far more challenging researching approaches, including prospective genetically informative designs. As correctly stated by Durbin and Hicks (2014), significant associations between a trait and a disorder cannot be considered as de facto confirmation of a spectrum/continuity or common cause model. Moreover, these authors have argued for an alternative model of personality-psychopathology associations that considers both traits and mental disorders as dynamic constructs, characterized by normative developmental processes that produce age-related changes in mean levels of traits and in prevalence rates of disorders. Such trait-disorder perspective that incorporates a more

dynamic and age-specific view seems particularly relevant for the field of oddity-related symptomatology, that is pre-eminently marked by specific periods of normative high “Oddity” in childhood. Therefore, future research that empirically explores this trait perspective on oddity-related disorders should incorporate a developmental framework in addressing the complex and dynamic associations between traits and related disorders.

### **Common Symptoms Versus Distinct Disorders**

Such empirical research will also have to elucidate the precise role of Oddity in each of the above-described clinical disorders. A first study with this newly created DIPS I Oddity trait has pointed to a strong empirical connection with Psychoticism (Verbeke & De Clercq, 2014), which signifies the fifth maladaptive trait factor in the DSM-5 trait measure (Personality Inventory for DSM-5 [PID-5]; Krueger et al., 2012). Given the evidence that the Psychoticism trait facets are most significant for Cluster A-related personality pathology in adults (Hopwood, Thomas, Markon, Wright, & Krueger, 2012), it can be hypothesized that a description on the age-specific Oddity factor will provide more insight into Cluster A personality pathology precursors. Given the presence of odd manifestations across disorders, including ASS, bipolar and obsessive-compulsive disorder, we hypothesize that also these disorders can, to some extent, be translated in terms of trait vulnerabilities. At the same time, it should be clear that we do not argue to reduce these complex conditions strictly to personality problems (De Clercq & De Fruyt, 2012; Widiger, 2010) and the current review should hence not be considered as a claim to stop approaching these various symptom sets as distinct disorders. On the contrary, an underlying common liability does not

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preclude that a disorder-specific screening and diagnosis is necessary in order to ascertain the most adequate treatment, that is often focused on a specific set of symptoms. For all of the above-mentioned childhood disorders, there is a large research tradition available on disorder-specific evidence-based therapeutic interventions including pharmaceutical (e.g., Kowatch et al., 2005; Schneider, Corrigan, Hayes, Kyriakopoulos, & Frangou, 2014), cognitive-behavioral (e.g., Abramowitz, Whiteside, & Deacon, 2006) and family-based therapies (Kaslow, Broth, Smith, & Collins, 2012), that all yielded promising results, especially when combined with each other. In order to get access to these treatment forms and all other accumulated knowledge on these distinct disorders, it remains pertinent to focus in the assessment process on the potential presence of one or more specific mental disorders. Beyond this, we do believe however that a trait approach may also signify a surplus value in this assessment process. When considering Oddity as an underlying vulnerability, it could be hypothesized that youngsters with an oddity-related diagnosis and an additional high Oddity trait score are more at risk to experience other oddity-related features and impairment than youngsters in which this underlying trait component is less prominently manifested. Such underlying liability may also explain the high levels of comorbidity and developmental shifts in symptomatology (Drabick & Kendall, 2010; Larsson, Dilshad, Lichtenstein, & Barker, 2011), with multifinality and equifinality as dominating developmental principles (De Fruyt & De Clercq, 2014) that are responsible for endless variations in developmental psychopathological trajectories.

In a related vein, future research in younger age groups will have to clarify whether Oddity is associated with a specific clinical risk profile or rather reflects a general tendency for dysfunction. Studies in adults already indicated that the PID-5 Psychoticism factor, conceptually equivalent with Oddity, correlated highly beyond schizophrenia with a wide range of psychopathological symptoms, including somatic complaints, depression and substance use (Hopwood et al., 2013). In line with these results, De Clercq et al. (2014) also demonstrated in an adolescent group that Psychoticism showed the strongest intercorrelations with the remaining PID-5 maladaptive trait domains. These findings may illustrate that Psychoticism/Oddity is not only relevant for describing disorders with an oddity-related content but also reflects a more general distress component, implying that children with a high Oddity trait score are potentially at risk for dysfunction on a wide range of domains. In line with this hypothesis, adult studies indeed demonstrated the deteriorating effect of the schizotypal personality disorder, indicating that this disorder is across personality disorders most closely related to general personality dysfunction (Caspi et al., 2014; Hengartner et al., 2014). These findings highlight the clinical relevance of the assessment of oddity-related traits and question the long-standing absence of a fifth Oddity factor in childhood dimensional personality pathology models.

### **Normative Versus Maladaptive Odd Manifestations**

Since the child-specific context is especially known for its developmental manifestations of explicit fantasy and creativity (Singer & Singer, 1990), a challenging issue for the applied clinical field is to separate

normative from maladaptive odd manifestations. Although difficult, this distinction is essential, in order to timely identify vulnerable children. The relevance of such early identification of maladaptive odd features can be concluded from prevention studies that have demonstrated the beneficial effects of environmental enrichment programs at a young age, leading to a less schizotypal outcome in adolescence (Raine, Mellinger, Liu, Venables, & Mednick, 2003). Also for other oddity-related disorders, including autism (e.g. Zwaigenbaum et al., 2009), OCD (e.g. Nakatani et al., 2011) and BPD (e.g. Kowatch et al., 2005), evidence of intervention programs has underscored the importance of an early detection for the most optimal therapeutic outcome. As described above, beyond their mutual similarities, maladaptive manifestations of Oddity can be distinguished from their normative counterparts in terms of their course, level of intrusiveness or reality loss. Regarding the course, the description of both normative and maladaptive odd manifestations has pointed to the age-relatedness of normative odd characteristics, implying that maladaptation should always be interpreted against the background of normative developmental manifestations of Oddity that are common at a certain age. Moreover, clinicians will always have to consider both a child's chronological age (i.e. age of the child based on its birth date) and psychological/mental age (i.e. age at which the child is functioning), since developmental maturation is a complex process that can be characterized by sudden shifts and stagnations in behavior that not always strictly follow the chronological age (Keenan & Evans, 2009). This implies for instance that a 12-year-old that is still experiencing these typical childhood miraculous beliefs is not by definition

at risk for oddity-related pathology, especially when s/he is also functioning at a less mature level in other domains than her/his chronological age would expect. Beyond these differences in course between normative and maladaptive odd manifestations, we have also pointed to differences in intrusiveness and reality loss. In this vein, it can be argued that, regardless of age, non-pathological manifestations of Oddity including fantasy, creativity and daydreaming, can be “switched off” when necessary, and are hence under control of the person who is manifesting them. On the contrary, maladaptive odd features across disorders have a more intrusive character and are interfering with a child’s general functioning. The clinical assessment process should hence explicitly focus on this impairment component that prevents the child from adaptive functioning across situations. De Fruyt and De Clercq (2014) recently proposed an integrative developmental model for the clinical assessment of personality pathology at a young age, including a description on a broad set of personality traits, complemented with a separate assessment of dysfunction or severity that has to be evaluated across informants and contexts. Methodologies evaluating general dysfunction status should hence be designed to also reflect this intrusive and reality-loss component in the assessment of oddity-related characteristics.

### **The Complex Alignment Between Oddity and Openness**

A final issue that was addressed in the current review was the equivocal association of the general FFM trait factor Openness to experience and its potential maladaptive counterpart Oddity. In the current literature, a consensus is emerging that both traits undoubtedly share a

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common ground, but that Oddity cannot univocally be considered as a maladaptive extension of Openness. Recent research on this alignment has pointed to the differential associations of the Openness facets with Cluster A-related pathology (Chmielewski et al., 2014; DeYoung et al., 2012), probably causing these mixed results across studies. More specifically, the Intellect/Curiosity Openness component appears not or even inversely related with schizotypal characteristics, whereas the Openness component describing fantasy, creativity and absorption does demonstrate a meaningful association with Cluster A-related pathology. Future empirical research with the childhood Oddity taxonomy could advance this debate by clarifying the complex association between Oddity and Openness at a young age. Given the seeming bifurcated nature of Openness, future research on this alignment in younger age groups could split up the higher-order Openness or Imagination component and focus on its underlying facets. It could be hypothesized that, when omitting Intellect/Curiosity from the higher-order trait Imagination (HiPIC; De Fruyt et al., 1999), a much more clear and interpretable joint Openness/Oddity factor will appear.

In sum, the current review has shown that the inclusion of a fifth Oddity trait factor in childhood dimensional models of personality pathology precursors is a necessary step to achieve a unifying comprehensive framework for studying personality and psychopathology cross-sectionally and longitudinally. Such all-inclusive framework will ultimately help to identify all trait components that are involved in specific clinical disorders manifested at a young age and will hence lead to a better understanding of the nature and course of childhood disorders and their treatment.

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## References

- Abramson, R.K., Ravan, S.A., Wright, H.H., Wieduwilt, K., Wolpert, C.M., Donnelly, S.A., Pericak-Vance, M.A., & Cuccaro, M.L. (2005). The relationship between restrictive and repetitive behaviors in individuals with autism and obsessive compulsive symptoms in parents. *Child Psychiatry and Human Development, 36*, 155–165. Doi: 10.1007/s10578-005-2973-7
- Achenbach, T.M., & Edelbrock, C. (1981). Behavioral problems and competencies of reported by parents of normal and disturbed children aged four to sixteen. *Monographs of the Society for Research in Child Development, 46*.
- Alloy, L.B., Abramson, L.Y., Urosevic, S., Walshaw, P.D., Nusslock, R., & Neeren, A.M. (2005). The psychosocial context of bipolar disorder: environmental, cognitive and developmental risk factors. *Clinical Psychology Review, 25*, 1043-1075.
- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5<sup>th</sup> ed.). Arlington, VA.
- Amerio, A., Odone, A., Marchesi, C., & Ghaemi, S.N. (2014). Treatment of comorbid bipolar disorder and obsessive-compulsive disorder: a systematic review. *Journal of Affective Disorders, 166*, 170-175. Doi: 10.1016/j.jad.2014.05.026
- Anckarsäter, H., Nilsson, T., Saury, J.M., Rastam, M., & Gilberg, C. (2008). Autism spectrum disorders in institutionalized subjects. *Nordic Journal of Psychiatry, 62*, 160-167. Doi: 10.1080/08039480801957269



- 
- Andreasen, N.C., & Olsen, S. (1982). Negative versus positive schizophrenia: definition and validation. *Archives of General Psychiatry*, *39*, 789-794.
- Asarnow, J.R., Dompson, M.C., & Goldstein, M.J. (1994). Childhood-onset schizophrenia: A follow-up study. *Schizophrenia Bulletin*, *20*, 599–617.
- Asarnow, J.R. (2005). Childhood-onset schizotypal disorder: a follow-up study and comparison with childhood-onset schizophrenia. *Journal of Child and Adolescent Psychopharmacology*, *15*, 395-402. Doi: 10.1089/cap.2005.15.39
- Ashton, M.C., & Lee, K.B. (2012). Oddity, Schizotypy/Dissociation and personality. *Journal of Personality*, *80*, 113-134. Doi: 10.1111/j.1467-6494.2011.00735.x
- Astington, J.W. (1993). *The child's discovery of the mind*. Cambridge, MA: Harvard University Press.
- Barneveld, P.S., Pieterse, J., de Sonnevile, L., van Rijn, S., Lahuis, B., van Engeland, H., & Swaab, H. (2011). Overlap of autistic and schizotypal traits in adolescents with autism spectrum disorders. *Schizophrenia Research*, *126*, 231-236. Doi: 10.1016/j.schres.2010.09.004
- Baron, M., & Risch, N. (1987). The spectrum concept of schizophrenia – evidence for a genetic-environmental continuum. *Journal of Psychiatric Research*, *22*, 969-978. Doi: 10.1016/0022-3956(87)90027-6
- Birmaher, B., Axelson, D., Strober, M., Gill, M.K., Valeri, S., Chiappetta, L., Ryan, N., Leonard, H., Hunt, J., Ivengar, S. et al. (2006). Clinical course of children and adolescents with bipolar spectrum disorders. *Archives of General Psychiatry*, *63*, 175-183. Doi: 10.1001/archpsyc.63.2.175

- Birmaher, B. (2013). Bipolar disorder in children and adolescents. *Child and Adolescent Mental Health, 18*, 140-148. Doi: 10.1111/camh.12021
- Besic, N. & Kerr, M. (2009). Punks, goths and other eye-catching peer crowds: do they fulfill a function for shy youths? *Journal of Research on Adolescence, 19*, 113-121. Doi: 10.1111/j.1532-7795.2009.00584.x
- Bottas, A., Cooke, R.G., & Richter, M.A. (2005). Comorbidity and pathophysiology of obsessive-compulsive disorder in schizophrenia: is there evidence for a schizo-obsessive subtype of schizophrenia? *Journal of Psychiatry and Neuroscience, 30*, 187-193.
- Butler, L.D. (2006). Normative dissociation. *Psychiatric Clinics of North America, 29*, 45.
- Camisa, K. M., Bockbrader, M. A., Lysaker, P., Rae, L. L., Brenner, C. A., & O'Donnell, B. F. (2005). Personality traits in schizophrenia and related personality disorders. *Psychiatry Research, 133*, 23–33.
- Carballo, J.J., Baca-Garcia, E., Blanco, C., Perez-Rodriguez, M.M., Arriero, M.A.J., Artes-Rodriguez, A., Rynn, M., Shaffer, D., & Oquendo, M.A. (2010). Stability of childhood anxiety disorder diagnoses: a follow-up naturalistic study in psychiatric care. *European Child and Adolescent Psychiatry, 19*, 395-403. Doi: 10.1007/s00787-009-0064-1
- Carlson, G.A., & Fish, B. (2005). Longitudinal course of schizophrenia spectrum symptoms in offspring of psychiatrically hospitalized mothers. *Journal of Child and Adolescent Psychopharmacology, 15*, 362-382. Doi: 10.1089/cap.2005.15.362

- 
- Caspi, A., Houts, R.M., Belsky, D.W., Goldman-Mellor, S.J., Harrington, H., Israel, S., Meier, M.H., Ramrakha, S., Shalev, I., Poulton, R., & Moffit, T.E. (2014). The p factor: one general psychopathology factor in the structure of psychiatric disorders? *Clinical Psychological Science, 2*, 119-137. Doi: 10.1177/2167702613497473
- Chen, M.H., Wei, H.T., Chen, L.C., Su, T.P., Bai, Y.M., Hsu, J.W., Huang, K.L., Chang, W.H., Chen, T.J., & Chen, Y.S. (2015). Autism spectrum disorder, attention deficit hyperactivity disorder, and psychiatric comorbidities: a nationwide study. *Research in Autism Spectrum Disorders, 10*, 1-6. Doi: 10.1016/j.rasd.2014.10.014
- Chmielewski, M., Bagby, R.M., Markon, K., Ring, A.J., & Ryder, A.G. (2014). Openness to Experience, intellect, schizotypal personality disorder, and psychoticism: resolving the controversy. *Journal of Personality Disorders, 28*, 483-499.
- Clark, L.A., Watson, D., & Reynolds, S. (1995). Diagnosis and classification of psychopathology: challenges to the current system and future directions. *Annual Review of Psychology, 46*, 121-153. Doi: 10.1146/annurev.ps.46.020195.001005
- Clemmensen, L., Vernal, D.L., & Steinhausen, H.C. (2012). A systematic review of the long-term outcome of early onset schizophrenia. *BMC Psychiatry, 12*, 150. Doi: 10.1186/1471-244X-12-150
- Costa, P.T., & McCrae, R.R. (1992). *Professional Manual: Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor-Inventory (NEO-FFI)*. Odessa, FL/ Psychological Assessment Resources.

- Costa, P.T., & Widiger, T.A. (2002). *Personality Disorders and the Five-Factor Model of personality* (2<sup>nd</sup> ed.). Washington D.C.: American Psychological Association.
- De Clercq, B., De Fruyt, F., Van Leeuwen, K., & Mervielde, I. (2006). The structure of maladaptive personality traits in childhood: A step toward an integrative developmental perspective for DSM-V. *Journal of Abnormal Psychology, 115*, 639-657. Doi: 10.1037/0021-843X.115.4.639
- De Clercq, B., & De Fruyt, F. (2012). A Five-Factor model framework for understanding childhood personality disorder antecedents. *Journal of Personality, 80*, 1533-1563. Doi: 10.1111/j.1467-6494.2012.00778.x
- De Clercq, B., De Fruyt, F., De Bolle, M., Van Hiel, A., Markon, K.E., & Krueger, R.F. (2014). The hierarchical structure and construct validity of DSM-5 personality traits in adolescence. *Journal of Personality*. Doi: 10.1111/jopy.12042
- De Fruyt, F., De Clercq, B., De Bolle, M., Wille, B., Markon, K. & Krueger, R.F. (2013). General and maladaptive traits in a five-factor framework for DSM-5 in a university student sample. *Assessment, 20*, 295-307. Doi: 10.1177/1073191113475808
- De Fruyt, F., & de Clercq, B. (2014). Antecedents of personality disorder in childhood and adolescence: toward an integrative developmental model. *Annual Review of Clinical Psychology, 10*, 449-476. Doi: 10.1146/annurev-clinpsy-032813-153634
- DeYoung, C.G., Grazioplene, R.G., & Peterson, J.B. (2012). From madness to genius: the Openness/Intellect trait domain as a paradoxical simplex.

---

*Journal of Research in Personality*, 46, 63-78. Doi: 10.1016/j.jrp.2011.12.003

Dobbert, D.L. (2007). Understanding personality disorders: an introduction. Greenwood Publishing Group.

Drabick, D.A.G., & Kendall, P.C. (2010). Developmental psychopathology and the diagnosis of mental health problems among youth. *Clinical Psychology-Science and Practice*, 17, 272-280. Doi: 10.1111/j.1468-2850.2010.01219.x

Driver, D.I., Gogtay, N., & Rapoport, J. L. (2013). Childhood onset schizophrenia and early onset schizophrenia spectrum disorders. *Child and Adolescent Psychiatric Clinics of North America*, 22, 539-555. Doi: 10.1016/j.chc.2013.04.001

Durbin, C.E., & Hicks, B.M. (2014). Personality and psychopathology: a stagnant field in need of development. *European Journal of Personality*, 28, 362-386.

Elsabbagh, M., Divan, G., Koh, Y. J., Kim, Y. S., Kauchali, S., Marcín, C., Montiel-Nava, C., Patel, V., Paula, C.S., Wang, C., Taghi Yasami, M., & Fombonne, E. (2012). Global prevalence of autism and other pervasive developmental disorders. *Autism Research*, 5, 160-179.

Enticott, P.G., Hoy, K.E., Herring, S.E., Johnston, P.J., Daskalakis, Z.J., & Fitzgerald, P.B. (2008). Reduced motor facilitation during action observation in schizophrenia: a mirror neuron deficit? *Schizophrenia Research*, 102, 116-121. Doi: 10.1016/j.schres.2008.04.001

Esterberg, M.L, Goulding, S.M., & Walker, E.F. (2010). Cluster A personality disorders: schizotypal, schizoid and paranoid personality disorders in

- childhood and adolescence. *Journal of Psychopathology and Behavioral Assessment*, 32, 515-528. Doi: 10.1007/s10862-010-9183-8
- Evans, D.W., Leckman, J.F., Carter, A., Reznick, J.S., Henshaw, D., King, R.A., & Pauls, D. (1997). Ritual, habit, and perfectionism: the prevalence and development of compulsive-like behavior in normal young children. *Child Development*, 68, 58–68. Doi: 10.2307/1131925
- Fonseca-Pedrero, E., Lemos-Giraldez, S., Paino-Pineiro, M., Villazon-Garcia, U., & Muniz, J. (2010). Schizotypal traits, obsessive-compulsive symptoms and social functioning in adolescents. *Comprehensive Psychiatry*, 51, 71-77. Doi: 10.1016/j.comppsy.2009.02.003
- Fonseca-Pedrero, E., Paino, M., Santaren-Rosell, M. & Lemos-Giraldez, S. (2013). Cluster A maladaptive personality patterns in a non-clinical adolescent population. *Psicothema*, 25, 171-178. Doi: 10.7334/psicothema2012.74
- Fountain, C., Winter, A.S., & Bearman, P.S. (2012). Six developmental trajectories characterize children with autism. *Pediatrics*, 129, 1112-1120. Doi: 10.1542/peds.2011-1601
- Freeman, M.P., Freeman, S.A., & McElroy, S.L. (2002). The comorbidity of bipolar and anxiety disorders: prevalence, psychobiology, and treatment issues. *Journal of Affective Disorders*, 68, 1-23.
- Giesbrecht, T., Merckelbach, H., Kater, M., & Sluis, A.F. (2007). Why dissociation and schizotypy overlap – the joint influence of fantasy proneness, cognitive failures, and childhood trauma. *Journal of Nervous and Mental Disease*, 195, 812-816. Doi: 10.1097/NMD.0b013e3181568137

- 
- Gillberg, C., Wahlström, J., Forsman, A., Hellgren, L., & Gillberg, I.C. (1986). Teenage psychoses epidemiology, classification and reduced optimality in the prenatal, perinatal and neonatal periods. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *27*, 87-98. Doi: 10.1111/j.1469-7610.1986.tb00624.x
- Goldberg, L. R. (1993). The structure of phenotypic personality traits. *American Psychologist*, *48*, 26–34.
- Goldberg, L. R. (1994). Resolving a scientific embarrassment: A comment on the articles in this special issue. *European Journal of Personality*, *8*, 351–356.
- Goldberg, L. R. (2001). Analyses of Digman's child-personality data: Derivation of Big-Five factor scores from each of six samples. *Journal of Personality*, *69*, 709–743.
- Gore, W.L., & Widiger, T.A. (2013). The DSM-5 dimensional trait model and five-factor models of general personality. *Journal of Abnormal Psychology*, *122*, 816-821. Doi: 10.1037/a0032822
- Goren, J., Phillips, L., Chapman, M., & Salo, B. (2012). Dissociative and psychotic experiences of adolescents admitted to a psychiatric inpatient unit. *Journal of Trauma and Dissociation*, *13*, 554-567. Doi: 10.1080/15299732.2012.694840
- Green, W.H., Padrongayol, M., Hardesty, A.S., & Bassiri, M. (1992). Schizophrenia with childhood onset: A phenomenological study of 38 cases. *Journal of the American Academy of Child and Adolescent Psychiatry*, *31*, 968-976. Doi: 10.1097/00004583-199209000-00027

- Grisham, J.R., Anderson, T.M., & Sachdev, P.S. (2008). Genetic and environmental influences on obsessive-compulsive disorder. *European Archives of Psychiatry and Clinical Neuroscience*, *258*, 107-116. Doi: 10.1016/S0005-7967(99)00181-3
- Hallerbäck, M.U., Lugnegard, T., & Gilberg, C. (2012). Is autism spectrum disorder common in schizophrenia? *Psychiatry Research*, *198*, 12-17. Doi: 10.1016/j.psychres.2012.01.016
- Halverson, C. F., Havill, V. L., Deal, J., Baker, S. R., Victor, J. B., Pavlopoulos, V., et al. (2003). Personality structure as derived from parent ratings of free descriptors of children: The inventory of children's individual differences. *Journal of Personality*, *71*, 995–1026.
- Harvey, A.G., Mullin, B.C., Hinshaw, S.P. (2006). Sleep and circadian rhythms in children and adolescents with bipolar disorders. *Development and Psychopathology*, *18*, 1147-1168.
- Hengartner, M.P., De Fruyt, F., Rodgers, S., Muller, M., Rossler, W., & Ajdacic-Gross, V. (2014). An integrative examination of general personality dysfunction in a large community sample. *Personality and Mental Health*, *8*, 276-289. Doi: 10.1002/pmh.1263
- Herzhoff, K., & Tackett, J.L. (2012). Establishing construct validity for Openness-to-Experience in middle childhood: contributions from personality and temperament. *Journal of Research in Personality*, *46*, 286-294. Doi: 10.1016/j.jrp.2012.02.007
- Hollander, E., King, A., Delaney, K., Smith, C.J., & Silverman, J.M. (2003). Obsessive-compulsive behaviors in parents of multiplex autism



- 
- families. *Psychiatry Research*, *117*, 11–16. Doi: 10.1016/S0165-1781(02)00304-9
- Hopwood, C. J., Thomas, K.M., Markon, K.E., Wright, A.G.C., & Krueger, R. F. (2012). DSM-5 personality traits and DSM-IV personality disorders. *Journal of Abnormal Psychology*, *121*, 424-432. Doi: 10.1037/a0026656
- Hopwood, C.J., Wright, A.G.C., Krueger, R.F., Schade, N., Markon, K.E., & Morey, L.C. (2013). DSM-5 pathological personality traits and the personality assessment inventory. *Assessment*, *20*, 269-285. Doi: 10.1177/1073191113486286
- Ivarsson, T., & Melin, K. (2008). Autism spectrum traits in children and adolescents with obsessive-compulsive disorder (OCD). *Journal of Anxiety Disorders*, *22*, 969-978. Doi: 10.1016/j.janxdis.2007.10.003
- John, O.P., Caspi, A., Robins, R.W., Moffitt, T.E., & Stouthamer-Loeber, M. (1994). The Little 5 - Exploring the nomological network of the Five-Factor Model of personality in adolescent boys. *Child Development*, *65*, 160–178. Doi: 10.1111/j.1467-8624.1994.tb00742.x
- Johnson, J.G., Bromley, E., Bornstein, R.F., & Sneed, J.R. (2006). Adolescent personality disorders. In D.A. Wolfe & E. J. Mash (Eds.), *Behavioral and emotional disorders in children and adolescents: Nature, assessment, and treatment* (pp. 463-484). New York: Guilford Press.
- Kang, D.H., Kim, S.H., Kim, C.W., Choi, J.S., Jang, J.H., Jung, M.H., Lee, J.M., Kim, S.I., & Kwon, J.S. (2008). Thalamus surface shape deformity in obsessive-compulsive disorder and schizophrenia. *Neuroreport*, *19*, 609-613.

- Kelleher, I., Connor, D., Clarke, M.C., Devlin, N., Harley, M., & Cannon, M. (2012). Prevalence of psychotic symptoms in childhood and adolescence: a systematic review and meta-analysis of population-based studies. *Psychological Medicine, 42*, 1857-1863. Doi: 10.1017/S0033291711002960
- Kennedy, S.H., Kutcher, S.P., Ralevski, E., & Brown, G.M. (1996). Nocturnal melatonin and 24-hour 6-sulphatoxymelatonin levels in various phases of bipolar affective disorder. *Psychiatry Research, 63*, 219-222. Doi: 10.1016/0165-1781(96)02910-1
- Khan, A.A., Jacobson, K.C., Gardner, C.O., Prescott, C.A., & Kendler, K.S. (2005). Personality and comorbidity of common psychiatric disorders. *British Journal of Psychiatry, 186*, 190-196. Doi: 10.1192/bjp.186.3.190
- Klinger, E., Henning, V.R., & Janssen, J.M. (2009). Fantasy-proneness dimensionalized: dissociative component is related to psychopathology, daydreaming as such is not. *Journal of Research in Personality, 43*, 506-510.
- Konstantareas, M.M., & Hewitt, T. (2001). Autistic disorder and schizophrenia: Diagnostic overlaps. *Journal of Autism and Developmental Disorders, 31*, 19-28. Doi: 0.1023/A:1005605528309
- Kotov, R., Gamez, W., Schmidt, F., & Watson, D. (2010). Linking 'big' personality traits to anxiety, depressive and substance use disorders: a meta-analysis. *Psychological Bulletin, 136*, 768-821. Doi: 10.1037/a0020327

- 
- Kowatch, R.A., Fristad, M., Birmaher, B., Wagner, K.D., Findling, R.L., & Hellander, M. (2005). Treatment guidelines for children and adolescents with bipolar disorder. *Journal of the American Academy of Child and Adolescent Psychiatry, 44*, 213-235. Doi: 10.1097/00004583-200503000-00006
- Krueger, R.F., Hicks, B.M., Patrick, C.J., Carlson, S.R., Iacono, W.G., & McGue, M. (2002). Etiologic connections among substance dependence, antisocial behavior, and personality: Modeling the externalizing spectrum. *Journal of Abnormal Psychology, 111*, 411-424. Doi: 10.1037//0021-843X.111.3.411
- Krueger, R.F., & Tackett, J.L. (2005). Progress and innovation: personality disorders and the vanguard of psychopathology research. *Journal of Personality Disorders, 19*, 540-546. Doi: 10.1521/pedi.2005.19.5.540
- Krueger, R.F., Derringer, J., Markon, K.E., Watson, D., & Skodol, A.E. (2012). Initial construction of a maladaptive personality trait model and inventory for DSM-5. *Psychological Medicine, 42*, 1879-1890. Doi: 10.1017/S0033291711002674
- Kwapil, T. R., Barrantes-Vidal, N., & Silvia, P. J. (2008). The dimensional structure of the Wisconsin Schizotypy Scales: factor identification and construct validity. *Schizophrenia Bulletin, 34*, 444-457.
- Larsson, H., Dilshad, R., Lichtenstein, P., & Barker, E.D. (2011). Developmental trajectories of DSM-IV symptoms of attention-deficit/hyperactivity disorder: genetic effect, family risk and associated psychopathology. *Journal of Child Psychology and Psychiatry, 52*, 954-963. Doi: 10.1111/j.1469-7610.2011.02379.x

- 
- Leckman, J.F., Walker, D.E., Goodman, W.K., Pauls, D.L., & Cohen, D.J. (1994). Just right perceptions associated with compulsive behavior in Tourette syndrome. *American Journal of Psychiatry*, *151*, 675-680.
- Lee, K., & Ashton, M. C. (2004). Psychometric properties of the HEXACO Personality Inventory. *Multivariate Behavioral Research*, *39*, 329–358.
- Levy, A., & Perry, A. (2011). Outcomes in adolescents and adults with autism: a review of the literature. *Research in Autism Spectrum Disorders*, *5*, 1271-1282. Doi: 10.1016/j.rasd.2011.01.023
- Leyfer, O.T., Folstein, S.E., Bacalman, S., Davis, N.O., Dinh, E., Morgan, J., Tager-Flusberg, H., & Lainhart, J.E. (2006). Comorbid psychiatric disorders in children with autism: interview development and rates of disorders. *Journal of Autism and Developmental Disorders*, *36*, 849-861. Doi: 10.1007/s10803-006-0123-0
- Limoges, E., Mottron, L., Bolduc, C., Berthiaume, C., & Godbout, R. (2005). Atypical sleep architecture and the autism phenotype. *Brain*, *128*, 1049-1061. Doi: 10.1093/brain/awh425
- Lochner, C., Seedat, S., Hemmings, S.M.J., Kunnear, C.J., Corfield, V.A., Niehaus, D.J.H., Moolman-Smook, J.C., & Stein, D.J. (2004). Dissociative experiences in obsessive-compulsive disorder and trichotillomania: clinical and genetic findings. *Comprehensive Psychiatry*, *45*, 384-391. Doi: 10.1016/j.comppsy.2004.03.010
- Mahowald, M. W., & Schenck, C. H. (2001). Evolving concepts of human state dissociation. *Archives Italiennes de Biologie*, *139*, 269–300.
- Mancebo, M.C., Garcia, A.M., Pinto, A., Freeman, J.B., Przeworski, A., Stout, R., Kane, J.S., Eisen, J.L., & Rasmussen, S.A. (2008). Juvenile-onset

- OCD: clinical features in children, adolescents and adults. *Acta Psychiatrica Scandinavica*, *118*, 149-159. Doi: 10.1111/j.1600-0447.2008.01224.x
- McCrae, R. R. (1994). Openness to Experience: Expanding the boundaries of Factor V. *European Journal of Personality*, *8*, 251–272.
- McCrae, R.R., & Costa, P.T. Jr. (1999). A five factor theory of personality. In L.A. Pervin & O.P. John (Eds.). *Handbook of personality: theory and research* (pp. 139-153). New York: Guilford Press.
- McLewin, L.A., & Muller, R.T. (2006). Childhood trauma, imaginary companions and the development of pathological dissociation. *Aggression and Violent Behavior*, *11*, 531-545. Doi: 10.1016/j.avb.2006.02.001
- Mehl, S., Rief, W., Luellmann, E., Ziegler, M., Kesting, M.L., & Lincoln, T.M. (2010). Are theory of mind deficits in understanding intentions of others associated with persecutory delusions? *Journal of Nervous and Mental Disease*, *198*, 516-519. Doi: 10.1097/NMD.0b013e3181e4c8d2
- Melke, J., Botros, H.G., Chaste, P., Betancur, C., Nygren, G., Anckarsater, H., Rastam, M., Stahlberg, O., Gillberg, I.C., Delorme, R., et al. (2008). Abnormal melatonin synthesis in autism spectrum disorders. *Molecular Psychiatry*, *13*, 90-98. Doi: 10.1038/sj.mp.4002016
- Merikangas, K.R., (1990). Comorbidity for anxiety and depression: review of family and genetic studies. In: Maser, J.D., Cloninger, C.R. (Eds.), *Comorbidity of Mood and Anxiety Disorders*. American Psychiatric Press, Washington, D. C., pp. 331–348.

- 
- Mervielde, I., Buyst, V., De Fruyt, F. (1995). The Validity of the Big Five as a model for teachers' ratings of individual-differences among children aged 4-12 years. *Personality and Individual Differences, 18*, 525–534. Doi: 10.1016/0191-8869(94)00175-R
- Mervielde, I., & De Fruyt, F. (1999). Construction of the Hierarchical Personality Inventory for Children (HiPIC). In I. Mervielde, I. Deary, F. De Fruyt & F. Ostendorf (Eds.), *Personality Psychology in Europe, Proceedings of the Eight European Conference on Personality Psychology* (pp. 107-127). Tilburg, The Netherlands: Tilburg University Press.
- Mervielde I., & De Fruyt, F. (2002). Assessing children's traits with the Hierarchical Personality Inventory for Children. In B. De Raad & M. Perugini (Eds.), *Big Five assessment* (pp. 129-146). Deattle, WA: Hogrefe & Huber.
- Micali, N., Heyman, I., Perez, M., Hilton, K., Nakatani, E., Turner, C., & Mataix-Cols, D.(2010). Long-term outcomes of obsessive-compulsive disorder: follow-up of 142 children and adolescents. *British Journal of Psychiatry, 197*, 128-134. Doi: 10.1192/bjp.bp.109.075317
- Miller, T.J., McGlashan, T.H., Rosen, J.L., Somjee, L., Markovich, P.J., Stein, K., & Woods, S.W. (2002). Prospective diagnosis of the initial prodrome for schizophrenia based on the structured interview for prodromal syndromes: Preliminary evidence of interrater reliability and predictive validity. *American Journal of Psychiatry, 159*, 863–865. Doi: 10.1176/appi.ajp.159.5.863

- 
- Minshew, N.J., & Keller, T.A. (2010). The nature of brain dysfunction in autism: functional brain imaging studies. *Current opinion in neurology*, 23, 124-130. Doi: 10.1097/WCO.0b013e32833782d4
- Mittal, V.A., Neumann, C., Saczawa, M., & Walker, E.F. (2008). Longitudinal progression of movement abnormalities in relation to psychotic symptoms in adolescents at high risk of schizophrenia. *Archives of General Psychiatry*, 65, 165–171. Doi: 10.1001/archgenpsychiatry.2007.23
- Mordre, M., Groholt, B., Knudsen, A.K., Sponheim, E., Mykletun, A., & Myhre, A.M. (2012). Is long-term prognosis for pervasive developmental disorder not otherwise specified different from prognosis for autistic disorder? Findings from a 30-year follow-up study. *Journal of Autism and Developmental Disorders*, 42, 920-928. Doi: 10.1007/s10803-011-1319-5
- Mula, M., Pini, S., Preve, M., Masini, M., Giovannini, I., & Cassano, G.B. (2009). Clinical correlates of depersonalization symptoms in patients with bipolar disorder. *Journal of Affective Disorders*, 115, 252-256. Doi: 10.1016/j.jad.2008.08.001
- Munesue, T., Ono, Y., Mutoh, K., Shimoda, K., Nakatani, H., & Kikuchi, M. (2008). High prevalence of bipolar comorbidity in adolescents and young adults with high-functioning autism spectrum disorder: a preliminary study of 44 outpatients. *Journal of Affective Disorders*, 11, 170-175. Doi: 10.1016/j.jad.2008.02.015
- Murray, R.M., Sham, P., Van Os, J., Zanelli, J., Cannon, M., & Mc Donald, C. (2004). A developmental model for similarities and dissimilarities

- between schizophrenia and bipolar disorder. *Schizophrenia Research*, 71, 405-416. Doi: 10.1016/j.schres.2004.03.002
- Nakatani, E., Krebs, G., Micali, N., Turner, C., Heyman, I., Mataix-Cols, D. (2011). Children with very-early onset obsessive-compulsive disorder: clinical features and treatment outcome. *Journal of Child Psychology and Psychiatry*, 52, 1261-1268. Doi: 10.1111/j.1469-7610.2011.02434.x
- Nathanson, C., Paulhus, D.L., & Williams, K.M. (2009). Personality and misconduct correlates of body modification and other cultural deviance markers. *Journal of Research in Personality*, 40, 779-802. Doi: 10.1016/j.jrp.2005.09.002
- Newman, D.L., Moffitt, T.E., Caspi, A., & Silva, P.A. (1998). Comorbid mental disorders: implications for treatment and sample selection. *Journal of Abnormal Psychology*, 107, 305-311. Doi: 10.1037//0021-843X.107.2.305
- Nicolson, R. & Rapoport, J.L. (1999). Childhood-onset schizophrenia: rare but worth studying. *Biological Psychiatry*, 46, 1418–1428.
- Nicolson, R., Lenane, M., Singaracharlu, S., Malaspina, D., Giedd, J.N., Hamburger, S.D., Gochman, P., Bedwell, J., Thaker, G.K., Fernandez, T., Hommer, D.W., & Rapoport, J.L. (2000). Premorbid speech and language impairments in childhood-onset schizophrenia: Association with risk factors. *American Journal of Psychiatry*, 157, 794-800.
- Norman, R.M.G., Davies, F., Malla, A.K., & Cortese, L. (1996). Relationship of obsessive-compulsive symptomatology to anxiety, depression and



- schizotypy in a clinical population. *British Journal of Clinical Psychology*, 35, 553-566. Doi: 10.1111/j.2044-8260.1996.tb01211.x
- Ogawa, J.R., Sroufe, L.A., Weinfield, N.S., Carlson, E.A., & Egeland, B. (1997). Development and fragmented self: longitudinal study of dissociative symptomatology in a nonclinical sample. *Development and psychopathology*, 9, 855-879.
- Owen, M.J., O'Donovan, M.C., Thapar, A., Craddock, N. (2011). Neurodevelopmental hypothesis of schizophrenia. *The British Journal of Psychiatry*, 198, 173–175. Doi: 10.1192/bjp.bp.110.084384
- Pavuluri, M.N., Herbener, E.S., & Sweeney, J.A. (2004). Psychotic symptoms in pediatric bipolar disorder. *Journal of Affective Disorders*, 80, 19-28. Doi: 10.1016/S0165-0327(03)00053-3
- Piaget, J.P. (1929). *The child's conception of the world*. London: Routledge & Kegan Paul.
- Piedmont, R.P., Sherman, M.F. & Sherman, N.C. (2009). Using the five-factor model to identify a new personality disorder domain: the case for experiential permeability. *Journal of Personality and Social Psychology*, 96, 1245-1258. Doi: 10.1037/a0015368
- Poulton, R., Caspi, A., Moffitt, T.E., Cannon, M., Murray, R., & Harrington, H. (2000). Children's self-reported psychotic symptoms and adult schizophreniform disorder – a 15 year longitudinal study. *Archives of General Psychiatry*, 57, 1053-1058. Doi: 10.1001/archpsyc.57.11.1053

- 
- Putnam, F.W. (1993). Dissociative disorders in children: behavioral profiles and problems. *Childhood Abuse and Neglect*, 17, 39-45. Doi: 10.1016/0145-2134(93)90006-Q
- Raine, A., Mellinger, K., Liu, J.H., Venables, P., & Mednick, S.A. (2003). Effects of environmental enrichment at ages 3-5 years on schizotypal personality and antisocial behavior at ages 17 and 23 years. *American Journal of Psychiatry*, 160, 1627-1635. Doi: 10.1176/appi.ajp.160.9.1627
- Rapoport, J., Chavez, A., & Greenstein, D. (2009). Autism spectrum disorder and childhood-onset schizophrenia: clinical and biological contributions to a relation revisited. *Journal of the American Academy of Child and Adolescent Psychiatry*, 48, 10-18. Doi: 10.1097/CHI.0b013e31818b1c63
- Remschmidt, H., Martin, M., Fleischhaker, C., Theisen, F.M., Hennighausen, K., Gutenbrunnen, C., & Schulz, E. (2007). Forty-two years later: the outcome of childhood-onset schizophrenia. *Journal of Neural Transmission*, 114, 505-512. Doi: 10.1007/s00702-006-0553-z
- Rossignol, D.A., Genuis, S.J., & Frye, R.E. (2014). Environmental toxicants and autism spectrum disorders: a systematic review. *Translational Psychiatry*, 4. Doi: 10.1038/tp.2014.4
- Rizzolatti, G., & Fabbri-Destro, M. (2010). Mirror neurons: from discovery to autism. *Experimental Brain Research*, 200, 223-237. Doi: 10.1007/s00221-009-2002-3

- 
- Ross, C.A. (1996). Epidemiology of dissociation in children and adolescents – extrapolations and speculations. *Child and Adolescent Psychiatric Clinics of North America*, 5, 273.
- Ross, S.R., Lutz, C.J., Bailey, S.E. (2002). Positive and negative symptoms of schizotypy and the five-factor model: a domain and facet level analysis. *Journal of Personality Assessment*, 79, 53-72. Doi: 10.1207/S15327752JPA7901\_04
- Rotarska-Jagiela, A., van de Ven, V., Eget-Knoechel, V., Uhlhaas, P.J., Vogeley, K., Linden, D.E.J. (2010). Resting-state network correlates of psychotic symptoms in schizophrenia. *Schizophrenia Research*, 117, 468-468. Doi: 10.1016/j.schres.2010.02.878
- Rothbaum, F., & Weisz, J. (1989). *Child psychopathology and the quest for control*. Newbury Park: SagePublications.
- Russ, S. W., Moore, M., & Farber, B. (2004). Effects of play training on play, creativity and emotional processes. *Poster session presented at the annual meeting of the American Psychological Association, Honolulu, HI*.
- Ruta, L., Mugno, D., D'Arrigo, V.G., Vitiello, B., & Mazzone, L. (2010). Obsessive-compulsive traits in children and adolescents with Asperger syndrome. *European Child and Adolescent Psychiatry*, 19, 17-24. Doi: 10.1007/s00787-009-0035-6
- Sar, V., Akyuz, G., Kundakci, T., Kiziltan, E., & Dogan, O. (2004). Childhood trauma, dissociation and psychiatric comorbidity in patients with conversion disorder. *American Journal of Psychiatry*, 161, 2271-2276. Doi: 10.1176/appi.ajp.161.12.2271

- Shiner, R. L. (2009). The development of personality disorders: Perspectives from normal personality development in childhood and adolescence. *Development and Psychopathology, 21*, 715-734. Doi: 10.1017/S0954579409000406
- Singer, J.L., & Antrobus, J.S. (1972). Daydreaming, imaginal processes, and personality: a normative study. In: Sheehan PW, editor. The function and nature of imagery. New York: Academic Press, p. 175–202.
- Singer, D., & Singer, J. (1990). *The house of make believe*. Cambridge: Harvard University Press.
- Steel, C., Mahmood, M., & Holmes, E.A. (2008). Positive schizotypy and trait dissociation as vulnerability factors for post-traumatic distress. *British Journal of Clinical Psychology, 47*, 245-249. Doi: 10.1348/014466507X255276
- Suzuki, T., Samuel, D.B., Pahlen, S., & Krueger, R.F. (2015). DSM-5 alternative personality disorder model traits as maladaptive extreme variants of the five-factor model: an item-response theory analysis. *Journal of Abnormal Psychology, 124*, 343-354. Doi: <http://dx.doi.org/10.1037/abn0000035>
- Tackett, J.L., Silberschmidt, A. L., Krueger, R.F., & Sponheim, S.R. (2008). A dimensional model of personality disorder: Incorporating DSM Cluster A characteristics. *Journal of Abnormal Psychology, 117*, 454-459. Doi: 10.1037/0021-843X.117.2.454
- Tackett, J.L., Balsis, S., Oltmanns, T.K.F., & Krueger, R.F. (2009). A unifying perspective on personality pathology across the life span: Developmental considerations for the fifth edition of the *Diagnostic*

- 
- and Statistical Manual of Mental Disorders. Development & Psychopathology, 21*, 687-713. Doi: 10.1017/S095457940900039X
- Tate, J.C., & Shelton, B.L. (2008). Personality correlates of tattooing and body piercing in a college sample: the kids are alright. *Personality and Individual Differences, 45*, 281-285. Doi: 10.1016/j.paid.2008.04.011
- Tellegen, A., & Waller, N. G. (1987). Exploring personality through test construction: Development of the multidimensional personality questionnaire. Unpublished manuscript, Minneapolis, Minnesota.
- Terracciano, A., Mc Crae, R.R., & Costa, P.T.Jr. (2010). Intra-individual change in personality stability and age. *Journal of Research in Personality, 44*, 31-37. Doi: 10.1016/j.jrp.2009.09.006
- Thomas, K.M., Yalch, M.M., Krueger, R.F., Wright, A.G.C., Markon, K.E., & Hopwood, C.J. (2013). The convergent structure of DSM-5 personality trait facets and five-factor model trait domains. *Assessment, 20*, 308-311. Doi: 10.1177/1073191112457589
- Tromp, N.B., & Koot, H.K. (2010). Dimensions of normal and abnormal personality: elucidating DSM-IV personality disorder symptoms in adolescents. *Journal of Personality, 78*, 839-864. Doi: 10.1111/j.1467-6494.2010.00635.x
- Trotman, H., MacMillan, A., & Walker, E. (2006). Cognitive function and symptoms in adolescents with schizotypal personality disorder. *Schizophrenia Bulletin, 32*, 489-497. Doi: 10.1093/schbul/sbj069
- Van Grootheest, D.S., Bartels, M., Cath, D.C., Beekman, A.T., Hudziak, J.J., & Boomsma, D.I. (2007). Genetic and environmental contributions underlying stability in childhood obsessive-compulsive behavior.

