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Social cognition, psychopathological symptoms, and family functioning in a sample of inpatient adolescents using variable-centered and person-centered approaches

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ABSTRACT

The process of diagnosis and treatment planning for adolescents requires clinicians to integrate information about various domains of functioning especially: clinical signs and symptoms, social cognition and family functioning. In the current study we applied an integrative analytic approach to mirror case conceptualization by clinicians. Our analyses were performed on the data gathered from the 328 inpatient adolescents. We used a broad range of measures of social-cognitive constructs, family functioning and parent-and self-reported psychopathology. Using a combination of variable-based (PCA) and person-centered (LCA) analyses we determined class membership of adolescents based on variation in social cognition, psychopathology, and family functioning. We identified five latent classes: two internalizing groups, two externalizing groups and a severe psychopathology group. Patterns of general hyperfunctioning (characterized by hypermentalizing and hypervigilance to emotional stimuli) and hypofunctioning (manifested in under-mentalizing and under-reactivity to emotional stimuli), can be observed in these groups.

Introduction

Traditional research in clinical child psychology has often focused on single categorical diagnosis, thereby ignoring the comorbidity among psychiatric disorders as well as subclinical intensity or subthreshold levels of symptoms (Westen, 2012). An increasing number of recent studies apply person-centered approaches that allow a researcher to distinguish groups of participants based on similar profiles of functioning in key domains instead of relying on categorical diagnosis (Bergman & Magnusson, 1997; Mezzich & Salloum, 2008). Even then, groups of individuals that cluster together are identified based on one dimension of functioning e.g. psychopathological symptoms, personality features, or family functioning characteristics (Martel, Goth-Owens, Martinez-Torteya, & Nigg, 2010; Olino, Klein, Farmer, Seeley, & Lewinsohn, 2012). Relying on single diagnosis or one domain of functioning stand in contrast to clinical practice where clinicians integrate information across various aspects of their patients' functioning. Of particular interest to clinicians aiming to develop treatment plans when

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working with adolescents is a focus on family functioning and various aspects of social cognition as these factors can be influenced in the process of therapy. Clinicians are also interested in family functioning and social cognition in recognition of the profound changes in these domains that occur during adolescence (Choudhury, Blakemore, & Charman, 2006). In the current study, we applied an integrative analytic approach to mirror case conceptualization by clinicians. Our aim was to identify groups of adolescents with similar profiles of functioning in three domains important for treatment planning: psychopathological symptoms, social cognition and family functioning. Below, we further justify a focus on these domains.

Social cognition refers to the perception, interpretation, and processing of all information relating to a person's social environment and relationships (Moskowitz, 2005), and subsumes a plethora of constructs including mentalizing, theory of mind, empathy, self-esteem, self-concept, attributional biases and so on (Moskowitz, 2005; Sharp, Fonagy, & Goodyer, 2008). Lieberman (2007) differenced various aspects of social cognition into explicit-controlled vs. implicit-automatic; self vs. other; and internal vs. external features of self or other. In addition to Lieberman's (2007) organization, Fonagy and Luyten (2009) have suggested a fourth dimension for the processing of social information to be cognitive vs. affective. For instance, cognitive features of social cognition include belief-desire reasoning and perspective taking, and affective features include affective empathy and mentalized affectivity.

Various aspects of social cognition have been shown to be impaired in child and adolescent psychopathology and are included in the treatment planning for these disorders. For instance, internalizing symptoms are associated more strongly with social-cognitive biases in relation to self (Bradley & Mathews, 1983) and others (Gotlib, Krasnoperova, Yue, Neubauer, & Joormann, 2004), higher level of experiential avoidance (attempts to avoid thoughts, feelings, memories, physical sensations, and other internal experiences) (Venta, Sharp, & Hart, 2012), whereas externalizing problems have been shown to relate to hostile attributional biases (Dodge, Laird, Lochman, Zelli, & Conduct Problems Prevention Research Group, 2002), distorted mentalizing (Sharp, Croudace, & Goodyer, 2007), and reduced emotion recognition from the eye region of the face and reduced empathy (Sharp, 2008; Sterzer, Stadler, Poustka, & Kleinschmidt, 2007).