- 
- Biological Psychiatry*, 61, 308-315. Doi: 10.1016/j.biopsych.2006.05.035
- Van Ijzendoorn, M.H., & Schuengel, C. (1996). The measurement of dissociation in normal and clinical populations: meta-analytic validation of the dissociative experiences scale (DES). *Clinical Psychology Review*, 16, 365-382. Doi: 10.1016/0272-7358(96)00006-2
- Van Kampen, D. (2009). Personality and psychopathology: a theory based revision of Eysenck's PEN model. *Clinical Practice and Epidemiology in Mental Health*, 5, 9–21.
- Van Os, J., Linscott, R.J., Myin-Germeys, I., Delespaul, P., & Krabbendam, L. (2009). A systematic review and meta-analysis of the psychosis continuum: evidence for a psychosis proneness-persistence-impairment model of psychotic disorder. *Psychological Medicine*, 39, 179-195. Doi: 10.1017/S0033291708003814
- Van Os, J., Kenis, G. & Rutten, B.P.F. (2010). The environment and schizophrenia. *Nature*, 468, 203-212. Doi: 10.1038/nature09563
- Verbeke, L., & De Clercq, B. (2014). Integrating oddity traits in a dimensional model for personality pathology precursors. *Journal of Abnormal Psychology*, 123, 598-612. Doi: 10.1037/a0037166F
- Vercammen, A., Kneegtering, H., den Boer, J.A., Liemburg, E.J., & Aleman, A. (2010). Auditory hallucinations in schizophrenia are associated with reduced functional connectivity of the temporo-parietal area. *Biological Psychiatry*, 67, 912-918. Doi: 10.1016/j.biopsych.2009.11.017

- 
- Watson, D., Clark, L.A., & Chmielewski, M. (2008). Structures of personality and their relevance to psychopathology: II. Further articulation of a comprehensive unified trait structure. *Journal of Personality, 76*, 1545-1585. Doi: 10.1111/j.1467-6494.2008.00531.x
- Welham, J., Isohanni, M., Jones, P., & McGrath, J. (2009). The antecedents of schizophrenia: a review of birth cohort studies. *Schizophrenia Bulletin, 35*, 603-623. Doi: 10.1093/schbul/sbn084
- Wewetzer, C., Jans, T., Muller, B., Neudorfl, A., Bucherl, U., Remschmidt, H., Warnke, A., & Herpertz-Dahlmann, B. (2001). Long-term outcome and prognosis of obsessive-compulsive disorder with onset in childhood or adolescence. *European Child and Adolescent Psychiatry, 10*, 37-46.
- Widiger, T.A., & Simonsen, E. (2005). Alternative dimensional models of personality disorder: Finding a common ground. *Journal of Personality Disorders, 19*(2), 110-130.
- Widiger, T.A., & Mullins-Sweatt, S. N. (2009). Five-factor model of personality disorder: a proposal for DSM-V. *Annual Review of Clinical Psychology, 5*, 115-138.
- Widiger, T.A. (2010). Cluster A personality symptomatology in youth. *Journal of Psychopathology and Behavioral Assessment, 32*, 551-556.
- Wiggins, J. S., & Pincus, H. A. (1989). Conceptions of personality disorder and dimensions of personality. *Psychological Assessment, 1*, 305-316.
- Williams, D., & Happé, F. (2010). Representing intentions in self and other: studies of autism and typical development. *Developmental Science, 13*, 307-319. Doi: 10.1111/j.1467-7687.2009.00885.x

- 
- Wolff, S. (1991). 'Schizoid' personality in childhood and adult life III: the childhood picture. *British Journal of Psychiatry*, *159*, 629-635. Doi: 10.1192/bjp.159.5.629
- Wright, A.G.C., & Simms, L.J. (2015). A metastructural model of mental disorders and pathological personality traits. *Psychological Medicine*, *45*, 2309-2319. Doi: 10.1017/S0033291715000252
- Woolfenden, S., Sarkozy, V., Ridley, G., & Williams, K. (2012). A systematic review on the diagnostic stability of Autism Spectrum Disorder. *Research in Autism Spectrum Disorders*, *6*, 345-354. Doi: 10.1016/j.rasd.2011.06.008
- Yung, A.R., Phillips, L.J., Yuen, H.P., Francey, S.M., McFarlane, C.A., Hallgren, M., & McGorry, P.D. (2003). Psychosis prediction: 12-month follow up of a high-risk ("prodromal") group. *Schizophrenia Research*, *60*, 21-32. Doi: 10.1016/S0920-9964(02)00167-6
- Zohar, A.H. (1999). The epidemiology of obsessive-compulsive disorder in children and adolescents. *Child and Adolescent Psychiatric Clinics of North America*, *8*, 445-460.
- Zohar, A.H., & Fels, L. (2001). Ritualistic behavior in young children. *Journal of Abnormal Child Psychology*, *29*, 121-128. Doi: 10.1023/A:1005231912747
- Zusne, L., & Jones, W. H. (1989). *Anomalistic psychology. A study of magical thinking* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Zwaigenbaum, L., Bryson, S., Lord, C., Rogers, S., Carter, A., Carver, L., Chawarska, K., Constantino, J., Dawson, G., Dobkins, K., Fein, D., Iverson, J., Klin, A., Landa, R., Messinger, D., Ozonoff, S., Sigman, M.,



Stone, W., Tager-Flusberg, H., & Yirmiya, N. (2009). Clinical assessment and management of toddlers with suspected autism disorder: insights from studies of high-risk infants. *Pediatrics*, *123*, 1383-1391. Doi: 10.1542/peds.2008-1606.



## Chapter 2

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### **Understanding schizotypal pathology in adolescence from individual developmental trajectories of childhood Oddity characteristics<sup>1</sup>**

#### **Abstract**

Although the schizotypal personality disorder (STPD) represents one of the most detrimental personality disorders (Hengartner et al., 2014), longitudinal research that prospectively examines its onset and developmental course is limited. By use of latent growth modeling (LGM), the current study ( $N = 485$ ) explored the developmental trajectory of potential childhood prodromal signs of STPD across three measurement waves with consecutive time intervals of one year. At a fourth assessment point in adolescence, STPD traits were assessed along the DSM-5 trait measure (APA, 2013). Beyond the general declining trend in odd characteristics over time, the results demonstrated that both an early onset of oddity-related characteristics as well as an increasing trend in these characteristics over time are predictive for adolescent schizotypal personality pathology. Moreover, our findings point to the significance of several childhood characteristics, such as academic achievement, socio-economic adversity and child personality, for understanding early onset or growth in odd features. These results underscore the significance of prodromal signs of STPD at a young age and highlight the relevance of

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<sup>1</sup>Verbeke, L., De Clercq, B., De Caluwé, E., & Hofmans, J. (*under review*). Understanding schizotypal pathology in adolescence from individual developmental trajectories of childhood oddity characteristics. *Development and Psychopathology*.

systematic screening processes that take it further than a one-point assessment.

## Introduction

Research on developmental precursors of the Schizotypal Personality Disorder (STPD; American Psychiatric Association, 2013) is one of the most intriguing topics in developmental psychopathology. The clinical expression of childhood schizotypal pathology is not only difficult to distinguish from that of related disorders (Jones et al., 2015), its low prevalence at a young age also severely complicates prospective research on its prodromal signs. This is an important limitation because an increasing consensus on childhood antecedents of adult personality disorders (De Fruyt & De Clercq, 2014; Kasen, Cohen, Skodol, Johnson, & Brook, 1999) suggests that the exploration of STPD childhood precursors is needed. This challenge has been ventured by a small number of research groups, and their findings indeed revealed that, although the onset of the STPD is typically observed in late adolescence or young adulthood (Castle, Wessely, & Murray, 1993; Häfner, Maurer, Löffler, & Riecher-Rössler, 1993), STPD-like symptoms are already present in childhood (Asarnow, 2005; Roberts, Garralda, & Renfrew, 2001). Examples of such STPD-like symptoms are social interaction deficits, solitary tendencies, odd speech and ideation, formal thought disorder, unusual perceptions, magical thinking, and preoccupation with bizarre fantasies and interests (Asarnow, 2005; Caplan & Guthrie, 1992; Esterberg, Goulding, & Walker, 2010; Jones et al., 2015; Nagy & Szatmari, 1986; Wolff, 1991), hence including symptoms of both the so-called “negative” (i.e. a lack of feelings or behaviors that are usually present, e.g. social disinterest) and “positive” (i.e. feelings or behaviors that are usually not present, e.g. hallucinations) schizophrenia spectrum symptoms clusters. Within this

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group of early STPD-like manifestations, the “odd” symptoms such as thought problems, magical thinking and unusual perceptual experiences appear the most specific for a STPD outcome (Barneveld et al., 2010; Fagel, de Sonnevile, van Engeland, & Swaab, 2014). However, despite the recent awareness that odd symptoms are indicative for STPD, our knowledge on how these oddity-related symptoms can be delineated from normative expressions of childhood fantasy remains limited (Jones et al., 2015). To tackle this issue, prospective research on the course of early odd manifestations is needed (Jones et al., 2015), especially because prospective research has the ability to clarify whether these oddity-related symptoms are indicative for future schizotypal pathology or are rather normative expressions of childhood fantasy and cognitive development that decrease over time and have a benign nature (Bartels-Velthuis, van de Willige, Jenner, van Os, & Wiersma, 2011; Dhossche et al., 2002; Escher et al., 2002; Kelleher et al., 2012; McGee et al., 2000; van Os, Linscott, Myin-Germeys, Delespaul, & Krabbendam, 2009; Yoshizumi et al., 2004).

Previous research on the developmental trajectories of oddity-related characteristics (including psychotic-like experiences such as hallucinations and delusions) has clearly underscored the prevalence of oddity-related characteristics at a young age, while also showing that these oddity-related characteristics decline as children proceed into childhood and adolescence (Bartels-Velthuis et al., 2011; Kelleher et al., 2012). Of particular importance, however, is the finding that not all children follow such a normative declining trend. In particular, some children show persisting oddity-related symptoms that can be predicted from the severity level of

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baseline symptoms (Bartels-Velthuis et al., 2011; De Loore et al., 2011), while still others are characterized by a moderate level of hallucinatory experiences and delusional beliefs at baseline followed by an increasing developmental trajectory of oddity-related characteristics (Mackie, Castellanos-Ryan, & Conrod, 2011). Integrating these findings suggests that STPD pathology may develop from (1) highly present childhood odd characteristics that further develop into a maladaptive trait, hence representing direct predecessors of adult STPD dysfunction, or from (2) a gradual increase of a more commonly accepted childhood odd-peculiar symptom that evolves into more explicit tendencies of schizotypal pathology.

Although both pathways indicate that the significance of early odd features for later STPD pathology can be explained from a course that is opposite to normative maturation processes (Woolley, 1997), none of the above-mentioned studies has specifically focused on the significance of early odd manifestations and their growth for later STPD. Instead, these studies described the outcome measure in terms of general psychopathology or specific psychotic symptoms of the schizophrenia spectrum, such as hallucinations or delusions (Bartels-Velthuis et al., 2011; De Loore et al., 2011; Dominguez, Wichers, Lieb, Wittchen, & van Os, 2011; Kelleher et al., 2012). Although the STPD is part of this schizophrenia spectrum, its clinical profile shows unique features that differentiate it from other schizophrenia-like pathologies, including the absence of overt psychosis in STPD and the presence of more subtle cognitive impairments compared to full-blown schizophrenia manifestations (Oldham, Skodol, &

Bender, 2005; Skodol et al., 2011). Therefore, there is a need for research that specifically addresses the STPD outcome. One study that did focus on adult STPD as predicted by a wide range of childhood problem behaviors, concluded that childhood oddity-related thought problems had the most predictive power for positive and disorganized schizotypal traits in adulthood, whereas none of the childhood problem behavior scales predicted negative adult schizotypal traits (Fagel et al., 2014). Although this study undoubtedly contributed to a better understanding of specific early STPD signs, the one-point assessment did not allow mapping out the course of oddity-related characteristics.

The current work addresses this important gap in the literature by prospectively examining the predictive value of an age-specific symptom set of early oddity-like characteristics derived from a general measure of childhood psychopathology (Child Behavior Checklist [CBCL]; Achenbach & Rescorla, 2001) to understand adolescent DSM-5 schizotypal pathology. By using a longitudinal design, the current study allows the examination of the course of odd characteristics across childhood age, thereby extending previous one-point assessment studies (Fagel et al., 2014). The first objective of this study was to explore the developmental trajectory of childhood oddity-like characteristics. Latent growth curve modeling (LGM; Preacher, Wichman, MacCallum, & Briggs, 2008) was used to capture the dynamics of these characteristics, modeling both individual differences in starting position and development over time. In line with normative developmental pathways (e.g., Kelleher et al., 2012), we hypothesized a general declining trend in oddity-related features over time. Moreover, we



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predicted individual differences in the developmental trajectories, with the presence of children in which these early oddity-related characteristics are persistent or even increasing over time. Our second objective was to explore the predictive value of these developmental trajectories for future schizotypal personality pathology, focusing on both onset and growth as relevant predictors of later STPD traits. By approaching the STPD as a dimensional construct, consisting of both “negative” and “positive” schizotypal traits, we explored whether oddity-related characteristics were mainly predictive for the conceptually most closely related positive schizotypal traits, or whether they were also relevant for the prediction of negative schizotypal traits. The third objective was to explore whether age, gender, socio-economic status, clinical status and cognitive performance were relevant covariates of this developmental course of odd characteristics, thereby corroborating previous evidence on the potential role of each of these factors (Bartels-Velthuis et al., 2011; Häfner et al., 1993; Hur, Choi, Yun, Chon, & Kwon, 2015; Welham et al., 2009). Finally, we aimed to explore how the baseline level of oddity-like features as well as the developmental course of these features were related to personality traits. This allowed us to verify whether differences in the early manifestation and course of odd characteristics were related to childhood personality.

## **Method**

### **Participants and Procedure**

To maximize the variability in psychopathology rates, we relied on a Flemish sample ( $N= 485$ ; 55.5% girls; 7.17-14.78 years old,  $M = 10.74$ ,  $SD = 1.50$ ), including community ( $n= 339$ ) and referred children ( $n= 146$ ). These

children were recruited by undergraduate psychology students of Ghent University in the course of the Personality and Affect Longitudinal Study (PALS). After one and two years respectively, follow-up assessments were organized (for detailed information on waves 1, 2, and 3, see De Bolle, Beyers, De Clercq, & De Fruyt, 2012). Four to six years after the initial assessment<sup>2</sup>, a fourth follow-up was organized ( $N = 344$ ; 61% girls; 12-20 years old,  $M = 16.06$ ,  $SD = 1.76$ ) (for detailed information on wave 4, see De Caluwé, De Clercq, De Bolle, & De Wolf, 2014). In this last follow-up, families were rewarded with an unannounced five euro voucher for their ongoing effort and commitment. Participants were guaranteed that the data would only serve research purposes and would be treated confidential. They all provided written informed consent and the study was approved by the Ghent University Ethical Review Board.

**Community sample.** Flemish-speaking children between 8 and 14 years old were recruited by students. Exclusion criteria for recruitment were mental retardation and physical constraints/disabilities. Families were visited at home and received information about the study aims, procedure and ethics. Children and mothers were asked to independently complete several questionnaires. The sample initially included 339 children (56.9% girls; mean age = 10.69 years,  $SD = 1.34$ ), with 243 adolescents (63.7% girls; mean age = 16.45 years,  $SD = 1.60$ ) showing a continued participation across the four waves, which represents a 72% enduring participation rate. The adolescents of the participating families did not differ in age compared to

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<sup>2</sup>Analyses for both groups separately (four versus six year time interval) showed similar results, suggesting that the different time lag between groups does not confound the results. These outputs are available upon request.

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the drop-outs ( $F(1, 337) = 0.48, p = .49$ ); however, they differed in gender (with 20.2% drop-out in girls vs. 39.0% in boys;  $F(1, 337) = 15.09, p < .001$ ). Further, the drop-outs had a significantly lower grade point average (Welch  $F(1, 125.19) = 8.39, p < .01$ ) and also the socio-economic status of the mothers and fathers of the drop-out group was significantly lower ( $F(1, 323) = 12.35, p < .01$  and  $F(1, 329) = 5.05, p < .05$ , respectively).

**Referred sample.** Children of the referred sample were recruited using exclusion criteria that were similar to these used for the children of the community group. A formal inclusion criterion was the enrollment in a mental health program or assignment to a waiting list after intake. No further specifications concerning the content of the mental health problems were set; hence, children with a broad range of emotional and/or behavioral problems participated. Relying on an online directory of registered mental health care providers in Flanders, third-year psychology students recruited the children. Students phoned the treating psychologists to explain the aims, procedure and ethics of the study and asked them to participate. To randomize the invitation procedure, psychologists were requested to invite the first family on their agenda. After agreeing to participate, families received a consent form, information letter, and questionnaires. Signed consent forms and completed questionnaires were returned in a sealed envelope at the next appointment. The initial referred sample included 146 children (52.1% girls; mean age = 10.87,  $SD = 1.84$ ). Seventy-five percent was enrolled in mental health services for the first time, with 71% receiving treatment at the moment of the study. The main reasons for psychotherapy were anxiety symptomatology (20.7%),

depressive symptomatology (14.5%), grief or emotional problems as a result of parental divorce (11.3%), behavioral difficulties (10.7%), personality pathology or identity issues (7.6%), developmental disorders (6.9%), psychosomatic complaints (6.3%), learning difficulties (5.0%), social problems (3.8%), attention or concentration problems (2.5%), sleep problems (1.9%), eating problems (1.3%), and self-injury/suicide attempts (0.6%). For the remaining 6.9%, the reason for referral was unknown. The final wave 4 of referred participants still included 101 adolescents (55% girls; mean age = 15.14 years,  $SD = 1.79$ ), which represents a 69% enduring participation rate. There were no significant differences between the drop-out group and the continued group in terms of age ( $F(1, 144) = 0.00, p = .99$ ), gender ( $F(1, 144) = 1.50, p = .22$ ), grade point average (Welch  $F(1, 56.68) = 3.66, p = .06$ ) and socio-economic status of the mothers and fathers ( $F(1, 137) = 3.48, p = .06$  and  $F(1, 116) = 0.85, p = .36$ , respectively).

### Measures

**Child Behavior Checklist (CBCL).** Across the three assessment waves, all mothers completed the CBCL (Achenbach & Rescorla, 2001; Verhulst & Van der Ende, 2001), a standardized measure of emotional and behavioral problems in children. The questionnaire consists of 113 items that had to be rated on a 3-point rating scale, comprising eight psychopathology scales (Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought Problems, Attention Problems, Rule-Breaking Behavior, and Aggressive Behavior). The CBCL shows excellent psychometric characteristics and numerous studies have supported its reliability and validity in both community and referred populations (Achenbach &

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Rescorla, 2001; Mick et al., 2003; Verhulst & Van der Ende, 2001). Three researchers well acquainted with childhood personality and psychopathology independently selected items from the CBCL that specifically captured oddity-related characteristics at a young age. This procedure resulted in the selection of seven items that represent odd thoughts and behavior, more specifically: item 13 (“Confused or seems to be in a fog”), item 17 (“Daydreams or gets lost in his/her thoughts”), item 40 (“Hears sound or voices that aren’t there”), item 70 (“Sees things that aren’t there”), item 80 (“Stares blankly”), item 84 (“Strange behavior”), and item 85 (“Strange ideas”). Items 13, 17 and 80 stem from the Attention Problems scale, whereas items 40, 70, 84, and 85 belong to the Thought Problems scale. The compound of these seven items demonstrates a sufficient reliability across waves with Cronbach’s alpha coefficients of .67 (wave 1), .60 (wave 2), and .70 (wave 3). Moreover, a one-factor model fitted the data well for each measurement occasion (see the Results section Step 1).

**Personality Inventory for DSM-5 (PID-5).** All adolescents filled out the Personality Inventory for DSM-5 (PID-5), which is the official copyrighted measure of the American Psychological Association (APA, 2013). The PID-5 operationalizes the DSM-5 personality pathology traits (Krueger, Derringer, Markon, Watson, & Skodol, 2012) adopted in Section III (APA, 2013). Although this measure was initially developed for adults, it also shows acceptable psychometric properties and a comparable factor structure in both community (De Clercq et al., 2014) and referred adolescents (De Caluwé et al., in preparation). The PID-5 consists of 220 items that have to be rated on a 4-point rating scale. These items group together into 25 trait

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facets that are hierarchically structured in five broad domains including Negative affectivity, Detachment, Antagonism, Disinhibition and Psychoticism. Recent research replicated the factor structure and supported the validity (e.g., De Fruyt et al., 2013; Hopwood, Thomas, Markon, Wright, & Krueger, 2012; Van den Broeck et al., 2014; Wright et al., 2012). In the present study, we selected the six trait facets that represent the Schizotypal personality disorder in Section III of DSM-5 (APA, 2013). Reliability analyses indicate – except for Suspiciousness ( $\alpha=.59$ ) – good to excellent Cronbach's alpha coefficients for all trait facets, including Restricted affectivity (.78), Unusual beliefs and experiences (.82), Cognitive and perceptual dysregulation (.84), Withdrawal (.88), and Eccentricity (.94). The lower alpha coefficient for Suspiciousness is in line with other studies (e.g., De Clercq et al., 2014; De Fruyt et al., 2013; Griffin & Samuel, 2014; Roskam et al., 2015; Van den Broeck et al., 2014), possibly resulting from a reversed formulation.

**Hierarchical Personality Inventory for Children (HiPIC).** All mothers completed the HiPIC at wave 4 (Mervielde & De Fruyt, 1999; Mervielde & De Fruyt, 2002; Mervielde, De Fruyt, & De Clercq, 2005), assessing children's general personality traits from a Five Factor Model (FFM; Costa & Widiger, 2002) perspective. The HiPIC includes 144 items to be rated on a 5-point rating scale that were constructed from parental descriptions of personality differences in childhood. Items are structured in 18 lower-order facets and are further organized in five higher-order domains of Emotional stability, Benevolence, Extraversion, Imagination and Conscientiousness. The HiPIC demonstrates a robust factor structure and is a reliable measure that can be used in both community and referred samples (De Clercq, De Fruyt, Koot, &

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Benoit, 2004; Mervielde & De Fruyt, 2002; Van Leeuwen, De Fruyt, & Mervielde, 2004). Moreover, good convergent and divergent validity was found in both types of participants (De Fruyt, Mervielde, Hoekstra, & Rolland, 2000; Prinzie et al., 2003). In the current study, reliability analyses of the five HiPIC domains indicated adequate internal consistencies, with Cronbach's alpha's ranging from .92 (Emotional stability) to .95 (Conscientiousness).

### **Statistical Analyses**

To capture change in oddity-related characteristics, we modeled our data using Latent Growth Modeling (LGM) along a stepwise procedure.

As a first step, we tested the measurement model for oddity-related characteristics for each wave separately using Confirmatory Factor Analysis (CFA). Because the item scores of the oddity-related characteristics are categorical in nature, we tested CFA models with categorical indicators using the Weighted Least Squares Mean and Variance adjusted (WLSMV) estimator (Flora & Curran, 2004) in Mplus version 7.2 (Muthén & Muthén, 2014). Model fit was assessed using two goodness-of-fit indices (i.e., the Comparative Fit Index (*CFI*) and the Tucker Lewis Index (*TLI*)), and one badness-of-fit measure (i.e., the Root mean Square Error of Approximation (*RMSEA*)). The *CFI* and *TLI* should exceed the critical value of .90, with values exceeding .95 indicating a good fitting model (Kline, 2005). For the *RMSEA* the upper critical value equals .10, with values lower than .08 suggesting a reasonable error of approximation (Kline, 2005; Vandenberg & Lance, 2000). As a matter of convention, we also report the  $\chi^2$  test. However, because this test is very sensitive to deviations from the conceptual model

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and is also highly affected by sample size (Kline, 2005), we do not use it to inform about model (mis)fit.

Because we aimed to measure growth in oddity-related characteristics across time, it was considered crucial that the oddity-related characteristics were measured in the same way across the different waves. To verify this, we tested for longitudinal measurement invariance in a stepwise manner. First, we examined whether the same factor configuration held across time (i.e., *configural invariance*) by testing a single CFA model in which all model parameters that were not required for identification purposes (see Millsap & Yun-Tein, 2004) were estimated freely at each wave<sup>3</sup>. Second, *metric invariance* was tested by, in addition to the constraints from the configural invariance model, also constraining the factor loadings to be equal across waves. Finally, *scalar invariance* was evaluated by, in addition to the factor loadings and the identification constraints, fixing the item thresholds. After each step, we evaluated the change in model fit. The traditional way to do so is by performing a  $\chi^2$ -difference test (Bollen, 1989; Cheung & Rensvold, 2002). However, because  $\Delta\chi^2$  is –similar to the traditional  $\chi^2$  test– highly sensitive and susceptible to sample size and non-normality, Cheung and Rensvold (2002) proposed to use  $\Delta CFI$ . Based on a simulation study, they showed that, if  $\Delta CFI$  is lower than .01, the fit of the model with more constraints does not differ from that of the less-constrained one, and therefore the more highly constrained

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<sup>3</sup> For model identification purposes, we fixed the factor loading of the item “Confused or seems to be in a fog” (i.e., the marker item) to one for each wave, constrained the first threshold of each item and the second threshold of the marker item to be equal across the three waves, fixed the factor mean on the first measurement occasion to zero, and fixed the unique variances on the first measurement occasion to one.



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model (which has fewer parameters and is thus more parsimonious) should be preferred. If  $\Delta CFI$  exceeds .01, at least one of the constrained parameters is non-invariant.

After testing for longitudinal measurement invariance, we modeled the dynamics of oddity-related characteristics using LGM. In the LGM, individual differences in starting position and development of oddity-related characteristics were represented by a latent intercept and a latent linear slope factor, respectively. To model the latent intercept factor, a factor loading of one on the intercept factor was stipulated for each wave-specific oddity-related characteristics factor. For the latent linear slope factor, we specified loadings of zero, one, and two for the first, second, and third wave-specific oddity-related characteristics factor respectively. By specifying the model in this way, the intercept captures individual differences in the expected oddity-related characteristics score at time zero, while the slope captures linear growth in the oddity-related characteristics scores over time. To assess model fit, we used the same fit indices and cut-off criteria as for the CFA's.

Next, we tested the factorial structure of our outcome measure (i.e., schizotypal personality disorder). Because in the subsequent step of the analyses the goal is to combine the LGM and this model, and because we did not want to overly complicate the final model, we decided not to use the raw items scores but rather the PID-5 facet scores as factor indicators. In this way, we tested a CFA model in which the facets Restricted affectivity, Withdrawal and Suspiciousness loaded on the "Negative schizotypal traits" factor, while Perceptual dysregulation, Eccentricity, and Unusual beliefs and

experiences loaded on the “Positive schizotypal traits” factor. As all these individual facets serve as markers of the general schizotypal personality disorder (APA, 2013), we allowed for a correlation between the negative and positive schizotypal traits factors.

In a final step, we regressed the latent intercept and slope factors on the negative and positive schizotypal traits factors to test whether individual differences in starting position and development of oddity-related characteristics were related to individual differences in positive and negative schizotypal traits. Moreover, we tested whether individual differences in starting position or development of oddity-related characteristics related to a number of covariates by jointly regressing the intercept and slope factors on these covariates.

## Results

### Step 1: Testing the Measurement Model for Oddity-related Characteristics

To test the measurement model for oddity-related characteristics, we conducted three separate CFA’s (one for each measurement occasion). In each of these CFA’s, the seven CBCL items loaded on one latent oddity-related characteristics factor. This analysis revealed that a one-factor model fitted the data well for each wave ( $\chi^2 = 46.81$ ,  $df = 14$ ,  $p < .001$ ;  $CFI = .97$ ;  $TLI = .95$ ;  $RMSEA = .07$  for wave 1;  $\chi^2 = 36.53$ ,  $df = 14$ ,  $p < .001$ ;  $CFI = .95$ ;  $TLI = .92$ ;  $RMSEA = .07$  for wave 2, and  $\chi^2 = 36.41$ ,  $df = 14$ ,  $p < .001$ ;  $CFI = .96$ ;  $TLI = .93$ ;  $RMSEA = .07$  for wave 3).

### Step 2: Testing for Longitudinal Measurement Invariance

Next, we tested whether oddity-related characteristics were measured in the same way across the three measurement occasions. To this

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end, we first examined whether the same factor configuration held across the three waves (i.e., *configural invariance*). This was done by testing a single CFA model for the three waves simultaneously. Although the separate models provided a good fit to the data, this one did not ( $\chi^2 = 473.49$ ,  $df = 202$ ,  $p < .001$ ;  $CFI = .88$ ;  $TLI = .88$ ;  $RMSEA = .05$ ); moreover, testing this model yielded an error message saying that the Psi matrix was not positive definite. To detect the cause of this misfit, we inspected the Modification Indices (MI's). These MI's strongly suggested to allow for residual covariances across waves for the item "Daydreams or gets lost in his/her thoughts". Note that "allowing covariances among measurement residuals for indicators that are repeated over time ... is common in longitudinal structural equation modeling" (Newsom, 2015; p. 43), and that "given that longitudinal correlations among measurement residuals are likely in most cases, not including them yields an incorrect model" (Newsom, 2015; p. 43). After including the residual covariances, model fit was acceptable ( $\chi^2 = 358.03$ ,  $df = 199$ ,  $p < .001$ ;  $CFI = .93$ ;  $TLI = .93$ ;  $RMSEA = .04$ ).

In the next step, we tested for *metric MI* by, apart from the necessary identification constraints also constraining the factor loadings to be equal across waves. Although adding these constraints resulted in a statistical significant  $\chi^2$ -difference test ( $\Delta\chi^2 = 23.83$ ,  $df = 12$ ,  $p = .022$ ), the MI's did not identify non-invariant loadings, and the  $\Delta CFI$  equalled  $-.002$  (meaning that the CFI of the metric model was higher than the configural one). Because of these reasons, we proceeded with this model ( $\chi^2 = 364.54$ ,  $df = 211$ ,  $p < .001$ ;  $CFI = .93$ ;  $TLI = .93$ ;  $RMSEA = .04$ ).

Finally, *scalar MI* was evaluated by, in addition to the factor loadings and the identification constraints, constraining the item thresholds across the three waves. Adding these constraints did not worsen model fit ( $\chi^2 = 374.83$ ,  $df = 222$ ,  $p < .001$ ;  $CFI = .93$ ;  $TLI = .93$ ;  $RMSEA = .04$ ), which can be concluded from a non-significant  $\chi^2$ -difference test ( $\Delta\chi^2 = 10.53$ ,  $df = 11$ ,  $p = .484$ ), and a  $\Delta CFI$  of 0. This sequence of invariance tests clearly showed that our measurements of oddity-related characteristics were invariant across the three waves, which allows us to test the dynamics of oddity-related characteristics using LGM.

### **Step 3: Testing Individual Differences in Starting Position and Development of Oddity-related Characteristics**

To test whether people differed in the starting position and development of oddity-related characteristics, we plotted the individual development trajectories across the three waves (see Figure 1). As shown in Figure 1, different participants indeed started at different positions, and they also developed at different growth rates. To supplement the visual inspection, we tested a LGM in which the latent intercept captures individual differences in the expected oddity-related characteristics score at time zero, while the latent slope captures linear growth in the oddity-related characteristics scores over time. This LGM showed a good fit to the data ( $\chi^2 = 370.41$ ,  $df = 221$ ,  $p < .001$ ;  $CFI = .93$ ;  $TLI = .94$ ;  $RMSEA = .04$ ). The results further revealed a number of important dynamics of oddity-related characteristics. In particular, participants on average decreased in oddity-related characteristics across time ( $Mean\ slope = -.14$ ;  $p = .027$ ). In addition to this mean-level change, the variance of both the latent intercept ( $s^2 = .99$ ;

$p < .001$ ) and the latent change factor ( $s^2 = .13$ ;  $p = .008$ ) was significant, implying that there are important individual differences in starting position and development of oddity-related characteristics. Finally, the correlation between the intercept and slope factor was not statistically significant ( $r = -.28$ ;  $p = .091$ ), indicating that higher/lower scores on oddity-related characteristics at wave 1 were not associated with increases/decreases in oddity-related characteristics over the three waves.

#### **Step 4: Testing the Factorial Structure of the Schizotypal Personality Disorder**

As mentioned in the Analysis section, we tested a CFA model in which the facets Restricted affectivity, Withdrawal and Suspiciousness loaded on the “Negative schizotypal traits” factor, while Perceptual dysregulation, Eccentricity, and Unusual beliefs and experiences loaded on the “Positive schizotypal traits” factor. Moreover, we allowed for a correlation between the negative and positive schizotypal traits factors. This analysis revealed that this two-factor model provided a good fit to the data ( $\chi^2 = 26.87$ ,  $df = 8$ ,  $p < .001$ ;  $CFI = .98$ ;  $TLI = .95$ ;  $RMSEA = .08$ ), which was not the case when all facets loaded on one underlying factor ( $\chi^2 = 60.07$ ,  $df = 9$ ,  $p < .001$ ;  $CFI = .93$ ;  $TLI = .89$ ;  $RMSEA = .13$ ).

#### **Step 5a: Relating Individual Differences in Starting Position and Development of Oddity-related Characteristics to Individual Differences in Positive and Negative Schizotypal Traits**

To test whether individual differences in starting position and development of oddity-related characteristics were related to individual differences in positive and negative schizotypal traits, we regressed the

latent intercept and slope factors of the LGM on the latent negative and positive schizotypal traits factors. This model again fitted the data well ( $\chi^2 = 514.22$ ,  $df = 352$ ,  $p < .001$ ;  $CFI = .93$ ;  $TLI = .93$ ;  $RMSEA = .03$ ). Regarding individual differences in starting position (or intercept), we found a positive relationship with positive ( $\beta = .44$ ,  $p < .001$ ) and negative schizotypal traits ( $\beta = .38$ ,  $p < .001$ ). Moreover, also individual differences in the development of oddity-related characteristics related in a positive way to positive ( $\beta = .43$ ,  $p < .001$ ) and negative schizotypal traits ( $\beta = .27$ ,  $p = .002$ ). In other words, individuals with a higher starting position and stronger growth in oddity-related characteristics were on average higher on schizotypal traits 4 to 6 years later, with a stronger prediction of both onset and growth for positive schizotypal traits.

### **Step 5b: Correlates of Individual Differences in Starting Position and Development of Oddity-related Characteristics**

Finally, we tested whether status (referred child versus community child), age at the first measurement occasion, gender, socio-economic status of both parents, academic achievement, and personality (i.e., Emotional stability, Extraversion, Imagination, Benevolence, and Conscientiousness) related to individual differences in starting position and development of oddity-related characteristics. We also explored how these differences in onset and growth were related to general personality traits. From Table 1, it can be concluded that referred children ( $\beta = .77$ ;  $p < .001$ ) displayed a higher oddity-related score at the start of the study, whereas belonging to the referred group was not related to growth of these odd characteristics. This implies that the overall declining trend of oddity-like

features holds for both community and referred children, indicating that normative maturation processes also occur in vulnerable children. Also, children with a mother with a lower socio-economic status ( $\beta = -.14, p < .05$ ) and participants with a lower grade point average ( $\beta = -.27, p < .001$ ) show a higher score on odd manifestations at the start of the study, whereas growth in oddity-related characteristics only related negatively to socio-economic status of the father ( $\beta = -.28, p < .05$ ). From a dispositional perspective, the results also show that both starting position and growth of oddity-related characteristics were negatively related to Emotional stability ( $\beta = -.52, p < .001$  and  $\beta = -.25, p < .01$  respectively), Extraversion ( $\beta = -.41, p < .001$  and  $\beta = -.24, p < .05$  respectively), Imagination ( $\beta = -.27, p < .001$  and  $\beta = -.30, p < .001$  respectively), Benevolence ( $\beta = -.47, p < .001$  and  $\beta = -.36, p < .001$  respectively), and Conscientiousness ( $\beta = -.30, p < .001$  and  $\beta = -.18, p < .05$  respectively). These results suggest that especially the onset score of odd characteristics is related to personality, with vulnerable children in terms of all five general personality traits having a higher risk to display oddity-like features at a young age. In a related vein, growth in odd features is to some extent associated with each of these five trait factors, suggesting that especially less manageable children are those with an increasing deviancy in terms of oddity-related characteristics across time.

### Discussion

The current study contributes to the further unraveling of potential childhood signs of later schizotypal personality pathology by prospectively exploring to what extent the early manifestation and course of oddity-like features are significant predictors of adolescent STPD. The use of latent

growth curve modeling allowed to account for individual differences in the trajectories of early odd features and enabled the further examination of potential relevant covariates of odd features across a significant time period. The results indicated an overall normative declining trend of oddity-related characteristics over time and suggested that both an early onset of odd characteristics as well as an increase in these characteristics over time are significant, though independent predictors of adolescent schizotypal personality pathology. Early onset and growth of childhood odd features were also both related to socio-economic adversity, whereas early onset was uniquely related to lower academic achievement of the child. From a trait perspective, the current results also underscore that vulnerable children in terms of personality, are more at risk to display oddity-related features at a young age as well as to develop these features over time. These results lead us to a number of theoretical and clinical implications.

First, the overall declining trend in oddity-related characteristics over time aligns with the findings of previous studies which demonstrated that psychotic-like manifestations are quite prevalent at a young age, but decrease as children grow older (Bartels-Velthuis et al., 2011; Dhossche et al., 2002; Escher et al., 2002; Kelleher et al., 2012; McGee et al., 2000; van Os et al., 2009; Yoshizumi et al., 2004). The current study extends these findings to a broader range of odd behavior, cognitions and feelings, and confirms that these features not necessarily represent a risk factor at a young age, since the majority of children “grows out” of unusual feelings, cognitions or behavior. Beyond this normative maturation, however, the current study also indicates that for some children, a severe level of odd



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features at an early age may have significant predictive value for later schizotypal personality pathology (Asarnow, 2005). From an early screening perspective, these two findings point to the relevance of a close follow-up of children with an early onset of oddity-related features because of their potential at-risk position, but also underscore the possible age-specificity of these same odd characteristics. Therefore, our findings call for decision-making processes on maladaptation that are not exclusively based upon a single assessment point in time but are rather interpreted against normative developmental trends during a specific age-phase.

Second, our study shows that independently from the level of significant odd features early in life, growth in these features is an equally important and independent predictor of later schizotypal pathology. This finding is reflected in the developmental trajectory of a group of children that contrasts with the overall normative trend (Mackie et al., 2014), because these children tend to increasingly display odd features. Again, the finding of such a developmental trajectory underscores the importance of systematic screening processes over time that may help to identify this potential risk group. From an overarching perspective on the first and second conclusion, the independency of early onset and growth points to distinct predictive pathways through which vulnerable children may proceed into adolescent schizotypal pathology. This result reflects the developmental principle of equifinality (Cicchetti & Rogosch, 1996), implying that there are diverse pathways to a similar clinical profile. Therefore, our findings are in line with previous studies that have demonstrated the crucial role of equifinality and multifinality in shaping personality pathology (Crick

& Cicchetti, 2009). Also, the predictive validity of early onset and growth appears to be significant for each of the two major subcomponents of STPD, although a stronger prediction for positive than for negative STPD traits was observed. This finding extends previous findings (Fagel et al., 2014), suggesting that early oddity-like problems are not only predictive of positive STPD symptoms, but are also relevant prodromal signs of negative STPD symptoms, which are conceptually less close.

Third, early onset and growth in psychopathology do not appear in a social vacuum, but are associated with a number of psychosocial and socio-economic correlates that are undoubtedly much more abundant than those that were included in the current design. Still, our results show that children with lower academic achievement are more prone to display early odd features, whereas growing up in socio-economic adversity appears to be a risk factor of not only early onset, but also of growth in odd features over time. Disadvantaged children are therefore especially vulnerable to later STPD pathology, and thus represent an important group for systematic follow-up (Morgan & Fisher, 2007; Van Os et al., 2009). Related to this, it has been previously demonstrated that low academic achievement may represent a valuable factor from a clinical point of view, as this is one of the factors with the potential to distinguish children with transient and benign psychotic manifestations from children at risk for transition to disorders within the schizophrenia spectrum (Bartels-Velthuis et al., 2011).

Fourth, our study also demonstrated a significant trait component of both onset and growth of odd features, with the strongest personality correlates for early onset. This may imply that early odd features can be

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especially understood as child-related vulnerability expressions, whereas the dynamics of growth in these features may be better explained from the multiple factors around the child or factors that interact with personality characteristics of the child. To some extent, these trait findings also align with previous cross-sectional studies on the associations of the Big Five personality traits with the STPD. In their extensive meta-analysis, Saulsman and Page (2004) pointed to a positive association of STPD with Neuroticism and negative associations with Extraversion and Agreeableness. Studies that adopted a more dimensional view on the STPD added to these findings by showing that the schizotypal Oddity/Eccentricity component was moderately negatively related to Conscientiousness and Agreeableness, while demonstrating a positive association with Neuroticism (Chmielewski & Watson, 2008). The current study expands this evidence towards younger age groups, and demonstrates that similar trait associations can be found at a younger age.

### **Limitations and Directions for Future Research**

Our study has several strengths, such as the inclusion of a longitudinal design with four measurement waves spanning two significant developmental stages, as well as the use of sophisticated data-analytic strategies, and the operationalization of the personality disorder outcome measure along the most recent DSM-5 guidelines. A number of limitations, however, should also be taken into account. First, only maternal ratings were used for mapping out the developmental trajectories of oddity-related characteristics. Although recent research has demonstrated the validity of maternal ratings of childhood odd characteristics (Verbeke, De Caluwé, &

De Clercq, in press), longitudinal research including children's self-reports on oddity-related features may be an interesting additional research line. Second, the developmental process of growth in odd characteristics throughout childhood appears to be associated with personality of the child. It may be an interesting avenue to further explore how exactly personality drives the development of these odd characteristics, thereby specifically focusing on interactive effects of child personality and environmental factors such as parenting that may facilitate a trajectory of increasing odd-eccentric appearance. Third, the current study only used DSM-5 schizotypal traits as outcome measure at time 4. Previous research, however, has indicated the predictive validity of early psychotic-like experiences for a wide range of non-psychotic psychopathology (Kelleher et al., 2015), suggesting that these symptoms may be indicative for general dysfunction rather than for a specific personality pathology trait profile. Future research should elaborate on this hypothesis and empirically examine to what extent oddity-related features in childhood serve as general risk factors for multiple forms of psychopathology (Debbané & Barrantes-Vidal, 2015), or can be considered as specific risk factors for disorders within the schizophrenia spectrum in general, and schizotypal personality disorder in particular. Finally, we relied on a general instrument for childhood psychopathology for the assessment of oddity-related characteristics. This decision was based on the current lack of developmentally appropriate assessment instruments that specifically focus on this domain of potential schizotypal precursors (De Clercq et al., 2006). Future research, however, may benefit from the use of more specific measures in order to

comprehensively cover the full range of oddity-related characteristics at a young age.

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### References

- Achenbach, T.M., & Rescorla, L.A. (2001). *Manual for the ASEBA school-age forms and profiles*. Burlington: University of Vermont Research Center for Children, Youth, and Families.
- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5<sup>th</sup> ed.). Arlington, VA.
- Asarnow, J.R. (2005). Childhood-onset schizotypal disorder: a follow-up study and comparison with childhood-onset schizophrenia. *Journal of Child and Adolescent Psychopharmacology*, 15, 395-402. Doi: 10.1089/cap.2005.15.39
- Barneveld, P.S., Pieterse, J., de Sonnevile, L., van Rijn, S., Lahuis, B., van Engeland, H., & Swaab, H. (2011). Overlap of autistic and schizotypal traits in adolescents with autism spectrum disorders. *Schizophrenia Research*, 126, 231-236. Doi: 10.1016/j.schres.2010.09.004
- Bartels-Velthuis, A.A., van deWillige, G., Jenner, J.A., van Os, J., & Wiersma, D. (2011). Course of auditory vocal hallucinations in childhood: 5-year follow-up study. *British Journal of Psychiatry*, 199, 296–302.
- Bollen, K. A. (1989). A new incremental fit index for general structural equation models. *Sociological methods and research*, 17, 303- 316.
- Caplan, R. & Guthrie, D. (1992). Communication deficits in childhood schizotypal personality disorder. *Journal of the American Academy of Child and Adolescent Psychiatry*, 31, 961–967.
- Castle, D.J., Wessely, S., & Murray, R.M. (1993). Sex and schizophrenia: effects of diagnostic stringency, and associations with and premorbid variables. *British Journal of Psychiatry*, 162, 658–664.

- 
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*, 233-255.
- Chmielewski, M., & Watson, D. (2008). The heterogeneous structure of schizotypal personality disorder: item-level factors of the Schizotypal Personality Questionnaire and their associations with obsessive-compulsive disorder symptoms, dissociative tendencies, and normal personality. *Journal of Abnormal Psychology, 117*, 364–376.
- Cicchetti, D., & Crick, N.R. (2009). Precursors and diverse pathways to personality disorder in children and adolescents. *Developmental Psychopathology, 21*, 683–85.
- Cicchetti, D., & Rogosch, F.A. (1996). Equifinality and multifinality in developmental psychopathology. *Developmental Psychopathology, 8*, 597–600.
- Costa, P.T., & Widiger, T.A. (2002). *Personality Disorders and the Five-Factor Model of personality* (2<sup>nd</sup> ed.). Washington D.C.: American Psychological Association.
- Debanné, M., & Barrantes-Vidal, N. (2015). Schizotypy from a developmental perspective. *Schizophrenia Bulletin, 41*, 386-395. Doi: 10.1093/schbul/sbu175
- De Bolle, M., Beyers, W., De Clercq, B., & De Fruyt, F. (2012). General personality and psychopathology in referred and nonreferred children and adolescents: an investigation of continuity, pathoplasty, and complication models. *Journal of Abnormal Psychology, 121*, 958-970. Doi: 10.1037 /a0027742

- 
- De Caluwé, E., De Clercq, B., De Bolle, M., & De Wolf, T. (2014). A General and Maladaptive Personality Perspective on Youth Obsessive-Compulsive Symptoms. *Journal of Personality Assessment, 96*, 495-502.
- De Caluwé, E., Verbeke, L., van Aken, M., Van der Heijden, P.T., Hutsebaut, J., & De Clercq, B. (in preparation). The DSM-5 trait measure in a clinical sample of adolescents and young adults: Structure, reliability and validity.
- De Clercq, B., De Fruyt, F., Koot, H., & Benoit, Y. (2004). Quality of life in children surviving cancer: A personality and multi-informant perspective. *Journal of Pediatric Psychology, 29*, 579-590. Doi: 10.1093/jpepsy/jsh060
- De Clercq, B., De Fruyt, F., De Bolle, M., Van Hiel, A., Markon, K.E., & Krueger, R.F. (2014). The hierarchical structure and construct validity of DSM-5 personality traits in adolescence. *Journal of Personality*. Doi: 10.1111/jopy.12042
- De Fruyt, F., Mervielde, I., Hoekstra, H.A., & Rolland, J. (2000). Assessing adolescents' personality with the NEO-PI-R. *Assessment, 7*, 329-345. Doi: 10.1177/107319110000700403
- De Fruyt, F., De Clercq, B., De Bolle, M., Wille, B., Markon, K. & Krueger, R.F. (2013). General and maladaptive traits in a five-factor framework for DSM-5 in a university student sample. *Assessment, 20*, 295-307. Doi: 10.1177/1073191113475808
- De Fruyt, F., & de Clercq, B. (2014). Antecedents of personality disorder in childhood and adolescence: toward an integrative developmental



- model. *Annual Review of Clinical Psychology*, *10*, 449-476. Doi: 10.1146/annurev-clinpsy-032813-153634
- De Loore, E., Gunther, N., Drukker, M., Feron, F., Sabbe, B., Deboutte, D., van Os, J., & Myin-Germeys, I. (2011). Persistence and outcome of auditory hallucinations in adolescence: a longitudinal general population study of 1800 individuals. *Schizophrenia Research*, *127*, 252-256.
- Dhossche, D., Ferdinand, R., Van Der Ende, J., Hofstra, M.B., & Verhulst, F. (2002). Diagnostic outcome of self-reported hallucinations in a community sample of adolescents. *Psychological Medicine*, *32*, 619–627.
- Dominguez, M.D., Wichers, M., Lieb, R., Wittchen, H.U., & Van Os, J. (2011). Evidence that onset of clinical psychosis is an outcome of progressively more persistent subclinical psychotic experiences: an 8-year cohort study. *Schizophrenia Bulletin*, *37*, 84–93.
- Escher, S., Delespaul, P., Romme, M., Buiks, A., & Van Os, J. (2003). Coping defence and depression in adolescents hearing voices. *Journal of Mental Health*, *12*, 91–99.
- Esterberg, M.L, Goulding, S.M., & Walker, E.F. (2010). Cluster A personality disorders: schizotypal, schizoid and paranoid personality disorders in childhood and adolescence. *Journal of Psychopathology and Behavioral Assessment*, *32*, 515-528. Doi: 10.1007/s10862-010-9183-8
- Fagel, S., de Sonneville, L., van Engeland, H., & Swaab, H. (2014). School-associated problem behavior in childhood and adolescence and development of adult schizotypal symptoms: a follow-up of a clinical

- cohort. *Journal of Abnormal Child Psychology*, *42*, 813-823. Doi: 10.1007/s10802-013-9829-6
- Flora, D.B., & Curran, P.J. (2014). An empirical evaluation of alternative models of estimation for confirmatory factor analysis with ordinal data. *Psychological Methods*, *9*, 466-491.
- Griffin, S.A., & Samuel, D.B. (2014). A closer look at the lower-order structure of the Personality Inventory for DSM-5: Comparison with the five-factor model. *Personality Disorders: Theory, Research and Treatment*, *5*, 406-412. Doi: 10.1037/per0000074
- Häfner, H., Maurer, K., Löffler, W., & Riecher-Rössler, A., (1993). The influence of age and sex on the onset and early course of schizophrenia. *British Journal of Psychiatry*, *162*, 80–86.
- Hengartner, M.P., Müller, M., Rodgers, S., Rössler, W., & Ajdacic-Gross, V. (2014). Interpersonal functioning deficits in association with DSM-IV personality disorder dimensions. *Social Psychiatry and Psychiatric Epidemiology*, *49*, 317-325.
- Hopwood, C.J., Thomas, K. M, Markon, K.E., Wright, A.G.C., Krueger, R.F. (2012). DSM-5 personality traits and DSM-IV personality disorders. *Journal of Abnormal Psychology*, *121*, 424-432. Doi: 10.1037/a0026656
- Hur, J.W., Choi, S., Yun, J., Chon, M., & Kwon, J.S. (2015). Parental socioeconomic status and prognosis in individuals with ultra-high risk for psychosis: a 2-year follow-up study. *Schizophrenia Research*, *168*, 56-61. Doi: 0.1016/j.schres.2015.07.020
- Jones, H.P., Testa, R.R., Ross, N., Seal, M.L., Pantelis, C., & Tonge, B. (2015). The Melbourne Assessment of schizotypy in kids: a useful measure of

- childhood schizotypal personality disorder. *Biomed Research International*, 1-10.
- Kasen, S., Cohen, P., Skodol, A. E., Johnson, J. G., & Brook, J. S. (1999). Influence of child and adolescent psychiatric disorders on young adult personality disorder. *American Journal of Psychiatry*, *156*, 1529–1535.
- Kelleher, I., Connor, D., Clarke, M.C., Devlin, N., Harley, M., & Cannon, M. (2012). Prevalence of psychotic symptoms in childhood and adolescence: a systematic review and meta-analysis of population-based studies. *Psychological Medicine*, *42*, 1857-1863. Doi: 10.1017/S0033291711002960
- Kelleher, I., Wigman, J.T.W., Harley, M., O’Hanlon, E., Coughlan, H., Rawdon, C., Murphy, J., Power, E., Higgins, N.M., & Cannon, M. (2015). Psychotic experiences in the population: association with functioning and mental distress. *Schizophrenia Research*, *165*, 9-14. Doi: 10.1016/j.schres.2015.03.020
- Kline, R.B. (2005), *Principles and Practice of Structural Equation Modeling* (2nd Edition ed.). New York: The Guilford Press.
- Krueger, R.F, Derringer, J., Markon, K.E., Watson, D., & Skodol, A.E (2012). Initial construction of a maladaptive personality trait model and inventory for DSM-5. *Psychological Medicine*, *42*, 1879-1890. Doi: 10.1017/S0033291711002674
- Mackie, C.J., Castellanos-Ryan, N., & Conrod, P.J., (2010). Developmental trajectories of psychotic-like experiences across adolescence: impact of victimization and substance use. *Psychological Medicine*, *41*, 47–58.

- 
- Mcgee, R., Williams, S., & Poulton, R. (2000). Hallucinations in nonpsychotic children. *Journal of the American Academy of Child & Adolescent Psychiatry, 39*, 12-13.
- Mervielde, I., & De Fruyt, F. (1999). Construction of the Hierarchical Personality Inventory for Children (HiPIC). In I. Mervielde, I. Deary, F. De Fruyt & F. Ostendorf (Eds.), *Personality Psychology in Europe, Proceedings of the Eight European Conference on Personality Psychology* (pp. 107-127). Tilburg, The Netherlands: Tilburg University Press.
- Mervielde I., & De Fruyt, F. (2002). Assessing children's traits with the Hierarchical Personality Inventory for Children. In B. De Raad & M. Perugini (Eds.), *Big Five assessment* (pp. 129-146). Deattle, WA: Hogrefe & Huber.
- Mervielde, I., De Fruyt, F., & De Clercq, B. (2005). *Hiërarchische Persoonlijkheidsvragenlijst voor Kinderen [Hierarchical Personality Inventory for Children]: Handleiding*. Amsterdam: Hogrefe Publishers.
- Mick, E., Biederman, J., Pandina, G., & Faraone, S.V. (2003). A preliminary meta-analysis of the child behavior checklist in pediatric bipolar disorder. *Biological Psychiatry, 53*, 1021–1027. Doi: 10.1016/s0006-3223(03)00234-8
- Millsap, R.E., & Yun-Tein, J. (2004). Assessing factorial invariance in ordered-categorical measures. *Multivariate Behavioral Research, 39*, 479-515.
- Morgan, C., & Fisher, H. (2007). Environment and schizophrenia: environmental factors in schizophrenia: childhood trauma - a critical review. *Schizophrenia Bulletin, 33*, 3–10.

- 
- Muthén, L., & Muthén, B. (2014). *Mplus user's guide*. Los Angeles, CA: Muthén & Muthén.
- Nagy, J. & Szatmari, P. (1986). A chart review of schizotypal personality disorders in children. *Journal of Autism and Developmental Disorders*, *16*, 351–367.
- Newsom, J.T. (2015). *Longitudinal Structural Equation Modeling: A comprehensive introduction*. Routledge, 2015
- Oldham, J.M., Skodol, A.E., & Bender, D.S. (2005). *Textbook of Personality Disorders*. American Psychiatric Publishing, Inc.
- Preacher, K. J., Wichman, A. L., MacCallum, R. C., & Briggs, N. E. (2008). *Latent growth curve modeling*. Thousand Oaks, CA: Sage Publications.
- Prinzle, P., Onghena, P., Hellinckx, W., Grietens, H., Ghesquiere, P., & Colpin, H. (2003). The additive and interactive effects of parenting and children's personality on externalizing behavior. *European Journal of Personality*, *17*, 95-117. Doi: 10.1002/per.467
- Roberts, E., Garralda, S. & Renfrew, D. (2001). Schizotypal disorder among child and adolescent mental health services users. *Journal of the American Academy of Child & Adolescent Psychiatry*, *40*, 1366-2001.
- Roskam, I., Galdiolo, S., Hansenne, M., Massoudi, K., Rossier, J., Gicquel, L., & Rolland, J.P. (2015). The psychometric properties of the French version of the Personality Inventory for DSM-5. *Plos One*, *10*. Doi: 10.1371/journal.pone.0133413
- Saulsman, L. M. & Page, A. C. (2004). The five-factor model and personality disorder empirical literature: A meta-analytic review. *Clinical*

---

*Psychology Review*, 23(8), 1055-1085. Doi: 10.1016/j.cpr.2002.09.001

Skodol, A.E., Bender, D.S., Morey, L.C., Clark, L.A., Oldham, J.M., Alarcon, R.D., Krueger, R.F., Verheul, R., Bell, C.C., & Siever, L.J. (2011). Personality disorder types proposed for DSM-5. *Journal of Personality Disorders*, 25, 136-169.

Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: suggestions, practices, and recommendations for organizational research. *Organizational Research Methods*, 3, 4-70. Doi: 10.1177/109442810031002

Van den Broeck, J., Bastiaansen, L., Rossi, G., Dierckx, E., de Clercq, B., & Hofmans, J. (2014). Hierarchical structure of maladaptive personality traits in older adults: Joint factor analysis of the PID-5 and the DAPP-BQ. *Journal of Personality Disorders*, 28, 198-211.

Van Leeuwen, K., De Fruyt, F., & Mervielde, I. (2004). A longitudinal study of the utility of the resilient, overcontrolled and undercontrolled personality types as predictors of children's and adolescents' problem behavior. *International Journal of Behavioral Development*, 28, 210-220. Doi: 10.1080/01650250344000424

Van Os, J., Linscott, R.J., Myin-Germeys, I., Delespaul, P., & Krabbendam, L. (2009). A systematic review and meta-analysis of the psychosis continuum: evidence for a psychosis proneness-persistence-impairment model of psychotic disorder. *Psychological Medicine*, 39, 179-195. Doi: 10.1017/S0033291708003814

- 
- Verbeke, L., De Caluwé, E., & De Clercq, B. (in press). A five-factor model of developmental personality pathology precursors. *Personality Disorders: Theory, Research and Treatment*.
- Verhulst, F.C, & Van der Ende, J. (2001). Handleiding voor de CBCL/ 6-18, YSR en TRF (Dutch manual for CBCL/6-18, YSR, and TRF). Erasmus
- Welham, J., Scott, J., Williams, G., Najman, J., Bor, W., O'Callaghan, M., & McGrath, J. (2009). Emotional and behavioural antecedents of young adults who screen positive for non-affective psychosis: a 21-year birth cohort study. *Psychological Medicine, 39*, 625-634.
- Wolff, S. (1991). 'Schizoid' personality in childhood and adult life III: the childhood picture. *British Journal of Psychiatry, 159*, 629-635. Doi: 10.1192/bjp.159.5.629
- Woolley, J. D. (1997). Thinking about fantasy: are children fundamentally different thinkers and believers from adults? *Child Development, 68*, 991-1011.
- Wright, A. G. C., Thomas, K. M., Hopwood, C. J., Markon, K. E., Pincus, A. L., & Krueger, R. F. (2012). The hierarchical structure of DSM-5 pathological personality traits. *Journal of Abnormal Psychology, 121*, 951-957. Doi: 10.1037/a0027669.
- Yoshizumi, T., Murase, S., Honjo, S., Kaneko, H., & Murakami, T. (2004). Hallucinatory experiences in a community sample of Japanese children. *Journal of the American Academy of Child & Adolescent Psychiatry, 43*, 1030–1036.

## Tables

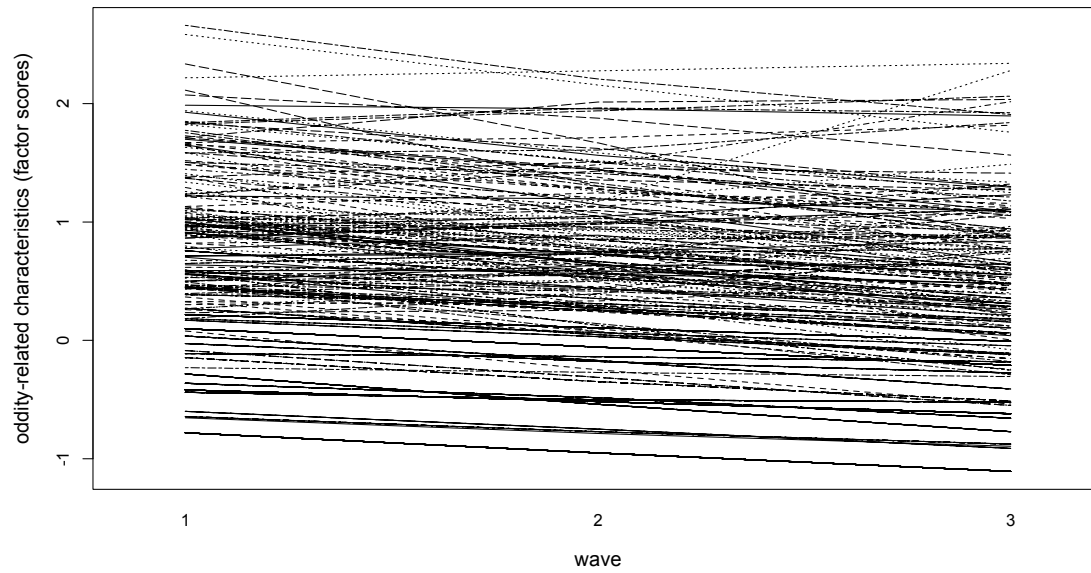
Table 1  
*Overview of Standardized Regression Coefficients when Regressing the Latent Intercept and Slope Factors on the Covariates*

	Intercept	Slope
Status (1 = referred)	.77**	.14
Age at $t_0$	-.10 <sup>†</sup>	-.15
Gender (1 = girl)	-.05	.05
SES mother	-.14*	-.04
SES father	-.16 <sup>†</sup>	-.28*
Grade point average	-.27**	-.09
Personality		
Emotional stability	-.52**	-.25**
Extraversion	-.41**	-.24*
Imagination	-.27**	-.30**
Benevolence	-.47**	-.36**
Conscientiousness	-.30**	-.18*

*Note:* SES = Socio-economic status. \*\*  $p < .01$ ; \*  $p < .05$ ; <sup>†</sup>  $p < .10$



**Figure**



*Figure 1.* Individual Developmental Trajectories of Oddity-related Characteristics across the Three Waves.



## Chapter 3

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### **Integrating Oddity traits in a dimensional model for personality pathology precursors<sup>1</sup>**

#### **Abstract**

Current dimensional measures of early personality pathology (e.g., the Dimensional Personality Symptom Item Pool [DIPSI]; De Clercq, De Fruyt, Van Leeuwen, & Mervielde, 2006) describe personality difficulties within a four-dimensional framework. The present study corroborates recent evidence on the relevance of including a fifth Oddity-related domain for a more comprehensive description of personality pathology, and presents the construction of an empirically-based taxonomy of early Oddity features. Psychometric and factor-analytic procedures were conducted on self- and maternal ratings of adolescents ( $N = 434$ ), resulting in four internally consistent facets that empirically collapse in one higher-order “Oddity” factor. From a structural perspective, this Oddity factor emerged as a clear fifth factor beyond the earlier proposed four-dimensional structure of child and adolescent personality pathology. Significant associations of Oddity with both general and maladaptive trait equivalents support the construct validity of this fifth factor, and challenge current hypotheses on the applicability of the continuity hypothesis on general and maladaptive trait

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<sup>1</sup> Verbeke, L., & De Clercq, B. (2014). Integrating Oddity traits in a dimensional model for personality pathology precursors. *Journal of Abnormal Psychology, 123*, 598-612.

Doi: 10.1037/a0037166F

variance within the Openness field. The results further suggest that Oddity traits are meaningfully associated with general psychopathology at a young age. These findings are discussed in terms of the importance of including a fifth Oddity-related factor in dimensional models of developmental personality pathology in order to acquire a more comprehensive description of the building blocks that underlie early personality difficulties.

## Introduction

Children and adolescents are generally known for their pronounced imagination and a remarkable curiosity in daily life. Although imagination is considered normative during these developmental periods (Piaget, 1929; Sharon & Wooley, 2004), there are substantial differences among young individuals in their tendency to fantasize and experience the typical childhood miraculous beliefs, to show creativity, and to approach the world with open-mindedness. These individual differences are suggested to have a trait character, and can be framed within the childhood-equivalent of the Five-Factor Model (Costa & McCrae, 1992) Openness to experience domain (Caspi, Roberts, & Shiner, 2005; De Fruyt, Mervielde, Hoekstra, & Rolland, 2000; Donahue, 1994; Gjerde & Cardilla, 2009; Mervielde, De Fruyt, & De Clercq, 2009; Quartier & Rossier, 2008). There is considerable evidence on the validity of this Openness to experience domain for a comprehensive general personality description in both adults (McCrae, 1994) and children (Goldberg, 2001; John, Caspi, Robins, Moffitt, & Stouthamer-Loeber, 1994; Mervielde, Buyst, & De Fruyt, 1995; Mervielde & De Fruyt, 2002), though there has been a longstanding debate on its relevance for representing manifestations of personality pathology (Livesley, 2005; Widiger & Simonsen, 2005). Some factor-analytic studies on the dimensional structure of personality pathology in adults have failed to empirically delineate a fifth maladaptive 'Openness' factor that accounts for a significant amount of personality disorder variance (O'Connor, 2005; Watson, et al., 2008), and meta-analytical evidence on the relation between personality disorders and five-factor model traits has suggested that the Openness trait has no

meaningful maladaptive variant to capture the variance of Cluster A-related disorders (Saulsman & Page, 2004). Others have situated schizotypal symptoms within FFM Openness (Camisa et al., 2005; Kwapil, Barrentas-Vidal, & Silvia, 2008; Markon, Krueger, & Watson, 2005; Ross, Lutz, & Baily, 2002), however, and empirical evidence in adults has more broadly pointed to the potential value of including a fifth factor for a more inclusive and adequate description of pathology related to schizotypal dysfunction and cognitive-perceptual distortions in general (Tackett, Silberschmidt, Krueger, & Sponheim, 2008; Piedmont, Sherman, & Sherman, 2009).

Since the notion of personality pathology has been successfully broadened towards younger age groups (De Clercq & De Fruyt, 2012; Tackett, Balsis, Oltmanns, & Krueger, 2009; Shiner, 2009; Tromp & Koot, 2010; Johnson, Bromley, Bornstein & Sneed, 2006), including evidence that supports a similar underlying dimensional structure across age (De Clercq, De Fruyt, Van Leeuwen, & Mervielde, 2006), it can be hypothesized that a similar maladaptive fifth factor is evenly important to describe personality dysfunction in children and adolescents. This hypothesis can be justified from the idea that early cognitive-perceptual aberrations and odd characteristics are already observable at a young age (Tackett et al., 2009), and show a significant predictive value for later dysfunction (Chen, Cohen, Kasen, & Johnson, 2006). The current study addresses this issue and presents the construction of an empirically based dimensional taxonomy for maladaptive Openness-related traits in youth.

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## **The Missing Domain in Dimensional Models of Personality Pathology Assessment**

From an assessment perspective, the exclusion of a fifth factor in dimensional models of personality disorders has inevitably led to a lack of comprehensiveness in terms of the description of Cluster A-related personality dysfunction (Widiger, 2010). Ironically, these Cluster A-related symptoms happen to be one of the most invalidating manifestations of psychopathology (Chen et al., 2006), and are hence relevant to be described in the course of clinical assessment. Corroborating this suggestion, several research groups have proposed a fifth factor from different conceptualizations, including “Oddity” (Watson et al., 2008), “Peculiarity” (Tackett et al., 2008), “Experiential permeability” (Piedmont et al., 2009), or “maladaptive Openness” (Ross et al., 2002). These proposals all have in common that they describe a fifth maladaptive factor that may have specific value in understanding those personality symptoms that are currently codified in the DSM Cluster A disorders. Apart from these maladaptive operationalizations of a fifth factor, it has also been suggested that such fifth factor can be strictly represented along the extremes of the FFM Openness domain (Widiger, 2010).

This variety of proposals has stimulated the DSM-5 Personality and Personality Disorders Workgroup to include a fifth domain in their work towards the construction of a trait model for the description of personality pathology (Krueger, Derringer, Markon, Watson, & Skodol, 2012). This trait model is now incorporated in Section III of the recently released DSM-5 (APA, 2013), and includes a fifth Psychoticism domain, assumed to capture

the trait variance of Cluster A personality disorders in adults, and comprising the lower-order facets Eccentricity, Cognitive & perceptual dysregulation and Unusual beliefs & experiences. At the structural level, Psychoticism exists as a fifth maladaptive personality factor next to the four established personality domains that are currently represented in most dimensional operationalizations of adult personality disorders (Widiger & Simonsen, 2005).

From a developmental perspective on personality pathology (Tromp & Koot, 2010; Tackett et al., 2009; Shiner, 2009; De Clercq, De Fruyt, & Widiger, 2009), these four established domains of personality pathology have shown to also represent the underlying structure of early personality problems (De Clercq, et al., 2006). In this vein, and parallel to recent developments in adult literature of personality pathology, exploring the content and structure of an additional 'fifth' factor in younger age groups can be considered relevant for a comprehensive description of personality pathology precursors.

### **Relevance of a Fifth Factor of Childhood Personality Pathology**

Although research on the developmental trajectory of Cluster A-related characteristics is scarce, there is a substantial body of evidence showing that youth with symptoms of the *schizotypal personality disorder (STPD)* are displaying similar symptomatic manifestations as adults diagnosed with STPD or schizophrenia (Esterberg, Goulding, & Walker, 2010). Compared to their healthy peers, adolescents with STPD symptoms exhibit larger cognitive deficits (Trotman, MacMillan, & Walker, 2006) and show more movement abnormalities (Mittal, Neuman, Saczawa, & Walker,



2008). Carlson and Fish (2005) followed a small sample of the offspring of psychiatrically hospitalized mothers, and showed that the absence of close friends, constricted affect, odd speech and suspiciousness emerge as the most common schizotypal symptoms in adolescence.

From a longitudinal perspective, Asarnow (2005) followed a group of children with an STPD diagnosis, and demonstrated that STPD was still the most frequent clinical outcome after 3 years, whereas 25% of this group converted to schizophrenia. These results are consistent with several other studies, demonstrating that a substantial proportion of youth who meet criteria for STPD continue to do so, and are in addition at risk for developing a genetically-related Axis I psychotic disorder such as schizophrenia (Asarnow, 2005; Miller et al., 2002; Yung et al., 2009).

These findings on early manifestations of Cluster-A related symptoms and their relative stability over time, point to the significance of including a fifth maladaptive trait factor in a dimensional model for personality pathology precursors. Several research groups have already addressed this issue following a top down approach in which adult personality taxonomies were tuned to more juvenile populations, incorporating a fifth Openness-like domain to represent Cluster A-related personality symptoms (the Schedule for Nonadaptive and Adaptive Personality for Youth (SNAP-Y); Linde, Stringer, Simms, & Clark, 2013 and the Shedler-Westen Assessment Procedure for Adolescents (SWAP-200-A); Westen, Shedler, Durrett, Glass, & Martens, 2003). These measures are widespread and have adequate psychometric properties (Clark, Livesley, Schroeder, & Irish, 1996; Westen & Shedler, 1999a,b; Westen & Muderrisoglu, 2003; Linde et al., 2013).

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However, none of these taxonomies was originally constructed for younger age groups. From an age-specific bottom-up perspective, the DIPSI was constructed as a response to the growing evidence that extreme positions on general traits may be indicative of personality dysfunction (Costa & Widiger, 2002), incorporating the idea that the complexity of personality disorder symptoms may not be entirely captured by general trait measures. Towards this end, items of the Hierarchical Personality Inventory for Children (H/PIC; Mervielde & De Fruyt, 1999), a lexically based five-factor personality inventory describing the range of general personality differences in childhood, were rewritten in more maladaptive extreme variants and complemented with clinical items of Axis-II measures that were considered relevant for younger age groups. During the construction process of the DIPSI, De Clercq et al. (2006) decided not to construct a child-specific maladaptive Openness domain that relied on its general trait equivalent (i.e. Imagination; Mervielde & De Fruyt, 1999). They hypothesized that maladaptive variants of this domain may not necessarily have a pathological character – at least not to parents. This decision was further in line with the former consensus among dimensionalists that a four-dimensional model adequately accounted for the variation in personality pathology symptoms (Widiger & Simonsen, 2005). After theoretical classification and empirical procedures (for a detailed overview of these analyses see De Clercq et al., 2006), 172 items were retained. These items are scored on a 5-point Likert scale and are structured in 27 lower-level facets. Factor analyses on these 27 facets further revealed 4 higher-order maladaptive trait dimensions, that can be described as Disagreeableness,

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Emotional instability, Introversive and Compulsivity. This four-dimensional higher-order structure was replicated across referred and non-referred groups of both children and adolescents (De Clercq et al., 2006). To date, the DIPSI is considered as a promising tool for capturing the childhood personality field (Clark, 2007), with recent studies underscoring its value (De Clercq, De Caluwé, & Decuyper, in press; Decuyper, De Bolle, De Fruyt, & De Clercq, 2011).

However, in light of the recent evidence that advocates the surplus value of a maladaptive Openness dimension for capturing Cluster A-related PD symptoms in adults (Tackett et al., 2008; Piedmont et al., 2009), it can be argued that the DIPSI lacks a maladaptive variant of the FFM Imagination domain and is hence not able to comprehensively describe the childhood personality pathology area (De Clercq, De Fruyt, & Widiger, 2009). From this perspective, the present study aims to extend the DIPSI with a maladaptive Openness module, following an age-specific and bottom-up methodology that parallels the original construction procedures as outlined in De Clercq et al. (2006). Such an expanded taxonomy would allow clinicians to generate an all-embracing clinical picture of a child's maladaptive personality functioning and may facilitate the identification of children who are potentially at risk for long-term personality difficulties, including Cluster-A related pathology.

The objectives of the current study are fourfold. The first aim is to define the field of Oddity using a comprehensive bottom-up approach, by assembling all descriptors that are assumed to be relevant Oddity characteristics in childhood. After these compilation procedures, this item-

pool will be analyzed in terms of replicable and interpretable underlying constructs. In a second objective, we will study the structural position of this Oddity domain in relation to the other DIPSi childhood personality pathology dimensions relying on principal factor analysis, in an attempt to explicate whether this domain can be delineated as a fifth factor beyond the common four-dimensional structure of early personality pathology. A third objective will focus on the construct validity of the Oddity domain by exploring its relations with general personality traits as well as with the four other domains of personality pathology measured with the DSM-5 trait measure (Krueger et al., 2012). Specific attention will be paid to the association of Oddity with its adaptive equivalent childhood Openness (Imagination) and its DSM-5 maladaptive conceptualization (Psychoticism), in order to clarify whether or not these three conceptualizations can be considered as related constructs. Finally, a fourth objective will focus on the criterion validity of the Oddity scale by exploring its associations with early childhood psychopathology.

## **Method**

### **Construction of a Childhood Maladaptive Openness Module.**

In an attempt to empirically delineate a fifth dimension of personality pathology in childhood, we constructed a specific Oddity item-pool for children, relying on compilation procedures that are similar to those used in the construction process of the DIPSi (De Clercq et al., 2006). In a first step, extreme variants of the childhood FFM HiPIC (Mervielde et al., 2009) Imagination domain were written. Given that extreme positions on the Intellect and Curiosity facets were not considered as indicative for

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personality related pathology (see also De Clercq et al., 2006), maladaptive Imagination descriptors exclusively relied on items of the Creativity facet (e.g., “I have original ideas” was revised into “Other people have difficulty understanding my originality”). This first step resulted in 8 descriptors. In addition, we wrote extreme developmental variants of the NEO-PI-R (Costa & Mc Crae, 1992; Hoekstra, Ormel, & De Fruyt, 1996) Openness facets with each of the items reflecting a more extreme and/or maladaptive content. We only focused on those facets that were assumed to be relevant in childhood and adolescence, including Openness to fantasy and Openness to feelings. This second step added 16 descriptors to the item-pool of odd and bizarre traits. We excluded the NEO-PI-R Openness facets Aesthetics and Values because the cognitive abilities that are associated with these facets are considered rather premature in childhood. Likewise, items of the Openness to Actions facet were omitted because a substantial amount of NEO-items assessing this facet refer to actions that are during childhood age primarily regulated by parents (for instance trying new food, planning a holiday in an unknown country). Extreme items of the Openness to Ideas facet were initially considered, but did not generate additional item content beyond the items that resulted from the HiPIC Creativity facet. Subsequently, we screened the child and adolescent case studies that were published in Morgan (1999) and retained all descriptors that were assumed appropriate to describe the cognitive-perceptual distortion area in childhood. This procedure generated 16 additional descriptors. The final item-pool of 40 descriptors was subjected to similar classification and refinement procedures as outlined in De Clercq et al. (2006), and resulted in

a selection of 25 Oddity-related items that are presumed to represent the fifth factor<sup>2</sup> in a dimensional model of childhood personality pathology.

### **Participants and Procedures**

Participants for the present study were adolescents and their mothers of the general population, recruited by 3<sup>rd</sup>-year trained undergraduate psychology students from Ghent University, who received course credit for collecting data. Students visited the families at home and asked both parents and adolescents to participate, assuring them that all information served only research purposes and would be treated as confidential. All parents and adolescents provided written informed consents and sent their email addresses to the students, who passed them to the coordinator of the research project. Subsequently, a unique login code was sent to all adolescents to enter the secured online assessment platform, accompanied by an email with detailed written instructions on how to complete the questionnaires.

Adolescents provided self-reports on the Dimensional Personality Symptom Itempool for Children (DIPSI; De Clercq et al., 2006), the Hierarchical Personality Inventory for Children (HiPIC; Mervielde & De Fruyt, 1999), the DSM-5 Personality Inventory (PID-5; Krueger et al., 2012 ) and the newly created Oddity module. All mothers provided observer ratings on the DIPSI, the NEO-Personality Inventory Revised (NEO-PI-R; Costa & Mc Crae,

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<sup>2</sup> We will refer to this item-pool with the term “Oddity” throughout the paper. This label should however not strictly be interpreted along the content of the adult Oddity factor that has been proposed in published studies such as in Watson et al. (2008) and Ashton and Lee (2012) , but should rather be considered as an overarching label for a fifth personality pathology factor at a young age. The initial item-pool is available upon request.

1992) and the Child Behavior Checklist (CBCL; Verhulst, Van der Ende, & Koot, 1996).

The sample consisted of 434 adolescents (44.7% male) and their mothers, with a mean age of 14.07 years (ranging from 11.63 to 17 years). There was a large diversity in the educational level of both parents and adolescents, supporting the relative representativeness of the present sample for the Flemish community of adolescents. Most adolescents (71.3%) were enrolled in a general secondary school program, 7.7% still attended primary school (grade 6) and 17.3% was enrolled in a vocational secondary education program. The majority of the parents obtained a non-academic (42.8% and 23.7% of the mothers and fathers respectively) or an academic degree (24.6% and 31.1% of the mothers and fathers respectively). For 7.7% of the mothers and 12.9% of the fathers, the educational level was restricted to general secondary school education. A degree in vocational secondary education was obtained by 20.2% of the mothers and 26.3% of the fathers. In 3.7% of the cases, we did not receive information regarding the educational level of the child or its parents.

### **Measures**

**HiPIC.** All adolescents completed the HiPIC, a questionnaire consisting of 144 items that need to be answered on a 5-point Likert scale. The HiPIC encompasses 5 domains (Extraversion, Conscientiousness, Emotional stability, Benevolence and Imagination) and 18 facets, each assessed by 8 items, that are hierarchically organized under these 5 primary traits. Benevolence is conceptually and empirically related to the FFM domain Agreeableness, whereas Imagination is linked to the Openness to

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experience domain (De Fruyt et al., 2000). Although the HiPIC was originally constructed as an observer-instrument, its reliability and validity has been demonstrated for self-ratings too (De Clercq et al., 2004; De Fruyt et al., 2000). The internal consistency of the current HiPIC ratings ranged at the domain-level from .84 (Imagination) to .91 (Extraversion).

**DIPSI.** Both mothers and adolescents completed the 172-item DIPSI (De Clercq et al., 2006), using a 5-point scale ranging from 1 (*very uncharacteristic*) to 5 (*very characteristic*). Scores were obtained for the 27 symptom clusters that are hierarchically organized in 4 dimensions of pathology: Disagreeableness, Emotional instability, Introversion and Compulsivity. Cronbach alpha reliabilities for the 4 higher-order dimensions were excellent for self- and maternal ratings respectively, namely .96 and .98 for Disagreeableness, .95 and .97 for Emotional instability, .90 and .93 for Introversion, and .88 and .90 for Compulsivity.

**NEO-PI-R.** Mothers of the adolescents completed the authorized Dutch translation of the Revised NEO Personality Inventory (NEO-PI-R; Costa & Mc Crae, 1992; Hoekstra, Ormel, & De Fruyt, 1996), one of the most frequently used inventories to assess the FFM dimensions of Neuroticism, Extraversion, Openness to Experience, Agreeableness and Conscientiousness. The NEO-PI-R comprises 240 items measuring 30 facets, which are hierarchically organized under the 5 domains (8 items per facet and 6 facets per FFM domain). NEO-PI-R items are presented on a 5-point Likert scale. Although the NEO-PI-R was primarily constructed for adults, research has indicated that it can be validly administered to adolescents from age 12 to 18 (De Fruyt et al., 2000), relying on parental reports



(Mervielde & De Fruyt, 2002). The 5 higher-order domains showed adequate reliabilities, with Cronbach alpha coefficients ranging from .86 (Openness to experience) to .95 (Conscientiousness).

**PID-5.** The Dutch self-report version of the Personality Inventory for DSM-5 (PID-5; Krueger et al., 2012) was administered to all adolescents, who provided self-reports on each of the DSM-5 personality traits that are proposed in DSM-5 as part of a multi-level assessment of personality disorders (APA, 2013). This instrument measures 5 domains (Negative affectivity, Detachment, Antagonism, Disinhibition and Psychoticism) and 25 lower-level trait pathology facets, by mean of 220 items to be rated on a 4-point Likert scale. For the Dutch version, official translation-backtranslation procedures were used and approval of the original authors was obtained. Reliability analysis of the 5 domain factors showed 5 internally consistent domains, with alphas ranging from .73 (Disinhibition) to .87 (Antagonism, Psychoticism).

**Oddity Item-pool.** All adolescents completed the newly constructed Oddity item-set, consisting of 25 items that are indicative of the cognitive-perceptual dysregulation area, to be scored on a 5-point scale ranging from 1 (*very uncharacteristic*) to 5 (*very characteristic*). The psychometric properties of this item-set are discussed below.

**CBCL.** All mothers were administered the Dutch version of The Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001; Verhulst et al., 1996), a widely used measure for describing behavioral and emotional problems in childhood and adolescence. Problem behaviors are scored on syndrome scales (Withdrawn/Depressed, Somatic complaints,

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Anxious/Depressed, Social problems, Attention problems, Delinquent behavior and Aggressive behavior) and broadband dimensions, including an Internalizing, Externalizing and Total problem dimension. A large body of research demonstrates the excellent psychometric properties of the CBCL, supporting its reliability and validity in both clinical and nonclinical samples (Achenbach, 1991; Verhulst et al., 1996). Alpha reliabilities for the broadband scales in this sample are .89 for Internalizing problems and .91 for Externalizing problems.

### **Underlying Structure of the Oddity Item Pool: Empirical Procedures**

The 25 Oddity items that resulted from the construction procedures were conceptually structured into 4 item-sets that all covered a specific Oddity aspect, after consensus among the authors. Parallel to the construction of the DIPSI item pool (De Clercq et al., 2006), these item-sets were subjected to psychometric analyses in order to obtain reliable and unidimensional facets (objective 1). In a first step, internal consistency of the item-sets was explored, including an empirically-based re-assignment of items that lowered the alpha reliability coefficient of the item-set in question. Re-assignment to another item-set was based upon the correlation coefficient of the item with the remaining item-sets. In a second step, the unidimensionality of the item-sets was explored by using four separate item-level principal-axis factoring analyses with oblique rotation. The four item-sets were each assumed to measure only one aspect of Oddity and were therefore expected to significantly load only one factor. From here on, item-sets with proven unidimensionality and adequate reliability were referred to as Oddity facets. Third, the higher-order

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structure of these Oddity facets was examined by principal-axis factor analysis, in order to explore whether the four facets can be structured under one single domain of Oddity. In addition, the empirical association of this Oddity factor with the established four-dimensional DIPSИ structure was examined (objective 2). Therefore, a joint principal-axis factoring with oblique rotation was conducted on the newly created Oddity facets and the 27 DIPSИ facets to examine the higher-order structure of all maladaptive personality facets. These analyses were run for both DIPSИ self- and maternal reports. In order to decide upon the numbers of factors to retain, different approaches were used. More specifically, we relied on the Velicer's minimum average partial test (MAP; Zwick & Velicer, 1986) and parallel analysis (Cota, Longman, Holden, & Fekken, 1993). The construct validity of the Oddity domain (objective 3) was examined by calculating the Pearson product-moment correlations of Oddity with the self-reports on the PID-5 (Krueger et al., 2012), as well as with self-reports on the HiPIC (Mervielde & De Fruyt, 1999) and maternal reports on the NEO-PI-R (Costa & Mc Crae, 1992). In order to further explore the validity of a five-factor structure across adaptive and maladaptive trait variance, a joint five-factor principal component analysis was conducted at the level of the trait domains of all self-reported adaptive and maladaptive trait measures. Finally, the criterion validity of the Oddity domain (objective 4) was explored by examining the Pearson product-moment correlations of the Oddity domain and facets with the maternal reports on the broadband and syndrome CBCL scales. Hierarchical regression analyses were conducted in order to examine the incremental validity of the Oddity domain beyond the four DIPSИ domains

(self-reports and maternal reports) in the prediction of childhood psychopathology as measured with the CBCL.

## Results

### Internal Consistency of the Oddity Item Sets

Internal consistency across item-sets was satisfying, with alpha reliability coefficients ranging from .76 to .89 (see Table 1). No items appeared to lower the alpha coefficient of any of the item-sets. Because of the higher number of items in the fourth item-set ( $n = 9$ ) compared to the other sets, three items from this fourth set were dropped. Item selection was based on the fact that their drop-out did not lower the alpha reliability coefficient of the item-set, with alpha remaining .89 after item removal. This first empirical procedure resulted in an item-pool of 22 items, organized in 4 internally consistent item-sets of Oddity. These sets were labeled 'Oversensitivity to feelings' (4 items), 'Extreme fantasy' (5 items), 'Daydreaming' (7 items) and 'Odd thoughts and behavior' (6 items). Sample items of each item-set are presented in Table 1. More specifically, the facet Oversensitivity to feelings describes behavior that reflects an extreme openness to both inner and others' emotions, leading to overwhelming emotional experiences. Extreme fantasy reflects an extreme tendency to indulge in fantasies, and to experience difficulties in differentiating between reality and fantasy. The facet Daydreaming describes absent-minded feelings, thoughts and behavior that interfere with daily activities, whereas the facet Odd thoughts and behavior describes thoughts and behavior that are odd, weird or puzzling to others.

### **Exploratory Factor Analyses Within Item Sets**

Principal-axis factoring with oblique rotation clearly underscored the unidimensional structure of each of the 4 item-sets. The last column of Table 1 presents the range of loadings of the items of each item set, indicating substantial loadings for all item-sets ranging from .52 to .78 for the Oversensitivity to feelings item-set, from .51 to .80 for the Extreme fantasy item-set, from .61 to .82 for the Daydreaming item-set and from .70 to .80 for the Odd thoughts and behavior item-set.

### **Empirical Structure of the Oddity Facets**

The four Oddity facets are highly intercorrelated, with coefficients ranging from .45 (Extreme fantasy and Oversensitivity to feelings) to .69 (Daydreaming and Odd thoughts and behavior). A facet level principal factor analysis with oblique rotation revealed a clear one-factor solution, explaining 69% of the total variance. All four facets showed substantial loadings on this underlying Oddity factor, ranging from .76 (Oversensitivity to feelings) to .88 (Odd thoughts and behavior).

### **Hierarchical Structure**

Table 2 presents the results of a joint exploratory principal-axis factor analysis on the self-reports of the 27 DIPS I facets and the 4 Oddity facets. MAP analysis (Zwick & Velicer, 1986) suggested to retain five factors, whereas parallel analysis (Cota et al., 1993) indicated that eight factors represented the most optimal solution. However, given the tendency of parallel analysis to indicate more factors than warranted (Buja & Eyuboglu, 1992), we decided to retain the five-factor solution, explaining 66.46% of the total variance. This five-factor solution replicated the four initial DIPS I

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factors (De Clercq et al., 2006) of Emotional instability, Disagreeableness, Compulsivity and Introversion, explaining respectively 39.74%, 9.90%, 7.26% and 5.55% of the total variance. Five facets (Shyness, Affective lability, Narcissistic traits, Inflexibility and Lack of empathy) showed primary loadings on a different higher order factor than in the original DIPSI structure, as outlined in De Clercq et al. (2006). In addition to these four factors, a clear Oddity factor emerged, explaining 4.35% of the total variance, with primary loadings from the Oddity facets on this factor ranging from .61 to .83. Most Oddity facets did not demonstrate any substantial cross-loadings, except for Oversensitivity to feelings, showing cross-loadings on Emotional instability and Introversion of .35 and -.41 respectively.

The same procedure was applied to the DIPSI maternal ratings and the self-ratings on the Oddity facets (Table 3). MAP analysis suggested a six-factor solution, whereas the number of retained factors according to the parallel analysis was again higher, suggesting eight factors as the most optimal solution. A closer look at the suggested six-factor solution, revealed that the DIPSI Emotional instability factor consisted of two sub-factors. A first factor represented an Anxious-Depressed component, with additional loadings from the Disagreeableness facets Irritability and Affective lability. The second sub-factor signified a Dependency – Insecurity factor. However, given the substantial cross-loadings of most of the facets of the Anxious-Depressed factor and the established four-dimensional structure of the DIPSI (De Clercq et al., 2006), we decided to retain the five-factor solution with five clear and interpretable factors, explaining 66.77% of the total variance. As shown in Table 3, the four original DIPSI factors were again

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replicated. Four original DIPS I facets (Disorderliness, Distraction, Lack of empathy and Inflexibility) loaded primarily on a different higher-order domain than in the original DIPS I structure (De Clercq et al., 2006). The Oddity factor in the maternal reports explains 7.19% of the total variance, with primary loadings from all Oddity facets ranging from .68 to .86. None of the Oddity facets demonstrated substantial cross-loadings. The results of Table 2 and Table 3 suggest preliminary evidence for a five-factor structure of personality pathology precursors with four Oddity facets that can generally be considered as factor-clear indicators of Oddity.

### **Construct Validity**

**Oddity and general personality.** Table 4 presents the correlations of the Oddity factor with self-reports on the HiPIC and maternal reports on the NEO-PI-R domains. Concerning the HiPIC domains, Oddity appears to be most strongly related to low Emotional stability, and has in addition a moderate negative correlation with Benevolence and Conscientiousness, and a moderate positive correlation with Imagination. For the NEO-PI-R maternal reports, a moderate positive relation was observed for Oddity and Neuroticism, and for Oddity and Openness to experience, as well as a moderate negative relation between Oddity and Conscientiousness.

At the lower-order Oddity facet level, all Oddity facets primarily correlate with HiPIC Emotional stability. Furthermore, all Oddity facets except Daydreaming are positively related to Imagination, whereas all Oddity facets except Oversensitivity to feelings are negatively related to Benevolence. Finally, the Oddity facets Daydreaming and Odd thoughts and behavior display an additional negative correlation with Conscientiousness.

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For the NEO-PI-R maternal reports, the Oddity facets Oversensitivity to feelings, Extreme fantasy and Daydreaming display moderate positive correlations with Neuroticism. Oversensitivity to feelings and Odd thoughts and behavior are related to Openness to experience, whereas only Daydreaming correlates with NEO-PI-R Agreeableness. Finally, both Daydreaming and Odd thoughts and behavior are negatively related to NEO-PI-R Conscientiousness.

Table 4 also presents the associations between Oddity and the facets of the fifth domain of the general trait measures (i.e. HiPIC self-reports and NEO PI-R maternal reports). All Oddity facets correlate positively with the HiPIC Creativity and Curiosity facets, with the highest correlations for the Oddity facet Odd thoughts and behavior. We found no association for Oddity (nor its facets) with the HiPIC Intellect facet. The Oddity facet Oversensitivity to feelings displays a significant association with the NEO PI-R Openness to aesthetics and Openness to feelings facets. Daydreaming is only related to Openness to fantasy, whereas Odd thoughts and behavior is positively associated with both NEO-PI-R Openness to fantasy and Openness to aesthetics.

**Oddity and maladaptive personality.** Table 5 shows that Oddity is primarily associated with the PID-5 Negative affect and Psychoticism domains, with additional correlations with Detachment, Antagonism and Disinhibition. At a lower-order level, all Oddity facets display positive correlations with all PID-5 domains, with Daydreaming and Odd thoughts and behavior as strongest correlating facets. Since both Oddity and PID-5 Psychoticism were constructed to capture Cluster A-related characteristics,



Table 5 also presents the correlations between Oddity and Psychoticism at the lower-order facet level. Oversensitivity to feelings correlates most strongly with the PID-5 Perceptual dysregulation facet, Extreme fantasy has the highest correlation with the PID-5 Unusual beliefs and experiences facet, and both Daydreaming and Odd thoughts and behavior show the highest association with the PID-5 Eccentricity facet. The Oddity total score is most strongly related to the PID-5 facets Eccentricity and Perceptual dysregulation.

**Joint structure of general and maladaptive personality traits.** A joint principal component analysis with oblique rotation was conducted on self-ratings on the DIPSI, PID-5 and HiPIC domains, as well as the Oddity factor. In line with recent conceptual evidence for a five-factor structure that subsumes both adaptive and maladaptive traits in adults (Gore & Widiger, 2013; Thomas et al., 2013) and adolescents (De Fruyt et al., 2013), we extracted five factors that are presented in Table 6. The first factor represents a Neuroticism factor, with primary loadings of HiPIC Emotional stability and its two maladaptive conceptualizations Emotional instability (DIPSI) and Negative affect (PID-5). The second factor with primary loadings of Extraversion (HiPIC), Detachment (PID-5) and Introversion (DIPSI) signifies an Extraversion factor. The third factor represents a Conscientiousness factor, with primary loadings for HiPIC Conscientiousness and DIPSI Compulsivity. However, the PID-5 Disinhibition domain that is presumed to load on the Conscientiousness component shows no significant loading on this factor, but is entirely subsumed by the fourth factor that represents an Antagonism factor. Finally, the fifth factor represents an Openness factor,

with primary loadings of HiPIC Imagination, DIPSI Oddity and PID-5 Psychoticism. The DIPSI Oddity factor additionally shows a substantial cross-loading on the Neuroticism component.

### **Criterion Validity**

**Oddity and psychopathology.** Table 7 presents the correlations between Oddity and the CBCL dimensions and syndrome scales. At the higher-order level, the Oddity factor demonstrates significant positive correlations with both the Internalizing, Externalizing and the Total problem score, with Daydreaming showing the highest correlations with all CBCL higher-order dimensions. An inspection of the correlations between the Oddity facets and the CBCL syndrome scales shows that Oversensitivity to feelings correlates positively with the CBCL internalizing scales Somatic complaints and Anxious-Depressed. Extreme fantasy is significantly related to Anxious-Depressed, Social problems and Thought problems. Daydreaming correlates positively with all CBCL syndrome scales, with the highest correlations for Attention problems, Withdrawn-Depressed and Somatic complaints. Finally, Odd thoughts and behavior is significantly related to Somatic complaints, Social problems and Attention problems.

Hierarchical regression analyses were conducted to examine the incremental validity of the Oddity domain beyond the four original DIPSI domains in the prediction of the CBCL syndrome scales. For the original DIPSI domains, both maternal and self-reports were used. Sex was entered in a first step as control variable. The results are presented in Table 8 and show that sex significantly predicts the internalizing problem scales Withdrawn-Depressed and Somatic complaints. Withdrawn behavior is

more common in boys, whereas somatic complaints are more frequently reported in girls. Compared to girls, boys also have higher problem scores on the syndrome scale Social problems and on all externalizing syndrome scales. The four original DIPSI domains, entered in a second step of the regressions, explained significant amounts of additional variance of all CBCL problem scales, ranging from 6% to 22% for the self-reports and from 13% to 48% for the maternal reports. Finally, the Oddity domain was entered in a third step. For the self-reports, Oddity only captured a significant amount of additional variance for Somatic complaints (1%). However, when the maternal-rated DIPSI domains were used in the second step, the Oddity domain captured additional variance beyond the four established DIPSI trait components for all internalizing problem scales, ranging from 1% to 2%.

### **Discussion**

The primary goal of the current study was the construction of an empirically-based item-pool to capture odd and bizarre traits in younger age groups. This objective builds upon evidence on the presence, significance and long-term stability of Cluster A characteristics at a young age (e.g. Cohen et al., 2005; Tackett et al., 2009). The relevance of taxonomic research on this topic can be understood from the lack of existing measures that tap this childhood Oddity field from an age-specific and dimensional trait perspective. Previous taxonomic research on childhood maladaptive traits resulted in the construction of the Dimensional Personality Symptom Itempool, which is nowadays considered as one of the most promising trait measures for childhood PD precursors (Clark, 2007, Tackett et al., in press). The DIPSI's initial lack of a fifth domain was partly embedded within the

relative consensus among dimensionalists that Openness-related personality symptoms were not unambiguously relevant for understanding personality pathology (Saulsman & Page, 2004). More recent evidence, however, has moved the authors of the DIPSI to explore this Oddity-related field following similar age-specific and bottom-up construction procedures (De Clercq et al., 2006). From this perspective, relevant Oddity-related descriptors were assembled and empirically structured in four homogeneous and unidimensional facets that were labelled as Oversensitivity to feelings, Extreme fantasy, Daydreaming, and Odd thoughts and behavior. In three different ways, the results of the empirical analyses on this itempool provide evidence for the value of integrating this Oddity factor in the original DIPSI taxonomy.

#### **A Five-Factor Structure Of Personality Pathology Precursors**

First, the present study provides support for a five-factor structure of personality pathology in younger age groups. A significant Oddity component with primary loadings of all Oddity facets popped up as a fifth maladaptive trait factor, indicating that the set of selected Oddity-related descriptors are meaningful, and represent a distinct area of personality problems that adds to the current maladaptive trait pathology dimensions. These Oddity facets displayed no substantial cross-loadings on other factors, except for the Oddity facet 'Oversensitivity to feelings', that seems to reflect a more internalizing nature relative to the other Oddity facets. However, all four Oddity facets have their principal loading on the Oddity factor, suggesting that these facets can generally be considered as relatively robust markers of Oddity. This childhood five-factor structure of personality

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pathology parallels recent evidence on the dimensional configuration of adult personality pathology (e.g. Krueger et al., 2012), and indicates that the nature of maladaptive traits can be organized within a similar conceptual framework across age.