Accordingly, most of the evidence-based psychotherapeutic approaches for adolescents focus on modification of different aspects of social cognition: e.g., cognitive-behavioral therapy and mentalization-based therapy focus on social-cognitive processes in relation to self and others (Fonagy et al., 2014; Kendall, 2011) whereas mindfulness and acceptance and commitment therapy pay particular attention to aspects of social cognition in relation to self (Coyne, McHugh, & Martinez, 2011; Semple & Burke, 2012). All of the mentioned above approaches refer to both emotional and cognitive aspects of social cognition.

Several theories of social-cognitive development consider the family environment as central to the development of social-cognitive capacity. For this and other reasons, the family environment is a second important domain of clinical relevance. For instance, mentalization-based theory suggests that family functioning (especially the attachment relationship with primary caregivers) provides the basis for the development of mentalizing (Fonagy, Gergely, Jurist, & Target, 2002; Sharp & Fonagy, 2008; Sharp et al., 2009). Consistent with this theory, research has shown that insecure attachment is associated with delayed theory of mind development in children (Fonagy, Steele, Steele, Moran, & Higgit, 1991). Similar findings have been demonstrated for a variety of other social-cognitive constructs (see Dykas & Cassidy, 2011 for a review). Beyond attachment, another important index of the quality of family functioning is parenting practices. Parenting practices are defined as the specific, goal-directed behaviors through which parents socialize their children and perform their parental duties (Darling & Steinberg, 1993). They have been shown to be an important correlate of the development of social-cognitive capacity. Mentalizing abilities were found to be inversely related to parental negative control behaviors (e.g. criticism, corporal punishments) (Hughes, Deater-Deckard, & Cutting, 1999; Pears & Moses, 2003), which do not promote children's understanding of effects of their behaviors on thoughts and feelings of other people. Parenting practices are also associated with internalizing and externalizing psychopathology. In particular, higher internalizing symptoms were found to be accompanied by high parental control (Wood, McLeod, Sigman, Hwang, & Chu, 2003), whereas externalizing symptoms are related most strongly to inconsistent discipline, poor monitoring and use of corporal punishment (Bailey, Hill, Oesterle, & Hawkins, 2009; Shelton, Frick, & Wootten, 1996).

Many studies support evidence that outcomes of therapy for adolescents with various externalizing and internalizing disorders are the most positive when parents or the whole family is engaged in treatment (Kaslow, Broth, Smith, & Collins, 2012). Many of these family-based interventions such as mentalization-based family therapy, cognitive-behavioral family therapy focus on change of social-cognitive processes in the family (Asen & Fonagy, 2012; Graham & Reynolds, 2013).

Taken together, it is clear that integration of information about family functioning, social cognition and psychopathology is very important for treatment planning for adolescents. The aim of the current study was to simultaneously assess and model the relationships between social cognition, family functioning and psychopathology with the ultimate goal of identifying classes of adolescents who are similar in patterns of covariation. To achieve this aim we combined two design approaches. First, we used a variable-centered approach, which is consistent with modern approaches to psychopathology emphasizing dimensional models in lieu of viewing psychopathology as discreet categories (Hudziak, Achenbach, Althoff, & Spine, 2007). Second, we applied a categorical, person-centered approach (latent class cluster analysis) which complements a variable-centered approach and allows researchers to distinguish groups of individuals characterized by similar profiles of psychopathological symptoms and functioning in various spheres related to psychopathology (Bergman & Magnusson, 1997), such as explored in our study: social cognition and family functioning. Moreover, as previous research demonstrated sex differences in social cognition, relationship styles (Baron-Cohen, 2002; Rose & Rudolph, 2006) and psychopathology (Zahn-Waxler, 1993), we explored differences in the proportions of girls and boys in our extracted latent classes. Basing on previous studies

(Baron-Cohen, 2002; Rose & Rudolph, 2006; Zahn-Waxler, 1993) we assumed that the majority of girls will be found in latent classes characterized by higher internalizing psychopathology and higher abilities in emotional aspects of social cognition in particular emotion recognition and empathy. On the other hand, we expect boys to predominate in class or classes with high severity of externalizing symptoms and lower abilities in emotional aspects of social cognition. Identification of adolescent girls and boys with different profiles of covariation in psychopathological symptoms, social cognition and family functioning would enable the development of more effective therapy methods in the future adjusted to integrated domains of problems in functioning.