From a broader structural perspective, the current study also suggests that the basic trait aspects of both general and maladaptive measures can be organized within a comparable five-factor structure, with the fifth factor representing shared variance of the trait domains of HiPIC Imagination, DIPSI Oddity and PID-5 Psychoticism. Parallel to previous studies, each of these three trait domains shows a significant, though smaller, cross-loading on another factor, with the HiPIC Imagination factor showing a cross-loading on Conscientiousness (De Fruyt et al., 2000), the Oddity factor on the Neuroticism factor (Watson, Stasik, Ro, & Clark, 2013; Gore & Widiger, 2013; De Clercq et al., 2013), and the Psychoticism factor on the Extraversion component (Thomas et al., 2013; De Fruyt et al., 2013). The different cross-loadings of the three Oddity-related trait domains indicate that, although they share a common ground, they also capture unique variance.

### **Construct Validity Of The Oddity Domain**

Second, the current results underscore the construct validity of the DIPSI's missing fifth domain from both a general and a maladaptive trait perspective. More specifically, the results showed that Oddity is significantly linked to the maladaptive PID-5 Psychoticism factor. Since both scales were developed to capture Cluster A-related characteristics, this strong association emphasizes that the Oddity factor represents a meaningful and

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valid childhood equivalent of the adult Cluster A-related maladaptive trait domain. In line with previous studies, Oddity is also strongly connected to the other maladaptive trait domains, suggesting that odd traits may capture a more general tendency of dysfunction (Krueger et al., 2012; De Clercq et al., 2013). The results on the significant association of Oddity with its adaptive trait counterpart extend recent work on the empirical association between adult maladaptive and general operationalizations of this fifth factor (Gore & Widiger, 2013; Thomas et al., 2013; De Fruyt et al., 2013) towards age-specific operationalizations, and suggests that the continuity hypothesis (Clark, 2007; Widiger & Samuel, 2005) on normal and abnormal trait variation holds across all five domains in younger age groups. However, it must also be noted that the general-maladaptive trait association is substantially smaller for the fifth domain than those that were previously reported for the four other DIPSII factors and their adaptive counterparts (De Clercq et al., 2006). This finding suggests that Oddity may represent a more ambiguous extreme variant of its general trait variant (Watson et al., 2013), compared to the other trait domains. Previous studies have for example illustrated that Oddity/Psychoticism shows a disparity in its relation with different aspects of Openness to experience, including stronger associations for aspects of fantasy than for aspects of intellect (DeYoung, Grazioplene, & Peterson, 2012). This hypothesis additionally connects with the finding that the correlation of Oddity with its general trait equivalents is smaller than the associations of Oddity with other trait factors of the currently used FFM measure (i.e., Emotional stability and Benevolence). The latter finding

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moreover replicates the results of Watson et al. (2013), who demonstrated that the PID-5 Psychoticism factor (Krueger et al., 2012) is more strongly connected to FFM Neuroticism, Conscientiousness and Agreeableness than it is to FFM Openness, and again generally suggests that across age the trait component of odd and bizarre symptomatology may also include a more overall tendency towards maladaptive trait functioning.

### **Criterion Validity Of The Oddity Domain**

Third, the present study examined the association of Oddity with childhood problem behavior from a cross-informant perspective, and demonstrated that Oddity traits are positively associated with both internalizing and externalizing childhood problems. At the lower-order level, we particularly observe meaningful correlations between Oversensitivity to feelings and the internalizing syndrome scales Somatic complaints and Anxious-Depressed, and between Daydreaming and all CBCL syndrome scales. The Oversensitivity to feelings facet partially aligns with the construct of affect intensity, which has been related to internalizing problems in previous studies (Durbin & Shafir, 2008; Silk, Steinberg, & Morris, 2003), even after controlling for emotion regulation strategies (Siener & Kerns, 2012), and is hence representing a meaningful trait aspect of internalizing psychopathology. Furthermore, across all Oddity facets, Daydreaming displays the strongest associations with both externalizing and internalizing psychopathology. A closer look at the Daydreaming items reveals that these items may not assess the normative component of daydreaming that is usually considered as a constructive process during childhood (Klinger, Henning, & Janssen, 2009), but rather describe a

dissociative tendency that has been linked in multiple studies to both internalizing and externalizing problem behavior (Seeley, Perosa, & Perosa, 2004), thus paralleling the current findings. Although the Oddity factor is the smallest of the childhood maladaptive trait structure that is currently proposed, these results point out that adding the Oddity factor to the current DIPSI measure contributes to a better understanding of especially internalizing problems at a young age.

### **Limitations And Directions For Future Research**

The present study includes several strengths, such as the use of an age-specific bottom-up approach in the compilation of the Oddity items, and the use of both maternal and self-reports. However, there are also a number of limitations that must be taken into account. First, the present findings are cross-sectional and do not provide information on the longitudinal course of Oddity trait vulnerability and its integration in a model of maladaptive personality traits over time. A second limitation concerns the psychological status of the chosen samples, which only included adolescents from the general population. Third, although maternal reports were used to obtain information on both general and maladaptive personality and psychopathology, we only relied on self-reports for the Oddity trait. This decision resulted from the fact that most of the Oddity items have a strong internal focus and may thus be more difficult to recognize or endorse from an observer perspective. Fourth, our results clearly underscore the convergent validity of the Oddity trait on the one hand, but question the discriminant validity on the other hand, as reflected in the high associations of Oddity with all other maladaptive trait domains.



Although this finding is in line with previous research in adolescents (e.g. De Clercq et al., 2013), future research should explore to what extent oddity captures a rather general factor of psychopathology in younger age groups. Finally, the current research only included adolescent samples. The empirical structure of Oddity and the various aspects of validity should hence be broadened in future research towards the age of childhood.

### **Conclusion**

In sum, the present study calls for the expansion of the current four-dimensional childhood maladaptive trait structure with a fifth Oddity component, and is embedded within the growing evidence that indicates a congruence between normal and pathological trait systems under the umbrella of a common set of five major dimensions of personality (De Fruyt et al., 2013; Gore & Widiger, 2013; Thomas et al., 2013). As firmly stated by Widiger and Presnall (2012), it is neither parsimonious nor theoretically consistent to omit a maladaptive Openness factor in personality disorder taxonomies. The present study has addressed this issue from a developmental perspective, and empirically demonstrated that the idea of five major building blocks of personality pathology also holds at a young age. This similar dimensional trait structure across different age groups may facilitate life-span research on the development and structure of personality pathology that has been hindered for a long time because of lacking descriptive trait taxonomies that were found applicable and valid from childhood onwards. From a clinical point of view, a specific trait description of bizarre and odd characteristics is necessary to fully capture the field of early personality pathology. Not only enables this fifth factor a more

comprehensive description of early personality pathology manifestations, it also contributes to our understanding of childhood general psychopathology. The inclusion of the Oddity scales in the DIPSI will make this taxonomy more suitable to unravel the most mysterious area of personality dysfunction in terms of its significance and value for understanding the etiology, course and outcome of early maladaptive pathways.

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## References

- Achenbach, T.M. (1991). Manual for the child behavior checklist/4-18 and 1991 profile. Burlington, University of Vermont Department of Psychiatry.
- Achenbach, T.M., & Rescorla, L.A. (2001). *Manual for the ASEBA school-age forms and profiles*. Burlington: University of Vermont Research Center for Children, Youth, and Families.
- American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders* (4<sup>th</sup> ed.). Washington, DC: Author.
- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5<sup>th</sup> ed.). Arlington, VA.
- Asarnow, J.R. (2005). Childhood-onset schizotypal disorder: a follow-up study and comparison with childhood-onset schizophrenia. *Journal of Child and Adolescent Psychopharmacology*, *15*, 395-402. Doi: 10.1089/cap.2005.15.39
- Ashton, M.C. & Lee, K.B. (2012). Oddity, Schizotypy/Dissociation and personality. *Journal of Personality*, *80*, 113-134. Doi: 10.1111/j.1467-6494.2011.00735.x
- Buja, A., & Eyuboglu, N.(1992). Remarks on parallel analysis. *Multivariate Behavioral Research*, *27*, 509-540. Doi: 10.1207/s15327906mbr2704\_2
- Camisa, K.M., Bockbrader, M.A., Lysaker, P., Rae, L.L., Brenner, C.A. & O'Donnell, B.F. (2005). Personality traits in schizophrenia and related personality disorders. *Psychiatry Research*, *133*, 23-33. Doi: 10.1016/j.psychres.2004.09.002

- 
- Carlson, G.A., & Fish, B. (2005). Longitudinal course of schizophrenia spectrum symptoms in offspring of psychiatrically hospitalized mothers. *Journal of Child and Adolescent Psychopharmacology*, *15*, 362-382. Doi: 10.1089/cap.2005.15.362
- Caspi, A., Roberts, B.W., & Shiner, R.L. (2005). Personality development: stability and change. *Annual Review of Psychology*, *56*, 453-484. Doi: 10.1146/annurev.psych.55.090902.141913
- Clark, L. A. (2007). Assessment and diagnosis of personality disorder: Perennial issues and an emerging reconceptualization. *Annual Review of Psychology*, *58*, 227–257.
- Clark, L.A., Livesley, W.J., Schroeder, M.L. & Irish, S.L. (1996). Convergence of two systems for assessing specific traits of personality disorder. *Psychological Assessment*, *8*, 294-303. Doi: 10.1037/1040-3590.8.3.294
- Clark, L. A., Simms, L. J., Wu, K. D., & Casillas, A. (2008). *Schedule for Nonadaptive and Adaptive Personality-second edition (SNAP-2)*. Minneapolis:University of Minnesota Press.
- Costa, P.T., & McCrae, R.R. (1992). *Professional Manual: Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor-Inventory (NEO-FFI)*. Odessa, FL/ Psychological Assessment Resources.
- Costa, P.T., & Widiger, T.A. (2002). *Personality Disorders and the Five-Factor Model of personality* (2<sup>nd</sup> ed.). Washington D.C.: American Psychological Association.
- Cota, A.A., Longman, R.S., Holden, R.R., & Fekken, G.C. (1993). Comparing different methods for implementing parallel analysis: a practical index

- of accuracy. *Educational and Psychological Measurement*, *53*, 865-875. Doi: 10.1177/0013164493053004001
- De Clercq, B., & De Fruyt, F. (2003). Personality disorder symptoms in adolescence: A five-factor model perspective. *Journal of Personality Disorders*, *17*, 269-292. Doi: 10.1521/pedi.17.4.269.23972
- De Clercq, B., De Fruyt, F., & Van Leeuwen, K. (2004). A “little-five” lexically based perspective on personality disorder symptoms in adolescence. *Journal of Personality Disorders*, *18*, 479-499. Doi: 10.1521/pedi.18.5.479.51324
- De Clercq, B., De Fruyt, F., Van Leeuwen, K., & Mervielde, I. (2006). The structure of maladaptive personality traits in childhood: A step toward an integrative developmental perspective for DSM-V. *Journal of Abnormal Psychology*, *115*, 639-657. Doi: 10.1037/0021-843X.115.4.639
- De Clercq, B., De Fruyt, F. & Widiger, T. (2009). Integrating a developmental perspective in dimensional models of personality disorders. *Clinical Psychology Review*, *29*, 154-162. Doi: 10.1016/j.cpr.2008.12.002
- De Clercq, B., & De Fruyt, F. (2012). A Five-Factor model framework for understanding childhood personality disorder antecedents. *Journal of Personality*, *80*, 1533-1563. Doi: 10.1111/j.1467-6494.2012.00778.x
- De Clercq, B., De Fruyt, F., De Bolle, M., Van Hiel, A., Markon, K.E., & Krueger, R.F. (In press). The hierarchical structure and construct validity of DSM-5 personality traits in adolescence. *Journal of Personality*. Doi: 10.1111/jopy.12042

- 
- De Clercq, B., Decuyper, M., & De Caluwé, E. (In press). Developmental Manifestations of Borderline Personality Pathology From An Age-Specific Dimensional Trait Framework, in Sharp, C. & Tackett J. L. (Eds.). *Handbook of Borderline Personality Disorder in Children and Adolescents*. Springer.
- Durbin, C. & Shafir, D. (2008). Emotion regulation and risk for depression. In J.R.Z. Abela & H.L. Hankin (Eds.), *Handbook of depression in children and adolescents* (pp. 149-176). New York, NY: Guilford Press.
- De Fruyt, F., Mervielde, I., Hoekstra, H.A., & Rolland, J. (2000). Assessing adolescents' personality with the NEO-PI-R. *Assessment*, 7, 329-345. Doi: 10.1177/107319110000700403
- De Fruyt, F., De Clercq, B., De Bolle, M., Wille, B., Markon, K. & Krueger, R.F. (2013). General and maladaptive traits in a five-factor framework for DSM-5 in a university student sample. *Assessment*, 20, 295-307. Doi: 10.1177/1073191113475808
- Decuyper, M., De Bolle, M., De Fruyt, F., & De Clercq, B. (2011). General and maladaptive personality dimensions and the assessment of callous-unemotional traits in adolescence. *Journal of Personality Disorders*, 25 (5), 681 - 701.
- DeYoung, C.G., Grazioplene, R.G., & Peterson, J.B. (2012). From madness to genius: the Openness/Intellect trait domain as a paradoxical simplex. *Journal of Research in Personality*, 46, 63-78. Doi: 10.1016/j.jrp.2011.12.003

- 
- Donahue, E.M. (1994). Do children use the Big 5, too? Content and structural form in personality description. *Journal of Personality*, *62*, 45-66. Doi: 10.1111/j.1467-6494.1994.tb00794.x
- Esterberg, M.L, Goulding, S.M., & Walker, E.F. (2010). A personality disorders: schizotypal, schizoid and paranoid personality disorders in childhood and adolescence. *Journal of Psychopathology and Behavioral Assessment*, *32*, 515-528. Doi: 10.1007/s10862-010-9183-8
- Gjerde, P.F., & Cardilla, K. (2009). Developmental implications of Openness to Experience in preschool children: gender differences in young adulthood. *Developmental Psychology*, *45*, 1455-1464. Doi: 10.1037/a0016714
- Goldberg L.R. (2001). Analyses of Digman's child-personality data: Derivation of Big Five factor scores from each of six samples. *Journal of Personality*, *69*, 709–743. Doi: 10.1111/1467-6494.695161
- Gore, W.L., & Widiger, T.A. (2013). The DSM-5 dimensional trait model and five-factor models of general personality. *Journal of Abnormal Psychology*, *122*, 816-821. Doi: 10.1037/a0032822
- Hoekstra, H.A., Ormel, J., & De Fruyt, F. (1996). *NEO-PI-R en NEO-FFI: Big 5 Persoonlijkheidsvragenlijsten*[*NEO-PI-R and NEO-FFI: Big 5 Personality Inventories*]. Lisse, The Netherlands: Swets & Zeitlinger.
- John, O.P., Caspi, A., Robins, R.W., Moffitt, T.E., & Stouthamer-Loeber, M. (1994). The Little 5 - Exploring the nomological network of the Five-Factor Model of personality in adolescent boys. *Child Development*, *65*, 160–178. Doi: 10.1111/j.1467-8624.1994.tb00742.x

- 
- Johnson, J.G., Bromley, E., Bornstein, R.F., & Sneed, J.R. (2006). Adolescent personality disorders. In D.A. Wolfe & E. J. Mash (Eds.), *Behavioral and emotional disorders in children and adolescents: Nature, assessment, and treatment* (pp. 463-484). New York: Guilford Press.
- Klinger, E., Henning, V.R., Janssen, J.M. (2009). Fantasy-proneness dimensionalized: dissociative component is related to psychopathology, daydreaming as such is not. *Journal of Research in Personality, 43*, 506-510. Doi: 10.1016/j.jrp.2008.12.017
- Krueger, R.F, Derringer, J., Markon, K.E., Watson, D., & Skodol, A.E (2012). Initial construction of a maladaptive personality trait model and inventory for DSM-5. *Psychological Medicine, 42*, 1879-1890. Doi: 10.1017/S0033291711002674
- Kwapil, T.R., Barrentas-Vidal, N. & Silvia, P. J. (2008). The dimensional structure of the Wisconsin schizotypy scales: factor identification and construct validity. *Schizophrenia Bulletin, 34*, 444-457. Doi: 10.1093/schbul/sbm098
- Linde, J.A., Stringer, D., Simms, L.J., & Clark, L.A. (2013). The Schedule for Nonadaptive and Adaptive Personality for Youth (SNAP-Y): a new measure for assessing adolescent personality and personality pathology. *Assessment, 20*, 387-404. Doi: 10.1177/1073191113489847
- Livesley, W. J. (2005). Behavioral and molecular genetic contributions to a dimensional classification of personality disorder. *Journal of Personality Disorders, 19*, 131-155.



- 
- Livesley, W.J., & Jackson, D.N. (2009). *Technical Manual for the Dimensional Assessment of Personality Pathology-Basic Questionnaire (DAPP-BQ)*. Michigan: Sigma Assessment Systems.
- McCrae, R.R. (1994). Openness to Experience – Expanding the boundaries of Factor V. *European Journal of Personality*, *8*, 251–272. Doi: 10.1002/per.2410080404
- Mervielde, I., Buyst, V., De Fruyt, F. (1995). The Validity of the Big Five as a model for teachers' ratings of individual-differences among children aged 4-12 years. *Personality and Individual Differences*, *18*, 525–534. Doi: 10.1016/0191-8869(94)00175-R
- Mervielde, I., & De Fruyt, F. (1999). Construction of the Hierarchical Personality Inventory for Children (HiPIC). In I. Mervielde, I. Deary, F. De Fruyt & F. Ostendorf (Eds.), *Personality Psychology in Europe, Proceedings of the Eight European Conference on Personality Psychology* (pp. 107-127). Tilburg, The Netherlands: Tilburg University Press.
- Mervielde, I., & De Fruyt, F. (2000). The big five personality factors as a model for the structure of children's peer nominations. *European Journal of Personality*, *14*, 91-106. Doi: 10.1002/(SICI)1099-0984(200003/04)14:2<91::AID-PER356>3.3.CO;2-Q
- Mervielde I., & De Fruyt, F. (2002). Assessing children's traits with the Hierarchical Personality Inventory for Children. In B. De Raad & M. Perugini (Eds.), *Big Five assessment* (pp. 129-146). Deattle, WA: Hogrefe & Huber.

- 
- Mervielde, I., De Fruyt, F., & De Clercq, B. (2009). *Hiërarchische Persoonlijkheidsvragenlijst voor Kinderen [Hierarchical Personality Inventory for Children]: Handleiding*. Amsterdam: Hogrefe Publishers.
- Miller, T.J., McGlashan, T.H., Rosen, J.L., Somjee, L., Markovich, P.J., Stein, K., & Woods, S.W. (2002). Prospective Diagnosis of the Initial Prodrome for Schizophrenia based on the Structured Interview for Prodromal Syndromes: Preliminary Evidence of Interrater Reliability and Predictive Validity. *American Journal of Psychiatry*, 159, 863-865. Doi: 10.1176/appi.ajp.159.5.863
- Mittal, V.A., Neumann, C., Saczawa, M., & Walker, E.F. (2008). Longitudinal progression of movement abnormalities in relation to psychotic symptoms in adolescents at high risk of schizophrenia. *Archives of General Psychiatry*, 65, 165–171. Doi: 10.1001/archgenpsychiatry.2007.23
- Morgan, R. K. (1999). *Case studies in child and adolescent psychopathology*. New Jersey: Prentice Hall, Upper Saddle River. (ch)
- O'Connor, B.P. (2005). A search for consensus on the dimensional structure of personality disorders. *Journal of Clinical Psychology*, 61(3), 323-345. Doi: 10.1002/jclp.20017
- Piaget, J. (1929). *The child's conception of the world*. London: Routledge & Kegan Paul.
- Piedmont, R.P., Sherman, M.F., Sherman, N.C. & Williams, J.E.G. (2003). A first look at the Structured Clinical Interview for DSM-IV Personality Disorders Screening Questionnaire: more than just a screener?

- 
- Measurement and Evaluation in Counseling and Development*, 36, 150-160.
- Piedmont, R.P., Sherman, M.F. & Sherman, N.C. (2009). Using the five-factor model to identify a new personality disorder domain: the case for experiential permeability. *Journal of Personality and Social Psychology*, 96, 1245-1258. Doi: 10.1037/a0015368
- Putnam, F.W., Helmers, K., & Trickett, P.K. (1993). Development, reliability and validity of a child dissociation scale. *Child Abuse & Neglect*, 17, 731-741. Doi: 10.1016/S0145-2134(08)80004-X
- Quartier, V., & Rossier, J. (2008). A study of personality in children aged 8-12 years: comparing self- and parents' ratings. *European Journal of Personality*, 22, 575-588. Doi: 10.1002/per.689
- Ro, E. & Clark, L.A. (2013). Interrelations between psychosocial functioning and adaptive- and maladaptive-range personality traits. *Journal of Abnormal Psychology*, 122, 822-835. Doi: 10.1037/a0033620
- Ross, S.R., Lutz, C.J., Bailey, S.E. (2002). Positive and negative symptoms of schizotypy and the five-factor model: a domain and facet level analysis. *Journal of Personality Assessment*, 79, 53-72. Doi: 10.1207/S15327752JPA7901\_04
- Samuel, D.B. & Widiger, T.A. (2008). A meta-analytic review of the relationships between the five-factor model and DSM-IV-TR personality disorders: a facet level analysis. *Clinical Psychology Review*, 28, 1326-1342. Doi: 10.1016/j.cpr.2008.07.002
- Saulsman, L.M. & Page, A.C. (2004). The five-factor model and personality disorder empirical literature: A meta-analytic review. *Clinical*

---

*Psychology Review*, 23(8), 1055-1085. Doi: 10.1016/j.cpr.2002.09.001

Seeley, S.M.K., Perosa, S.L., & Perosa, L.M. (2004). A validation study of the adolescent dissociative experiences scale. *Child Abuse & Neglect*, 28, 755-769. Doi: 10.1016/j.chiabu.2004.01.006

Sharon, T., & Woolley, J. D. (2004). Do monsters dream? Young children's understanding of the fantasy/reality distinction. *British Journal of Developmental Psychology*, 22, 293–310. Doi:10.1348/026151004323044627

Shiner, R. L. (2009). The development of personality disorders: Perspectives from normal personality development in childhood and adolescence. *Development and Psychopathology*, 21, 715-734. Doi: 10.1017/S0954579409000406

Silk, J.S., Steinberg, L., & Morris, A.S. (2003). Adolescents' emotion regulation in daily life: links to depressive symptoms and problem behavior. *Child Development*, 74, 1869-1880. Doi: 10.1046/j.1467-8624.2003.00643.x

Siener, S., & Kerns, K.A. (2012). Emotion regulation and depressive symptoms in preadolescence. *Child Psychiatry & Human Development*, 43, 414-430. Doi: 10.1007/s10578-011-0274-x

Tackett, J.L., Silberschmidt, A. L., Krueger, R.F., & Sponheim, S.R. (2008). A dimensional model of personality disorder: Incorporating DSM Cluster A characteristics. *Journal of Abnormal Psychology*, 117, 454-459. Doi: 10.1037/0021-843X.117.2.454

- 
- Tackett, J.L., Balsis, S., Oltmanns, T.K.F., & Krueger, R.F. (2009). A unifying perspective on personality pathology across the life span: Developmental considerations for the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders*. *Development & Psychopathology, 21*, 687-713. Doi: 10.1017/S095457940900039X
- Tackett, J.L., Herzhoff, K., Reardon, K.W., De Clercq, B., & Sharp, C. (in press). The externalizing spectrum in youth: incorporating personality pathology. *Journal of Adolescence*.
- Thomas, K.M., Yalch, M.M., Krueger, R.F., Wright, A.G.C., Markon, K.E., & Hopwood, C.J. (2013). The convergent structure of DSM-5 personality trait facets and five-factor model trait domains. *Assessment, 20*, 308-311. Doi: 10.1177/1073191112457589
- Tromp, N.B., & Koot, H.K. (2008). Dimensions of personality pathology in adolescents: Psychometric properties of the DAPP-BQ-A. *Journal of Personality Disorders, 22*, 623-638.
- Tromp, N.B., & Koot, H.K. (2009). Dimensions of personality pathology in adolescents: relations to DSM-IV personality disorder symptoms. *Journal of Personality Disorders, 23*, 514-527.
- Tromp, N.B., & Koot, H.K. (2010). Dimensions of normal and abnormal personality: elucidating DSM-IV personality disorder symptoms in adolescents. *Journal of Personality, 78*, 839-864. Doi: 10.1111/j.1467-6494.2010.00635.x
- Trotman, H., MacMillan, A., & Walker, E. (2006). Cognitive function and symptoms in adolescents with schizotypal personality disorder. *Schizophrenia Bulletin, 32*, 489-497. Doi: 10.1093/schbul/sbj069

- 
- Verhulst, F.C., Van der Ende, J., & Koot, H.M. (1996). *Handleiding voor de CBCL/4-18*. [Manual of the CBCL/4-18]. Rotterdam, the Netherlands: Erasmus Universiteit, Afdeling Kinder- en Jeugdpsychiatrie.
- Watson, D., Clark, L.A., & Chmielewski, M. (2008). Structures of personality and their relevance to psychopathology: II. Further articulation of a comprehensive unified trait structure. *Journal of Personality, 76*, 1545-1585. Doi: 10.1111/j.1467-6494.2008.00531.x
- Watson, D., Stasik, S.M., Ro, E., & Clark, L.A. (2013). Integrating normal and pathological personality: relating the DSM-5 trait-dimensional model to general traits of personality. *Assessment, 312-326*. Doi: 10.1177/1073191113485810
- Westen, D., & Schedler, J. (1999a). Revising and assessing Axis II: I. Developing a clinically and empirically valid assessment method. *American Journal of Psychiatry, 156*, 258-272.
- Westen, D., & Schedler, J. (1999b). Revising and assessing Axis II: II. Toward an empirically based and clinically useful classification of personality disorders. *American Journal of Psychiatry, 156*, 273-285.
- Westen, D. & Muderrisoglu, S. (2003). Assessing personality disorders using a systematic clinical interview: Evaluation of an alternative to structured interviews. *Journal of Personality Disorders, 17*, 351-369. Doi: 10.1521/pedi.17.4.351.23967
- Westen, D., Shedler, J., Durrett, C., Glass, S., & Martens, A. (2003). Personality diagnoses in adolescence: DSM-IV axis II diagnoses and an empirically derived alternative. *American Journal of Psychiatry, 160*, 952-966. Doi: 10.1176/appi.ajp.160.5.952

- 
- Widiger, T. A., & Samuel, D. B. (2005). Diagnostic categories or dimensions: A question for *DSM-V*. *Journal of Abnormal Psychology, 114*, 494–504. Doi: 10.1037/0021-843X.114.4.494
- Widiger, T.A., & Simonsen, E. (2005). Alternative dimensional models of personality disorder: Finding a common ground. *Journal of Personality Disorders, 19*(2), 110-130. Doi: 10.1521/pedi.19.2.110.62628
- Widiger, T.A. (2010). Cluster A personality symptomatology in youth. *Journal of Psychopathology and Behavioral Assessment, 32*, 551-556. Doi: 10.1007/s10862-010-9204-7
- Widiger, T.A., & Presnall, J.R. (2013). Clinical application of the five-factor model. *Journal of Personality, 81*, 515-527. Doi: 10.1111/jopy.12004
- Yung, A.R., Nelson, B., Baker, K., Buckby, J.A., Baksheev, G., & Cosgrave, E.M. (2009). Psychotic-like experiences in a community sample of adolescents: implications for the continuum model of psychosis and prediction of schizophrenia. *Australian and New Zealand Journal of Psychiatry, 43*, 118-128. Doi: 10.1080/00048670802607188
- Zwick, W.R., & Velicer, W.F. (1986). Comparison of five rules for determining the number of components to retain. *Psychological Bulletin, 99*, 432-442. Doi: 10.1037/0033-2909.99.3.432

## Tables

Table 1  
*Oddity Facets After Theoretical and Empirical Compilation Procedures*

Oddity facet	Sample items	$N_{\text{items}}$	$M$	ICC	$\alpha$	Range <sub>loadings</sub>
Oversensitivity to feelings	I feel intensely upset when I see something sad on television.	4	.45	.76		.52 - .78
	Sometimes I empathize too strongly with others' feelings or experiences.					
Extreme fantasy	I hear or see things that others don't hear or see.	5	.45	.80		.51 - .80
	I get lost in fantasy more than other kids of my age.					
Daydreaming	My daydreaming interferes with my ability to complete daily tasks at school or home.	7	.49	.87		.61 - .82
	I often forget what I was doing just moments before.					
Odd thoughts and behavior	I sometimes say things that others find odd or strange.	6	.58	.89		.70 - .80
	I have ideas that others cannot follow.					

*Note.* ICC = inter item correlation coefficient.



Table 2  
*Joint Factor Structure of the Dimensional Personality Symptom Item Pool (DIPSI, self-reports)*

DIPSI facet	Five Factor Structure				
	INS	DIS	COMP	ITR	ODD
Lack of self-confidence	<b>.81</b>	-.08	-.07	.08	-.14
Dependency	<b>.78</b>	.26	.04	-.03	.22
Ineffective coping	<b>.74</b>	.02	.09	-.21	-.19
Anxious traits	<b>.74</b>	-.07	.17	-.02	-.19
Submissiveness	<b>.68</b>	.03	-.03	.18	-.03
Insecure attachment	<b>.64</b>	.10	.27	.08	.22
Depressive traits	<b>.59</b>	-.02	-.05	.08	-.36
Separation anxiety	<b>.56</b>	.03	-.02	.02	-.09
Shyness	<b>.50</b>	-.22	.07	.49	-.19
Affective lability	<b>.45</b>	.31	.02	-.10	-.32
Impulsivity	.14	<b>.76</b>	-.08	.02	-.09
Hyperactive traits	.08	<b>.71</b>	.11	-.18	-.03
Resistance	-.08	<b>.71</b>	-.06	.31	-.06
Hyperexpressive traits	.11	<b>.69</b>	.38	-.12	-.02
Risk behavior	-.07	<b>.67</b>	.04	.01	-.31
Disorderliness	.23	<b>.66</b>	-.36	.14	-.06
Dominance – Egocentrism	-.11	<b>.64</b>	.50	.04	-.07
Distraction	.26	<b>.52</b>	-.22	.27	-.03
Irritable – Aggressive traits	.29	<b>.44</b>	.08	.17	-.21
Perfectionism	.16	.02	<b>.80</b>	-.04	-.06
Extreme order	.04	-.31	<b>.78</b>	.13	-.02
Extreme achievement	.07	.18	<b>.68</b>	.02	-.09
Narcissistic traits	.02	.45	<b>.52</b>	.04	-.10
Inflexibility	.29	.24	<b>.35</b>	.27	-.16
Lack of empathy	-.14	.36	.03	<b>.74</b>	.02
Withdrawn traits	.21	-.13	.09	<b>.69</b>	-.16
Paranoid traits	.37	-.06	.19	<b>.50</b>	-.18
Odd thoughts and behavior	-.11	.13	.08	.11	<b>-.83</b>
Daydreaming	.13	.14	-.10	.05	<b>-.75</b>
Extreme fantasy	-.01	.01	.15	.11	<b>-.73</b>
Oversensitivity to feelings	.35	.03	.07	-.41	<b>-.61</b>

*Note.* Primary loadings are marked in bold. INS = Emotional instability; DIS = Disagreeableness; COMP = Compulsivity; ITR = Introversion ; ODD = Oddity.

Table 3  
*Joint Factor Structure of the Dimensional Personality Symptom Item Pool (DIPSI, maternal reports)*

DIPSI facet	Five Factor Structure				
	INS	DIS	COMP	ODD	ITR
Anxious traits	<b>.86</b>	.08	.18	.09	.03
Lack of self-confidence	<b>.83</b>	.19	-.05	.09	.14
Dependency	<b>.78</b>	-.14	-.07	-.04	-.08
Ineffective coping	<b>.70</b>	-.22	.03	.17	-.06
Separation anxiety	<b>.69</b>	.00	.09	-.07	.06
Insecure attachment	<b>.68</b>	-.05	.12	-.11	.07
Submissiveness	<b>.53</b>	-.03	-.10	-.00	.30
Depressive traits	<b>.51</b>	-.08	.02	.13	.34
Dominance – egocentrism	-.15	<b>-.91</b>	.18	.05	.06
Hyperexpressive traits	.05	<b>-.87</b>	.11	.05	-.08
Risk behavior	.00	<b>-.76</b>	-.06	.03	.07
Narcissistic traits	-.06	<b>-.76</b>	.31	.01	.12
Hyperactive traits	.19	<b>-.74</b>	.02	-.02	-.19
Impulsivity	.21	<b>-.72</b>	-.32	.01	.01
Resistance	-.05	<b>-.64</b>	-.22	.01	.38
Irritable – Aggressive traits	.18	<b>-.54</b>	-.10	.13	.28
Affective lability	.31	<b>-.51</b>	-.10	.15	.13
Perfectionism	.18	-.22	<b>.79</b>	.05	-.04
Extreme order	.10	.14	<b>.73</b>	-.08	.18
Extreme achievement	.12	-.34	<b>.67</b>	.04	-.06
Disorderliness	.23	-.45	<b>-.55</b>	.07	.07
Distraction	.40	-.41	<b>-.45</b>	-.02	.16
Odd thoughts and behavior	-.15	-.03	.02	<b>.86</b>	.07
Daydreaming	-.03	-.00	-.10	<b>.83</b>	.06
Extreme fantasy	-.02	.04	-.01	<b>.72</b>	-.01
Oversensitivity to feelings	.11	.02	.08	<b>.68</b>	-.13
Shyness	.30	.14	.05	.09	<b>.71</b>
Lack of empathy	-.14	-.44	.00	-.02	<b>.69</b>
Withdrawn traits	.14	.05	-.04	.02	<b>.68</b>
Paranoid traits	.34	-.04	.24	.02	<b>.53</b>
Inflexibility	.38	-.20	.20	.06	<b>.39</b>

*Note.* Primary loadings are marked in bold. INS = Emotional instability; DIS = Disagreeableness; COMP = Compulsivity; ITR = Introversion ; ODD = Oddity.

Table 4

*Correlations of the Oddity with Self-reports on the HiPIC Domains and Imagination Facets and Maternal Reports on the NEO-PI-R Domains and Openness to Experience Facets*

Scale	Oddity facets				Oddity domain
	Oversensitivity to feelings	Extreme fantasy	Daydreaming	Odd thoughts and behavior	Oddity
<b>HiPIC (self)</b>					
Emotional stability	-.44*	-.35*	-.34*	-.28*	-.43*
Extraversion	.11	-.09	-.12	-.07	-.05
Imagination	.19*	.17*	.12	.28*	.23*
Creativity	.23*	.25*	.17*	.33*	.30*
Intellect	.01	-.08	-.07	.01	-.04
Curiosity	.19*	.19*	.16*	.27*	.25*
Benevolence	-.15	-.20*	-.27*	-.29*	-.28*
Conscientiousness	-.04	-.05	-.33*	-.16*	-.18*
<b>NEO-PI-R (mother)</b>					
Neuroticism	.22*	.18*	.19*	.14	.22*
Extraversion	.05	-.11	-.09	-.05	-.05
Openness to exp	.27*	.12	.13	.20*	.22*
Fantasy	.07	.13	.17*	.17*	.16*
Aesthetics	.37*	.11	.14	.15*	.24*
Feelings	.28*	.06	.03	.11	.15*
Actions	.08	.04	.06	.09	.08
Ideas	.08	.09	.03	.15	.10
Values	.11	-.04	.04	.03	.05
Agreeableness	-.03	-.05	-.16*	-.13	-.11
Conscientiousness	-.01	-.13	-.24*	-.16*	-.17*

Note. \*  $p < .003$  according to the Bonferroni adjustment

Table 5  
*Correlations of the Oddity Construct with Self-reports on the PID-5 Domains and Psychoticism Facets*

Scale	Oddity facets				Oddity domain
	Oversensitivity to feelings	Extreme fantasy	Daydreaming	Odd thoughts and behavior	Oddity
<b>PID-5</b>					
Negative affect	.54**	.50**	.58**	.53**	.65**
Detachment	.19**	.42**	.42**	.41**	.43**
Antagonism	.26**	.39**	.40**	.48**	.46**
Disinhibition	.36**	.42**	.56**	.52**	.56**
Psychoticism	.46**	.70**	.66**	.74**	.77**
Eccentricity	.32**	.61**	.66**	.63**	.76**
Perceptual dysreg	.60**	.66**	.65**	.46**	.71**
Unusual bel&ex	.41**	.83**	.59**	.54**	.58**

Note. \*  $p < .01$

Table 6  
*Joint Factor Structure of the Self-reports on the HiPIC, DIPSI (Supplemented with Oddity) and the PID-5 Domains*

Scale	Factor structure				
	N	E	C	A	O
<i>DIPSI</i> Emo instab	<b>.89</b>	-.05	.05	-.03	.04
<i>HiPIC</i> Emo stab	<b>-.88</b>	-.11	.07	.16	-.12
<i>PID-5</i> Neg affect	<b>.57</b>	-.15	.03	-.32	.19
<i>HiPIC</i> Extraversion	.07	<b>.94</b>	.01	-.14	.25
<i>PID-5</i> Detachment	.06	<b>-.81</b>	-.02	-.19	.14
<i>DIPSI</i> Introversion	.27	<b>-.68</b>	.12	-.06	.18
<i>HiPIC</i> Conscientness	-.11	-.04	<b>.83</b>	.32	.09
<i>DIPSI</i> Compulsivity	.34	.01	<b>.81</b>	-.33	.00
<i>HiPIC</i> Benevolence	.12	.07	.01	<b>.96</b>	.22
<i>PID-5</i> Antagonism	-.15	-.09	.10	<b>-.88</b>	.21
<i>DIPSI</i> Disagress	.35	.15	-.07	<b>-.73</b>	.06
<i>PID-5</i> Disinhibition	.18	.02	-.17	<b>-.69</b>	.22
<i>HiPIC</i> Imagination	-.20	.20	.30	.07	<b>.77</b>
<i>DIPSI</i> Oddity	.45	-.08	-.15	-.08	<b>.60</b>
<i>PID-5</i> Psychoticism	.18	-.36	-.16	.24	<b>.59</b>

*Note.* Primary loadings are marked in bold. N = Neuroticism; E = Extraversion; C = Conscientiousness; A = Agreeableness; O = Openness to Experience.

Table 7  
*Correlations of the Oddity Construct with Maternal Reports on the CBCL Dimensions and Syndromes*

Scale	Oddity facets				Oddity domain Oddity
	Oversensitivity to feelings	Extreme fantasy	Daydreaming	Odd thoughts and behavior	
<b>CBCL dimensions</b>					
Internalizing problems	.23*	.15	.27*	.17*	.25*
Externalizing problems	.10	.10	.23*	.15*	.18*
Total problems	.18*	.17*	.30*	.20*	.26*
<b>CBCL syndromes</b>					
Withdrawn- Depressed	.08	.10	.24*	.13	.17*
Somatic complaints	.26*	.11	.23*	.15*	.23*
Anxious- Depressed	.23*	.14*	.18*	.13	.21*
Social problems	.12	.18*	.17*	.15*	.18*
Thought problems	.13	.15*	.20*	.13	.18*
Attention problems	.05	.12	.25*	.16*	.17*
Delinquent behavior	.08	.07	.21*	.14	.15*
Aggressive behavior	.10	.11	.22*	.14	.17*

Note. \*  $p < .005$  according to Bonferroni adjustment.

Table 8

*Hierarchical Regression Analyses Predicting Maternal-rated CBCL Syndromes from DIPSI Domains (Self- and Maternal Ratings) and Oddity Domain (Self-ratings)*

	Self-rated DIPSI domains				Maternal-rated DIPSI domains			
	R <sup>2</sup>	Δ R <sup>2</sup>	F <sub>change</sub>	Std β	R <sup>2</sup>	Δ R <sup>2</sup>	F <sub>change</sub>	Std β
<b>Withdr-Depr</b>								
Step 1: Sex	.02	.02	6.99**	.13**	.02	.02	6.99**	.13**
Step 2: DIS, INS, ITR, COMP	.15	.14	16.71***	-.04, .09, .36***, -.14**	.43	.41	74.94***	-.08, .10, .64***, -.19***
Step 3: ODD	.15	.00	.16	.03	.44	.01	<b>4.37*</b>	.08*
<b>Anxious-Depr</b>								
Step 1: Sex	.00	.00	.50	.03	.00	.00	.50	.03
Step 2: DIS, INS, ITR, COMP	.11	.11	12.48***	-.17**, .41***, .01, -.00	.45	.45	82.94***	-.16**, .72***, -.00, .05
Step 3: ODD	.11	.00	1.79	.09	.46	.02	<b>9.88*</b>	.12**
<b>Somatic comp</b>								
Step 1: Sex	.01	.01	5.33**	-.11*	.01	.01	5.33*	-.11*
Step 2: DIS, INS, ITR, COMP	.09	.08	9.10***	-.02, .31***, .04, -.14*	.14	.13	15.25***	.02, .36***, .01, -.09
Step 3: ODD	.10	.01	<b>3.87*</b>	.13*	.16	.02	<b>11.83**</b>	.16**
<b>Social prob</b>								
Step 1: Sex	.02	.02	8.01**	.14**	.02	.02	8.01**	.14**
Step 2: DIS, INS, ITR, COMP	.10	.08	9.59***	.14*, .12, .13, -.13*	.37	.36	58.45***	.21***, .39***, .11, -.09*
Step 3: ODD	.10	.00	.28	.04	.38	.00	2.22	.06
<b>Thought prob</b>								
Step 1: Sex	.00	.00	.77	.04	.00	.00	.77	.04
Step 2: DIS, INS, ITR, COMP	.06	.06	6.39***	.19**, .06, .06, -.07	.24	.24	32.86***	.19***, .29***, .09, -.01
Step 3: ODD	.06	.00	.69	.06	.25	.01	2.85	.08
<b>Attention prob</b>								
Step 1: Sex	.08	.08	38.05***	.29***	.08	.08	38.05***	.29***
Step 2: DIS, INS, ITR, COMP	.30	.22	33.32***	.50***, .08, -.18**, -.24***	.55	.47	109.87***	.61***, .21***, -.11*, -.27***
Step 3: ODD	.30	.00	.44	.04	.55	.00	1.60	.04
<b>Delinquent bh</b>								
Step 1: Sex	.03	.03	12.15**	.17**	.03	.03	12.15**	.17**
Step 2: DIS, INS, ITR, COMP	.17	.15	18.86***	.46***, -.07, -.04, -.12*	.41	.38	67.34***	.66***, -.10, .04, -.08
Step 3: ODD	.17	.00	.13	-.02	.41	.00	.26	.02
<b>Aggressive bh</b>								
Step 1: Sex	.02	.02	6.55*	.12*	.02	.02	6.55*	.12*
Step 2: DIS, INS, ITR, COMP	.14	.14	16.60***	.44***, -.11, .02, -.14**	.50	.48	100.22***	.72***, .00, -.02, -.05
Step 3: ODD	.14	.00	.50	.05	.50	.00	.23	.02

Note. Std β = Standardized Beta coefficient; DIS = Disagreeableness; INS = Emotional instability; ITR = Introversion; COMP = Compulsivity; ODD = Oddity. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .





## Chapter 4

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### **A five-factor model of developmental personality pathology precursors<sup>1</sup>**

#### **Abstract**

There is growing consensus that the dimensional structure of early personality pathology can be organized within a similar framework as in adults (De Clercq, et al., 2006; Tromp & Koot, 2008). From this perspective, the Dimensional Personality Symptom Itempool (DIPSI) was recently expanded from a four- to a five-dimensional trait structure (Verbeke & De Clercq, 2014), including Disagreeableness, Emotional instability, Introversion, Compulsivity and Oddity. This developmental maladaptive trait structure is in need of further research, however, before it can be accepted as a valid framework for describing early manifestations of personality dysfunction. By use of ESEM-analyses, the current study explored the fit of the five-factor DIPSI framework across four different samples ( $N = 1456$ ), and replicated five higher-order factors that demonstrated scalar invariance across age and metric invariance across informants and clinical status. These results underscore the robustness of five underlying dimensions of personality pathology at a young age and highlight adequate psychometric properties of the proposed DIPSI measure for describing childhood personality pathology precursors.

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<sup>1</sup> Verbeke, L., De Caluwé, E., & De Clercq, B. (in press). A five-factor model of developmental personality pathology precursors. *Personality Disorders: Theory, Research and Treatment*.

## Introduction

Recent evidence has suggested that childhood personality pathology can be represented by a five-factor higher order structure (Verbeke & De Clercq, 2014), with a fifth factor emerging next to the four established trait factors of developmental personality pathology, as proposed by the DIPSI model (De Clercq, De Fruyt, Van Leeuwen, & Mervielde, 2006). This five-factor structure connects with the well-known dimensional structure of adult personality pathology (Krueger, Derringer, Markon, Watson, & Skodol, 2012), and may facilitate longitudinal studies on the development of personality disorder traits across developmental stages within a single structural framework. This early five-factor trait structure, however, is in need of further research before it can be accepted as a valid underlying frame for describing PD traits in younger age groups. From this perspective, the present study aims to provide a more solid empirical base for the recently proposed five-factor PD trait structure as elaborated in the DIPSI model (Verbeke & De Clercq, 2014), by examining its factorial invariance across childhood and adolescent age, self- and other ratings, and clinical status.

### **Moving from Four to Five Dimensions in Personality Pathology Models**

The past decade, dimensional personality pathology models have gradually switched from four to five maladaptive trait factors in order to obtain the most comprehensive description of adult personality pathology. In 2005, Widiger and Simonsen (2005) compared a comprehensive set of adult dimensional models for personality disorders, and concluded -in line with the traditional view - that a four-dimensional structure represented the

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common ground for describing personality pathology. These four factors were clearly rooted in the Five-Factor Model (FFM; Costa & McCrae, 1992), each representing maladaptive or extreme low or high variants of four out of five established general trait factors. Most of the reviewed dimensional personality pathology models did not include a fifth factor representing maladaptive Openness to experience, a finding that was further consistent with meta-analytic evidence suggesting that FFM Openness to experience is not relevant for the prediction of personality pathology (Saulsman & Page, 2004). Widiger and Simonsen (2005) did acknowledge, however, that a four-factor model would fail to specifically represent schizotypal cognitive-perceptual aberrations. Recent studies indeed demonstrated a meaningful relation between FFM high Openness and schizotypal symptomatology (e.g. Camisa, Brockbrader, Lysaker, Rae, Brenner, & O'Donnell, 2005; Kwapil, Barrentas-Vidal, & Silvia, 2008; Samuel & Widiger, 2008), indicating the relevance of a maladaptive Openness component for the description of Cluster A-related personality pathology (Widiger, Livesley, & Clark, 2009). From different perspectives, several research groups have thus proposed a fifth factor from different conceptualizations, including Oddity (Watson, Clark, & Chmielewski, 2008), Peculiarity (Tackett, Silberschmidt, Krueger, & Sponheim, 2008), Experiential permeability (Piedmont, Sherman, & Sherman, 2009), or maladaptive Openness (Ross, Lutz, & Bailey, 2002) for a more comprehensive assessment of personality disorder symptoms. The taxonomic position of this fifth maladaptive factor is currently still unclear. Proponents of the FFM have placed it strictly along the extremes of the FFM Openness domain (Widiger, 2010) for reasons of parsimony and

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consistency, given that all other FFM trait domains include both normal and abnormal variants (Widiger, 2011). Alternatively, other studies have advocated a more complex association between Openness and a Cluster A-related trait factor (Chmielewski, Bagby, Markon, Ring, & Ryder, 2014; DeYoung, Grazioplene, & Peterson, 2012), with some authors even proposing that this maladaptive trait factor is entirely distinct from Openness (Watson, Clark, & Chmielewski, 2008). Beyond this debate, however, there is a consensus on the necessity of a fifth maladaptive trait factor in order to capture the whole spectrum of maladaptive trait manifestations.