Method

Participants

This study included a sample of 481 consecutive admissions of adolescents between the ages of 12–17-year-olds to the adolescent unit of a private psychiatric hospital between October 2008 and June 2013. Consent and assent for study participation were obtained from both parents and adolescents. Inclusion criteria for study participation consisted of: (1) any adolescent patient between 12 and 17 years of age, and (2) sufficient fluency in English to complete all research. Exclusion criteria for study participation comprised the following: (1) diagnosis of schizophrenia or any psychotic disorder, and/or (2) diagnosis of mental retardation. Based on these criteria, 94 patients were excluded before participation in the assessment protocol. An additional 59 adolescent were excluded from the cluster analysis because of missing data for one or more measures included in our analysis. After these exclusions, a total of 328 participants (209 girls and 119 boys) were used in subsequent analyses.

To see if exclusions introduced bias, t-tests for all of the used in the analysis measures were conducted to see if adolescent patients who were excluded from analysis data were significantly different from those included. Analyses revealed no significant differences (for all variables $p > .05$) between groups.

Measures

Social-cognitive measures

The Movie for Assessment of Social Cognition (MASC; Dziobek et al., 2006) was used to assess complex social-cognitive processing across several modalities (affective and cognitive; implicit and explicit) in relation to others. The storyline of the movie involved four characters spending time together with themes focused on peer and romantic relationships. Adolescents were asked to imagine what the characters thought or felt as soon as each scene ended. Answer choices were presented in a mutually exclusive multiple-choice format with four response options hypermentalizing – going beyond the data, often distorted and sometimes paranoid, undermentalizing – insufficient mental-state reasoning resulting in incorrect, 'reduced' mental-state attribution, no mentalizing, or accurate mentalizing, to form four separate scales by summing total responses for each subscale.

Adequate psychometric properties have been established for the MASC (Dziobek et al., 2006). In the current study all impairment subscales, including no mentalizing, undermentalizing, and hypermentalizing were used in the analyses.

Self-report measure of reflective function. The Reflective Function Questionnaire for Youths (RFQY; Sharp et al., 2009) was used as measure of explicit social cognition related to cognitive and affective content, in relation to self and others. This measure is adapted from the adult version which was developed in the United Kingdom (Fonagy & Ghinai, unpublished manuscript). The RFQY is a 46-item self-report measure with two subscales. Scale A consists of 23 items where optimal reflective function was scored at the mid-point of the scale, and extreme responses indicated poor reflective function. Scale B included items where a higher score indicated high reflective function, and was also formed of 23 items which were averaged to form an overall subscale score. A total RFQY score was then derived by summing the scores for scales A and B, with higher scores indicating a high capacity for reflective function.

Adequate psychometric properties have been established for the RFQY. The internal consistency was $\alpha = .78$ which was in an acceptable range (Ha, Sharp, Ensink, Fonagy, & Cirino, 2013). The internal consistency was acceptable (.78) for the current study.

Avoidance and Fusion Questionnaire for Youth (AFQ-Y; Greco, Lambert, & Baer, 2008) was used as a measure of explicit social cognition, related to cognitive and affective content in relation to self. It is a 17-item self-report measure that assesses psychological inflexibility, comprised of cognitive fusion and experiential avoidance, in youths. It was adapted from the Acceptance and Action Questionnaire (Hayes et al., 2004), used to assess the same constructs in adults. In a previous study conducted by Greco et al. (2008), the AFQ-Y demonstrated adequate internal consistency (.90). In the present sample, internal consistency of this measure was similar, with a Cronbach's alpha of .89.

The Child's Eyes Test (CET) is a measure of explicit social cognition, related to affective content in relation to others, and was developed by Baron-Cohen, Wheelwright, Scahill, Lawson, and Spong (2001). Adolescents were presented with 28 pictures of the eye region of the face and instructed to examine each photo carefully to determine which word best fits what the person in the photo seemed to be thinking or feeling. Adequate psychometrics have been reported for this measure (Baron-Cohen et al., 2001). In the current study, the continuous total score was examined in all analyses.

The Basic Empathy Scale (BES) was used as a measure of explicit social cognition related to affective content, in relation to others. It is a 40-item self-report measure developed to assess the multidimensional aspects of empathy (Jolliffe & Farrington, 2006). Good convergent and divergent validity have been demonstrated for the BES (Jolliffe & Farrington, 2006). The scale had two subscales: affective and cognitive empathy that were used in this study. Internal reliability for this measure was good ($\alpha = .85$) for the current study.