The shift from a four to a five-factor model of maladaptive traits was accelerated by the DSM-5 Personality and Personality Disorders workgroup who developed an alternative dimensional trait model for DSM-5 (APA, 2013). Beyond the four established maladaptive trait factors (Widiger & Simonsen, 2005), the DSM-5 trait model (Krueger et al., 2011) incorporated a fifth higher-order Psychoticism factor for the assessment of schizotypal characteristics (APA, 2013). Although the alignment between FFM Openness and DSM-5 Psychoticism is less linear and more complex than for the other trait components, recent studies have demonstrated that both trait domains share a common ground (De Fruyt et al., 2013; Gore & Widiger, 2013; Thomas et al., 2013), suggesting that across all FFM personality domains, both normal and abnormal personality dimensions can be integrated within one overarching five-factor framework.

### **The Fifth Factor at Young Age**

Parallel to recent developments in adult personality literature, childhood dimensional personality pathology models such as the Dimensional Personality Symptom Item pool (DIPSI; De Clercq et al., 2006) have acknowledged the need for a fifth maladaptive trait factor. Originally, the DIPSI (De Clercq et al., 2006) consisted of four higher-order components, labeled as Disagreeableness, Emotional instability, Introversion and Compulsivity, and representing extreme maladaptive ends of the childhood FFM domains Agreeableness, Neuroticism, Extraversion and Conscientiousness respectively. This four-factor DIPSI has been put forward as a highly promising tool for the assessment of personality pathology precursors (Clark, 2007), and has been validated across studies. Adequate psychometric properties and structural consistencies have been reported across multiple informants, cross-sectional and longitudinal assessments, and several criterion measures have underscored the relevance and validity of the DIPSI trait dimensions (De Clercq et al., 2010; De Clercq, Van Leeuwen, Van den Noortgate, De Bolle, & De Fruyt, 2009; De Clercq, Van Leeuwen, De Fruyt, Van Hiel, & Mervielde, 2008; Decuyper, De Bolle, De Clercq, & De Fruyt, 2011; Decuyper, De Clercq, & Tackett, 2015; Tackett, Herzhoff, Harden, Page-Gould, & Josephs, 2014; Tackett, Herzhoff, Reardon, De Clercq, & Sharp, 2014; Tackett, Kushner, Herzhoff, Smack, & Reardon, 2014; Tackett, Kushner, Josephs, Harden, Page-Gould, & Tucker-Drob, 2014).

Relying on similar empirical procedures as reported in De Clercq et al. (2006), an item pool with potential descriptors of schizotypal characteristics

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including cognitive-perceptual distortions and eccentric behavior was constructed (Verbeke & De Clercq, 2014). After extensive empirical and statistical analyses, 22 items were retained, and empirically structured in the facets Oversensitivity to feelings, Extreme fantasy, Daydreaming and Odd thoughts and behavior. At a higher-order level, these four facets were organized in one higher-order trait factor labeled “Oddity”, that empirically emerged as a fifth factor next to the four established DIPSI domains in exploratory factor analyses (Verbeke & De Clercq, 2014).

Although Oddity characterizes the smallest and least common trait factor, its inclusion in a childhood personality pathology model is valuable. The Oddity facets not only enable a comprehensive age-specific assessment of Cluster A personality pathology characteristics, but may also create avenues for a broader exploration of underlying trait vulnerabilities across a wide range of childhood disorders with a bizarre component, such as for instance the bipolar and autism spectrum disorders (De Clercq et al., 2010). Preliminary research with this extended DIPSI has already pointed to the clinical relevance of Oddity, as this factor leads to more explained variance of broad internalizing problems at a young age (Verbeke & De Clercq, 2014). A recent study also shows that specific Oddity traits are differentially related to social interaction processes in youth, depending upon the specific interpersonal context (Verbeke, De Clercq, van der Heijden, Hutsebaut, & Van Aken, in press). These results underscore the significance of a fifth maladaptive trait factor for understanding different areas of childhood functioning.

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The present study aims to further strengthen the Oddity construct as proposed in the initial study of Verbeke and De Clercq (2014), by examining its psychometric properties and structural features. More specifically, factorial invariance of the five-factor structure will be tested across age, informants and clinical status, in order to verify whether a similar underlying framework for describing early personality pathology can be used for children versus adolescents, self-ratings versus parental ratings and for youngsters from the general population versus youngsters with a referred status.

### **The Current Study**

The empirical strategies for constructing the Oddity trait factor, including its integration within a five-factor trait structure, have been comprehensively described in Verbeke and De Clercq (2014). By use of ESEM analyses (Asparouhov & Muthén, 2009), the current study aims to corroborate this initial evidence and will explore the replicability of the five-factor maladaptive trait structure across different samples. We hypothesize that the addition of 22 age-specific Oddity items to the original DIPSI structure will result in a five-factor developmental personality pathology structure replicable across age, informants and clinical status, hence paralleling the established five-factor trait structure in adults (De Clercq et al., 2014; Fossati, Krueger, Markon, Borroni, & Maffei, 2013; Griffin & Samuel, 2014; Krueger et al., 2011; Wright & Simms, 2014).

## Method

### Participants and Procedures

Participants of the current study ( $N = 1456$ ) originate from four different samples. Across samples, all participants were informed about the purpose and procedures of the study, and were assured that all information served only research purposes and would be treated as confidential. Subsequently, written informed consent was obtained from all participants.

**Community children (self-ratings): sample 1.** Participants of sample 1 ( $N = 105$ ) included children from the general population, recruited by trained undergraduate and master psychology students from Ghent University. Students visited the participants at home and provided their email address to the research coordinator. Subsequently, a unique login code was sent to all children, accompanied by an email with detailed written instructions on how to complete the questionnaires. Children entered the secured online assessment platform with their login code and provided electronic self-ratings. The sample consisted of 105 children (46.7% male), with a mean age of 12.53 years (ranging from 11.63 to 12.99 years). Most children ( $n=60$ ) were in the first year of secondary school, whereas 19 children still attended primary school. For 26 children, we did not receive information regarding the educational level.

**Community adolescents (self-ratings): sample 2.** Participants of sample 2 were adolescents ( $N = 627$ ) from different secondary schools in Flanders, recruited by undergraduate and master psychology students from Ghent University. Study aims were explained and unique login codes were distributed in the classroom. All participants filled out the questionnaires on



a secured online assessment platform, resulting in a sample of 401 girls and 226 boys, with a mean age of 15.02 years (ranging from 13.02 to 18.92 years). The majority (57.54%) of the subjects attended general secondary education, 21.13% of the adolescents were enrolled in technical secondary education, 11.27% followed art secondary education, and a small group of adolescents (8.65%) followed vocational secondary program. Information regarding the educational level was lacking for 20.73% of the participants.

**Community children (mother-ratings): sample 3.** Sample 3 ( $N = 500$ ) was collected by both undergraduate and master psychology students from Ghent University. Undergraduate students received course credit for collecting data. Master students collected data in the course of their master thesis. Students visited the families at home and asked mothers to complete several questionnaires about their child. The sample included 249 girls and 246 boys (in five cases gender information was lacking) attending various primary schools, with a mean age of 9.81 years old (range between 7 and 12 years old).

**Referred adolescents (self-ratings): sample 4.** Participants of sample 4 ( $N = 223$ ) were recruited from two juvenile justice institutions in Flanders, where adolescents are incarcerated after referral by a juvenile judge. This incarceration is considered to be the harshest measure that can be imposed, and is only decided by the judge in case of serious offenses or a problematic situation at home. Adolescents were eligible to participate if the following criteria were met: (i) incarceration in a juvenile justice institution for at least one month; (ii) mastery of the Dutch language; and (iii) having sufficient cognitive abilities. The latter criteria were verified by

both the staff and the trained researcher, who screened the adolescent's ability to participate in Dutch conversations and to understand the informed assent form. All participants were addressed individually and the assessment was organized in a private area of the juvenile justice institution. Beyond the informed consent that was obtained from all participating adolescents, all parents received in addition an information letter about the study aims and were provided the possibility to refuse participation of their child. The sample consisted of 223 adolescents (54.7% male), with a mean age of 15.81 years (ranging from 13 to 18 years). Adolescents ended up in the detention center for various reasons, including offences against property (22.7%), violence/aggression offences (25%), drug-related offences (27.1%), fugues (26.5%), truancy (9.9%), persistent rearing problems (40.4%), possession of weapons (2.7%) and sexual crimes (7.2%), with the majority (65.5%) demonstrating more than one reason for placement.

### **Measures**

**DIPSI.** Participants of samples 1, 2 and 4 provided self-reports on the established four-factor Dimensional Personality Symptom Item Pool (DIPSI; De Clercq et al., 2006), whereas maternal DIPSI reports were collected in sample 3. The DIPSI consists of 172 items to be answered on a 5-point Likert scale (1=barely characteristic, 2= slightly characteristic, 3= more or less characteristic, 4= characteristic, 5=highly characteristic). Scores were obtained for the 27 symptom clusters that are hierarchically organized in four dimensions of pathology. Reliability analyses of the DIPSI domains and facets indicated that the Cronbach's alpha coefficients of the four higher-

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order dimensions were adequate across samples (ranging from .86 to .98, median value = .95). At the facet-level, reliability coefficients were generally good (ranging from .69 to .93, median value = .82), except for a lower alpha coefficient for the Insecure attachment facet in the samples with self-reports<sup>2</sup>. All Cronbach's alpha coefficients and descriptive statistics are available upon request.

**Oddity item-pool.** The newly developed Oddity item-pool was filled out by all participants of samples 1, 2 and 4 and by all mothers of sample 3. This Oddity scale consists of 22 items to be answered on a 5-point Likert scale (1=barely characteristic, 2= slightly characteristic, 3= more or less characteristic, 4= characteristic, 5=highly characteristic), and are empirically structured in four underlying facets (Oversensitivity to feelings, Extreme fantasy, Daydreaming, and Odd thoughts and behavior), further organized in one higher-order Oddity trait factor. The reliabilities of the higher-order Oddity domain ranged from .93 to .94 across samples, (facets range= .73 to .91, median value = .85), and can be considered as adequate. All Cronbach's alpha coefficients and descriptive statistics are available upon request.

### **Model Construction: Data Analytic Strategy**

To evaluate model fit and parameter estimations, exploratory structural equation modeling (ESEM; Asparouhov & Muthén, 2009) was conducted using Mplus Version 7.3 (Muthén & Muthén, 2014). This ESEM

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<sup>2</sup> The lower reliability coefficient for Insecure attachment has also been found in other studies with DIPSI self-reports (Decuyper et al., 2011; Tackett et al., 2014). This finding does not seem to result from one particular item that systematically lowers the reliability coefficient, but may rather stem from item content of some of the Attachment indicators that is more sensitive to responses that are driven by contextual factors in case of self-reports.

approach allows non-zero loadings on factors other than the primary targeted factor (i.e., cross-loadings), which is generally required for modeling complex personality data (Marsh et al., 2010). This ESEM approach has been successfully applied to personality data in previous research, resulting in improved model fit compared to CFA (Furnham et al., 2013; Marsh et al., 2010). We relied on the maximum likelihood robust (MLR) estimator because of non-normality of the data (Yuan & Bentler, 2000), and used an oblique (oblimin) rotation, allowing the factors to correlate. Based on the structural results as published in Verbeke and De Clercq (2014), an ESEM model with five factors was fitted to the four samples separately. To enable a comparison of fit between the five- versus traditional four-factor model of the DIPSI, a model with four factors was also fitted to the four samples.

In a second step, we conducted multi-group ESEM analyses to examine measurement invariance of the five-factor structure across age, informants and clinical status. Measurement invariance across age was explored comparing sample 1 (community children; self-reports) with sample 2 (community adolescents; self-reports), measurement invariance across informants was tested along sample 1 (community children; self-reports) and sample 3 (community children; mother-reports), and measurement invariance across clinical status was examined by comparing sample 2 (community adolescents; self-ratings) with sample 4 (incarcerated adolescents; self-ratings).

Measurement invariance was tested along three models with increasing cross-group restrictions on parameters (Muthén & Muthén,

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2014), defined as configural invariance (equality of factor structure), metric invariance (equality of factor loadings) and scalar invariance (equality of factor loadings and intercepts). In line with the ESEM analyses, we used the oblimin rotation and the MLR estimator. The scaling correction factor and the Satorra-Bentler scaled chi-square (Satorra & Bentler, 2001) difference test were used to evaluate differences in fit of the compared nested models. Because the  $\Delta\chi^2$  is sensitive to sample sizes and to minor deviations between the groups' sample covariance matrices, a set of other fit indices that are not influenced by sample size was also calculated (Cheung & Rensvold, 1999; Vandenberg & Lance, 2000), including the standardized root mean square residual (SRMR; Hu & Bentler, 1999), the root-mean-square error of approximation (RMSEA; Steiger, 1990) and the comparative fit index (CFI; Bentler, 1990). Given that the relative fit indices  $\Delta$ RMSEA and  $\Delta$ CFI are superior to the  $\Delta\chi^2$  for model fit evaluation (Cheung & Rensvold, 1999), these indices were additionally used to evaluate the difference in fit between the more restricted and less restricted models for exploring metric and scalar invariance.

## Results

### Exploratory Structural Equation Modeling (ESEM)

The results of the ESEM analyses on the DIPSI and Oddity facets are represented in Table 1 and indicate a good fit of a five-factor structure across samples, with  $\chi^2/df$  ratios of 1.89 (sample 1), 4.15 (sample 2), 4.72 (sample 3) and 2.18 (sample 4) (Kline, 2005; Schumacker & Lomax, 2004; Ullman, 2001). However, this absolute fit index has been criticized (Finch & West, 1997; Kelloway, 1996; Schermelleh-Engel, Mossbrugger, & Müller,

2003) and several alternative fit indices have been proposed. Table 1 presents an alternative index of overall fit, the RMSEA (Steiger, 1990), with values of .09 (samples 1 and 3) and .07 (samples 2 and 4) pointing to an acceptable/approximate fit of the five-factor solution (Chen, Curran, Bollen, Kirby, & Paxton, 2008). The CFI (Bentler, 1990) is frequently used in (E)SEM (McDonald & Ringo Ho, 2002) and reports for the five-factor solution adequate values of .91 and .93 in sample 2 and 4 respectively, and values of .89 and .88 for sample 1 and 3 respectively, which are very close to an acceptable level. The SRMR, an absolute measure of fit (Hu & Bentler, 1999), indicates values of .03 in all samples, thus suggesting an adequate fit of the five-factor solution to the data. Moreover, Table 1 also shows the fit indices of the traditional four-factor DIPSI structure, suggesting a consistently worse fit to the data compared to the five-factor solution, as reflected in a higher  $\chi^2/df$ , RMSEA and SRMR, and a lower CFI across all four samples. This four-factor solution revealed the four established DIPSI components in all samples, with the Oddity facets having their primary loading on Emotional instability in Sample 2 and 4, and on Disagreeableness in Sample 1. In Sample 3, the Oddity facets were not significantly loading on any of the four factors. Given the worse fit and less clear interpretability of the four-factor solution, a five-factor structure of developmental personality pathology was retained for further analyses.

Table 2 presents the factor inter-correlations for the five-factor solution. Across samples, significant inter-correlations are observed, with the majority of the trait inter-correlations ranging between .30 and .50 across samples. Trait inter-correlations generally show a similar pattern

across samples, with the Oddity factor demonstrating the highest inter-correlations with the other factors and Compulsivity demonstrating the lowest inter-correlations. Only in sample 4, this pattern is different, with the highest inter-correlations observed for Disagreeableness.

### **Interpretation of the ESEM Factors**

The standardized rotated factor loadings are presented in Table 3 (samples 1 and 2) and Table 4 (samples 3 and 4). Across samples, the first factor (F1) is Disagreeableness, with the majority of the original Disagreeableness facets having their primary loading on this factor. In every sample, however, 2 to 4 Disagreeableness facets (out of a total of 12 facets) primarily load a different factor, with Lack of empathy consistently loading on F3. The second factor (F2) represents Emotional instability, with primary loadings of almost all original Emotional instability facets in samples 2, 3 and 4, whereas sample 1 shows a higher number of Emotional instability facets with primary loadings on the third factor. The third factor (F3) represents an Introversion/Detachment component, with all original DIPSI Introversion facets having their primary loading on this factor across samples. The fourth factor (F4) signifies Compulsivity, with primary loadings of the three original Compulsivity facets in samples 1, 2 and 3. In sample 4, one Compulsivity facet has its primary loading on a different factor. Finally, the fifth factor (F5) represents a pure Oddity component across samples 1, 2 and 3, with sample 1 demonstrating an equally high cross-loading of one facet on the Emotional instability factor. In the referred sample 4, however, the Oddity factor is in terms of factor loadings mixed with Emotional instability (F2).

### Measurement Invariance: Multi-Group ESEM

Table 5 reports the results of measurement invariance of the DIPSI five-factor structure across age, informants and clinical status. With regard to age, configural invariance is supported by the acceptable absolute fit indices (SRMR, RMSEA and CFI). In addition, also metric invariance is clearly present because the  $\Delta\chi^2$  value is non-significant, and all absolute (SRMR, RMSEA and CFI) and relative fit indices ( $\Delta$ RMSEA and  $\Delta$ CFI) are good. Furthermore, also scalar invariance is present because of acceptable absolute (SRMR=.040, RMSEA=.068 and CFI=.900) and relative fit indices ( $\Delta$ RMSEA = .000 and  $\Delta$ CFI = .003). These results indicate the equivalence of the factor structure of the extended DIPSI taxonomy across childhood and adolescence, both in terms of basic and more stringent factorial invariance.

Across informants, basic configural invariance can be supported with acceptable absolute fit indices, though the CFI is slightly below the .90 benchmark. Also metric invariance can largely be supported in view of the acceptable relative ( $\Delta$ RMSEA = -.007 and  $\Delta$ CFI = -.002) and absolute (SRMR=.048, RMSEA=.086 and CFI=.878) fit indices that are acceptable or close to an acceptable level. An inspection of the fit indices of scalar invariance demonstrates that this stringent level of factorial invariance cannot be retained across different informants.

Finally, analyses on invariance of factor structure across samples from the general and referred population show acceptable absolute fit indices for configural (SRMR=.029, RMSEA=.073 and CFI=.911) and metric (SRMR=.044, RMSEA=.069 and CFI=.903) invariance. Metric invariance is further supported by two relative fit indices ( $\Delta$ RMSEA = -.004 and  $\Delta$ CFI = -.008), that



can be considered as adequate. Scalar invariance across groups with clinical status, however, is not supported by the results.

### **Discussion**

The current study aimed to explore the fit and factorial invariance of the recently proposed five-factor structure for personality pathology precursors in younger age groups, as elaborated by the DIPSI model (De Clercq, et al., 2006). This five-factor structure was empirically confirmed by the current results, and provided evidence for scalar invariance across age and metric invariance across informants and clinical status. Beyond the four established DIPSI components (De Clercq et al., 2006), a clear fifth factor emerged across samples, signifying the recently constructed Oddity trait component (Verbeke & De Clercq, 2014). Several conclusions both at the conceptual as well as the assessment level can be drawn from the current results.

First, the findings confirm that maladaptive personality traits at a young age can be structured along a similar conceptual five-factor framework as in adults (Krueger et al., 2012). Beyond this structural similarity at the taxonomic level, however, it is generally accepted that assessing these traits in childhood and adolescence requires tools that are sensitive to age-specific expressions of underlying traits, and may differ from the adult expression (De Clercq & De Fruyt, 2007). This assumption has been the initial reason for constructing a developmentally oriented tool for early maladaptive traits (De Clercq et al., 2006). The current study corroborates previous evidence on the validity of this Dimensional Personality Symptom Inventory measure (DIPSI; De Clercq et al., 2006), and

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demonstrates that the extended five-factor DIPSI (Verbeke & De Clercq, 2014) may be a viable tool to provide the most comprehensive and age-appropriate assessment of early personality dysfunction, thereby underscoring its validity both in childhood and adolescence, in referred and non-referred groups, as well as using self- or informant ratings. Moreover, the underlying five-factor framework of the DIPSI creates avenues for longitudinal research across different developmental stages, that aims to build empirical bridges between early developmental manifestations of five-factor model personality pathology and adult PD outcomes in terms of these same five maladaptive trait factors.

Second, the results of the current study suggest that the four Oddity facets Oversensitivity to feelings, Extreme Fantasy, Daydreaming and Odd thoughts and behavior can be generally considered as valid indicators of developmental Oddity traits. Even in the youngest group, a clear fifth Oddity trait factor was found with high loadings of each of the Oddity facets, suggesting that odd characteristics already represent a distinct maladaptive constellation at a young age that is not captured by other maladaptive trait factors. These results parallel and extend the findings of Verbeke and De Clercq (2014), and provide a solid argument for the significance of a fifth Oddity component in the underlying structure of maladaptive traits at a young age. However, Oddity appeared overall to be significantly correlated with the other basic trait domains, potentially indicating that Oddity comprises beyond its distinctiveness also a general pathology component.

Third, the specific cross-loadings of the Oddity facets on the Emotional instability factor in the referred sample of adolescents align with

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factor-analytic results of other dimensional personality disorder taxonomies (DAPP-BQ; Livesley & Jackson, 2009; SNAP; Clark et al.; in press) that have demonstrated a connection between cognitive-perceptual distortions and the Neuroticism domain, both in adults (Wright et al., 2012) and in younger age groups (De Clercq, et al., 2014). Especially in samples with a severe psychopathological status, such as in the current group of youth offenders (Kaszynski et al., 2014), there is a high saturation of overall pathology that may be responsible for the blending of different maladaptive trait factors. Also other studies have indicated that personality pathology trait factors may be more intertwined in clinical samples (Quilty, Ayearst, Chmielewski, Pollock, & Bagby, 2013), with especially the fifth Cluster A-related trait factor demonstrating significant associations with a wide range of psychopathological complaints (Hopwood et al., 2013).

Finally, from an applied perspective, two issues are noteworthy. First of all, the current findings on measurement invariance across age at the most stringent level indicate that DIPSI ratings can be validly compared across childhood and adolescence, enabling the study of developmental processes of change and stability. The somehow lower-level of invariance across informants indicates that both self-and informant ratings can be validly depicted within a similar five-factor framework, but also point to the necessity of including multiple informants in childhood PD assessment, in order to capture all relevant and unique information on a child's functioning. At this point, the current results move away from the initial assumption on the presumed introspective nature of oddity-related traits (Verbeke & De Clercq, 2014), and demonstrate that informants with a close

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connection to the child may also serve as adequate informants of oddity-related characteristics. In a related vein, the current results confirm the presence of a similar underlying five-factor framework across referred and community groups, indicating that children with psychopathology or problem behavior do not fundamentally differ from children of the general population in terms of their personality structure. Also, these results empirically imply that associations between variables across referred and community samples can be confidently made (Vandenberg & Lane, 2001). Exploring mean-level differences across groups with a different clinical status should however be interpreted cautiously (Vandenberg & Lane, 2001), given the absence of strict invariance. Second, the significance of an Oddity trait component in the basic maladaptive trait structure of children and adolescents not only enables a comprehensive assessment of all potentially relevant childhood traits for adult personality disorders, but also draws new perspectives on our understanding of general childhood disorders that include a bizarre component and have traditionally not been described from a trait angle. More specifically, issues such as co-occurrence among these disorders and stability over time may be more readily understood when including a trait assessment.

### **Limitations and Directions for Future Research**

The current study includes several strengths, such as the use of multiple samples with different age range, clinical status and different informants. Several limitations, however, have also to be taken into account. First, the use of informant data was restricted to only one childhood sample and only included maternal ratings. In order to explore

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whether the five-factor DIPSII can be reliably scored from an observer perspective, future research should also include other informants (e.g. fathers, teachers) that provide DIPSII ratings across different age ranges. Second, the current study did not include very young children, hampering generalizability of the current findings to early childhood. In line with findings on general personality development (Caspi, Roberts, & Shiner, 2005), however, it can be hypothesized that a five-factor framework for maladaptive traits is also valid from early childhood onwards. Future research may explore this issue empirically, and additionally focus on the developmental change and stability in the phenotypic expression of Oddity across different age stages. As ongoing cognitive development has been demonstrated to play a role in the phenotypic manifestations of Openness to experience from early childhood to adolescence (Caspi et al., 2005; Soto & John, 2014), it would be interesting to examine whether similar cognitive maturation processes also influence developmental differences in Oddity. Third, the referred sample of the current study represents a very specific clinical group of adolescents with a severe psychiatric status (Kaszynski et al., 2014). For reasons of representativeness, future work with the five-factor DIPSII should include referred samples with a broader variety of problem behavior, in order to explore whether the structure of early personality pathology is similar across referred groups with varying levels of severity. Finally, the current study only focused on the underlying structure of the DIPSII across samples, and did not evaluate the clinical validity of this developmental PD measure. Both cross-sectional and longitudinal studies

will have to clarify the clinical significance of the extended DIPSI and the fifth Oddity factor more specifically.

In sum, the current study provides evidence for a robust five-factor framework of personality pathology precursors in childhood. These results extend the overall consensus on the validity of five underlying trait factors for describing general personality traits across the life-span (Caspi, Roberts, & Shiner, 2005) toward the description of maladaptive personality, and build a bridge with established five-factor operationalizations of personality disorders as elaborated by the FFM PD tradition (Widiger & Costa, 2012) as well as by the recent DSM-5 trait model for personality disorders (APA, 2013). Such overarching five-factor framework may facilitate future longitudinal research on the development and structure of personality pathology from childhood onwards.

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### References

- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5<sup>th</sup> ed.). Arlington, VA.
- Asparouhov, T. & Muthén, B. (2009). Exploratory structural equation modeling. *Structural Equation Modeling*, *16*, 397-438. Doi: 10.1080/10705510903008204
- Bentler, P.M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, *107*, 238-247. Doi: 10.1037/0033-2909.107.2.238
- Camisa, K. M., Bockbrader, M. A., Lysaker, P., Rae, L. L., Brenner, C.A. & O'Donnell, B. F. (2005). Personality traits in schizophrenia and related personality disorders. *Psychiatry Research*, *133*, 23-33. Doi: 10.1016/j.psychres.2004.09.002
- Caspi, A., Roberts, B. W., & Shiner, R. L. (2005). Personality development: Stability and change. *Annual Review of Psychology*, *56*, 453-484. Doi: 10.1146/annurev.psych.55.090902.141913
- Costa, P. T., & McCrae, R. R. (1992). *Professional Manual: Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor-Inventory (NEO-FFI)*. Odessa, FL/ Psychological Assessment Resources.
- Chen, F.F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling – A multidisciplinary journal*, *14*, 464-504.
- Chen, F., Curran, P. J., Bollen, K. A., Kirby, J., & Paxton, P. (2008). An empirical evaluation of the use of fixed cutoff points in RMSEA test

- 
- statistic in structural equation models. *Sociological Methods & Research*, 36, 462-494.
- Cheung, G. W., & Rensvold, R. B. (1999). Testing factorial invariance across groups: a reconceptualization and proposed new method. *Journal of Management*, 25, 1-27. Doi : 10.1177/014920639902500101
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, 9, 233-255. doi: 10.1207/s15328007sem0902\_5
- Chmielewski, M., Bagby, R. M., Markon, K., Ring, A. J., & Ryder, A. G. (2014). Openness to Experience, intellect, schizotypal personality disorder, and psychoticism: resolving the controversy. *Journal of Personality Disorders*, 28, 483-499.
- Clark, L. A., Simms, L. J., Wu, K. D., Casillas, A. Manual for the Schedule for Nonadaptive and Adaptive Personality (SNAP-2) Minneapolis: University of Minnesota Press; (in press).
- Decuyper, M., De Bolle, M., De Clercq, B., & De Fruyt, F. (2011). General and maladaptive personality dimensions and the assessment of callous-unemotional traits in adolescence. *Journal of Personality Disorders*, 25, 681-701.
- Decuyper, M., De Clercq, B., & Tackett, J. (2015). Assessing maladaptive traits in youth: an English-language version of the Dimensional Personality Symptom Itempool. *Personality Disorders: Theory, Research and Treatment*.
- De Clercq, B., De Fruyt, F., Van Leeuwen, K., & Mervielde, I. (2006). The structure of maladaptive personality traits in childhood: A step



- toward an integrative developmental perspective for DSM-V. *Journal of Abnormal Psychology*, *115*, 639-657. Doi: 10.1037/0021-843X.115.4.639
- De Clercq, B., & De Fruyt, F. (2007). Childhood antecedents of personality disorder. *Current Opinion in Psychiatry*, *20*, 57-61. Doi: 10.1097/YCO.0b013e328010c827
- De Clercq, B., Van Leeuwen, K., De Fruyt, F., Van Hiel, A., & Mervielde, I. (2008). Maladaptive personality traits and psychopathology in childhood and adolescence: the moderating effect of parenting. *Journal of Personality*, *76*, 357-383. Doi: 10.1111/j.1467-6494.2007.00489.x
- De Clercq, B., Van Leeuwen, K., Van den Noortgate, W., De Bolle, M., & De Fruyt, F. (2009). Childhood personality pathology: dimensional stability and change. *Development and Psychopathology*, *21*, 853-869. Doi: 10.1017/S0954579409000467
- De Clercq, B., Aelterman, N., De Pauw, S., De Bolle, M., Decuyper, M., & Tackett, J. (2010). Delineating autism spectrum symptoms from a maladaptive trait perspective. *Journal of Psychopathology and Behavioral Assessment*, *32*, 529-536. Doi: 10.1007/s10862-010-9191-8
- De Clercq, B., De Fruyt, F., De Bolle, M., Van Hiel, A., Markon, K. E., & Krueger, R. F. (2014). The hierarchical structure and construct validity of the PID-5 trait measure in adolescence. *Journal of Personality*, *82*, 158-169. Doi: 10.1111/jopy.12042
- De Fruyt, F., De Clercq, B., De Bolle, M., Wille, B., Markon, K. & Krueger, R. F. (2013). General and maladaptive traits in a five-factor framework for

- 
- DSM-5 in a university student sample. *Assessment*, *20*, 295-307. Doi: 10.1177/1073191113475808
- De Fruyt, F., & de Clercq, B. (2014). Antecedents of personality disorder in childhood and adolescence: toward an integrative developmental model. *Annual Review of Clinical Psychology*, *10*, 449-476. Doi: 10.1146/annurev-clinpsy-032813-153634
- DeYoung, C. G., Grazioplene, R. G., & Peterson, J. B. (2012). From madness to genius: the Openness/Intellect trait domain as a paradoxical simplex. *Journal of Research in Personality*, *46*, 63-78. Doi: 10.1016/j.jrp.2011.12.003
- Finch, J. F., & West, S. G. (1997). The investigation of personality structure: Statistical models. *Journal of Research in Personality*, *31*, 439-485. Doi: 10.1006/jrpe.1997.2194
- Fossati, A., Krueger, R. F., Markon, K. E., Borroni, S., & Maffei, C. (2013). Reliability and validity of the Personality Inventory for DSM-5 (PID-5): Predicting DSM-IV personality disorders and psychopathy in community-dwelling Italian adults. *Assessment*, *20*, 689-708. Doi: 10.1177/1073191113504984
- Furnham, A., Guenole, N., Levine, S.Z., & Chamorro-Premuzic, T. (2013). The NEO Personality Inventory-Revised: Factor structure and gender invariance from exploratory structural equation modeling analyses in a high-stakes setting. *Assessment*, *20*, 14-23. Doi: 10.1177/1073191112448213

- 
- Gore, W. L., & Widiger, T. A. (2013). The DSM-5 dimensional trait model and five-factor models of general personality. *Journal of Abnormal Psychology, 122*, 816-821. Doi: 10.1037/a0032822
- Griffin, S. A., & Samuel, D. B. (2014). A closer look at the lower-order structure of the personality inventory for DSM-5: comparison with the five-factor model. *Personality Disorders: Theory, Research and Treatment, 5*, 406-412. Doi: 10.1037/per0000074
- Hopwood, C, Wright, A. G. C., Krueger, R. F., Schade, N., Markon, K. E., & Morey, L. C. (2013). DSM-5 pathological personality traits and the Personality Assessment Inventory. *Assessment, 20*, 269-285. Doi: 10.1177/1073191113486286
- Hu, L., & Bentler, P. M. (1999). Evaluating model fit. In R.H. Hoyle (Ed.), *Structural Equation Modeling Concepts Issues and Applications*, (pp. 76-99). Thousand Oaks, CA: Sage.
- Kaszynski, K., Kallis, D.L., Karnik, N., Soller, M., Hunter, S., Haapanen, R., Blair, J., & Steiner, H. (2014). Incarcerated youth with personality disorders: prevalence, comorbidity and convergent validity. *Personality and Mental Health, 8*, 42-51. Doi: 10.1002/pmh.1241
- Kelloway, E. K. (1996). Common practices in structural equation modeling. In C. L. Cooper & I. Robertson (Eds.), *International review of industrial and organizational psychology* (pp. 141-180). Chichester, United Kingdom: Wiley.
- Kline, R.B. (2005), *Principles and Practice of Structural Equation Modeling* (2nd Edition ed.). New York: The Guilford Press.

- 
- Krueger, R. F., Derringer, J., Markon, K. E., Watson, D., & Skodol, A. E. (2012). Initial construction of a maladaptive personality trait model and inventory for DSM-5. *Psychological Medicine, 42*, 1879-1890. Doi: 10.1017/S0033291711002674
- Kwapil, T. R., Barrentas-Vidal, N. & Silvia, P. J. (2008). The dimensional structure of the Wisconsin schizotypy scales: factor identification and construct validity. *Schizophrenia Bulletin, 34*, 444-457. Doi: 10.1093/schbul/sbm098
- Livesley, W. J., & Jackson, D. N. (2009). *Technical Manual for the Dimensional Assessment of Personality Pathology-Basic Questionnaire (DAPP-BQ)*. Michigan: Sigma Assessment Systems.
- Marsh, H. W., Lüdtke, O., Muthén, B., Asparouhov, T., Morin, A. J. S., Trautwein, U., & Nagengast, B. (2010). A new look at the big-five factor structure through exploratory structural equation modelling. *Psychological Assessment, 22*, 471-491. Doi: 10.1037/a0019227
- McDonald, R. ., & Ringo Ho, M.-H. (2002). Principles and practice in reporting structural equation analyses. *Psychological Methods, 1*, 64-82. Doi: 10.1037//1082-989X.7.1.64
- Muthén, L., & Muthén, B. (2014). *Mplus user's guide*. Los Angeles, CA: Muthén & Muthén.
- Piedmont, R. P., Sherman, M. F. & Sherman, N. C. (2009). Using the five-factor model to identify a new personality disorder domain: the case for experiential permeability. *Journal of Personality and Psychology, 96*, 1245-1258. Doi: 10.1037/a0015368

- 
- Quilty, L., Ayearst, L., Chmielewski, M., Pollock, B. G., & Bagby, M. (2013). The psychometric properties of the Personality Inventory for DSM-5 in an APA DSM-5 field trial sample. *Assessment, 20*, 362-369. Doi: 10.1177/1073191113486183
- Ross, S. R., Lutz, C. J., Bailey, S. E. (2002). Positive and negative symptoms of schizotypy and the five-factor model: a domain and facet level analysis. *Journal of Personality Assessment, 79*, 53-72. Doi: 10.1207/S15327752JPA7901\_04
- Samuel, D. B. & Widiger, T. A. (2008). A meta-analytic review of the relationships between the five-factor model and DSM-IV-TR personality disorders: a facet level analysis. *Clinical Psychology Review, 28*, 1326-1342. Doi: 10.1016/j.cpr.2008.07.002
- Satorra, A., & Bentler, P. M. (2001). A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika, 66*, 507-514. doi: 10.1007/BF02296192
- Saulsman, L. M. & Page, A. C. (2004). The five-factor model and personality disorder empirical literature: A meta-analytic review. *Clinical Psychology Review, 23*(8), 1055-1085. Doi: 10.1016/j.cpr.2002.09.001
- Schermelleh-Engel, K., Mossbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online, 2*, 23-74.
- Schumacker, R. E., & Lomax, R. G. (2010). A beginner's guide to structural equation modeling (3rd ed.). New York: Routledge.

- 
- Soto, C. J., & John, O. P. (2014). Traits in transition: The structure of parent-reported personality traits from early childhood to early adulthood. *Journal of Personality, 82*, 182-199. Doi: 10.1111/jopy.12044
- Steiger, J. H. (1990). Structural model evaluation and modification: an interval estimation approach. *Multivariate Behavioral Research, 25*, 173-180. Doi: 10.1207/s15327906mbr2502\_4
- Tackett, J. L., Silberschmidt, A. L., Krueger, R. F., & Sponheim, S. R. (2008). A dimensional model of personality disorder: Incorporating DSM Cluster A characteristics. *Journal of Abnormal Psychology, 117*, 454-459. Doi: 10.1037/0021-843X.117.2.454
- Tackett, J. L., Herzhoff, K., Harden, K. P., Page-Gold, E., & Josephs, R. A. (2014). Personality x hormone interactions in adolescent externalizing psychopathology. *Personality Disorders: Theory, Research and Treatment, 5*, 235-246. Doi: 10.1037/per0000075
- Tackett, J. L., Herzhoff, K., Reardon, K. W., De Clercq, B., & Sharp, C. (2014). The externalizing spectrum in youth: incorporating personality pathology. *Journal of Adolescence, 37*, 659-668. Doi: 10.1016/j.adolescence.2013.10.009
- Tackett, J. L., Kushner, S., Herzhoff, K., Smack, A. J., & Reardon, K. W. (2014). Viewing relational aggression through multiple lenses: Temperament, personality, and personality pathology. *Development and Psychopathology, 26*, 863-877. Doi: 10.1017/S0954579414000443
- Tackett, J. L., Kushner, S., Josephs, R. A., Harden, K. P., Page-Gould, E., & Tucker-Drob, E. M. (201). Cortisol reactivity and recovery in the

- context of adolescent personality disorder. *Journal of Personality Disorders, 28*, 25-39.
- Thomas, K. M., Yalch, M. M., Krueger, R. F., Wright, A. G. C., Markon, K. E., & Hopwood, C. J. (2013). The convergent structure of DSM-5 personality trait facets and five-factor model trait domains. *Assessment, 20*, 308-311. Doi: 10.1177/1073191112457589
- Tromp, N., & Koot, H. (2008). Dimensions of personality pathology in adolescents: psychometric properties of the DAPP-BQ-A. *Journal of Personality Disorders, 22*, 623-638.
- Ullman, J. B. (2001). Structural equation modeling. In B. G. Tabachnick & L. S. Fidell (2001). *Using Multivariate Statistics* (4th ed; pp 653- 771). Needham Heights, MA: Allyn & Bacon.
- Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: suggestions, practices, and recommendations for organizational research. *Organizational Research Methods, 3*, 4-70. Doi: 10.1177/109442810031002
- Verbeke, L., & De Clercq, B. (2014). Integrating oddity traits in a dimensional model for personality pathology precursors. *Journal of Abnormal Psychology, 123*, 598-612. Doi: 10.1037/a0037166F
- Verbeke, L., De Clercq, B., van der Heijden, P., Hutsebaut, J., & van Aken, M.A.G. (2015). The relevance of schizotypal traits for understanding interpersonal functioning in adolescents with psychiatric problems. *Personality Disorders: Theory, Research and Treatment*.
- Watson, D., Clark, L. A., & Chmielewski, M. (2008). Structures of personality and their relevance to psychopathology: II. Further articulation of a

- comprehensive unified trait structure. *Journal of Personality*, 76, 1545-1585. Doi: 10.1111/j.1467-6494.2008.00531.x
- Widiger, T. A., & Simonsen, E. (2005). Alternative dimensional models of personality disorder: Finding a common ground. *Journal of Personality Disorders*, 19(2), 110-130. Doi: 10.1521/pedi.19.2.110.62628
- Widiger, T. A., Livesley, W. J., & Clark, L.A. (2009). An integrative dimensional classification of personality disorder. *Psychological Assessment*, 21, 243-255. Doi: 10.1037/a0016606
- Widiger, T. A. (2010). Cluster A personality symptomatology in youth. *Journal of Psychopathology and Behavioral Assessment*, 32, 551-556. Doi: 10.1007/s10862-010-9204-7
- Widiger, T. A. (2011). Integrating normal and abnormal personality structure: a proposal for DSM-V. *Journal of Personality Disorders*, 25, 338-363.
- Widiger, T. A., & Costa, P. T. (2012). Integrating normal and abnormal personality structure: the five-factor model. *Journal of Personality*, 80, 1471-1506. Doi: 10.1111/j.1467-6494.2012.00776.x
- Wright, A. G. C., Thomas, K. M., Hopwood, C. J., Markon, K. E., Pincus, A. L. & Krueger, R. F. (2012). The hierarchical structure of DSM-5 pathological personality traits. *Journal of Abnormal Psychology*, 121, 951-957.
- Wright, A. G. S., & Simms, L. J. (2014). On the structure of personality disorder traits: conjoint analyses of the CAT-PD, PID-5 and NEO-PI-3 trait models. *Personality Disorders: Theory, Research and Treatment*, 5, 43-54. Doi: 10.1037/per0000037



Yuan, K. H., & Bentler, P. M. (2000). Three likelihood-based methods for mean and covariance structure analysis with nonnormal missing data. In M. E. Sobel, & M. P. Becker (Eds.), *Sociological Methodology 2000*, Vol 30 (Vol. 30, pp. 165-200). Malden: Blackwell Pub.

## Tables

Table 1

*ESEM Four-Factor and Five-Factor Solution Fit Statistics Across Samples*

	$\chi^2$	<i>df</i>	$\chi^2/df$	RMSEA	CFI	SRMR
Four-Factor Solution						
Sample 1	726.78	347	2.09	.10	.85	.04
Sample 2	1905.65	347	5.49	.09	.85	.04
Sample 3	1901.26	347	5.48	.10	.84	.04
Sample 4	923.80	347	2.66	.09	.89	.04
Five-Factor Solution						
Sample 1	605.35	320	1.89	.09	.89	.03
Sample 2	1326.44	320	4.15	.07	.91	.03
Sample 3	1511.16	320	4.72	.09	.88	.03
Sample 4	696.34	320	2.18	.07	.93	.03

*Note.* *df* = degrees of freedom; RSMEA = root mean square error of approximation; CFI = comparative fit index; SRMR = standardized root mean square residual.

Table 2  
*Factor Intercorrelations for the Five-Factor Solution Across Samples*

	F1	F2	F3	F4	F5
Sample 1					
F1	1.00 <sup>***</sup>				
F2	.24	1.00 <sup>***</sup>			
F3	.42 <sup>**</sup>	.41 <sup>*</sup>	1.00 <sup>***</sup>		
F4	.34 <sup>***</sup>	.29	.29 <sup>*</sup>	1.00 <sup>***</sup>	
F5	.56 <sup>***</sup>	.33	.45 <sup>**</sup>	.31 <sup>**</sup>	1.00 <sup>***</sup>
Sample 2					
F1	1.00 <sup>***</sup>				
F2	.15 <sup>*</sup>	1.00 <sup>***</sup>			
F3	.26 <sup>***</sup>	.29 <sup>***</sup>	1.00 <sup>***</sup>		
F4	.24 <sup>***</sup>	.27 <sup>***</sup>	.20 <sup>**</sup>	1.00 <sup>***</sup>	
F5	.37 <sup>***</sup>	.45 <sup>***</sup>	.30 <sup>***</sup>	.26 <sup>***</sup>	1.00 <sup>***</sup>
Sample 3					
F1	1.00 <sup>***</sup>				
F2	.49 <sup>***</sup>	1.00 <sup>***</sup>			
F3	.34 <sup>***</sup>	.41 <sup>***</sup>	1.00 <sup>***</sup>		
F4	.00	.08	-.02	1.00 <sup>***</sup>	
F5	.48 <sup>***</sup>	.58 <sup>***</sup>	.34 <sup>***</sup>	-.15	1.00 <sup>***</sup>
Sample 4					
F1	1.00 <sup>***</sup>				
F2	.53 <sup>***</sup>	1.00 <sup>***</sup>			
F3	.36 <sup>***</sup>	.41 <sup>***</sup>	1.00 <sup>***</sup>		
F4	.20	.31 <sup>**</sup>	.26 <sup>**</sup>	1.00 <sup>***</sup>	
F5	.49 <sup>***</sup>	.29 <sup>***</sup>	.31 <sup>**</sup>	.26 <sup>**</sup>	1.00 <sup>***</sup>

*Note.* F1 = Disagreeableness, F2 = Emotional Instability, F3 = Introversion/Detachment, F4 = Compulsivity, F5 = Oddity. <sup>\*\*\*</sup>  $p < .001$ ; <sup>\*\*</sup>  $p < .01$ ; <sup>\*</sup>  $p < .05$ .

Table 3

*ESEM Standardized Factor Loadings of the DIPSI and Oddity Facets: Sample 1 (Community Children; Self-Ratings) and Sample 2 (Community Adolescents; Self-Ratings)*

Facets	Sample 1					Sample 2				
	F1	F2	F3	F4	F5	F1	F2	F3	F4	F5
EXPR	<b>.73</b> <sup>***</sup>	.15 <sup>*</sup>	-.15	.27 <sup>*</sup>	.08	<b>.57</b> <sup>***</sup>	.03	-.02	.50 <sup>***</sup>	.00
ACTI	<b>.63</b> <sup>***</sup>	.23	-.07	.02	.03	<b>.61</b> <sup>***</sup>	.14 <sup>**</sup>	-.26 <sup>***</sup>	.19	.05
DOMI	<b>.74</b> <sup>***</sup>	-.10	-.03	.19	.18	.51 <sup>***</sup>	-.16 <sup>***</sup>	.09	<b>.56</b> <sup>***</sup>	.08 <sup>*</sup>
IMPU	<b>.41</b> <sup>***</sup>	-.03	.33 <sup>*</sup>	.09	.25 <sup>*</sup>	<b>.70</b> <sup>***</sup>	.15 <sup>***</sup>	-.03	-.06	.14 <sup>**</sup>
IRRI	.36 <sup>*</sup>	.16	<b>.46</b> <sup>**</sup>	-.06	.18	<b>.42</b> <sup>***</sup>	.30 <sup>***</sup>	.17 <sup>**</sup>	.11	.13 <sup>*</sup>
DISO	<b>.63</b> <sup>***</sup>	.04	.23	-.22	.06	<b>.67</b> <sup>***</sup>	.09 <sup>*</sup>	.13 <sup>*</sup>	-.27 <sup>**</sup>	.12 <sup>**</sup>
DIST	<b>.48</b> <sup>**</sup>	.16	.32	-.19	-.06	<b>.59</b> <sup>***</sup>	.25 <sup>***</sup>	.20 <sup>***</sup>	-.11	.03
RISK	<b>.48</b> <sup>***</sup>	.05	.03	.16	.26 <sup>*</sup>	<b>.61</b> <sup>***</sup>	.00	-.04	.06	.25 <sup>***</sup>
NARC	<b>.52</b> <sup>**</sup>	-.04	-.10	.24	.32 <sup>*</sup>	.32 <sup>**</sup>	-.15 <sup>***</sup>	.14 <sup>**</sup>	<b>.57</b> <sup>***</sup>	.15 <sup>**</sup>
LABI	<b>.48</b> <sup>**</sup>	.21	.14	-.11	.31	.23 <sup>***</sup>	<b>.47</b> <sup>***</sup>	.00	.03	.28 <sup>***</sup>
RESI	<b>.56</b> <sup>***</sup>	-.18	.37 <sup>*</sup>	.03	.10	<b>.62</b> <sup>***</sup>	-.08 <sup>*</sup>	.37 <sup>***</sup>	.01	.06
EMPA	.28	-.36	<b>.64</b> <sup>***</sup>	-.03	.14	.36 <sup>***</sup>	-.16 <sup>***</sup>	<b>.64</b> <sup>***</sup>	.09	.03
DEPE	.33 <sup>**</sup>	<b>.47</b>	.31	.10	-.10	.30 <sup>***</sup>	<b>.60</b> <sup>***</sup>	.05	.18 <sup>**</sup>	-.14 <sup>***</sup>
ANXI	.07	<b>.55</b>	.21 <sup>***</sup>	.32 <sup>***</sup>	.05	-.06 <sup>*</sup>	<b>.81</b> <sup>***</sup>	.02	.10 <sup>*</sup>	.05
SELF	-.05	<b>.51</b>	.47	.01	.13	-.04	<b>.81</b> <sup>***</sup>	.12 <sup>*</sup>	-.03	-.02
ATTA	.16	<b>.42</b>	.28	.27 <sup>**</sup>	-.07	.15 <sup>*</sup>	<b>.40</b> <sup>***</sup>	.09	.27 <sup>***</sup>	-.05
SUBM	.02	.19	<b>.60</b> <sup>*</sup>	.10	.02	.12 <sup>**</sup>	<b>.49</b> <sup>***</sup>	.22 <sup>***</sup>	.03	.01
STRE	.12	<b>.68</b> <sup>***</sup>	.05	.09	.21	.04	<b>.75</b> <sup>***</sup>	-.11 <sup>**</sup>	.13 <sup>***</sup>	.08
SEPA	.17	.22	<b>.46</b>	.20	-.06	.11 <sup>**</sup>	<b>.54</b> <sup>**</sup>	.09	.00	.12 <sup>*</sup>
DEPR	.13	.36	<b>.42</b>	.14	.14	.08	<b>.66</b> <sup>***</sup>	.15 <sup>**</sup>	.08 <sup>**</sup>	.17 <sup>**</sup>
FLEX	.26 <sup>*</sup>	.15	<b>.53</b> <sup>*</sup>	.23 <sup>*</sup>	.02	.13	.27 <sup>***</sup>	.26 <sup>***</sup>	<b>.34</b> <sup>***</sup>	.21 <sup>***</sup>
SHYN	-.02	.02	<b>.80</b> <sup>***</sup>	.06	.07	-.14 <sup>*</sup>	.23 <sup>**</sup>	<b>.62</b> <sup>***</sup>	.00	.13 <sup>**</sup>
PARA	-.23 <sup>*</sup>	.18	<b>.69</b> <sup>**</sup>	.07	.24 <sup>*</sup>	-.10	.38 <sup>***</sup>	<b>.62</b> <sup>***</sup>	.06	.09 <sup>**</sup>
WITH	.02	.15	<b>.58</b> <sup>**</sup>	.20 <sup>*</sup>	.19	.00	.34 <sup>***</sup>	<b>.53</b> <sup>***</sup>	.13	.15 <sup>***</sup>
PERF	.09	.05	.10	<b>.83</b> <sup>***</sup>	-.03	-.11	.18 <sup>***</sup>	-.02	<b>.80</b> <sup>***</sup>	.05
ACHI	.11	-.07	-.10	<b>.67</b> <sup>***</sup>	.21	.01	.14 <sup>***</sup>	-.02	<b>.66</b> <sup>***</sup>	.06
ORDE	-.15	.06	.11	<b>.68</b> <sup>***</sup>	-.07	-.34 <sup>**</sup>	.10 <sup>*</sup>	.13 <sup>*</sup>	<b>.67</b> <sup>***</sup>	.00
SENS	.00	<b>.52</b> <sup>**</sup>	-.08	-.03	.51	-.05	.36 <sup>***</sup>	-.26 <sup>***</sup>	.05	<b>.58</b> <sup>***</sup>
EXFAN	.01	-.15	.11	.17	<b>.72</b> <sup>***</sup>	-.05	-.04	.17 <sup>***</sup>	.11 <sup>**</sup>	<b>.67</b> <sup>***</sup>
DAYDR	.17	.20	.08	-.19 <sup>*</sup>	<b>.68</b> <sup>***</sup>	.11 <sup>*</sup>	.15 <sup>***</sup>	-.01	-.11 <sup>***</sup>	<b>.75</b> <sup>***</sup>
ODDTB	.07	.03	-.06	.06	<b>.84</b> <sup>***</sup>	.01	-.15 <sup>***</sup>	.05	.05	<b>.88</b> <sup>***</sup>

*Note.* Primary loadings are marked in bold. EXPR = Hyperexpressive traits; ACTI = Hyperactive traits, DOMI = Dominance-Egocentrism; IMPU = Impulsivity; IRRI = Irritable-Aggressive traits; DISO = Disorderliness; DIST = Distraction; RISK = Risk behavior; NARC = Narcissistic traits; LABI = Affective lability; RESI = Resistance; EMPA = Lack of empathy; DEPE = Dependency; ANXI = Anxious traits; SELF = Lack of self-confidence; ATTA =

Insecure attachment; SUBM = submissiveness; STRE = Ineffective coping; SEPA = Separation anxiety; DEPR = Depressive traits; FLEX = Inflexibility; SHYN = Shyness; PARA = Paranoid traits; WITH = Withdrawn traits; PERF = Perfectionism; ACHI = Extreme achievement striving; ORDE = Extreme order; SENS = Oversensitivity to feelings; EXFA = Extreme fantasy; DAYD = Daydreaming; ODDTB = Odd thoughts and behavior. \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ .

Table 4  
*ESEM Standardized Factor Loadings of the DIPSI and Oddity Facets: Sample 3 (Community Children; Mother-Ratings) and Sample 4 (Incarcerated Adolescents; Self-Ratings)*

Facets	Sample 3					Sample 4				
	F1	F2	F3	F4	F5	F1	F2	F3	F4	F5
EXPR	<b>.84</b> <sup>***</sup>	.02	-.02	.01	.12 <sup>**</sup>	.05	.19 <sup>***</sup>	-.04	-.02	<b>.84</b> <sup>***</sup>
ACTI	<b>.61</b> <sup>***</sup>	.21 <sup>**</sup>	-.16 <sup>**</sup>	-.20	.14	<b>.56</b> <sup>***</sup>	.16	-.25 <sup>***</sup>	.10	.29 <sup>**</sup>
DOMI	<b>.92</b> <sup>***</sup>	-.03	.12 <sup>**</sup>	.06	-.08 <sup>*</sup>	.35 <sup>***</sup>	-.19 <sup>**</sup>	.06	.16 <sup>*</sup>	<b>.64</b> <sup>***</sup>
IMPU	<b>.50</b> <sup>***</sup>	.17 <sup>*</sup>	.02	-.35 <sup>**</sup>	.24 <sup>**</sup>	<b>.81</b> <sup>***</sup>	.04	.08	.03	-.05
IRRI	<b>.43</b> <sup>***</sup>	.40 <sup>**</sup>	.23 <sup>*</sup>	-.16 <sup>*</sup>	-.03	<b>.63</b> <sup>***</sup>	.20 <sup>*</sup>	.13	.04	-.03
DISO	.23 <sup>*</sup>	.37 <sup>***</sup>	-.04	<b>-.52</b> <sup>***</sup>	.14	<b>.57</b> <sup>***</sup>	.30 <sup>***</sup>	.04	-.39 <sup>***</sup>	.15 <sup>*</sup>
DIST	.20 <sup>*</sup>	.46 <sup>***</sup>	.06	<b>-.50</b> <sup>***</sup>	.18	<b>.55</b> <sup>***</sup>	.38 <sup>***</sup>	.02	-.18 <sup>*</sup>	.06
RISK	<b>.57</b> <sup>***</sup>	-.03	.02	-.12	.27 <sup>**</sup>	<b>.83</b> <sup>***</sup>	-.08	.02	.11	.07
NARC	<b>.80</b> <sup>***</sup>	-.02	.07	.18 <sup>*</sup>	.05	-.10	-.01	.10 <sup>*</sup>	.04	<b>.86</b> <sup>***</sup>
LABI	.29 <sup>***</sup>	<b>.49</b> <sup>***</sup>	.17 <sup>*</sup>	-.11	.12	<b>.54</b> <sup>***</sup>	.35 <sup>***</sup>	.07	.15	-.05
RESI	<b>.52</b> <sup>***</sup>	-.07	.42 <sup>***</sup>	-.15 <sup>**</sup>	.12 <sup>*</sup>	<b>.57</b> <sup>***</sup>	-.04	.21 <sup>**</sup>	-.13	.30 <sup>***</sup>
EMPA	.35 <sup>***</sup>	-.02	<b>.68</b> <sup>***</sup>	-.04	.08 <sup>*</sup>	.20 <sup>*</sup>	-.23 <sup>*</sup>	<b>.55</b> <sup>***</sup>	-.07	.34 <sup>***</sup>
DEPE	.08	<b>.71</b> <sup>***</sup>	.10	-.10	.05	.05	<b>.76</b> <sup>***</sup>	.00	-.10	.25 <sup>***</sup>
ANXI	-.06	<b>.86</b> <sup>***</sup>	.10	.10 <sup>*</sup>	.04	.11 <sup>*</sup>	<b>.66</b> <sup>***</sup>	.10	.31 <sup>***</sup>	-.03
SELF	-.07	<b>.92</b> <sup>***</sup>	.03	.04	-.03	-.01	<b>.87</b> <sup>***</sup>	.12	-.07	-.03
ATTA	.13 <sup>**</sup>	<b>.63</b> <sup>***</sup>	.06	.04	.10	-.04	<b>.53</b> <sup>***</sup>	-.22 <sup>*</sup>	.08	.22 <sup>*</sup>
SUBM	-.04	<b>.51</b> <sup>***</sup>	.13	.01	.27 <sup>**</sup>	.00	<b>.62</b> <sup>***</sup>	.24 <sup>*</sup>	.02	.14 <sup>*</sup>
STRE	.17 <sup>***</sup>	<b>.74</b> <sup>***</sup>	-.03	-.04	.09	.23 <sup>**</sup>	<b>.63</b> <sup>***</sup>	.03	.20 <sup>**</sup>	.01
SEPA	.05	<b>.66</b> <sup>***</sup>	.05	.03	-.03	.01	<b>.81</b> <sup>***</sup>	-.06	.02	-.06
DEPR	.07	<b>.51</b> <sup>***</sup>	.33 <sup>***</sup>	.02	.13	.13	<b>.64</b> <sup>***</sup>	.14 <sup>*</sup>	.11	-.11 <sup>*</sup>
FLEX	.27 <sup>***</sup>	<b>.34</b> <sup>***</sup>	.30 <sup>***</sup>	.09	.20 <sup>**</sup>	.29 <sup>***</sup>	.26 <sup>**</sup>	<b>.31</b> <sup>***</sup>	.22 <sup>***</sup>	.18 <sup>**</sup>
SHYN	-.06	.37 <sup>**</sup>	<b>.60</b> <sup>***</sup>	.11 <sup>**</sup>	.17 <sup>***</sup>	-.11 <sup>*</sup>	.48 <sup>**</sup>	<b>.57</b> <sup>***</sup>	.06	.11
PARA	.00	.41 <sup>***</sup>	<b>.51</b> <sup>***</sup>	.08	.16 <sup>***</sup>	.14 <sup>*</sup>	.22	<b>.54</b> <sup>***</sup>	.24 <sup>**</sup>	.06
WITH	-.04	.34 <sup>**</sup>	<b>.55</b> <sup>***</sup>	.02	.12	.24 <sup>*</sup>	.18	<b>.48</b> <sup>***</sup>	.17 <sup>*</sup>	-.14 <sup>*</sup>
PERF	.36 <sup>**</sup>	.37 <sup>*</sup>	-.06	<b>.53</b> <sup>***</sup>	.11 <sup>*</sup>	.13 <sup>*</sup>	.10	.03	<b>.54</b> <sup>***</sup>	.38 <sup>**</sup>
ACHI	.42 <sup>***</sup>	.32 <sup>*</sup>	-.11	<b>.53</b> <sup>***</sup>	-.06	.08	.04	.05	.30 <sup>**</sup>	<b>.51</b> <sup>***</sup>
ORDE	.11	.19	.26 <sup>**</sup>	<b>.55</b> <sup>***</sup>	.08	-.05	.17	.12	<b>.66</b> <sup>***</sup>	.13
SENS	.07	.41 <sup>***</sup>	-.36 <sup>***</sup>	.18	<b>.45</b> <sup>***</sup>	.12	<b>.69</b> <sup>***</sup>	-.13	.11	.06
EXFAN	-.03	-.01	.04	.10 <sup>**</sup>	<b>.81</b> <sup>***</sup>	-.01	<b>.64</b> <sup>***</sup>	.12	.08	.08
DAYDR	-.14 <sup>**</sup>	.15 <sup>**</sup>	.03	-.18 <sup>**</sup>	<b>.73</b> <sup>***</sup>	.27 <sup>**</sup>	<b>.57</b> <sup>***</sup>	.12	.04	-.06
ODDTB	.10 <sup>**</sup>	-.14 <sup>***</sup>	.05	.00	<b>.93</b> <sup>***</sup>	.18	<b>.44</b> <sup>***</sup>	.13	.04	.22 <sup>*</sup>

Note. Primary loadings are marked in bold. EXPR = Hyperexpressive traits; ACTI = Hyperactive traits, DOMI = Dominance-Egocentrism; IMPU = Impulsivity; IRRI = Irritable-Aggressive traits; DISO = Disorderliness; DIST = Distraction; RISK = Risk behavior; NARC = Narcissistic traits; LABI = Affective lability; RESI = Resistance; EMPA = Lack of empathy; DEPE = Dependency; ANXI = Anxious traits; SELF = Lack of self-confidence; ATTA =

Insecure attachment; SUBM = submissiveness; STRE = Ineffective coping; SEPA = Separation anxiety; DEPR = Depressive traits; FLEX = Inflexibility; SHYN = Shyness; PARA = Paranoid traits; WITH = Withdrawn traits; PERF = Perfectionism; ACHI = Extreme achievement striving; ORDE = Extreme order; SENS = Oversensitivity to feelings; EXFA = Extreme fantasy; DAYD = Daydreaming; ODDTB = Odd thoughts and behavior. \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ .

Table 5  
 Measurement Invariance: Multi-Group ESEM Fit Indices for the DIPSI and Oddity Five-Factor Structure Across Age, Informants and Clinical Status

Model description	$\chi^2$	Correction	df	$\Delta\chi^2$	$\Delta df$	p	SRMR	RMSEA	CFI	$\Delta RMSEA$	$\Delta CFI$
<b>Age</b>											
Model 1	1997.41	1.05	640				.030	.076	.899		
Model 2	2078.19	1.11	770	149.08	130	.12	.040	.068	.903	-.008	.004
Model 3	2146.63	1.11	796	68.44	26	.00	.040	.068	.900	.000	.003
<b>Informants</b>											
Model 1	2216.40	1.07	640				.030	.093	.880		
Model 2	2371.24	1.14	770	223.40	130	.00	.048	.086	.878	-.007	-.002
Model 3	2862.91	1.07	796	359.00	26	.00	.058	.096	.842	.010	-.036
<b>Clinical status</b>											
Model 1	2061.29	1.08	640				.029	.073	.911		
Model 2	2318.49	1.12	770	281.34	130	.00	.044	.069	.903	-.004	-.008
Model 3	2782.29	1.11	796	604.09	26	.00	.050	.077	.875	.008	-.028

Note. The fit index  $\chi^2$  refers to the Satorra-Bentler scaled chi-square. Correction refers to the scaling correction factor for the maximum likelihood robust estimator (MLR). This estimator was used to control for non-normal data with missings. The fit index  $\Delta\chi^2$  refers to the Satorra-Bentler scaled difference chi-square test statistic and was used because we relied on the MLR estimator.  $\Delta$ , delta (difference); SRI Standardized Root Mean square Residual; RMSEA, Root Mean Square of Error of Approximation; CFI, Comparative Fit Index. Model 1 = Configural invariance, Model 2 = Metric invariance; Model 3 = Scalar invariance.



## Chapter 5

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# The relevance of schizotypal traits for understanding interpersonal functioning in adolescents with psychiatric problems<sup>1</sup>

### Abstract

Social relationships are considered highly important throughout adolescence (Kenny et al., 2013), both for the further development and consolidation of identity, social roles and skills. The schizotypal personality disorder (STPD) has a strong negative impact on these relationships with both parents and peers (Hengartner et al., 2014; Cramer et al., 2006a), and can thus be considered as a risk factor for early maladaptive social functioning. The current study focuses on the relevance of different dimensional STPD traits for understanding social functioning, by examining their unique associations with global and more specific parental and peer relationship characteristics in a group of referred late-adolescents ( $N=205$ , mean age = 20.27). Negative schizotypal traits, assessed by the DSM-5 (APA, 2013) STPD traits Restricted affectivity, Withdrawal and Suspiciousness (Krueger et al., 2012) appeared to be a unique predictor for less maternal and peer social support. Positive schizotypal traits were measured with the age-specific Oddity trait scale (Verbeke & De Clercq, 2014) and proved to be a unique predictor beyond negative schizotypal traits for negative interactions with adolescents' mother and a best friend. These results

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<sup>1</sup>Verbeke, L., De Clercq, B., Van der Heijden, P., Hutsebaut, J., & van Aken, M. (in press). *Personality Disorders: Theory, Research and Treatment*.

highlight the heterogeneous nature of the STPD construct and suggest that a dimensional description may contribute to a more detailed understanding of how the STPD relates to poor interpersonal relationship quality in vulnerable adolescents.

## Introduction

Adolescence is generally considered a critical period for social development (La Greca & Harrison, 2005), consisting of core developmental tasks that are indispensable for further psychological growth towards adulthood (DeHart, Stroufe, & Cooper, 2004). Parents (Sheeber, Davis, Leve, Hops, & Tildesley, 2007) and peers (Brown & Klute, 2003; La Greca & Harrison, 2005) are of crucial importance during this period, since relationship quality with these key figures has a large impact on adolescents' mental health (Kenny, Dooley, & Fitzgerald, 2013). The presence of maladaptive personality characteristics may signify a major threat for the quality of these social relationships, as shown in multiple studies indicating the strong association of personality pathology with poor interpersonal functioning (Cramer, Torgersen, & Kringlen, 2006a; Hengartner, Müller, Rodgers, Rössler, & Ajdacic-Gross, 2014; Chen et al., 2006). Across all DSM-5 (APA, 2013) personality disorders (PDs), the eccentric Cluster A PDs show the strongest negative correlations with quality of contact with family and friends (Cramer et al., 2006a). Within this Cluster A, the schizotypal PD (STPD) is most strongly related to problems in social interactions with different attachment figures (Hengartner et al., 2014), implicating that STPD-related pathology may signify one of the most detrimental PDs for adolescents.

Most studies have approached STPD as a unitary and categorical construct, consisting of a broad set of symptoms (APA, 2013). A compelling amount of studies, however, has already convincingly demonstrated that the heterogeneity of schizotypal symptoms is best captured in a

multidimensional structure (e.g. Gross, Mellin, Silvia, Barrantes-Vidal, & Kwapil, 2014; Kwapil, Barrantes-Vidal, & Silvia, 2008; Vollema & van den Bosch, 1995), including a “positive” and a “negative” dimension. The positive schizotypy dimension is reflecting aberrant mental activity (e.g. ideas of reference), whereas the negative symptoms comprise social anhedonia and dysfunction (APA, 2013). In order to fully understand the significance of schizotypal pathology in interactions within the close network of adolescents, research that examines the specific and unique relevance of both components is needed. The present study focuses on this unique role of both positive and negative STPD characteristics in understanding various aspects of relational functioning with both parents and peers in a sample of late adolescents with a referred status.

### **Cluster A Personality Pathology and Social Functioning**

Problematic social interactions are essential to all personality disorders (Hengartner et al., 2014) and are therefore explicitly mentioned as a diagnostic criterion (Criterion A) for a PD diagnosis in the current DSM-5 (APA, 2013). However, very few studies have examined the association of PDs with specific aspects of interpersonal functioning (Hengartner et al., 2014). Several studies in adults have addressed this issue more indirectly by use of the broad construct of “quality of life”, since all quality of life conceptualizations systematically cover social dimensions (Hornquist, 1982; Aaronson, 1988). Other studies have approached interpersonal functioning in PDs as an aspect of “functional impairment” (Skodol et al., 2005). Across all conceptualizations of interpersonal functioning, Cluster A personality pathology appears to be one of the strongest correlates of problematic

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close relationships (Cramer et al., 2006a, 2006b; Hengartner et al., 2014). Skodol and colleagues (2005) specifically stated that patients with a Cluster A PD experience more severe impairment in social relationships than patients with borderline, avoidant or obsessive-compulsive personality disorder. More specifically, quality of life studies have demonstrated that the three Cluster A PDs are all significant negative predictors of a variety of social quality of life indicators, such as contact with family of origin and social support in case of illness (Cramer et al., 2006a, 2006b). Examining more specific aspects of interpersonal functioning, Hengartner and colleagues (2014) demonstrated that all three Cluster A disorders are related to living alone, distress and conflicts in friendships, and having no partner or experiencing distress in partnership (Hengartner et al., 2014).

Although Cluster A PDs share a common ground and are to some extent all associated with problematic social interactions, some notable differences have also been observed, with the most pronounced effects for STPD. For example, in the study of Hengartner et al. (2014), the STPD is the only Cluster A disorder that was negatively associated with all indicators of interpersonal functioning and was additionally predictive for not being married or having children, feeling lonely and having conflicts with a partner. These findings led the authors to conclude that schizotypal symptoms are among the most destructive traits for establishing adequate interpersonal relationships. In a related vein, also Cramer and colleagues (2006a) suggested that strongest reduction of quality of life in contact with friends and family of origin was observed for the STPD.

From a developmental perspective on the relationship between STPD and interpersonal function, similar research is rather scarce, although Chen et al. (2006) demonstrated that schizotypal traits in late adolescence are the only Cluster A predictor of reduced social quality of life more than ten years later. A few other studies confirmed that youth with STPD symptoms are experiencing a wide range of social difficulties. In a study of Mittal, Tessner and Walker (2007), adolescents diagnosed with STPD reported significantly less social interactions with friends in real life, but engaged more in social interactions on the internet compared with a control group of adolescents diagnosed with a different PD including other Cluster A PDs. These results may point to the fact that adolescents with STPD are socially motivated but experience an interpersonal inconvenience in real-life situations. Moreover, adolescents with schizotypal traits appear to be more at risk to be confronted with different forms of peer victimization (Fung & Raine, 2012).

### **Positive Versus Negative Schizotypal Traits**

Categorical PD research does not make a distinction between positive and negative STPD symptoms, but considers the STPD as a unitary construct (APA, 2013). Several studies have adopted a more dimensional approach on schizotypal traits by using the dimensional schizotypy construct (Tiliopoulos & Goodall, 2009; Cohen & Davis, 2009; Abbott & Byrne, 2012) or other dimensional schizotypal trait factors (Keeley, Flanagan, & McCluskey, 2014) that allow for a more fine-tuned description of STPD traits. The construct of “schizotypy” is widespread in the literature and is considered as a vulnerability for schizophrenia spectrum disorders, including the schizotypal personality disorder. Schizotypy is usually conceptualized as a continuum of

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schizophrenia spectrum-like abnormalities, ranging from non-clinical manifestations to Cluster A personality pathology, to full-blown psychosis (Kwapil, Barrantes-Vidal, & Silvia, 2008). Empirical evidence has repeatedly pointed to a multidimensional structure of schizotypy (Gross et al., 2014), with positive and negative schizotypy as most consistently replicated factors (Kwapil, 2008; Kwapil, Ros-Morente, Silvia, & Barrantes-Vidal, 2012). Several authors have used these dimensions of positive and negative schizotypy in order to investigate the unique influence of both symptom groups on several indices of functioning (Dinn, Harris, Aycicegi, Greene, & Andover, 2002; Kwapil et al., 2008), including interpersonal relationships with family and friends. In this vein, Cohen and Davis (2009) demonstrated that the negative schizotypy symptoms showed the most striking unique contribution to problematic interactions with parents and peers. These results were replicated in a study of Abbott and Byrne (2012) in a sample of university students, and also in an experience sampling study with undergraduate students, negative schizotypy was characterized by social disinterest as reflected in the associations of negative schizotypal traits with greater social distance to others, feelings of less closeness and the desire to be alone (Kwapil, Brown, Silvia, Myin-Germeys, & Barrantes-Vidal, 2012).

Beyond this consensus on the role of negative symptoms in poor interpersonal relationship quality, also positive schizotypal symptoms may contribute to difficulties in relationships with parents and peers. People high on positive schizotypy experience a social ambivalence, that can be understood from the association of positive schizotypy with an increased desire to be alone when with others but also with an increased desire to be

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with others when alone (Kwapil et al., 2012). Wolff (1991) stated that positive schizotypal symptoms of odd or eccentric behavior may hamper relations with peers in adolescence, and Mittal et al. (2007) suggest that next to negative schizotypal symptoms, also other STPD symptoms at a young age such as irregular and limited gesturing (Mittal et al., 2006), motor abnormalities (Walker, Lewis, Loewy, & Palyo, 1999; Mittal, Dhruv, Tessner, Walder, & Walker, 2007) and problems in interpreting non-verbal cues (Logan, 1999), may complicate adequate interpersonal functioning. Recent studies confirm that both schizotypy dimensions are associated with poorer social functioning (Kwapil et al., 2008; Kwapil, Gross, Silvia, Barrantes-Vidal, 2013), although only negative schizotypy was predictive for social indicators that are specifically related to closeness in relationships. Also from a DSM-5 trait perspective, there is some evidence that positive-like schizotypal traits are uniquely related to communication difficulties. The higher-order Psychoticism trait, in DSM-5 Section III proposed for the assessment of positive STPD symptoms (APA, 2013), proved to be a very robust predictor of impairment in communication in a clinical sample of adults (Keeley, Flanagan, & McCluskey, 2014).

In sum, most studies on the association of schizotypal features and interpersonal functioning highlight the relevance of negative STPD symptoms (Cohen & Davis, 2009; Abbott & Byrne, 2012; Henry, Bailey, & Rendell, 2008), although preliminary evidence suggests that also positive STPD symptoms significantly contribute to problematic social interactions (Mittal et al., 2007; Keeley et al., 2014). The current study aims to elaborate the specific associations of different STPD traits with both parental and peer



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relationships in adolescence, by focusing on particular relational features, as suggested by Hengartner et al. (2014).

### **The Current Study**

In line with several studies that have adopted the “quality of life” construct in examining the association of STPD traits and interpersonal interactions (Cramer et al., 2006a; 2006b; Cohen & Davis, 2009; Abbott & Byrne, 2012), the current study will explore in a first step the unique associations between positive versus negative STPD symptoms and parental/peer relationships. In a second step, also more specific relationship characteristics with these attachment figures will be explored, including both positive parental and peer interactions (i.e. attachment, caregiving and affiliation behavior) and negative interactions (i.e. criticism, conflicts and antagonism) with parents and peers, in order to obtain a more detailed understanding on the association of schizotypal symptoms with these important social interactions in adolescents’ daily lives. Starting from the STPD conceptualization in the hybrid DSM-5 personality pathology (APA, 2013) model, negative STPD traits will be assessed by the proposed DSM-5 facets Restricted affectivity, Withdrawal and Suspiciousness, as recent evidence demonstrated the general applicability of the DSM-5 trait model in adolescents (De Clercq, De Fruyt, De Bolle, Van Hiel, Markon, & Krueger, 2014). Psychometric properties of the higher-order Psychoticism trait, however, assessing positive schizotypal characteristics (APA, 2013), behaved differently in a younger age group compared to adult findings (Krueger, Derringer, Markon, Watson, & Skodol, 2012). This finding has led the authors to conclude that the DSM-5 Psychoticism trait factor may not be

fully developmentally appropriate (De Clercq et al., 2014). Therefore, positive schizotypal characteristics will be measured by relying on the recently developed Oddity trait scale (Verbeke & De Clercq, 2014) of the Dimensional Personality Symptom Itempool (DIPSI; De Clercq, De Fruyt, Van Leeuwen, & Mervielde, 2006), an age-specific maladaptive trait instrument. In order to get more insight in the unique associations of STPD symptomatology with parental and peer relationship characteristics, the incremental validity of both negative and positive symptoms above and beyond each other will be explored. We expect unique incremental effects of both symptom groups in the prediction of interpersonal functioning with parents and peers.

## **Method**

### **Participants and Procedures**

Participants ( $N=223$ , 69.5% females) were recruited from two mental health institutes in the Netherlands, which are the 'Centre for Adolescent Psychiatry, Reinier Van Arkelgroep Den Bosch' and 'De Viersprong, The Netherlands Institute for personality disorders'. Most participants were referred by their general practitioner for assessment and treatment of psychiatric problems. All participants were asked to participate in the present study at the moment of admission. After receiving a description of the study, patients from Reinier Van Arkelgroep received an information letter with a personal login code that provided access to a protected online assessment platform. If patients from De Viersprong approved to participate, their email address was passed to the research coordinator at Ghent University, who subsequently e-mailed them a unique login code to

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enter the online questionnaires. Approximately 750 patients were invited to participate in the present study of which 223 patients actually logged in on our assessment platform (response rate of 29.73%).

Patients with an IQ below 85 were a priori excluded. Because the present study focused on a sample of late adolescents and young adults, we also excluded all participants younger than 16 ( $n=7$ ) and older than 24 ( $n=11$ ) for further analyses, resulting in a sample of 205 participants with 69.8% girls. The age of the remaining participants ranged between 16 and 24 years ( $M=20.27$ ,  $SD=2.21$ ). Almost all participants ( $n=197$ , 96.1%) had the Dutch ethnicity, with 3.9% ( $n=8$ ) of the participants reporting a foreign origin. The majority of the participants lived with one or both parents ( $n=130$ , 63.4%), whereas 17.1% ( $n=35$ ) lived alone or with a partner ( $n=10$ , 4.9%). A small group ( $n=15$ , 7.3%) were inpatients, residing at the mental health care institute. Finally, 7.3% ( $n=15$ ) had another living situation, such as living with another family member or in a foster family. Almost half of the participants were at the moment of assessment not enrolled in an education program ( $n=101$ , 49.3%), whereas 67 participants (32.8%) were enrolled in a secondary school program. Finally, 36 participants were following a professional ( $n=27$ , 13.2%) or academic ( $n=9$ , 4.4%) higher-education program. Three fourths of the participants ( $n=157$ , 76.6%) filled out all measures, whereas 48 (23.4%) participants had a missing value at one or more of the measures. The pattern of missing values was estimated by Little's Missing completely at random (MCAR) test, which was not significant.

## Measures

**Cluster A-related personality pathology.** The recently released DSM-5 trait (APA, 2013) measure allows to describe negative schizotypal traits along a dimensional perspective, and proposes three facets that each describe an aspect of negative schizotypal symptoms (Krueger et al., 2012). Restricted affectivity (7 items) is part of the higher-order Negative affect factor and describes a tendency to not experience or express emotions, whereas Withdrawal (10 items) and Suspiciousness (7 items) belong to the higher-order Detachment factor, with Withdrawal reflecting a need to keep distance from other people and Suspiciousness describing a basic mistrust of other people. Cronbach alpha reliabilities for self-reports on these Restricted affectivity, Withdrawal and Suspiciousness facets were acceptable, with values of .79, .91 and .76 respectively.

For the assessment of positive schizotypal traits, the Oddity trait scale (Verbeke & De Clercq, 2014) of the Dimensional Personality Symptom Itempool (DIPSI; De Clercq et al., 2006) was used, which assesses age-specific positive Cluster A-related personality disorder characteristics. This Oddity scale consists of 22 items to be answered on a 5-point Likert scale, that cluster together in four underlying facets (Oversensitivity to feelings, Extreme fantasy, Daydreaming, and Odd thoughts and behavior) and one higher-order Oddity trait factor. Oversensitivity to feelings (4 items) describes behavior that reflects an extreme openness to both inner and others' emotions, leading to overwhelming emotional experiences. Extreme fantasy (5 items) reflects an extreme tendency to indulge in fantasies, and to experience difficulties in differentiating between reality and fantasy. The

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facet Daydreaming (7 items) describes absent-minded feelings, thoughts and behavior that interfere with daily activities, whereas the facet Odd thoughts and behavior (6 items) describes thoughts and behavior that are odd, weird or puzzling to others. Cronbach alpha reliabilities in the current sample were acceptable, with values of .71 (Oversensitivity to feelings), .74 (Extreme Fantasy), .87 (Daydreaming), and .91 (Odd thoughts and behavior).

**Quality of Life – peer and parental relations.** Adolescents' general experience of the quality of their parental and peer relationships was assessed with self-reports on a quality of life measure for youth, the KIDSCREEN-27 (Kidscreen Group Europe, 2006). This instrument originally consists of 27 items on a 5-point Likert scale, with higher scores indicating a better quality of life. For the current study, we only selected the two KIDSCREEN dimensions referring to parental and peer relationships. The dimension Autonomy & Parents consists of 7 items assessing feelings of autonomy, relations with parents and more financial issues. The Social support and Peer relations (4 items) dimension assesses positive interactions with friends. Cronbach alpha reliabilities were adequate, with values of .78 (Autonomy & Parents) and .83 (Social support & Peer relations).

**Parental and peer relationship characteristics.** The Network of Relationships Inventory: Behavioral Systems Version (NRI-BSV; Furman & Buhrmester, 2009) is a 24-item questionnaire that assesses eight features of close relationships. Two scales assess attachment behaviors, two scales describe caregiving behaviors and one scale assesses affiliation behaviors. Next to these positive interactions and social support scales, there are also

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three scales assessing negative interactions of criticism, conflict and antagonism. Furthermore, two broadband factor scales 'Social support' (mean of all positive interactions scales) and 'Negative interactions' (mean of all negative interactions scales) can be calculated. Participants answered all questions three times: one time about their relationship with a mother figure, a second time about their relationship with a father figure and a last time about their relationship with someone that they considered as a 'best friend'. Cronbach alpha reliabilities for the maternal and paternal relationship broadband scales are excellent, with values of .92 and .93 for maternal and paternal Social support respectively, and .96 for both maternal and paternal Negative interactions. Alpha reliabilities for the peer relationship features amounted to .95 for Social support and .89 for Negative interactions.

### **Statistical Analyses**

Bivariate correlations were calculated between negative and positive schizotypal symptoms, as well as between schizotypal characteristics, social indices of quality of life and relationship characteristics. Because the main objective of this study was to get more insight in the unique contribution of negative and positive Cluster A-related symptoms in the prediction of interpersonal functioning, hierarchical regression analyses were conducted, with gender entered as a control variable in a first step, and the positive and negative STPD facets as a second and third block respectively. In a second regression analysis, the order of block 2 and 3 was reversed. Each of these regression analyses were separately run for the KIDSCREEN-27 (Kidscreen Group Europe, 2006) and NRI-BSV (Furman & Buhrmester, 2009) domains as

dependent variables. All correlations between STPD symptoms and constructs of social functioning were corrected for the large amount of tests (i.e. Bonferroni correction).

## Results

### Bivariate Correlations

Table 1 demonstrates the intercorrelations between the negative and positive STPD traits. The negative STPD facet Restricted affectivity is not significantly related to any of the Oddity facets, whereas Withdrawal demonstrates significant positive correlations with the Oddity facets Extreme Fantasy ( $r=.33$ ), Daydreaming ( $r=.37$ ) and Odd thoughts and behavior ( $r=.28$ ) respectively ( $p<.001$ ). Finally, Suspiciousness is most closely related to all Oddity facets, with correlation coefficients of .28 for Oversensitivity to feelings, .35 for Extreme Fantasy, .37 for Daydreaming and .35 for Odd thoughts and behavior ( $p<.001$ ).

Bivariate correlations of the schizotypal facets with the KIDSCREEN-27 dimensions and NRI factors are reported in Table 2. Because of the large amount of tests, only correlations that were still significant after Bonferroni correction will be discussed. The negative STPD facets Withdrawal and Suspiciousness are negatively related to Autonomy & Parents, with correlation coefficients of  $-.26$  and  $-.28$  respectively ( $p<.002$ ), whereas only Withdrawal demonstrates a significant negative association with Social support and peers ( $r=-.39$ ,  $p<.002$ ). The Oddity facets are generally less associated with the KIDSCREEN-27 dimensions, with only Oversensitivity to feelings and Daydreaming demonstrating a significant negative association with Autonomy & Parents. The lower-part of Table 2 reflects the

correlations between the schizotypal facets and the NRI factors for maternal, paternal and peer relationships, and shows that high scores on Restricted affectivity are associated with less maternal support ( $r=-.33$ ,  $p<.002$ ), whereas high scores on Daydreaming and Odd thoughts and behavior are associated with more maternal Negative interactions ( $r=.26$ ,  $p<.002$ ). In the relationship with father, none of the STPD facets is demonstrating a significant association with relationship characteristics. Finally, in the relationship with a peer, Withdrawal is negatively related to peer social support ( $r=-.31$ ,  $p<.002$ ), whereas Odd thoughts and behavior is again significantly correlated with Negative interactions ( $r=.26$ ,  $p<.002$ ). Adolescents with negative schizotypal traits, especially in terms of high Restricted affectivity and Withdrawal, thus experience less social support from attachment figures but these similar traits are not related to more negative interactions. In contrast, positive schizotypal traits appear unrelated to social support, but are associated with more negative interactions with mother and a best friend, especially for high scores on Daydreaming and Odd thoughts and behavior.

### **Hierarchical Regression Analyses**

Table 3 presents the results for the regressions on the KIDSCREEN-27 dimensions Autonomy & Parents and Social support & Peers. For both KIDSCREEN-27 dimensions, gender was not a significant predictor. The Oddity facets were entered in a second step, explaining 10% additional variance in the prediction of Autonomy & Parents and no significant variance in the prediction of Social support and peers. The three negative STPD facets were entered in a third step and explained incremental validity



above and beyond the Oddity facets for both Autonomy & Parents (7%) and Social support & Peers (17%), with Restricted affectivity as a significant negative predictor for Autonomy & Parents ( $\beta=-.20, p<.05$ ) and Withdrawal as significant negative predictor of Social support & Peers ( $\beta=-.44, p<.01$ ). When reversing the sequence of step 2 and 3, the negative STPD facets in step 2 explained for both KIDSCREEN-27 domains additional variance, amounting to 12% for Autonomy & Parents and to 15% for Social support & Peers. The four Oddity facets did not add any incremental variance in the prediction of both KIDSCREEN dimensions in a third step.

Table 4 and 5 present the results of the hierarchical regressions on the NRI relationship quality domains, with Table 4 reflecting the results of the parental relationships and Table 5 including peer relationship characteristics. For the parental NRI domains, gender is only a significant predictor for maternal Negative interactions, with girls reporting higher scores than boys. When the positive STPD facets are added in step 2, they only explain a significant amount of variance for maternal Negative interactions (9%), with Odd thoughts and behavior as a significant predictor ( $\beta=.25, p<.05$ ). The three negative STPD facets in step 3 explain incremental validity above and beyond gender and the positive STPD facets in the prediction of maternal Social support, with Restricted affectivity as a significant negative predictor ( $\beta=-.30, p<.01$ ). Reversing the order of steps 2 and 3, the negative STPD facets predict in step 2 less social support from both mother (11%) and father (7%), with Restricted affectivity as negative predictor ( $\beta=-.31, p<.01$ ) in the prediction of maternal Social support. The four positive STPD facets in step 3 explain additional variance above gender

and the negative STPD facets in the prediction of Negative interactions with the mother (7%), with Odd thoughts and behavior as significant predictor ( $\beta=.24, p<.05$ ).

Regarding the relationship characteristics with a peer (Table 5), gender is a significant predictor for peer Social support (10%), with girls reporting more peer support than boys. When the positive STPD facets are added in step 2, these facets explain an additional 11% of the variance in the prediction of peer Negative interactions, whereas they do not add significant variance in the prediction of peer Social support. The negative STPD facets display an incremental validity in the third step above and beyond gender and the positive STPD facets in the prediction of peer Social support (13%), with Withdrawal as significant negative predictor ( $\beta=-.41, p<.001$ ). Changing the order of steps 2 and 3 demonstrates that the negative STPD facets are a significant predictor of less peer social support in step 2 (10%, Withdrawal  $\beta=-.34, p<.001$ ). The positive STPD facets display an incremental validity in the third step above and beyond gender and the negative STPD facets in the prediction of peer Negative interactions (8%), but none of the specific positive STPD facets appeared to be a significant predictor.

## Discussion

The current study explored whether schizotypal traits are relevant for understanding interpersonal functioning in referred adolescents, and indicates in line with other studies a significant association with impaired relationship quality (Cramer et al., 2006a; Hengartner et al., 2014). In two different ways, the current study expands previous findings in this research

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area. First, the significance of including *different significant attachment figures* has been demonstrated, as schizotypal traits behave differently in the interpersonal context, depending upon the specific relationship type that is explored (i.e. relationship with mother, father or peer). Second, the current results point to the need of specifying the *kind of interaction* (i.e. positive versus negative interactions), given that the small but unique associations of positive and negative schizotypal traits with impaired social functioning flow from different components, with the negative schizotypal traits mainly relating to less positive interactions and the positive schizotypal traits contributing to a higher rate of negative interactions across attachment figures.

### **Schizotypal Traits and Their Associations across Attachment Figures**

The current study confirms previous findings that have pointed to the negative association of adolescent schizotypal traits and parental relationship quality. Moreover, our results underscore the relevance of examining maternal and paternal relationship characteristics separately, since schizotypal traits appear to be only related to the adolescent-mother relationship and are unrelated to paternal relationship characteristics. This finding can possibly be framed within normative developmental attachment pathways that implicate a less secure and more distant attachment style with the father during adolescence (Doyle, Lawford, & Markiewicz, 2009), and would not have been noticed when traditional quality of life measures that subsume parental characteristics in one variable were used. The relevance of a detailed relationship assessment can also be demonstrated at the level of peer relationships, with negative schizotypal traits as significant

negative correlates of overall peer relationship quality, whereas also positive schizotypal traits pop up as a correlate when exclusively focusing on the relationship with a best friend. Adolescents with high positive schizotypal traits hence experience more negative interactions with their best friend, but these same schizotypal traits are not related to social dysfunction in the broader context of peer-functioning.

The significance of each of the more specific STPD facets also showed to be different across attachment figures. Across measures, Restricted affectivity appears to be the unique correlate of impaired parental relationship quality, whereas Withdrawal is the relevant facet for understanding reduced peer relationship quality. Since establishing peer relationships requires a pro-active engagement of an adolescent, it seems not surprising that withdrawn behavior is mainly related to impaired quality of peer relations. In contrast, an adolescent cannot entirely withdraw from the relationship with his or her mother. The mother-child relationship is by definition rather unconditional and is generally considered as an intimate understanding with room for expressing emotionally related issues. The association between (experienced) less social support and the lack of affective expression can be framed from this perspective, with mutual influences between both actors that are involved. It may be the case that, due to the child's restricted affective expression, mothers are no longer able to adequately respond to the need for social support of their child. Vice versa, attachment theory research has demonstrated that children with less responsive and supportive mothers become less emotionally competent (Colle & Del Giudice, 2011), indicating that adolescents' restricted emotional

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pattern in the mother-child relationship rather represents a learning effect of a non-responsive maternal parenting style. Since all dyadic relationships are characterized by mutual influences (Kashy & Kenny, 2000), with interaction partners affecting each other's cognitions, emotions and behaviors, both mother and child probably contribute to this negative interactive process, putting youngsters with negative schizotypal traits at risk for missing the highly important maternal social support at that age.

### **Schizotypal Traits and Their Associations with Different Kinds of Interactions**

Schizotypal traits and relationship characteristics were dimensionally assessed and grouped in conceptually different subcomponents, i.e. positive versus negative schizotypal traits and positive versus negative interactions, with a clear correlation pattern across attachment figures. First, negative schizotypal traits proved to be consistently associated with less experienced positive interactions with the mother and with a best friend. These results are in line with previous studies that have indicated the significant effect of negative schizotypy features in the prediction of less satisfaction with personal relationships (Abbott & Byrne, 2012; Cohen & Davis, 2009). Second, positive STPD traits were consistently related to higher rates of negative interactions, with Odd thoughts and behavior and Oversensitivity to feelings as significant predictors in the relationship with the mother and a best friend respectively.

These findings may imply that the distress and conflicts in social interactions as often reported in the STPD (Hengartner et al., 2014; Cramer et al., 2006a) are in particular connected to the positive schizotypal

symptoms. Evidence for this hypothesis can be found in research demonstrating that positive schizotypal symptoms frequently co-occur with aggressive behavior (Raine, Fung, & Lam, 2011), and are associated with high impulsivity scores (Dinn et al. 2002) and paranoid traits (Kwapil et al., 2012; Barrantes-Vidal, Chun, Myin-Germeys, & Kwapil, 2013), that may drive the high level of conflicts. An explanation for this association has been searched in the underlying cognitive processes that are important for successful social interactions, such as emotion recognition (Moskowitz, 2005). Recent research indicates in this regard that especially positive schizotypal symptoms are associated with difficulties in 'reading' the emotions of others in everyday social interactions, due to perceptual aberrations (Abbott & Byrne, 2013). A cognitive mechanism that flows from these positive STPD symptoms and systematically gives everyday social cues a more negative or hostile connotation may hence be partly responsible for the reported adversarial and aggressive interactions with the mother and a best friend, at least in the adolescents' experience.

### **Schizotypal Trait Assessment**

Although most research on the multidimensional nature of schizotypal personality traits has used established measures of the schizotypy construct, including the Wisconsin Schizotypy Scales (WSS; Chapman et al., 1976, Chapman et al., 1978; Eckblad et al., 1982; Eckblad & Chapman, 1983) and the Schizotypal Personality Questionnaire (SPQ; Raine et al., 1991), the current study has adopted an alternative assessment approach. The assessment of negative schizotypal traits was based on the proposal included in the DSM-5 section 3 (APA, 2013), comprising the three

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facets Restricted affectivity, Withdrawal and Suspiciousness. The allocation of Suspiciousness in the “negative” trait dimension is questionable though, since research with other schizotypy measures has demonstrated that Suspiciousness is also part of the cognitive-perceptual positive schizotypy factor (Gross et al., 2014). Our results confirm this less unidimensional nature of Suspiciousness, since this negative schizotypal trait demonstrates the highest intercorrelations with positive schizotypal facets.

Because the DSM-5 proposal for the assessment of positive schizotypal traits appeared to be developmentally inappropriate (De Clercq et al., 2014), the age-specific Oddity scale (Verbeke & De Clercq, 2014) of the Dimensional Personality Symptom Itempool (DIPSI; De Clercq et al., 2006) was used. Although this scale is considered promising for the assessment of positive schizotypal characteristics in youth (Verbeke & De Clercq; 2014), it should be mentioned that this conceptualization of positive schizotypal traits differs from those of the above-described traditional schizotypy measures. More specifically, the Oddity facets Oversensitivity to feelings and Daydreaming are not presented in other positive schizotypy measures, and may represent developmentally expressions of positive schizotypy traits in adulthood. Moreover, one of the positive schizotypy facets (Odd thoughts and behavior) of the age-specific Oddity scale also conceptually aligns with a third dimension of disorganized behavior that is often used in schizotypy research, which subsumes odd and eccentric behavior and odd speech (Raine, 1991). Previous research has pointed to the significance of these disorganized schizotypal traits for understanding diminished relationship quality (Abbott & Byrne, 2012; Cohen & Davis,

2009). Although the currently used scale structures the facet of Odd thoughts and behavior differently compared to adult schizotypy taxonomies, the results confirm its relevance in describing interpersonal conflicts as they help to explain negative interactions with mother.

### **Limitations and Directions for Future Research**

Several limitations have to be taken into account when interpreting the current data. First, only the perspective of the adolescent was assessed, resulting in an exclusive assessment of the adolescents' subjective experiences that may be biased by their psychopathological status. Second, the present findings are cross-sectional and do not provide causal evidence on the influence of schizotypal traits on parental and peer relationships. Third, we did not include relationship characteristics with a romantic partner that may also play an important role at this age (Shulman & Scharf, 2000), and would have provided a more inclusive picture on adolescent STPD traits and relational functioning. Future studies may address this issue from a longitudinal perspective, as it can be hypothesized that early STPD symptoms may have a negative impact on this adolescent romantic relationship quality, and form the roots of negative relational functioning in adult couples, as recently described in a sample of married couples (South, 2014). Fourth, the current study did not take into account co-occurring psychopathology such as depression that may also influence peer and parental relationship quality (Enfoux et al., 2013). Finally, it may be interesting to further elaborate the adolescent-father relationship in adolescents with vulnerable trait profiles and to explore the potential interaction effect between negative and positive schizotypal traits. In this



regard, recent work has pointed to crucial interactions between schizotypy dimensions during adolescent development (Debbané & Barrantes-Vidal, 2015). Although we did not investigate these interaction effects because of the limited sample size in the current study, this may be a highly promising avenue for future work.

### **Conclusion**

The results of the current study suggest that STPD traits may play a role in the dyadic interactions between late adolescents and their mothers and friends. By assessing specific aspects of parental and peer relationship characteristics, we were able to delineate more detailed associations of both negative and positive STPD traits with experienced relationship quality across different attachment figures. Whereas the social-inhibited STPD traits are associated with the experience of less positive interactions, odd and eccentric traits appear to be particularly relevant for the understanding of negative social interactions within the close network of a group of vulnerable adolescents. These results also underscore the relevance of a comprehensive maladaptive trait assessment in terms of STPD traits, since different STPD subcomponents appear to independently contribute to social maladjustment.

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## References

- Aaronson, N.K. (1988). Quantitative issues in health-related quality of life assessment. *Health Policy, 10*, 217-230. Doi: 10.1016/0168-8510(88)90058-9
- Abbott, G.R., & Byrne, L. K. (2012). Schizotypy and subjective well-being in university students. *Psychiatry Research, 196*, 154-156.
- Abbott, G.R., & Byrne, L. K. (2013). Schizotypal traits are associated with poorer identification of emotions from dynamic stimuli. *Psychiatry Research, 207*, 40-44.
- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5<sup>th</sup> ed.). Arlington, VA.
- Barrantes-Vidal, N., Chun, C.A., Myin-Germeys, I., & Kwapil, T.R. (2013). Psychometric schizotypy predicts psychotic-like, paranoid, and negative symptoms in daily life. *Journal of Abnormal Psychology, 122*, 1077-1087. Doi: 10.1037/a0034793
- Bourdeau, G., Masse, M., & Lecomte, T. (2012). Social functioning in early psychosis: are all the domains predicted by the same variables? *Early Intervention in Psychiatry, 6*, 317-321. Doi: <http://dx.doi.org/10.1111/j.1751-7893.2011.00337.x>.
- Brown, B. B., & Klute, C. (2003). Friendships, cliques and crowds. In G. R. Adams, & M. D. Berzonsky (Eds.), *Blackwell handbook of adolescence* (pp. 330-348). Oxford: Blackwell.
- Chang, W.C., Hui, C.L.M., Tang, J.Y.M., Wong, G.H.Y., Lam, M.M.L., Chan, S.K.W., & Chen, E.Y.H. (2011). Persistent negative symptoms in first-

- episode schizophrenia: a prospective three-year follow-up study. *Schizophrenia Research*, *133*, 22–28.
- Chapman, L. J., Chapman, J. P., & Raulin, M. L. (1976). Scales for physical and social anhedonia. *Journal of Abnormal Psychology*, *85*, 374 – 382. doi:10.1037/0021-843X.85.4.374
- Chapman, L. J., Chapman, J. P., & Raulin, M. L. (1978). Body image aberration in schizophrenia. *Journal of Abnormal Psychology*, *87*, 399 – 407. doi:10.1037/0021-843X.87.4.399
- Chen, H., Cohen, P., Kasen, S. & Johnson, J.G. (2006). Adolescent Axis I and personality disorders predict quality of life during young adulthood. *Journal of Adolescent Health*, *39*, 14-19. Doi: 10.1016/j.jadohealth.2005.07.005
- Cohen, A.S., & Davis, T.E. (2009). Quality of life across the schizotypy spectrum: findings from a large nonclinical sample. *Comprehensive Psychiatry*, *50*, 408-414.
- Colle, L. & Giudice, M. (2011). Patterns of attachment and emotional competence in middle childhood. *Social Development*, *20*, 51-72. Doi: 10.1111/j.1467-9507.2010.00576.x
- Cramer, V., Torgersen, S., & Kringlen, E. (2006a). Personality disorders and quality of life. A population study. *Comprehensive Psychiatry*, *47*, 178-184.
- Cramer, V., Torgersen, S., & Kringlen, E. (2006b). Socio-demographic conditions, subjective somatic health, Axis I disorders and personality disorders in the common population: the relationship to quality of life. *Journal of Personality Disorders*, *21*, 552-567.

- 
- DeHart, G.B., Stroufe, A., & Cooper, R.G. (2004). *Child Development: its nature and course*. New York: McGraw-Hill.
- De Clercq, B., De Fruyt, F., Van Leeuwen, K., & Mervielde, I. (2006). The structure of maladaptive personality traits in childhood: A step toward an integrative developmental perspective for DSM-V. *Journal of Abnormal Psychology, 115*, 639-657. Doi: 10.1037/0021-843X.115.4.639
- De Clercq, B., De Fruyt, F., De Bolle, M., Van Hiel, A., Markon, K.E., & Krueger, R.F. (2014). The hierarchical structure and construct validity of the PID-5 trait measure in adolescence. *Journal of Personality, 82*, 158-169. Doi: 10.1111/jopy.12042
- Debbané, M., & Barrantes-Vidal, N. (2015). Schizotypy from a developmental perspective. *Schizophrenia Bulletin, 41*, 386-395. Doi: 10.1093/schbul/sbu175
- Dinn, W.M., Harris, C.L., Aycicegi, A., Greene, P., & Andover, M.S. (2002). Positive and negative schizotypy in a student sample: neurocognitive and clinical correlates. *Schizophrenia Research, 56*, 171-185. Doi: 10.1016/S0920-9964(01)00230-4
- Doyle, A.B., Lawford, H., & Markiewicz, D. (2009). Attachment style with mother, father, best friend and romantic partner during adolescence. *Journal of Research on Adolescence, 19*, 690-714.
- Eckblad, M., Chapman, L. J., Chapman, J. P., & Mishlove, M. (1982). The revised social anhedonia scale. Unpublished test (copies available from T. R. Kwapil, Department of Psychology, University of North Carolina at Greensboro, P.O. Box 26170 Greensboro, NC 27402-6170

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- Eckblad, M., & Chapman, L. J. (1983). Magical ideation as an indicator of schizotypy. *Journal of Consulting and Clinical Psychology, 51*, 215-225.
- Enfoux, A., Courtois, R., Duijsens, I., Reveillere, C., Senon, J.L., Magnin, G., Voyer, M., Montmasson, H., Camus, V., & El-Hage, W. (2013). Comorbidity between personality disorders and depressive symptomatology in women: a cross-sectional study of three different transitional life stages. *Personality and Mental Health, 7*, 233-241. Doi: 10.1002/pmh.1228
- Freeman, D. (2007). Suspicious minds: the psychology of persecutory delusions. *Clinical Psychology Review, 27*, 425-457. Doi: 10.1016/j.cpr.2006.10.004
- Fung, A.L.C., & Raine, A. (2012). Peer victimization as a risk factor for schizotypal personality in childhood and adolescence. *Journal of Personality Disorders, 26*, 428-434.
- Furman, W., & Buhrmester, D. (2009). The network of relationships inventory: behavioral systems version. *International Journal of Behavioral Development, 33*, 470-478.
- Gross, G.M., Mellin, J., Silvia, P.J., Barantes-Vidal, N., & Kwapil, T.R. (2014). Comparing the factor structure of the Wisconsin schizotypy scales and the schizotypal personality questionnaire. *Personality disorders: Theory, Research and Treatment, 5*, 397-405. Doi: 10.1037/per0000090
- Hengartner, M.P., Müller, M., Rodgers, S., Rössler, W., & Ajdacic-Gross, V. (2014). Interpersonal functioning deficits in association with DSM-IV

- personality disorder dimensions. *Social Psychiatry and Psychiatric Epidemiology*, *49*, 317-325.
- Henry, J.D., Bailey, P.E., & Rendell, P.G. (2008). Empathy, social functioning and schizotypy. *Psychiatry Research*, *160*, 15-22. Doi: 10.1016/j.psychres.2007.04.014
- Hornquist, J.O. (1982). The concept of quality of life. *Scandinavian Journal of Social Medicine*, *10*, 57-61.
- Hummelen, B., Pedersen, G., & Karterud, S. (2012). Some suggestions for the DSM-5 schizotypal personality disorder construct. *Comprehensive Psychiatry*, *53*, 341-349. Doi: 10.1016/j.comppsy.2011.05.009
- Kashy, D. A., & Kenny, D. A. (2000). The analysis of data from dyads and groups. In H. T. Reis & C. M. Judd (Eds.), *Handbook of research methods in social psychology* (pp. 451–477). New York: Cambridge University Press.
- Keeley, J.W., Flanagan, E.H., & McCluskey, D.L. (2014). Functional impairment and the DSM-5 dimensional system for personality disorder. *Journal of Personality Disorders*, *28*, 657-674.
- Kenny, R., Dooley, B., & Fitzgerald, A. (2013). Interpersonal relationships and emotional distress in adolescence. *Journal of Adolescence*, *36*, 351-360. Doi: 10.1016/j.adolescence.2012.12.005
- Kidscreen Group Europe. (2006). *The Kidscreen questionnaires. Quality of life questionnaires for children and adolescents— handbook*. Lengerich: Papst Science Publisher.
- Krueger, R.F, Derringer, J., Markon, K.E., Watson, D., & Skodol, A.E (2012). Initial construction of a maladaptive personality trait model

- and inventory for DSM-5. *Psychological Medicine*, 42, 1879-1890. Doi: 10.1017/S0033291711002674
- Kwapil, T.R., Barrantes-Vidal, N., & Silvia, P. J. (2008). The dimensional structure of the Wisconsin Schizotypy scales: factor identification and construct validity. *Schizophrenia Bulletin*, 34, 444–457. Doi: 10.1093/schbul/sbm098
- Kwapil, T.R., Brown, L.H., Silvia, P.J., Myin-Germeys, I., & Barrantes-Vidal, N. (2012). The expression of positive and negative schizotypy in daily life: an experience sampling study. *Psychological Medicine*, 42, 2555-2666. Doi: 10.1017/S0033291712000827
- Kwapil, T.R., Ros-Morente, A., Silvia, P.J., & Barrantes-Vidal, N. (2012). Factor invariance of psychometric schizotypy in Spanish and American samples. *Journal of Psychopathology and Behavioral Assessment*, 34, 145-152. Doi: 10.1007/s10862-011-9258-1
- Kwapil, T.R., Gross, G.M., Silvia, P.J., & Barrantes-Vidal, N. (2013). Prediction of psychopathology and functional impairment by positive and negative schizotypy in the Chapmans' ten-year longitudinal study. *Journal of Abnormal Psychology*, 122, 807-815. Doi: 10.1037/a0033759
- La Greca, A. M., & Harrison, H. M. (2005). Adolescent peer relations, friendships, and romantic relationships: do they predict social anxiety and depression? *Journal of Clinical Child and Adolescent Psychology*, 34(1), 49–61. Doi: 10.1207/s15374424jccp3401\_5
- Logan, C.B. (1999). *Emotion Recognition and Schizotypal Personality Disorder*. Emory U, Atlanta.

- Mittal, V.A., Tessner, K.D., McMillan, A.L., Delawalla, Z., Trottmann, H., Walker, E. (2006). Gesture behavior in unmedicated schizotypal adolescents. *Journal of Abnormal Psychology, 115* (2), 351-358. Doi:
- Mittal, V.A., Tessner, K.D., & Walker, E.F. (2007). Elevated social internet use and schizotypal personality disorder in adolescents. *Schizophrenia Research, 94*, 50-57.
- Mittal, V.A., Dhruv, S., Tessner, K.D., Walder, D.J., Walker, E.F. (2007). The relations among putative bio risk markers in schizotypal adolescents: minor physical anomalies, movement abnormalities and salivary cortisol. *Biological Psychiatry, 61* (10), 1179–1186.
- Moskowitz, G.B. (2005). *Social Cognition: Understanding Self and Others*. Guilford Press, New York.
- Raine, A. (1991). The SPQ-A scale for the assessment of schizotypal personality based on DSM-III-R criteria. *Schizophrenia Bulletin, 17*, 555-564.
- Raine, A., Fung, A.L.C., & Lam, B.Y.H. (2011). Peer victimization partially mediates the schizotypy-aggression relationship in children and adolescents. *Schizophrenia Bulletin, 37*, 937-945.
- Sheeber, L. B., Davis, B., Leve, C., Hops, H., & Tildesley, E. (2007). Adolescent's relationships with their mothers and fathers: associations with depressive disorder and subdiagnostic symptomology. *Journal of Abnormal Psychology, 116*(1), 144–154.
- Shulman, S., & Scharf, M. (2000). Adolescent romantic behaviours and perceptions: age- and gender-related differences, and links with



- family and peer relationships. *Journal of Research on Adolescence*, *10*(1), 99–118.
- Skodol, A.E., Pagano, M.E., Bender, D.S., Shea, M.T., Gunderson, J.G., Yen, S., Stout, R.L., Morey, L.C., Sanislow, C.A., Grilo, C.M., Zanarini, M.C., & McGlashan, T.H. (2005). Stability of functional impairment in patients with schizotypal, borderline, avoidant, or obsessive-compulsive personality disorder over two years. *Psychological Medicine*, *35*, 443-451.
- South, S.C. (2014). Personality pathology and daily aspects of marital functioning. *Personality Disorders: Theory, Research and Treatment*, *5*, 195-203. Doi: 10.1037/per0000039
- Tiliopoulos, N., & Goodall, K. (2009). The neglected link between adult attachment and schizotypal personality traits. *Personality and Individual Differences*, *47*, 299-304. Doi: 10.1016/j.paid.2009.03.017
- Verbeke, L., & De Clercq, B. (2014). Integrating oddity traits in a dimensional model for personality pathology precursors. *Journal of Abnormal Psychology*, *123*, 598-612. Doi: 10.1037/a0037166F
- Vollema, M.G., & van den Bosch, R.J. (1995). The multidimensionality of schizotypy. *Schizophrenia Bulletin*, *21*, 19-31.
- Walker, E., Lewis, N., Loewy, R., & Palyo, S. (1999). Motor dysfunction and risk for schizophrenia. *Developmental Psychopathology*, *11* (3), 509–523
- Wolff, S., 1991. Schizoid personality in childhood and adult life: I. The vagaries of diagnostic labeling. *British Journal of Psychiatry*, *159*, 615-620.

## Tables

Table 1  
*Bivariate Correlations between Positive and Negative STPD Facets.*

	Oddity facets			
	Oversensitivity to feelings	Extreme Fantasy	Daydreaming	Odd thoughts & behavior
<b>PID-5 facets</b>				
Restricted affectivity	-.16 <sup>*</sup>	.02	.16 <sup>*</sup>	.14
Withdrawal	.16	.33 <sup>**</sup>	.37 <sup>**</sup>	.28 <sup>**</sup>
Suspiciousness	.28 <sup>**</sup>	.35 <sup>**</sup>	.37 <sup>**</sup>	.35 <sup>**</sup>

*Note.* <sup>\*</sup>  $p < .05$ ; <sup>\*\*</sup>  $p < .01$ .

Table 2  
*Bivariate Correlations between Positive and Negative STPD Traits with KIDSCREEN-27 Dimensions and NRI-BSV Factor Scores for Maternal, Paternal and Peer Relationship.*

Scale	Negative STPD traits PID-5 facets			Positive STPD traits Oddity facets			
	RA	WD	SP	OTF	EF	DD	OTB
<b>KIDSCREEN</b>							
Autonomy & Parents	-.22**	<b>-.26***</b>	<b>-.28***</b>	<b>-.25***</b>	-.16	<b>-.31***</b>	-.23**
Social support & peers	-.18*	<b>-.39***</b>	-.16	.11	.01	.01	.03
<b>NRI mother</b>							
Social support	<b>-.33***</b>	-.15	-.16*	-.05	-.01	-.21*	-.08
Negative interactions	.08	.09	.13	.16*	.15	<b>.26***</b>	<b>.26***</b>
<b>NRI father</b>							
Social support	-.19*	-.25**	-.14	-.08	.02	-.20*	-.06
Negative interactions	.02	.04	.02	.19	.06	.19*	.07
<b>NRI peer</b>							
Social support	-.15	<b>-.31***</b>	-.07	.25**	.16.	.12	.08
Negative interactions	.00	.15	.17*	-.02	.24**	.20*	<b>.26***</b>

Note. \* p < .05; \*\* p < .01. \*\*\* p < .002 according to Bonferroni adjustment, marked in boldface. RA=Restricted affectivity, WD = Withdrawal, SP = Suspiciousness; OTF = Oversensitivity to feelings; EF = Extreme Fantasy; DD = Daydreaming; OTB = Odd thoughts and behavior.

Table 3  
*Multiple Hierarchical Regression Analyses KIDSCREEN-27 Dimensions, Negative STPD Facets and Positive STPD Facets.*

Criteria and predictor	R <sup>2</sup>	ΔR <sup>2</sup>	F <sub>change</sub>	Predictor (Standardized β)
<b>Autonomy &amp; Parents</b>				
Step 1: Sex	.02	.02	3.54	Sex (-.15)
<i>Negative above positive</i>				
Step 2: Oddity facets	.12	.10	4.34**	OTF (-.14), EF (.13), DD (-.22), OTB (-.12)
Step 3: PID-5 facets	.20	.07	4.53**	RA (-.20*), WD (-.05), SP (-.14)
<i>Positive above negative</i>				
Step 2: PID-5 facets	.14	.12	7.22**	RA (-.18*), WD (-.02), SP (-.20*)
Step 3: Oddity facets	.20	.05	2.42	OTF (-.18), EF (.14), DD (-.12), OTB (-.09)
<b>Social support &amp; Peers</b>				
Step 1: Sex	.01	.01	1.61	Sex (.11)
<i>Negative above positive</i>				
Step 2: Oddity facets	.03	.02	.62	OTF (.15), EF (-.08), DD (-.10), OTB (.10)
Step 3: PID-5 facets	.20	.17	9.50**	RA (.03), WD (-.44**), SP (-.05)
<i>Positive above negative</i>				
Step 2: PID-5 facets	.16	.15	8.41**	RA (.01), WD (-.40**), SP (.02)
Step 3: Oddity facets	.20	.04	1.47	OTF (.11), EF (.00), DD (.06), OTB (.07)

*Note.* RA=Restricted affectivity, WD=Withdrawal, SP=Suspiciousness; OTF = Oversensitivity to feelings; EF = Extreme Fantasy; DD = Daydreaming; OTB = Odd thoughts and behavior.

\* p < .05; \*\* p < .01.

Table 4  
*Multiple Hierarchical Regression Analyses NRI Factors for Parental Relationships, Negative STPD Facets and Positive STPD Facets.*

Criteria and predictor	R <sup>2</sup>	ΔR <sup>2</sup>	F <sub>change</sub>	Predictor (Standardized β)
<b>Social support mother</b>				
Step 1: Sex	.01	.01	.90	Sex (.08)
<i>Negative above positive</i>				
Step 2: Oddity facets	.07	.06	2.36	OTF (.01), EF (.16), DD (-.32**), OTB (.04)
Step 3: PID-5 facets	.15	.08	4.59*	RA (-.30**), WD (.07), SP (-.10)
<i>Positive above negative</i>				
Step 2: PID-5 facets	.11	.11	5.62**	RA (-.31**), WD (.04), SP (-.11)
Step 3: Oddity facets	.15	.04	1.69	OTF (-.07), EF (.15), DD (-.24*), OTB (.08)
<b>Negative interactions mother</b>				
Step 1: Sex	.04	.04	5.38*	Sex (.19*)
<i>Negative above positive</i>				
Step 2: Oddity facets	.12	.09	3.58*	OTF (.00), EF (-.13), DD (.16), OTB (.25*)
Step 3: PID-5 facets	.13	.00	.19	RA (.07), WD (-.04), SP (.02)
<i>Positive above negative</i>				
Step 2: PID-5 facets	.05	.02	.94	RA (.08), WD (-.00), SP (.09)
Step 3: Oddity facets	.13	.07	2.91*	OTF (.02), EF (-.12), DD (.15), OTB (.24*)
<b>Social support father</b>				
Step 1: Sex	.00	.00	.17	Sex (-.03)
<i>Negative above positive</i>				
Step 2: Oddity facets	.06	.06	2.38	OTF (-.02), EF (.20), DD (-.31**), OTB (.02)
Step 3: PID-5 facets	.11	.05	2.53	RA (.07), WD (-.04), SP (.02)
<i>Positive above negative</i>				
Step 2: PID-5 facets	.07	.07	3.49*	RA (-.12), WD (-.18), SP (.02)
Step 3: Oddity facets	.11	.04	1.68	OTF (-.06), EF (.22), DD (-.23), OTB (.03)
<b>Negative interactions father</b>				
Step 1: Sex	.02	.02	2.75	Sex (.14)
<i>Negative above positive</i>				
Step 2: Oddity facets	.05	.03	1.30	OTF (.03), EF (-.07), DD (.23), OTB (-.04)
Step 3: PID-5 facets	.06	.00	1.00	RA (.05), WD (-.01), SP (-.03)
<i>Positive above negative</i>				
Step 2: PID-5 facets	.02	.01	.22	RA (.05), WD (.02), SP (.00)
Step 3: Oddity facets	.06	.03	1.18	OTF (.04), EF (-.06), DD (.22), OTB (-.04)

Note. RA=Restricted affectivity, WD=Withdrawal, SP=Suspiciousness; OTF = Oversensitivity to feelings; EF = Extreme Fantasy; DD= Daydreaming; OTB = Odd thoughts and behavior. \* p < .05; \*\* p < .01

Table 5  
*Multiple Hierarchical Regression Analyses NRI Factors for Peer Relationships, Negative STPD Facets and Positive STPD Facets.*

Criteria and predictor	R <sup>2</sup>	ΔR <sup>2</sup>	F <sub>change</sub>	Predictor (Standardized β)
<b>Social support peer</b>				
Step 1: Sex	.10	.10	15.16**	Sex (.31**)
<i>Negative above positive</i>				
Step 2: Oddity facets	.14	.04	1.57	OTF (.16), EF (.11), DD (-.02), OTB (-.04)
Step 3: PID-5 facets	.27	.13	7.90**	RA (-.07), WD (-.41**), SP (-.02)
<i>Positive above negative</i>				
Step 2: PID-5 facets	.19	.10	5.39**	RA (-.02), WD (-.34**), SP (.07)
Step 3: Oddity facets	.27	.08	3.41*	OTF (.12), EF (.16), DD (.12), OTB (-.04)
<b>Negative interactions peer</b>				
Step 1: Sex	.00	.00	.11	Sex (.01)
<i>Negative above positive</i>				
Step 2: Oddity facets	.11	.11	4.09**	OTF (-.23*), EF (.18), DD (.13), OTB (.15)
Step 3: PID-5 facets	.13	.02	1.16	RA (-.11), WD (.03), SP (.15)
<i>Positive above negative</i>				
Step 2: PID-5 facets	.05	.05	2.25	RA (-.08), WD (.09), SP (.18)
Step 3: Oddity facets	.13	.08	3.18*	OTF (-.27*), EF (.15), DD (.13), OTB (.13)

*Note.* RA=Restricted affectivity, WD=Withdrawal, SP=Suspiciousness; OTF = Oversensitivity to feelings; EF = Extreme Fantasy; DD= Daydreaming; OTB = Odd thoughts and behavior. \* p < .05; \*\* p < .01

## Chapter 6

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### **General discussion**

This final chapter summarizes and integrates the major findings resulting from the different studies that all addressed aspects of the content, structure, or significance of developmental manifestations of Oddity. Implications for both theory and practice are outlined and some general strengths and limitations as well as promising directions for future research are delineated. Finally, we close with the main conclusion that stems from this doctoral dissertation.

## Research Overview

The present doctoral dissertation focused on developmental manifestations of Oddity, a field in childhood personality pathology that has traditionally been largely understudied. Five different chapters addressed specific aspects of the content, structure or significance of oddity manifestations at a young age.

First, the content and significance of Oddity in younger age groups was addressed in Chapter 1, as this chapter pointed to the presence of oddity-related characteristics across disorders and set out the rationale for elaborating a trait perspective on these relatively stable odd cognitions, feelings and behaviors. From an empirical perspective, Chapter 2 also contributed to this trait rationale, by demonstrating the predictive validity of childhood Oddity manifestations for schizotypal pathology in adolescence. These first two chapters hence indicated that odd cognitions, feelings and behaviors make up a clinically valid construct at a young age, that can be differentiated from more normative odd manifestations and signifies a valuable constellation of individual differences that may improve the comprehensiveness of trait models for childhood personality precursors. Towards this end, an age-specific dimensional Oddity taxonomy was constructed in Chapter 3, and was empirically integrated in the established DIPSI model structure of personality pathology precipitants. Chapter 4 focused on the validity of this five-factor structure of personality pathology precursors across samples with different characteristics in terms of age, informant and clinical status. Finally, Chapter 5 addressed the clinical relevance of Oddity, which is specified in this study as “positive” schizotypal



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traits, and explored its significance relative to “negative” schizotypal traits in the prediction of social relationships in a group of vulnerable adolescents. Below, the main findings of these five chapters will be discussed.

From a cross-disorder perspective, Chapter 1 (Verbeke, De Caluwé, & De Clercq, under review) overviews all childhood Oddity symptoms that may occur in the course of childhood disorders. This review study further provides evidence for a number of shared characteristics across disorders, including similarities in biological underpinnings, phenotypic expression, course and outcome (e.g., Asarnow, Dompson, & Goldstein, 1994; Carballo et al., 2010; Clemmensen, Vernal, & Steinhausen, 2012; Driver et al., 2013; Fountain, Winter, & Bearman, 2012; Ogowa, Sroufe, Weinfield, Carlson, & Egeland, 1997; Remschmidt et al., 2007). Building upon this evidence, Chapter 1 proposes that this commonality may signify the presence of an underlying childhood trait liability that gives rise to a variety of odd manifestations across disorders. In a second objective, Chapter 1 also conceptually addresses the distinction between normative odd manifestations and more pathological-related oddity symptoms. This distinction is particularly relevant in younger age groups, as childhood/adolescence can be characterized by features (e.g., presence of an imaginary companion) that are connected to maladaptive odd manifestations but are in fact developmentally appropriate and not predictive for later maladjustment (McLewin & Muller, 2006). Therefore, Chapter 1 additionally delineates several guidelines that enable the differentiation of normative versus maladaptive childhood oddity manifestations. In sum, Chapter 1 can be read as a first step towards a trait

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operationalization of maladaptive odd cognitions, feelings and behaviors in younger age groups, hence paralleling recent advances in dimensional personality pathology models for adults that also incorporated a fifth maladaptive trait domain in order to capture Cluster A-related characteristics (Krueger et al., 2012).

Corroborating Chapter 1, Chapter 2 (Verbeke, De Clercq, De Caluwé, & Hofmans, under review) takes an empirical angle on the significance of early childhood bizarre and odd characteristics for understanding future schizotypal personality pathology. More specifically, maladaptive odd manifestations were assessed at three different points in childhood, and latent growth curve modeling was used in order to map out individual differences in the starting position and trend of these manifestations over time. These analyses revealed a general declining trend in oddity characteristics over time, hence pointing to the potential normative character of these characteristics, as children show less of these manifestations as they become cognitively more mature. However, early odd manifestations not always occur in the course of normative development of childhood fantasy and cognitive development (Kelleher et al., 2012), and do not appear to decrease over time for all children. The findings of Chapter 2 demonstrated more specifically that children with high scores on oddity-related characteristics early in development, as well as children with an increasing pattern of oddity-related characteristics over time, were more at risk to develop schizotypal pathology in adolescence. In addition, the results suggested that child-related characteristics (academic achievement and child personality) were mainly associated with onset of

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oddity symptoms, whereas environmentally related factors (socio-economic adversity) were especially relevant to understand the dynamics of growth in these features. To conclude, Chapter 2 provides, beyond the conceptual evidence from Chapter 1, empirically-based evidence for the relevance of the assessment of oddity-related characteristics at a young age, as it indicates that these symptoms may represent significant schizotypal personality pathology precursors and hence need to be included within established childhood personality pathology models.

Corroborating the evidence of Chapter 1 and 2 on the significance of odd characteristics at a young age, Chapter 3 (Verbeke & De Clercq, 2014) presents the construction of an age-specific childhood Oddity taxonomy in order to ensure the most comprehensive coverage of bizarre and odd manifestations in childhood. Moreover, building upon the advocated trait perspective as elaborated in Chapter 1 and 2, the construction procedures started with the writing process of extreme, maladaptive variants of childhood Openness/Imagination trait items (Costa & Mc Crae, 1992; Mervielde & De Fruyt, 1999) supplemented with items from clinical case studies (Morgan, 1999). Based upon factor analyses, four internally consistent facets were empirically delineated, representing Oversensitivity to feelings, Extreme fantasy, Daydreaming and Odd thoughts and behavior, each capturing a specific aspect of Oddity and clustering together in one higher-order Oddity factor. This Oddity factor proved to fit in an established four-factor model of personality disorder precipitants (Dimensional Personality Symptom Itempool [DIPSI]; De Clercq, De Fruyt, Van Leeuwen, & Mervielde, 2006), as it emerged as a fifth separate factor. Additional

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analyses further provided clear evidence for the construct validity of Oddity, indicating meaningful relations with its general trait equivalent Openness to experience/Imagination (Costa & McCrae, 1992; Mervielde & De Fruyt, 1999) and its maladaptive adult counterpart Psychoticism (Krueger et al., 2012). A joint factor analysis additionally demonstrated that these three related trait domains load on the same factor. The criterion validity of Oddity was supported from the findings on its incremental validity for the prediction of internalizing problems, above and beyond the four other DIPS trait factors. Chapter 3 hence signifies an important step towards a five-factor model of personality pathology precursors, providing psychometric support for a fifth Oddity factor. Moreover, such early maladaptive five-factor structure in childhood connects with both the five-factor framework of general childhood personality (Mervielde & De Fruyt, 1999) and established personality disorder taxonomies for adults (e.g., PID-5; Krueger et al., 2012), hence facilitating future longitudinal research on the development and structure of personality (pathology) across the life-span from one overarching five-factor framework. This early maladaptive five-factor trait structure, however, is in need of further research before it can be accepted as a valid underlying frame for describing PD traits in younger age groups.

From this perspective, Chapter 4 (Verbeke, De Caluwé, & De Clercq, in press) builds upon the preliminary evidence of Chapter 3 and aimed to further validate the newly proposed DIPS five-factor structure of the previous chapter. Across samples with different characteristics in terms of age, clinical status and informant, a five-factor structure was replicated,

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including a clear fifth Oddity component across samples. Moreover, strict factorial invariance across age and strong factorial invariance across clinical status and informants was demonstrated. These results underscore the robustness of five underlying dimensions of personality pathology at a young age and demonstrate that the DIPSI factors behave similarly across groups with different characteristics, hence underscoring the validity of the DIPSI trait model for the description of early PD manifestations in both childhood and adolescence, referred and non-referred groups and relying on both self- and parental ratings.

In Chapter 5 (Verbeke, De Clercq, van der Heijden, Hutsebaut, & van Aken, in press), we elaborated on the clinical significance of the Oddity trait and compared the relative contribution of positive versus negative schizotypal traits in the prediction of relationship quality characteristics with different attachment figures. This interpersonal focus can be considered relevant (Hengartner, Müller, Rodgers, Rössler, & Ajdacic-Gross, 2014), as social functioning has been repeatedly demonstrated to be impaired in individuals with schizotypal personality disorder (STPD). This approach enabled to examine the clinical relevance of the positive schizotypal Oddity traits *per se*, by differentiating them from co-occurring negative schizotypal traits in the course of the STPD. The results of this chapter pointed to differential effects of the positive versus negative STPD traits on the quality of interpersonal relationships, depending upon the specific relation type (i.e., relationship with mother, father or best friend) and the kind of interaction (i.e., positive versus negative interactions) that was explored. Whereas negative schizotypal traits were

mainly related to less positive maternal and peer interaction, Oddity traits were generally relevant for the understanding of negative interactions of criticism, conflict and antagonism with these attachment figures. This study hence points to the clinical relevance of Oddity traits, as they uniquely contribute to the amount of social impairment that is often reported within the course of the STPD.

### **Discussion of the Main Findings**

The current dissertation aimed to elucidate a field in developmental personality pathology that has received little attention until to date. Across the five studies, several major findings concerning the *content*, *structure* and *significance* of early Oddity manifestations can be distilled.

First, the current work provides important insights in the *content* of developmental Oddity manifestations. From a literature review, we concluded that oddity-related expressions may occur in the course of several childhood disorders, and include both cognitive (e.g., delusions and hallucinations), emotional (e.g., feelings of being different than others, feeling the odd one out) and behavioral aspects (e.g., eccentric behavior, strong rituals). This was replicated from an empirical point of view, as four Oddity facets were delineated from a bottom-up approach, each describing specific childhood Oddity manifestations expressed in feelings (e.g. Oversensitivity to feelings), thoughts (e.g. Extreme fantasy) or specific behavior (e.g. Odd thoughts and behavior). From both a conceptual and empirical perspective, the current work also underscored the relative stability of these odd manifestations over time. This diversity in phenotypic manifestations of Oddity across a range of aspects of human functioning as

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well as their relative stability and long-term significance aligns with a **trait perspective on Oddity**, since personality traits have indeed been defined as habitual patterns of behavior, thought and emotions that are relatively stable over time (Allport, 1937). These maladaptive trait manifestations, however, are sometimes **difficult to differentiate from normative developmental processes**, as there are clear similarities in the specific content that is covered. More specifically, especially at a very young age, the content of maladaptive Oddity manifestations may be intertwined with normative fantasy and imagination processes (Astington, 1993; Piaget, 1929), as well as with normative ritualistic (Evans et al., 1997) and odd and eccentric (Dobbert, 2007) behaviors. The present dissertation addresses this issue and suggests that a differentiation between normative versus maladaptive odd characteristics is possible, relying on differences in terms of course, intrusiveness, reality loss, and personality correlates. In this regard, general Openness to experience/Imagination appears to be involved in normative odd manifestations (Klinger, Henning, & Janssen, 2009; Tate & Shelton, 2008), whereas Oddity is presumed to capture the more maladaptive odd expressions (Caspi et al., 2014). Openness to experience (or the childhood variant Imagination) indeed has repeatedly shown to validly describe childhood individual differences in fantasy and creativity (Caspi, Roberts, & Shiner, 2005; De Fruyt, Mervielde, Hoekstra, & Rolland, 2000; Donahue, 1994; Gjerde & Cardilla, 2009; Mervielde, De Fruyt, & De Clercq, 2009; Quartier & Rossier, 2008), and represents the fifth factor in general childhood models of personality (Costa & Mc Crae, 1992; Mervielde & De Fruyt, 1999). In contrast with the other four general-maladaptive trait

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dimensions, however, there is less consensus on a continuum for Openness-Oddity, because the content of both factors does not seem to align as much as the other general-maladaptive trait equivalents do. Whereas some authors did place Oddity strictly along the extremes of general Openness to experience (Widiger, 2010; Widiger, 2011), others consider these two factors as entirely distinct from each other (Watson, Clark, & Chmielewski, 2014). The Openness – Oddity association in younger age groups is in the current dissertation age-specifically addressed from both a conceptual and an empirical perspective and resulted in a more nuanced conclusion, as our research findings demonstrate that **Imagination and Oddity undoubtedly share a common ground but cannot unequivocally be considered as an extension of each other**. More specifically, we suggested that only specific aspects of Imagination (i.e., fantasy and creativity) are related to maladaptive odd expressions, whereas other Openness facets (i.e., intellect and curiosity) have no or even an inverse association with Oddity. This finding parallels recent advances in the field that have pointed to a complex Openness–Oddity/Psychoticism/Schizotypy association in adults (Chmielewski, Bagby, Markon, Ring, & Ryder, 2014; DeYoung, Grazioplene, & Peterson, 2012). Finally, from a top-down approach, the content of the proposed Oddity taxonomy empirically aligns with the maladaptive Psychoticism trait (Verbeke & De Clercq, 2014) of the recently released dimensional PD trait model (Krueger et al., 2012) of DSM-5 (APA, 2013). Since Psychoticism is presumed to represent the cluster of positive schizotypal symptoms in adults (APA, 2013), it can hence be concluded that **Oddity captures a schizotypal PD content at a young age**. An examination



of the different Oddity and Psychoticism facets, however, also points to differences, with some facets (e.g. Daydreaming) exclusively represented in the childhood model. This finding may reflect **differences in the expression of personality disorder symptoms across developmental stages**, an issue that was also already addressed by De Clercq et al. (2014), further underscoring the need for age-appropriate assessment instruments of personality pathology.

A second main finding relates to the *structure* of Oddity traits at a young age. At a lower-order level, the Oddity items can be structured in the four facets “Oversensitivity to feelings”, “Extreme fantasy”, “Daydreaming” and “Odd thoughts and behavior” that cluster together in one higher-order Oddity factor, which can in turn be integrated in the established childhood four-dimensional PD trait structure. This **early maladaptive five-factor structure has a robust nature**, as reflected in its replicability and factorial invariance across samples of varying age, informants and clinical status, and hence **connects with an established maladaptive five-factor structure for personality pathology in adults** (Krueger et al., 2012), with Oddity representing the childhood variant of the DSM-5 Psychoticism trait. These results hence extend the overall consensus on the validity of five underlying trait factors for describing general personality across the life-span (Caspi, Roberts, & Shiner, 2005) toward the description of maladaptive personality. This structural similarity of personality pathology across developmental stages is of crucial importance for future longitudinal research on the development of personality pathology, because it provides a single framework for conceptualizing personality pathology symptoms across the

life-span, hence improving the feasibility of examining different indices of personality continuity or change.

Third, the clinical *significance* of the Oddity trait facets was clearly demonstrated across studies, as **Oddity appeared to prospectively predict schizotypal pathology at a later age**, hence underscoring their relevance as developmental precursors of this severe personality disorder. Moreover, Oddity traits have a clinical value above and beyond the negative schizotypal traits that can be reliably traced in adolescent psychiatric patients **and appeared to significantly contribute our understanding of interpersonal relationships in adolescence**. It can be presumed, however, that the clinical relevance of Oddity is not limited to the schizotypal personality disorder but extends to a wider range of childhood psychopathology, as **Oddity is involved in both internalizing and more externalizing problem behavior**. From an internalizing perspective, our results showed that Oddity uniquely contributes to our understanding of specific childhood internalizing problems, such as somatic complaints. Oddity hence appears to reflect an internalizing component that is not represented within the DIPSI trait factors Emotional Instability and Introversion, probably stemming from the Oddity facet Oversensitivity to feelings that partially aligns with the construct of affect intensity, which has been related to internalizing problems in previous studies (Durbin & Shafir, 2008; Silk, Steinberg, & Morris, 2003). From an externalizing perspective, Oddity appeared to be associated with negative interactions of conflict, hostility and antagonism within the close network. This more externalizing component of positive schizotypal trait pathology aligns with evidence on

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the association between schizophrenia spectrum pathology and aggression (Bo, Abu-Akel, Kongerslev, Helt Haahr, & Simonsen, 2011; Raine et al., 2006), and possible originates from the interference of positive schizotypal traits with cognitive mechanisms (e.g. emotion recognition) that are important for successful social interactions (Abbott & Byrne, 2013; Moskowitz, 2005). In sum, these findings connect with the evolving research field that has pointed to the importance of early personality disorder symptoms for a better understanding of childhood psychopathology (De Fruyt & De Clercq, 2014) and extend this trait perspective towards a field that was currently not systematically represented in childhood personality pathology models (De Clercq et al., 2006).

### **Implications for the assessment of personality pathology precursors**

The findings of the current doctoral dissertation have several implications for the assessment of maladaptive personality traits in younger age groups. First, an extension from a dimensional four-factor model of personality pathology precursors towards a five-factor model implies that the comprehensiveness of the previously validated four-factor DIPSI model (De Clercq et al., 2010; De Clercq, Van Leeuwen, De Fruyt, Van Hiel, & Mervielde, 2008; De Clercq, Van Leeuwen, Van den Noortgate, De Bolle, & De Fruyt, 2009; Decuyper, De Bolle, De Clercq, & De Fruyt, 2011; Decuyper, De Clercq, & Tackett, 2015; Tackett, Herzhoff, Harden, Page-Gould, & Josephs, 2014; Tackett, Herzhoff, Reardon, De Clercq, & Sharp, 2014; Tackett, Kushner, Herzhoff, Smack, & Reardon, 2014; Tackett, Kushner, Josephs, Harden, Page-Gould, & Tucker-Drob, 2014) may significantly

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increase, especially for the coverage of Cluster A-related PD precursors. The proposed Oddity taxonomy, allowing an age-specific, and empirically-based assessment of odd characteristics in younger age groups, may be advised to be part of all future work with the DIPSI as to enable the most comprehensive understanding of personality dysfunction at a young age. Moreover, the extended DIPSI model now more closely connects with the PID-5 trait model (Krueger et al., 2012) that is proposed by DSM-5 (APA, 2013) in Section 3, used for the evaluation of pathological personality traits in the personality disorder assessment process. By proposing a trait model that is conceptually and structurally linked to this DSM-5 trait model, although representing a content that is more developmentally appropriate, the current dissertation opens avenues for a similar assessment process across the life-span that takes differences in the expression of personality disorder symptoms across developmental stages into account.

A second implication originates from the robustness of this extended five-factor DIPSI structure across groups with a varying age, informant type and clinical status, implying that the extended DIPSI taxonomy can be validly used in both adolescents and children from the age of 7 onwards, relying on either self-or parental-reports, and across groups with a varying clinical status. Moreover, the factorial invariance of the DIPSI structure enables a reliable and valid comparison between groups that differ in terms of age, status or informant, as differences in DIPSI scores can be presumed to represent real trait differences, and not just the result of a psychometric artefact.

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Finally, the current dissertation findings corroborate and extend previous work on the assessment of early personality pathology precursors along a step-wise procedure (De Clercq & De Fruyt, 2012; De Fruyt & De Clercq, 2014). More specifically, it has previously been proposed to start from a general trait assessment (step 1, for instance with the HiPIC), supplemented with a maladaptive trait assessment in case of extreme general trait scores (step 2, for instance with the DIPSI), followed by a judgement of severity/impairment across different contexts (step 3). These assessment guidelines also apply to the extended DIPSI model, as Oddity is considered as a fifth factor next to the established trait factors. The assessment of early Oddity traits, however, requires some specific attention. First, given the complex and non-linear alignment between childhood Openness and Oddity, an extremely high Openness score does not necessarily require further assessment with the DIPSI. Only when these extreme scores result from the Creativity/Fantasy facet of Openness, the Oddity module should be administered to further refine these extreme trait scores. A second point of attention relates to step 3 of the personality pathology assessment process, focusing on the experienced impairment across different contexts. As outlined in Chapter 1, the level of impairment signifies a key element in the differentiation of maladaptive from normative oddity manifestations. Whereas normative manifestations of high fantasy are under a child's control and do not interfere with general functioning, maladaptive Oddity manifestations generally have an uncontrollable nature that is associated with impairment for either the child or its environment. This third step hence makes up a crucial part of the assessment process,

especially with regard to Oddity. A third issue relates to the course of Oddity manifestations, that appear to be transient in case of normality and persistent or increasing in case of pathology. This points to the relevance of systematic screening processes that take it further than a one-point assessment in order to differentiate normative from more maladaptive Oddity-related pathways.

### **Strengths, Limitations and Future Research Directions**

This general discussion will be closed with an overview of both the strengths and limitations of the current work. Additionally, several suggestions for future work are provided.

#### **Strengths**

The research outlined in the current dissertation addresses a field in childhood personality pathology that has traditionally been neglected by developmental personality researchers. The current project knows several strengths that have contributed to the validity of the proposed results. First, we relied on both cross-sectional and longitudinal designs, allowing us to explore both the co-occurring associations of Oddity as well as their impact over time. Second, we included large samples that covered an age-span from 7 to 24 years old, enabling the study of structural features of Oddity-related manifestations from childhood to late adolescence, and hence covering different developmental periods. Third, beyond the use of community samples, the current work also included two clinically-referred samples. This enlarged the variability in Oddity trait scores and enabled a profound study of the dimensional Oddity trait at a young age. Fourth, we relied on different informants, as the current work included both self- and

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maternal ratings on Oddity and criterion measures. Finally, various statistical techniques were carried out to analyze this wealth of data, including sophisticated methods such as latent growth and exploratory structural equation modeling. This demonstrates that the current work was conducted from a profound methodological angle, thus offering a significant empirically-based contribution to the field of developmental personality pathology.

### **Limitations and Suggestions for Further Research**

Although the current dissertation can be considered as an important step towards a fully integrative model of personality pathology precursors, it leaves at the same time still much space for future research on Oddity in younger age groups. Moreover, beyond the above-mentioned strengths, also several limitations can be delineated. As a first limitation, it can be stated that the current work only investigated the relevance of the Oddity trait in schizotypal personality pathology, but did not address the role of Oddity in other childhood disorders with a presumed Oddity component as outlined in Chapter 1. This decision resulted from the need to first construct an age-specific and empirically-sound Oddity assessment tool, that is now ready to be systematically used in future work on childhood personality pathology precursors. Although we consider the work of Chapter 5, focusing on the role of Oddity in social functioning, as highly relevant, future work should address the role of Oddity in other areas of psychosocial functioning. In a related vein, a second limitation entails the lack of a study design that was able to clarify to what extent Oddity captures a rather general factor of psychopathology in younger age groups, or is associated with specific

vulnerability factors. More specifically, future research should clarify to what extent Oddity-related features in childhood serve as general risk factors for multiple forms of psychopathology or can be considered as risk factors for disorders that are conceptually most closely related to Oddity, such as those covered by the schizophrenia spectrum. A third limitation concerns the use of only two types of informants, i.e. self- and maternal ratings. In order to enhance the validity of the Oddity taxonomy and the DIPSI measure in general, future research should also incorporate other informants (e.g., father, teacher, peer), as early maladaptive traits are presumed to have an impact on the family -, interpersonal – and school context (De Fruyt & De Clercq, 2014). Finally, although we included two child samples, the majority of our participants were adolescents. Future research that examines the clinical relevance of Oddity trait manifestations in (younger) child samples may signify a surplus value, especially because normative manifestations of Openness are already present at this age (Caspi et al., 2005; Soto & John, 2014).

### **Conclusion**

In five different studies, the current dissertation provided more insight in the content, structure and significance of odd manifestations at a young age. The inclusion of an Oddity trait factor in an age-specific dimensional model for personality pathology precursors (DIPSI; De Clercq et al., 2006) provides both researchers and clinicians a developmentally appropriate operationalization of the most mysterious area of personality symptoms and may enable research that further unravels its significance for understanding the etiology, course and outcome of early maladaptive



pathways. Moreover, by proposing a five-factor model for childhood personality pathology, the current dissertation builds the bridge towards one overarching five-factor framework for describing both general and maladaptive personality across the life span. Such overarching framework will not only facilitate future longitudinal research on the development and structure of personality pathology from childhood onwards, but is also relevant from a more applied perspective as it enables an assessment procedure of personality dysfunction that is structurally similar across developmental stages. To conclude, the current dissertation can be read as a call to take the small but highly relevant area of childhood Oddity into account, as we are convinced that this trait domain is indispensable for the most comprehensive understanding of early personality pathology manifestations. From a normative perspective, however, the current dissertation also points to the importance of carefully considering Oddity symptoms against the background of normative fantasy development. As early Oddity manifestations generally decline as children age, we hope to alert clinicians to not overly interpret early Oddity symptoms in the context of an evolving personality disorder, but encourage them to systematically follow vulnerable children over time in order to identify those children that do develop into increasing maladaptation.

## References

- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5<sup>th</sup> ed.). Arlington, VA.
- Abbott, G.R., & Byrne, L. K. (2013). Schizotypal traits are associated with poorer identification of emotions from dynamic stimuli. *Psychiatry Research, 207*, 40-44.
- Allport, G.W. (1937). *Personality: a psychological interpretation*. New York: Holt, Rinehart and Winston.
- Asarnow, J.R., Dompson, M.C., & Goldstein, M.J. (1994). Childhood-onset schizophrenia: A follow-up study. *Schizophrenia Bulletin, 20*, 599–617.
- Astington, J.W. (1993). *The child's discovery of the mind*. Cambridge, MA: Harvard University Press.
- Bo, S., Abu-Akel, A., Kongerslev, M., Helt Haahr, U., & Simonsen, E. (2011). Risk factors for violence among patients with schizophrenia. *Clinical Psychology Review, 31*, 711-726.
- Carballo, J.J., Baca-Garcia, E., Blanco, C., Perez-Rodriguez, M.M., Arriero, M.A.J., Artes-Rodriguez, A., Rynn, M., Shaffer, D., & Oquendo, M.A. (2010). Stability of childhood anxiety disorder diagnoses: a follow-up naturalistic study in psychiatric care. *European Child and Adolescent Psychiatry, 19*, 395-403. Doi: 10.1007/s00787-009-0064-1
- Caspi, A., Houts, R.M., Belsky, D.W., Goldman-Mellor, S.J., Harrington, H., Israel, S., Meier, M.H., Ramrakha, S., Shalev, I., Poulton, R., & Moffit, T.E. (2014). The p factor: one general psychopathology factor in the structure of psychiatric disorders? *Clinical Psychological Science, 2*, 119-137. Doi: 10.1177/2167702613497473

- 
- Caspi, A., Roberts, B.W., & Shiner, R.L. (2005). Personality development: stability and change. *Annual Review of Psychology, 56*, 453-484. Doi: 10.1146/annurev.psych.55.090902.141913
- Chmielewski, M., Bagby, R.M., Markon, K., Ring, A.J., & Ryder, A.G. (2014). Openness to Experience, intellect, schizotypal personality disorder, and psychoticism: resolving the controversy. *Journal of Personality Disorders, 28*, 483-499.
- Clemmensen, L., Vernal, D.L., & Steinhausen, H.C. (2012). A systematic review of the long-term outcome of early onset schizophrenia. *BMC Psychiatry, 12*, 150. Doi: 10.1186/1471-244X-12-150
- Costa, P.T., & McCrae, R.R. (1992). *Professional Manual: Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor-Inventory (NEO-FFI)*. Odessa, FL/ Psychological Assessment Resources.
- De Clercq, B., Aelterman, N., De Pauw, S., De Bolle, M., Decuyper, M., & Tackett, J. (2010). Delineating autism spectrum symptoms from a maladaptive trait perspective. *Journal of Psychopathology and Behavioral Assessment, 32*, 529-536. Doi: 10.1007/s10862-010-9191-8
- De Clercq, B., & De Fruyt, F. (2012). A Five-Factor model framework for understanding childhood personality disorder antecedents. *Journal of Personality, 80*, 1533-1563. Doi: 10.1111/j.1467-6494.2012.00778.x
- De Clercq, B., De Fruyt, F., De Bolle, M., Van Hiel, A., Markon, K.E., & Krueger, R.F. (2014). The hierarchical structure and construct validity of the PID-5 trait measure in adolescence. *Journal of Personality, 82*, 158-169. Doi: 10.1111/jopy.12042

- 
- De Clercq, B., De Fruyt, F., Van Leeuwen, K., & Mervielde, I. (2006). The structure of maladaptive personality traits in childhood: A step toward an integrative developmental perspective for DSM-V. *Journal of Abnormal Psychology, 115*, 639-657. Doi: 10.1037/0021-843X.115.4.639
- De Clercq, B., Van Leeuwen, K., De Fruyt, F., Van Hiel, A., & Mervielde, I. (2008). Maladaptive personality traits and psychopathology in childhood and adolescence: the moderating effect of parenting. *Journal of Personality, 76*, 357-383. Doi: 10.1111/j.1467-6494.2007.00489.x
- De Clercq, B., Van Leeuwen, K., Van den Noortgate, W., De Bolle, M., & De Fruyt, F. (2009). Childhood personality pathology: dimensional stability and change. *Development and Psychopathology, 21*, 853-869. Doi: 10.1017/S0954579409000467
- Decuyper, M., De Bolle, M., De Clercq, B., & De Fruyt, F. (2011). General and maladaptive personality dimensions and the assessment of callous-unemotional traits in adolescence. *Journal of Personality Disorders, 25*, 681-701.
- Decuyper, M., De Clercq, B., & Tackett, J. (2015). Assessing maladaptive traits in youth: an English-language version of the Dimensional Personality Symptom Itempool. *Personality Disorders: Theory, Research and Treatment*.
- De Fruyt, F., & De Clercq, B. (2014). Antecedents of personality disorder in childhood and adolescence: toward an integrative developmental

- model. *Annual Review of Clinical Psychology*, *10*, 449-476. Doi: 10.1146/annurev-clinpsy-032813-153634
- De Fruyt, F., Mervielde, I., Hoekstra, H.A., & Rolland, J. (2000). Assessing adolescents' personality with the NEO-PI-R. *Assessment*, *7*, 329-345. Doi: 10.1177/107319110000700403
- DeYoung, C.G., Grazioplene, R.G., & Peterson, J.B. (2012). From madness to genius: the Openness/Intellect trait domain as a paradoxical simplex. *Journal of Research in Personality*, *46*, 63-78. Doi: 10.1016/j.jrp.2011.12.003
- Dobbert, D.L. (2007). Understanding personality disorders: an introduction. Greenwood Publishing Group.
- Donahue, E.M. (1994). Do children use the Big 5, too? Content and structural form in personality description. *Journal of Personality*, *62*, 45-66. Doi: 10.1111/j.1467-6494.1994.tb00794.x
- Driver, D.I., Gogtay, N., & Rapoport, J. L. (2013). Childhood onset schizophrenia and early onset schizophrenia spectrum disorders. *Child and Adolescent Psychiatric Clinics of North America*, *22*, 539-555. Doi: 10.1016/j.chc.2013.04.001
- Durbin, C. & Shafir, D. (2008). Emotion regulation and risk for depression. In J.R.Z. Abela & H.L. Hankin (Eds.), *Handbook of depression in children and adolescents* (pp. 149-176). New York, NY: Guilford Press.
- Evans, D.W., Leckman, J.F., Carter, A., Reznick, J.S., Henshaw, D., King, R.A., & Pauls, D. (1997). Ritual, habit, and perfectionism: the prevalence and development of compulsive-like behavior in normal young children. *Child Development*, *68*, 58-68. Doi: 10.2307/1131925

- 
- Fountain, C., Winter, A.S., & Bearman, P.S. (2012). Six developmental trajectories characterize children with autism. *Pediatrics, 129*, 1112-1120. Doi: 10.1542/peds.2011-1601
- Gjerde, P.F., & Cardilla, K. (2009). Developmental implications of Openness to Experience in preschool children: gender differences in young adulthood. *Developmental Psychology, 45*, 1455-1464. Doi: 10.1037/a0016714
- Hengartner, M.P., Müller, M., Rodgers, S., Rössler, W., & Ajdacic-Gross, V. (2014). Interpersonal functioning deficits in association with DSM-IV personality disorder dimensions. *Social Psychiatry and Psychiatric Epidemiology, 49*, 317-325.
- Kelleher, I., Connor, D., Clarke, M.C., Devlin, N., Harley, M., & Cannon, M. (2012). Prevalence of psychotic symptoms in childhood and adolescence: a systematic review and meta-analysis of population-based studies. *Psychological Medicine, 42*, 1857-1863. Doi: 10.1017/S0033291711002960
- Klinger, E., Henning, V.R., & Janssen, J.M. (2009). Fantasy-proneness dimensionalized: dissociative component is related to psychopathology, daydreaming as such is not. *Journal of Research in Personality, 43*, 506-510.
- Krueger, R. F., Derringer, J., Markon, K. E., Watson, D., & Skodol, A. E. (2012). Initial construction of a maladaptive personality trait model and inventory for DSM-5. *Psychological Medicine, 42*, 1879-1890. Doi: 10.1017/S0033291711002674

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- McLewin, L.A., & Muller, R.T. (2006). Childhood trauma, imaginary companions and the development of pathological dissociation. *Aggression and Violent Behavior, 11*, 531-545. Doi: 10.1016/j.avb.2006.02.001
- Mervielde, I., & De Fruyt, F. (1999). Construction of the Hierarchical Personality Inventory for Children (HiPIC). In I. Mervielde, I. Deary, F. De Fruyt & F. Ostendorf (Eds.), *Personality Psychology in Europe, Proceedings of the Eight European Conference on Personality Psychology* (pp. 107-127). Tilburg, The Netherlands: Tilburg University Press.
- Mervielde, I., De Fruyt, F., & De Clercq, B. (2009). *Hiërarchische Persoonlijkheidsvragenlijst voor Kinderen [Hierarchical Personality Inventory for Children]: Handleiding*. Amsterdam: Hogrefe Publishers.
- Morgan, R. K. (1999). *Case studies in child and adolescent psychopathology*. New Jersey: Prentice Hall, Upper Saddle River. (ch)
- Moskowitz, G.B. (2005). *Social Cognition: Understanding Self and Others*. Guilford Press, New York.
- Ogawa, J.R., Sroufe, L.A., Weinfield, N.S., Carlson, E.A., & Egeland, B. (1997). Development and fragmented self: longitudinal study of dissociative symptomatology in a nonclinical sample. *Development and Psychopathology, 9*, 855-879.
- Piaget, J.P. (1929). *The child's conception of the world*. London: Routledge & Kegan Paul.

- Quartier, V., & Rossier, J. (2008). A study of personality in children aged 8-12 years: comparing self- and parents' ratings. *European Journal of Personality, 22*, 575-588. Doi: 10.1002/per.689
- Raine, A., Dodge, K., Loeber, R., Gatzke-Kopp, L., Lynam, D., Reynolds, C., Stouthamer-Loeber, M., & Liu, J.H. (2006). The reactive-proactive aggression questionnaire: Differential correlates of reactive and proactive aggression in adolescent boys. *Aggressive Behavior, 32*, 159-171. Doi: 10.1002/ab.20115
- Remschmidt, H., Martin, M., Fleischhaker, C., Theisen, F.M., Hennighausen, K., Gutenbrunnen, C., & Schulz, E. (2007). Forty-two years later: the outcome of childhood-onset schizophrenia. *Journal of Neural Transmission, 114*, 505-512. Doi: 10.1007/s00702-006-0553-z
- Silk, J.S., Steinberg, L., & Morris, A.S. (2003). Adolescents' emotion regulation in daily life: links to depressive symptoms and problem behavior. *Child Development, 74*, 1869-1880. Doi: 10.1046/j.1467-8624.2003.00643.x
- Soto, C. J., & John, O. P. (2014). Traits in transition: The structure of parent-reported personality traits from early childhood to early adulthood. *Journal of Personality, 82*, 182-199. Doi: 10.1111/jopy.12044
- Tackett, J. L., Herzhoff, K., Harden, K. P., Page-Gold, E., & Josephs, R. A. (2014). Personality x hormone interactions in adolescent externalizing psychopathology. *Personality Disorders: Theory, Research and Treatment, 5*, 235-246. Doi: 10.1037/per0000075
- Tackett, J. L., Herzhoff, K., Reardon, K. W., De Clercq, B., & Sharp, C. (2014). The externalizing spectrum in youth: incorporating personality



- pathology. *Journal of Adolescence*, 37, 659-668. Doi: 10.1016/j.adolescence.2013.10.009
- Tackett, J. L., Kushner, S., Herzhoff, K., Smack, A. J., & Reardon, K. W. (2014). Viewing relational aggression through multiple lenses: Temperament, personality, and personality pathology. *Development and Psychopathology*, 26, 863-877. Doi: 10.1017/S0954579414000443
- Tackett, J. L., Kushner, S., Josephs, R. A., Harden, K. P., Page-Gould, E., & Tucker-Drob, E. M. (201). Cortisol reactivity and recovery in the context of adolescent personality disorder. *Journal of Personality Disorders*, 28, 25-39.
- Tate, J.C., & Shelton, B.L. (2008). Personality correlates of tattooing and body piercing in a college sample: the kids are alright. *Personality and Individual Differences*, 45, 281-285. Doi: 10.1016/j.paid.2008.04.011
- Verbeke, L., De Caluwé, E., & De Clercq, B. (in press). A five-factor model of developmental personality pathology precursors. *Personality Disorders: Theory, Research and Treatment*.
- Verbeke, L., De Caluwé, E., & De Clercq, B. (under review). Oddity characteristics in childhood. *Journal of Research in Personality*.
- Verbeke, L., & De Clercq, B. (2014). Integrating oddity traits in a dimensional model for personality pathology precursors. *Journal of Abnormal Psychology*, 123, 598-612. Doi: 10.1037/a0037166F
- Verbeke, L., De Clercq, B., De Caluwé, E., & Hofmans, J. (under review). Understanding schizotypal pathology in adolescence from individual developmental trajectories of childhood oddity characteristics. *Development and Psychopathology*.

- Verbeke, L., De Clercq, B., van der Heijden, P., Hutsebaut, J., & van Aken, M.A.G. (in press). The relevance of schizotypal traits for understanding interpersonal functioning in adolescents with psychiatric problems. *Personality Disorders: Theory, Research and Treatment*.
- Watson, D., Clark, L.A., & Chmielewski, M. (2008). Structures of personality and their relevance to psychopathology: II. Further articulation of a comprehensive unified trait structure. *Journal of Personality, 76*, 1545-1585. Doi: 10.1111/j.1467-6494.2008.00531.x
- Widiger, T. A. (2010). Cluster A personality symptomatology in youth. *Journal of Psychopathology and Behavioral Assessment, 32*, 551-556. Doi: 10.1007/s10862-010-9204-7
- Widiger, T. A. (2011). Integrating normal and abnormal personality structure: a proposal for DSM-V. *Journal of Personality Disorders, 25*, 338-363.

## Nederlandstalige samenvatting

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### **Ontwikkelingsmanifestaties van Bizarre Symptomen: Inhoud, structuur en betekenis**

#### **Introductie**

Huidig doctoraatsproject kan gekaderd worden binnen het onderzoeksterrein van ontwikkelingsvoorlopers van persoonlijkheids-pathologie, en de wijze waarop deze eigenschappen op jonge leeftijd vanuit dimensioneel oogpunt kunnen worden beschreven. Dit dimensioneel perspectief op persoonlijkheidspathologie kende de voorbije jaren steeds meer aanhang binnen de volwassenenliteratuur (Widiger & Costa, 2002), hoofdzakelijk gestuurd vanuit de bevinding dat de categoriale beschrijving een heel aantal problemen met zich meebrengt die de betrouwbaarheid en validiteit van persoonlijkheidspathologische diagnoses ondermijnen (Trull & Durrett, 2005). Vanuit dit alternatief dimensioneel vertrekpunt vormde de Dimensional Personality Symptom Itempool (DIPSI; De Clercq, De Fruyt, Van Leeuwen, & Mervielde, 2006) één van de eerste taxonomieën die vanuit leeftijdsspecifiek oogpunt pathologische manifestaties van persoonlijkheid beoogde te beschrijven aan de hand van vier voorgestelde brede dimensies van persoonlijkheidspathologie (i.e. Onwelwillendheid, Emotionele instabiliteit, Introversie en Compulsiviteit), welke men kan beschouwen als maladaptieve extensies van vier algemene trekken uit het Vijffactorenmodel (VFM; Costa & Mc Crae, 1992). Dit model kende internationaal gezien erkenning (Clark, 2007; Tackett, Herzhoff, Harden, Page-Gould, & Josephs, 2014), waarbij de betrouwbaarheid en validiteit vanuit verschillende

onderzoeksdesigns werd onderschreven (voor een recent overzicht zie Decuyper, De Clercq, & Tackett, 2015), maar miste een vijfde factor die de maladaptieve equivalent van Openheid voor ervaringen representeerde. Hoewel de exclusie van deze vijfde factor bij de constructie van de DIPSI een weloverwogen beslissing was (De Clercq et al., 2006; Mervielde, De Clercq, De Fruyt, & Van Leeuwen, 2005), en parallel liep met het toenmalige debat binnen de volwassenenliteratuur omtrent de bijdrage van Openheid voor het begrijpen van persoonlijkheidspathologie (Saulsman & Page, 2004), werd het belang van een vijfde maladaptieve persoonlijkheidstrekk ter beschrijving van bizarre cognities, percepties en gevoelens, welke vooral tot uiting komen in het beloop van de schizotypische persoonlijkheidsstoornis (APA, 2013), de voorbije jaren steeds meer naar voren geschoven (Tackett, Silberschmidt, Krueger, & Sponheim, 2008; Piedmont, Sherman, & Sherman, 2009). Deze groeiende consensus reflecteerde zich in de inclusie van de factor “Psychoticisme” in het dimensionele trekmodel voor persoonlijkheidsstoornissen (Krueger, Derringer, Markon, Watson, & Skodol, 2012) dat in de meest recente DSM-5 editie (APA, 2013) werd uitgewerkt. Op jonge leeftijd bleef de specifieke inhoud, structuur en betekenis van dit “bizarre” trekdomein echter lange tijd onderbelicht. Dit is allicht te wijten aan verschillende moeilijkheden die inherent zijn aan de fenomenologie van de symptomen binnen dit domein van persoonlijkheidspathologie op jonge leeftijd, zoals in het hiernavolgende stuk wordt uiteengezet.

## **Diagnostiek van Bizarre Symptomen op Jonge Leeftijd: Uitdagingen en Valkuilen**

Een eerste moeilijkheid situeert zich in het feit dat bizarre symptomen voorkomen in het beloop van verschillende klinische stoornissen in de kindertijd. Deze bizarre manifestaties zijn het meest uitgesproken voor pediatrische schizofrenie spectrum pathologie (APA, 2013; Esterberg, Goulding, & Walker, 2010), maar er zijn nog tal van andere stoornissen die een “bizarre” component lijken te hebben (Verbeke, De Caluwé, & De Clercq, under review). Zo zijn bijvoorbeeld de autismespectrumstoornis en de obsessief-compulsieve stoornis gekenmerkt door cognities, gevoelens en gedragingen die als “bizar” kunnen bestempeld worden (APA, 2013), en worden kinderen met dissociatieve en/of bipolaire neigingen ook vaak geconfronteerd met hallucinaties en waanbeelden (Pavuluri, Herbener, & Sweeney, 2004; Putnam, 1993). Deze verspreiding van bizarre symptomen over stoornissen heen kan ervoor gezorgd hebben dat deze karakteristieken telkens vanuit een ander diagnostisch kader werden geïnterpreteerd, zonder dat er vanuit een meer overkoepelend perspectief werd gefocust op een onderliggende component die mogelijks verantwoordelijk is voor deze verschillende fenotypische manifestaties.

Een tweede moeilijkheid die inherent is aan de studie van bizarre karakteristieken bij kinderen en jongeren betreft hun overlap met normatieve manifestaties van kinderlijke fantasie. Zo zijn maladaptieve bizarre eigenschappen, zoals bvb. ongewone percepties en hallucinaties, op jonge leeftijd soms moeilijk te onderscheiden van de typische kinderfantasieën, zoals bvb. het hebben van een imaginair vriendje

(McLewin & Muller, 2006). Vanuit dit gegeven kan worden verklaard waarom weinig onderzoeksgroepen binnen de persoonlijkheidspsychologie investeerden in onderzoek naar Bizarre Symptomen op jonge leeftijd en de lange termijn betekenis voor de ontwikkeling van persoonlijkheidspathologie, wat resulteerde in de langdurige afwezigheid van deze trek in de meeste ontwikkelingsgerichte maladaptieve trekmodellen (De Clercq et al., 2006). Een laatste factor die het trekonderzoek naar bizarre manifestaties op jonge leeftijd kan bemoeilijkt hebben, betreft de diepgewortelde categoriale traditie die eigen is aan onderzoek naar psychopathologie in het algemeen. Meer bepaald worden bizarre karakteristieken op jonge leeftijd het vaakst onderzocht binnen het kader van schizofrenie spectrum pathologie, waar zij onder de zogenaamde “positieve” symptomen vallen (APA, 2013). Schizofrenie spectrum stoornissen omvatten daarnaast ook steeds een waaier aan “negatieve” symptomen, gebruikt als verzamelnaam voor tekorten in normale emotionele responsen (APA, 2013). Het meeste onderzoek naar schizofrenie spectrum pathologie op jonge leeftijd beschouwt deze twee symptoom clusters echter als één categoriale entiteit (bvb. Hengartner, Müller, Rodgers, Rössler, & Ajdacic-Gross, 2014), met als gevolg dat onderzoek met expliciete focus op de positieve, bizarre symptomen beperkt is gebleven.

Ondanks deze moeilijkheden is er een stijgende evidentie voor de relevantie van de trek Bizarre Symptomen op jonge leeftijd (Esterberg et al., 2010; Tackett, Silberschmidt, Krueger, & Sponheim, 2008) en worden onderzoekers binnen het domein van de ontwikkelingsgerichte persoonlijkheidspathologie uitgedaagd om aandacht te schenken aan de

vroege manifestaties van deze trek. In zes verschillende hoofdstukken focust dit doctoraatsproject dan ook op specifieke aspecten van de *inhoud*, *structuur* en/of *betekenis* van ontwikkelingsmanifestaties van Bizarre Symptomen op jonge leeftijd, in een poging een bijdrage te leveren aan dit onderzoeksdomein.

## **Ontwikkelingsmanifestaties van Bizarre Symptomen: Inhoud, structuur en betekenis**

### **Hoofdstuk 1: Bizarre Symptomen op Jonge Leeftijd**

Hoofdstuk 1 (Verbeke, De Caluwé, & De Clercq, under review) gaat in op de *inhoud* en *betekenis* van Bizarre Symptomen vanuit een conceptueel perspectief, vertrekkende vanuit een overzicht van alle “bizarre symptomen” die op jonge leeftijd kunnen voorkomen. Deze symptomen manifesteren zich in tal van stoornissen (bvb. schizotypische persoonlijkheidsstoornis, obsessief-compulsieve stoornis), maar vertonen toch een aantal opvallende gemeenschappelijke kenmerken. Meer bepaald lijken al deze bizarre manifestaties over stoornissen heen een vrij stabiel verloop (bvb., Asarnow, 2005; Carballo et al., 2010; Fountain, Winter, & Bearman, 2012) te kennen, zijn ze geassocieerd met negatieve uitkomsten op lange termijn (bvb., Birmaher et al., 2006; Clemmensen, Vernal, & Steinhausen, 2012) en is er evidentie voor een hoge comorbiditeit en gelijkaardige biologische basis van deze verschillende stoornissen met een “bizarre” component (bvb., Barneveld et al., 2011; Fonseca-Pedrero, Lemos-Giraldez, Paino-Pineiro, Villazon-Garcia, & Muniz, 2010; Kang et al., 2008). Deze eigenschappen doen vermoeden dat er een onderliggende “liability” of een trekcomponent aan de basis ligt, die zich uit in verschillende

fenotypische manifestaties. In een tweede luik staat dit hoofdstuk vervolgens stil bij het soms moeilijke onderscheid tussen maladaptieve en normatieve bizarre manifestaties op jonge leeftijd. Dit hoofdstuk stelt enkele richtlijnen voor die dit onderscheid moeten mogelijk maken, en wijst op verschillen tussen maladaptieve en normatieve bizarre symptomen wat betreft verloop, impact op het functioneren, realiteitsverlies en persoonlijkheidscorrelaten, waarbij Openheid voor ervaringen/Vindingrijkheid betrokken is bij de normatieve bizarre manifestaties (Klinger, Henning, & Janssen, 2009; Tate & Shelton, 2008) en een maladaptieve Bizarre trekcomponent aanleiding geeft tot meer maladaptieve bizarre symptomen (Caspi et al., 2014). Dit eerste hoofdstuk kan bijgevolg beschouwd worden als een eerste stap naar een trekperspectief op bizarre gedragingen, cognities en gevoelens op jonge leeftijd.

## **Hoofdstuk 2: Schizotypische Pathologie in de Adolescentie Begrijpen vanuit Individuele Ontwikkelingspaden van Bizarre Symptomen in de Kindertijd**

In Hoofdstuk 2 (Verbeke, De Clercq, De Caluwé, & Hofmans, under reivew) wordt verder ingegaan op de *inhoud* en *betekenis* van bizarre manifestaties, waarbij de rationale voor een trekperspectief verder uitgewerkt wordt vanuit een empirisch oogpunt. Meer bepaald exploreert de longitudinale studie in Hoofdstuk 2 hoe bizarre karakteristieken zich ontwikkelen doorheen de tijd en al dan niet aanleiding geven tot latere schizotypische persoonlijkheidstrekken. Hiertoe worden bizarre karakteristieken op basis van een algemene maat voor psychopathologie op jonge leeftijd op drie verschillende momenten in de kindertijd gemeten,



gevolgd door een meting van schizotypische trekken op een vierde meetmoment in de adolescentie. De resultaten van de latente groeicurves, gebruikt om individuele verschillen in de ontwikkelingspaden van bizarre manifestaties in kaart te brengen, tonen enerzijds aan dat de meeste kinderen een dalende trend in bizarre symptomen vertonen, wat wijst op een maturatie-effect (Kelleher et al., 2012). Anderzijds blijkt dit gedrag niet altijd onschuldig, en zijn zowel een hoge startpositie als een stijgende trend van deze bizarre manifestaties predictief voor schizotypische trekken in de adolescentie. Dit hoofdstuk wijst bovendien op het belang van andere kindkarakteristieken (schoolresultaten en algemene persoonlijkheid) en omgevingsparameters (socio-economische status), die bijdragen tot de hoge startpositie of stijging van deze bizarre symptomen over de tijd heen. Dit hoofdstuk biedt bijgevolg empirische evidentie voor de lange-termijn significantie van bizarre karakteristieken in de kindertijd voor schizotypische pathologie en pleit voor de inclusie van dit domein in huidige modellen voor persoonlijkheidspathologie op jonge leeftijd.

### **Hoofdstuk 3: De Integratie van Bizarre Symptomen in een Dimensioneel en Ontwikkelingsgericht Model voor Persoonlijkheidspathologie**

Aangezien voorgaande hoofdstukken aantoonde dat bizarre manifestaties klinisch relevant zijn en mogelijks best benaderd worden vanuit een trekperspectief, focust Hoofdstuk 3 (Verbeke & De Clercq, 2014) op de empirisch gebaseerde constructie van een comprehensieve trektaxonomie voor Bizarre Symptomen, en kaart hierbij de *structuur* van bizarre manifestaties op jonge leeftijd aan. Net zoals bij de constructie van de originele DIPS (De Clercq et al., 2006) worden hiertoe in eerste instantie

maladaptieve descriptoren gegenereerd op basis van items die indicatief zijn voor het domein Openheid voor ervaringen/Vindingrijkheid (Costa & Mc Crae, 1992; Mervielde & De Fruyt, 1999), aangevuld met items uit klinische gevalstudies (Morgan, 1999), dit om het domein van bizarre manifestaties op jonge leeftijd zo volledig mogelijk te representeren. Op basis van zowel conceptuele als factor-analytische procedures op deze itempool, kunnen vier facetten van Bizarre Symptomen onderscheiden worden. Deze vier facetten (nl. Overgevoeligheid voor emoties, Extreme fantasie, Dagdromen en Bizarre gedachten en gedrag) beschrijven elk een specifiek aspect van Bizarre Symptomen op jonge leeftijd en clusteren empirisch samen in één hogere-orde Bizarre Symptomen factor. Hoofdstuk 3 vindt evidentie voor zowel de construct- als criterium validiteit van deze nieuwe maladaptieve trek, gereflecteerd in betekenisvolle associaties met zowel algemene als maladaptieve persoonlijkheid en psychopathologie. Deze studie toont bovendien aan dat deze Bizarre Symptomen factor kan beschouwd worden als vijfde DIPSI factor, naast de vier reeds bestaande factoren, en biedt preliminaire evidentie voor een vijf-factoren model van persoonlijkheidspathologie op jonge leeftijd.

#### **Hoofdstuk 4: een Vijf-Factoren Model van Persoonlijkheidspathologie op Jonge Leeftijd**

Hoofdstuk 4 (Verbeke, De Caluwé, & De Clercq, in press) bouwt verder op de *structuur* van Bizarre Symptomen op jonge leeftijd en ambiert een validatie van het vijf-factoren DIPSI model. Meer specifiek wordt de fit van de vijf-factoren structuur van maladaptieve persoonlijkheid geëxploreerd in vier steekproeven, die van elkaar verschillen op vlak van

leeftijd (kinderen versus adolescenten), type informant (zelf- versus moederbeoordelingen) en klinische status (algemene populatie versus klinische setting). Over steekproeven heen blijken deze fitstatistieken adequaat en kan er een duidelijke vijfde Bizarre Symptomen trekfactor afgeleid worden. Bovendien biedt dit hoofdstuk evidentie voor de factoriële invariantie van dit vijf-factorenmodel over leeftijden, informanten en klinische status heen. Deze resultaten bevestigen de robuustheid van het DIPSI vijf-factoren model en tonen aan dat persoonlijkheidspathologie op jonge leeftijd vanuit eenzelfde structureel kader kan worden beschreven voor kinderen versus jongeren, voor ouder- versus zelfbeoordelingen, en voor individuen uit de algemene versus uit een klinische populatie.

### **Hoofdstuk 5: Het Belang van Schizotypische Trekken voor een Beter Begrip van Interpersoonlijk Functioneren bij Adolescenten met Psychische Problemen**

In Hoofdstuk 5 (Verbeke, De Clercq, van der Heijden, Hutsebaut, & van Aken, in press) wordt dieper ingegaan op de klinische *betekenis* van de trek Bizarre Symptomen. Meer bepaald wordt in deze studie het belang van positieve versus negatieve schizotypische trekken met elkaar vergeleken in de voorspelling van relatiekwaliteit met verschillende figuren uit het dichte netwerk van jongeren met een psychische problematiek. Deze benadering laat toe om de klinische relevantie van Bizarre Symptomen *an sich* te onderzoeken, gezien we deze trek loskoppelen van de negatieve schizotypische trekken waarmee Bizarre Symptomen in het beloop van de schizotypische persoonlijkheidsstoornis steeds samengaat. De resultaten van deze studie tonen aan dat positieve en negatieve schizotypische trekken

elk op unieke wijze correleren met de relatiekwaliteit van jongeren. Meer specifiek blijken de negatieve trekken geassocieerd met minder positieve interacties met zowel de moeder als de beste vriend van de jongeren, terwijl de positieve trekken (i.e., Bizarre Symptomen) aanleiding geven tot meer conflicten en vijandigheid in de interactie met deze figuren. Deze resultaten wijzen op de relevantie van een comprehensieve diagnostiek van schizotypische trekken op jonge leeftijd, inclusief een Bizarre Symptomen component, gezien ook deze trek uniek geassocieerd lijken te zijn met het sociaal functioneren van jongeren.

### **Hoofdstuk 6: Algemene Discussie**

Dit proefschrift sluit af met een algemene discussie, waarin de voornaamste bevindingen uit de vijf voorgaande hoofdstukken worden georganiseerd rond de drie centrale thema's van dit proefschrift, namelijk de *inhoud*, *structuur* en *betekenis* van Bizarre Symptomen op jonge leeftijd. Wat betreft de *inhoud* van vroege bizarre manifestaties is er evidentie voor een maladaptieve Bizarre Symptomen trekcomponent die tot uiting kan komen in diverse stoornissen, maar vooral een schizotypische trekinhoud reflecteert. De manifestaties van deze trek verschillen van de "bizarre" cognities, gevoelens en gedragingen die kunnen voorkomen in de normatieve ontwikkeling en kunnen niet louter beschouwd worden als extreme, maladaptieve uitingen van de trek Openheid voor ervaringen/Vindingrijkheid, hoewel deze twee trekken een duidelijke gemeenschappelijke grond hebben. De *structuur* van Bizarre Symptomen op jonge leeftijd wordt op een lagere-orde niveau gereflecteerd in vier facetten die samen clusteren in één hogere-orde trekcomponent, welke op zijn beurt

de vijfde factor vormt in een robuust ontwikkelingsgericht trekmodel voor persoonlijkheidspathologie op jonge leeftijd (DIPSI; De Clercq et al., 2006). De *betekenis* van vroege bizarre manifestaties tenslotte, komt tot uiting in hun voorspellende waarde voor schizotypische trekken in de adolescentie en bijdrage in zowel internaliserend als meer externaliserend probleemgedrag. Hoofdstuk 6 staat verder stil bij de implicaties van dit proefschrift voor de diagnostiek van persoonlijkheidspathologie bij kinderen en jongeren. Hiertoe wordt de implementatie van de vijf-factoren DIPSI voorgesteld in functie van het genereren van een comprehensieve beschrijving van maladaptieve trekmanifestaties op jonge leeftijd. Tot slot wordt er stilgestaan bij zowel de sterktes als de beperkingen van dit proefschrift, met oog voor suggesties voor toekomstig onderzoek.

### **Conclusie**

Dit proefschrift draagt bij tot een beter begrip van de *inhoud*, *structuur* en *betekenis* van bizarre manifestaties op jonge leeftijd. De toevoeging van de Bizarre Symptomen trek aan het DIPSI model biedt zowel onderzoekers als klinici de mogelijkheid om deze bizarre manifestaties op een ontwikkelingsgerichte manier te operationaliseren, en kan zo leiden tot een beter inzicht in dit mysterieuze domein van persoonlijkheidsdysfunctie. Dit proefschrift kan dan ook gelezen worden als een oproep aan zowel onderzoekers als klinici om dit Bizarre Symptomen trekdomein mee in rekening te brengen, gezien we overtuigd zijn dat deze toevoeging noodzakelijk is voor de volledige representatie van maladaptieve trekmanifestaties op jonge leeftijd en ook bijdraagt aan één overkoepelend vijf-factorenmodel voor de operationalisatie van zowel algemene als

maladaptieve persoonlijkheid over leeftijden heen. Anderzijds willen we echter ook wijzen op het mogelijk normatieve karakter van deze bizarre manifestaties en hun functie binnen de algemene fantasie ontwikkeling, gezien bizarre symptomen normaal gezien meer op de achtergrond verdwijnen bij het ouder worden. We willen klinici dan ook waarschuwen niet te snel conclusies te trekken over het maladaptieve karakter van deze manifestaties, maar pleiten voor een systematische opvolging van kwetsbare kinderen doorheen de tijd.

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## Referenties

- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5<sup>th</sup> ed.). Arlington, VA.
- Asarnow, J.R. (2005). Childhood-onset schizotypal disorder: a follow-up study and comparison with childhood-onset schizophrenia. *Journal of Child and Adolescent Psychopharmacology*, *15*, 395-402. Doi: 10.1089/cap.2005.15.39
- Barneveld, P.S., Pieterse, J., de Sonnevile, L., van Rijn, S., Lahuis, B., van Engeland, H., & Swaab, H. (2011). Overlap of autistic and schizotypal traits in adolescents with autism spectrum disorders. *Schizophrenia Research*, *126*, 231-236. Doi: 10.1016/j.schres.2010.09.004
- Birmaher, B., Axelson, D., Strober, M., Gill, M.K., Valeri, S., Chiappetta, L., Ryan, N., Leonard, H., Hunt, J., Ivengar, S. et al. (2006). Clinical course of children and adolescents with bipolar spectrum disorders. *Archives of General Psychiatry*, *63*, 175-183. Doi: 10.1001/archpsyc.63.2.175
- Carballo, J.J., Baca-Garcia, E., Blanco, C., Perez-Rodriguez, M.M., Arriero, M.A.J., Artes-Rodriguez, A., Rynn, M., Shaffer, D., & Oquendo, M.A. (2010). Stability of childhood anxiety disorder diagnoses: a follow-up naturalistic study in psychiatric care. *European Child and Adolescent Psychiatry*, *19*, 395-403. Doi: 10.1007/s00787-009-0064-1
- Caspi, A., Houts, R.M., Belsky, D.W., Goldman-Mellor, S.J., Harrington, H., Israel, S., Meier, M.H., Ramrakha, S., Shalev, I., Poulton, R., & Moffit, T.E. (2014). The p factor: one general psychopathology factor in the structure of psychiatric disorders? *Clinical Psychological Science*, *2*, 119-137. Doi: 10.1177/2167702613497473

- Clark, L. A. (2007). Assessment and diagnosis of personality disorder: Perennial issues and an emerging reconceptualization. *Annual Review of Psychology, 58*, 227–257.
- Clemmensen, L., Vernal, D.L., & Steinhausen, H.C. (2012). A systematic review of the long-term outcome of early onset schizophrenia. *BMC Psychiatry, 12*, 150. Doi: 10.1186/1471-244X-12-150
- Costa, P.T., & McCrae, R.R. (1992). *Professional Manual: Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor-Inventory (NEO-FFI)*. Odessa, FL/ Psychological Assessment Resources.
- De Clercq, B., & De Fruyt, F. (2012). A Five-Factor model framework for understanding childhood personality disorder antecedents. *Journal of Personality, 80*, 1533-1563. Doi: 10.1111/j.1467-6494.2012.00778.x
- De Clercq, B., De Fruyt, F., Van Leeuwen, K., & Mervielde, I. (2006). The structure of maladaptive personality traits in childhood: A step toward an integrative developmental perspective for DSM-V. *Journal of Abnormal Psychology, 115*, 639-657. Doi: 10.1037/0021-843X.115.4.639
- Decuyper, M., De Bolle, M., De Clercq, B., & De Fruyt, F. (2011). General and maladaptive personality dimensions and the assessment of callous-unemotional traits in adolescence. *Journal of Personality Disorders, 25*, 681-701.
- Decuyper, M., De Clercq, B., & Tackett, J. (2015). Assessing maladaptive traits in youth: an English-language version of the Dimensional Personality Symptom Itempool. *Personality Disorders: Theory, Research and Treatment*.



- 
- De Fruyt, F., & de Clercq, B. (2014). Antecedents of personality disorder in childhood and adolescence: toward an integrative developmental model. *Annual Review of Clinical Psychology, 10*, 449-476. Doi: 10.1146/annurev-clinpsy-032813-153634
- Esterberg, M.L, Goulding, S.M., & Walker, E.F. (2010). A personality disorders: schizotypal, schizoid and paranoid personality disorders in childhood and adolescence. *Journal of Psychopathology and Behavioral Assessment, 32*, 515-528. Doi: 10.1007/s10862-010-9183-8
- Fonseca-Pedrero, E., Lemos-Giraldez, S., Paino-Pineiro, M., Villazon-Garcia, U., & Muniz, J. (2010). Schizotypal traits, obsessive-compulsive symptoms and social functioning in adolescents. *Comprehensive Psychiatry, 51*, 71-77. Doi: 10.1016/j.comppsy.2009.02.003
- Fountain, C., Winter, A.S., & Bearman, P.S. (2012). Six developmental trajectories characterize children with autism. *Pediatrics, 129*, 1112-1120. Doi: 10.1542/peds.2011-1601
- Hengartner, M.P., Müller, M., Rodgers, S., Rössler, W., & Ajdacic-Gross, V. (2014). Interpersonal functioning deficits in association with DSM-IV personality disorder dimensions. *Social Psychiatry and Psychiatric Epidemiology, 49*, 317-325.
- Kang, D.H., Kim, S.H., Kim, C.W., Choi, J.S., Jang, J.H., Jung, M.H., Lee, J.M., Kim, S.I., & Kwon, J.S. (2008). Thalamus surface shape deformity in obsessive-compulsive disorder and schizophrenia. *Neuroreport, 19*, 609-613.
- Kelleher, I., Connor, D., Clarke, M.C., Devlin, N., Harley, M., & Cannon, M. (2012). Prevalence of psychotic symptoms in childhood and

- adolescence: a systematic review and meta-analysis of population-based studies. *Psychological Medicine*, 42, 1857-1863. Doi: 10.1017/S0033291711002960
- Klinger, E., Henning, V.R., & Janssen, J.M. (2009). Fantasy-proneness dimensionalized: dissociative component is related to psychopathology, daydreaming as such is not. *Journal of Research in Personality*, 43, 506-510.
- Krueger, R. F., Derringer, J., Markon, K. E., Watson, D., & Skodol, A. E. (2012). Initial construction of a maladaptive personality trait model and inventory for DSM-5. *Psychological Medicine*, 42, 1879-1890. Doi: 10.1017/S0033291711002674
- McLewin, L.A., & Muller, R.T. (2006). Childhood trauma, imaginary companions and the development of pathological dissociation. *Aggression and Violent Behavior*, 11, 531-545. Doi: 10.1016/j.avb.2006.02.001
- Mervielde, I., De Clercq, B., De Fruyt, F., & Van Leeuwen, K. (2005). Temperament, personality, and developmental psychopathology as childhood antecedents of personality disorders. *Journal of Personality Disorders*, 19, 171-201.
- Mervielde, I., & De Fruyt, F. (1999). Construction of the Hierarchical Personality Inventory for Children (HiPIC). In I. Mervielde, I. Deary, F. De Fruyt & F. Ostendorf (Eds.), *Personality Psychology in Europe, Proceedings of the Eight European Conference on Personality Psychology* (pp. 107-127). Tilburg, The Netherlands: Tilburg University Press.

- 
- Morgan, R. K. (1999). *Case studies in child and adolescent psychopathology*. New Jersey: Prentice Hall, Upper Saddle River. (ch)
- Pavuluri, M.N., Herbener, E.S., & Sweeney, J.A. (2004). Psychotic symptoms in pediatric bipolar disorder. *Journal of Affective Disorders, 80*, 19-28. Doi: 10.1016/S0165-0327(03)00053-3
- Piedmont, R.P., Sherman, M.F. & Sherman, N.C. (2009). Using the five-factor model to identify a new personality disorder domain: the case for experiential permeability. *Journal of Personality and Social Psychology, 96*, 1245-1258. Doi: 10.1037/a0015368
- Putnam, F.W. (1993). Dissociative disorders in children: behavioral profiles and problems. *Childhood Abuse and Neglect, 17*, 39-45. Doi: 10.1016/0145-2134(93)90006-Q
- Saulsman, L.M. & Page, A.C. (2004). The five-factor model and personality disorder empirical literature: A meta-analytic review. *Clinical Psychology Review, 23(8)*, 1055-1085. Doi: 10.1016/j.cpr.2002.09.001
- Tackett, J. L., Herzhoff, K., Harden, K. P., Page-Gold, E., & Josephs, R. A. (2014). Personality x hormone interactions in adolescent externalizing psychopathology. *Personality Disorders: Theory, Research and Treatment, 5*, 235-246. Doi: 10.1037/per0000075
- Tackett, J. L., Silberschmidt, A. L., Krueger, R. F., & Sponheim, S. R. (2008). A dimensional model of personality disorder: Incorporating DSM Cluster A characteristics. *Journal of Abnormal Psychology, 117*, 454-459. Doi: 10.1037/0021-843X.117.2.454

- Tate, J.C., & Shelton, B.L. (2008). Personality correlates of tattooing and body piercing in a college sample: the kids are alright. *Personality and Individual Differences, 45*, 281-285. Doi: 10.1016/j.paid.2008.04.011
- Trull, T. J., & Durrett, C. A. (2005). Categorical and dimensional models of personality disorder. *Annual Review of Clinical Psychology, 1*, 355–380.
- Verbeke, L., De Caluwé, E., & De Clercq, B. (in press). A five-factor model of developmental personality pathology precursors. *Personality Disorders: Theory, Research and Treatment*.
- Verbeke, L., De Caluwé, E., & De Clercq, B. (under review). Oddity characteristics in childhood. *Journal of Research in Personality*.
- Verbeke, L., & De Clercq, B. (2014). Integrating oddity traits in a dimensional model for personality pathology precursors. *Journal of Abnormal Psychology, 123*, 598-612. Doi: 10.1037/a0037166F
- Verbeke, L., De Clercq, B., De Caluwé, E., & Hofmans, J. (under review). Understanding schizotypal pathology in adolescence from individual developmental trajectories of childhood oddity characteristics. *Development and Psychopathology*.
- Verbeke, L., De Clercq, B., van der Heijden, P., Hutsebaut, J., & van Aken, M.A.G. (in press). The relevance of schizotypal traits for understanding interpersonal functioning in adolescents with psychiatric problems. *Personality Disorders: Theory, Research and Treatment*.

Widiger, T. A., & Costa, P. T., Jr. (2002). *Personality disorders and the five-factor model of personality* (2nd ed.). Washington, DC: American Psychological Association.



# Data Storage Fact Sheets

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Data Storage Fact Sheet

Name/identifier study: Oddity across time (Chapter 2 PhD Lize Verbeke)

Author: Lize Verbeke

Date: 10/03/2016

## 1. Contact details

=====

### 1a. Main researcher

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- name: Lize Verbeke
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### 1b. Responsible Staff Member (ZAP)

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If a response is not received when using the above contact details, please send an email to [data.pp@ugent.be](mailto:data.pp@ugent.be) or contact Data Management, Faculty of Psychology and Educational Sciences, Henri Dunantlaan 2, 9000 Ghent, Belgium.

## 2. Information about the datasets to which this sheet applies

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\* Reference of the publication in which the datasets are reported: Verbeke, L., De Clercq, B., De Caluwé, E., & Hofmans, J. (*under review*). Understanding schizotypal pathology in adolescence from individual developmental trajectories of childhood oddity characteristics. *Development and Psychopathology*.

\* Which datasets in that publication does this sheet apply to?: The sheet applies to all the data used in the publication.

## 3. Information about the files that have been stored

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## 3a. Raw data

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\* Have the raw data been stored by the main researcher?  YES /  NO

If NO, please justify:

\* On which platform are the raw data stored?

- researcher PC
- research group file server
- other (specify): ...

\* Who has direct access to the raw data (i.e., without intervention of another person)?

- main researcher
- responsible ZAP



- all members of the research group
- all members of UGent
- other (specify): IT worker Steven Vandenhole and postdoctoral researcher Elien De Caluwé (= co-author of the publication)

### 3b. Other files

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\* Which other files have been stored?

- file(s) describing the transition from raw data to reported results. Specify: ...
- file(s) containing processed data. Specify: scale scores.
- file(s) containing analyses. Specify: Input and output files (Mplus) and syntaxes and output files (SPSS).
- files(s) containing information about informed consent (blank copy of the informed consent form)
- a file specifying legal and ethical provisions.
- file(s) that describe the content of the stored files and how this content should be interpreted. Specify: ...
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## Data Storage Fact Sheet

Name/identifier study: Paper JAbP (Chapter 3 PhD Lize Verbeke)

Author: Lize Verbeke

Date: 10/03/2016

## 1. Contact details

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## 1a. Main researcher

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- responsible ZAP

- all members of the research group
- all members of UGent
- other (specify): IT worker Steven Vandenhole

### 3b. Other files

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- other files. Specify: SPSS syntaxes describing the transition from the raw data to the processed data.

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## Data Storage Fact Sheet

Name/identifier study: Five-factor structure PDTRT (Chapter 4 PhD Lize Verbeke)

Author: Lize Verbeke

Date: 10/03/2016

## 1. Contact details

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## 1a. Main researcher

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- e-mail: Lize.Verbeke@ugent.be

## 1b. Responsible Staff Member (ZAP)

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- name: Prof. Dr. Barbara De Clercq
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## 2. Information about the datasets to which this sheet applies

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\* Reference of the publication in which the datasets are reported: Verbeke, L., De Caluwé, E., & De Clercq, B. (in press). A five-factor model of developmental personality pathology precursors. *Personality Disorders: Theory, Research and Treatment*.

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## 3. Information about the files that have been stored

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## 3a. Raw data

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\* Have the raw data been stored by the main researcher?  YES /  NO

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\* On which platform are the raw data stored?

- researcher PC
- research group file server
- other (specify): ...

\* Who has direct access to the raw data (i.e., without intervention of another person)?

- main researcher
- responsible ZAP



- all members of the research group
- all members of UGent
- other (specify): IT worker Steven Vandenhole

### 3b. Other files

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#### \* Which other files have been stored?

- file(s) describing the transition from raw data to reported results. Specify: ...
- file(s) containing processed data. Specify: scale scores.
- file(s) containing analyses. Specify: Input and output files (Mplus) and syntaxes (SPSS).
- files(s) containing information about informed consent (blank copy of the informed consent form)
- a file specifying legal and ethical provisions: The documents that were submitted to the Ethical Commission are on my PC and I have a paper letter with the approval of the Ethical Commission (concerning Sample 4 of this study, youth delinquents)
- file(s) that describe the content of the stored files and how this content should be interpreted. Specify: ...
- other files. Specify: SPSS syntaxes describing the transition from the raw data to the processed data.

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## Data Storage Fact Sheet

Name/identifier study: Oddity and social functioning PDTRT (Chapter 5 PhD Lize Verbeke)

Author: Lize Verbeke

Date: 10/03/2016

### 1. Contact details

=====

#### 1a. Main researcher

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- name: Lize Verbeke
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#### 1b. Responsible Staff Member (ZAP)

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- name: Prof. Dr. Barbara De Clercq
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## 3. Information about the files that have been stored

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### 3a. Raw data

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\* On which platform are the raw data stored?

- researcher PC
- research group file server
- other (specify): ...

\* Who has direct access to the raw data (i.e., without intervention of another person)?

- main researcher
- responsible ZAP

- all members of the research group
- all members of UGent
- other (specify): IT worker Steven Vandenhole

### 3b. Other files

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#### \* Which other files have been stored?

- file(s) describing the transition from raw data to reported results. Specify: ...
- file(s) containing processed data. Specify: scale scores.
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