Measures of psychopathological symptoms

Child Behavior Checklist (CBSL; Achenbach & Rescorla, 2001) is a parent-report questionnaire in which parents rate their adolescent's problem behaviors. The measure yields a number of scales, some empirically derived (the Syndrome Scales) and some theoretically based (the *DSM*-oriented scales). For the current study the subscale scores for Syndrome Scales: Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problem, Thought Problems, Attention Problems, Rule-Breaking Behavior and Aggressive Behavior were used as continuous measures of parent-reported psychopathology.

Youth Self-Report (YSR; Achenbach & Rescorla, 2001) is a self-report questionnaire modeled after the CBCL for use with adolescents between the ages of 11 and 18. It is organized similarly, and the same Syndrome Scales subscale scores were utilized in the current study as continuous measures of psychopathology. For both measures, the raw scores were used as recommended for research purposes by Achenbach and Rescorla (2001).

Measures of family functioning

Security Scale. The Security Scale is a short questionnaire-based measure of attachment style and children's perception of the degree to which their parents are (1) available to them, (2) dependable, and (3) easy to engage. The scale had two subscales: the first nine items included dependency and the other items included availability of parents. The Security Scale was found to have good convergent validity and acceptable internal consistency (Kerns, Klepac, & Cole, 1996). Internal reliability was very good ($\alpha = .91$) for the current study.

Alabama Parenting Questionnaire (APQ) for children and parents. The APQ (Frick, 1991) includes 35 items, rated on a 5-point frequency scale ranging from 1 (never) to 5 (always), assessing five parenting constructs: parental involvement, use of positive reinforcement, poor parental monitoring and supervision, use of inconsistent discipline, and corporal punishment. The APQ involves parent and child global report forms.

In past research, the internal consistency reliability of the five scales has been moderate ($\alpha = .63–.80$; Shelton et al., 1996). In our study internal consistency was good for children version of APQ ($\alpha = .80$) and moderate for parent's version ($\alpha = .67$).

Procedures

This study was approved by the appropriate institutional review board. All adolescents admitted to an inpatient psychiatric unit were approached on the day of admission about participating in this study. Informed consent from the parents was collected first, and if granted, assent from the adolescent was obtained in person. Adolescents were then consecutively assessed by doctoral level clinical psychology students, licensed clinicians, and/or trained clinical research assistants. Interviews were conducted independently and in private. Assessments were dispersed over an average of three days so that participants were never engaged in research activities for more than 90 min at a time. We therefore feel confident that respondent fatigue did not negatively effect the quality of the data.

Data analytic strategy

To extract groups of children with different profiles of psychopathological symptoms, social cognitive and family functioning, the following steps were applied: 1) principal component analysis, 2) latent class cluster analysis and 3) Bayesian information criterion and the Bootstrap Likelihood Ratio test.

Principal component analysis (PCA) was performed in order to reduce the number of dimensions on which the clustering would be carried out, because previous studies (e.g., Ben-Hur & Guyon, 2003; Jackson, 1991; Jolliffe, 2002) had indicated that clustering could benefit from a preprocessing step of feature/variable selection by using PCA to convert a set of observations of correlated variables into a smaller set of uncorrelated variables called principal components.

To divide children into groups, a latent class cluster analysis (LCA) was conducted. We used Mclust R package (Fraley, Raftery, & Scrucca, 2013) to perform LCA. Comparison of three LCA packages: Latent GOLD, poLCA, and Mclust conducted by Haughton, Legrand, and Woolford (2009) revealed that the results obtained using Mclust outperform these obtained by two other packages.

To determine the number of groups and to ensure that groups were not arbitrarily formed, we used Bayesian information criteria (Raftery, 1995) and the Bootstrap Likelihood Ratio test (BLRT; McLachlan & Peel, 2000). The BLRT was shown to outperform BIC and other fit indices and it is recommended to accept the number of classes suggested by the BLRT when discrepancies are found across these indices (Nylund, Asparouhov, & Muthén, 2007).

We were then able to confirm the characteristics of each latent class by evaluating group differences on the observed variables. To this end, we used ANOVAs.

Results

Results of the principle components analysis

Variables designated to clustering varied in their scope. Therefore, scaling and centering of data were performed prior to PCA. Varimax rotation was used and three factors were extracted, capable of explaining 33% of the variance (Table 1).

The first component can best be described as a Predominantly-internalizing component which included (i) all of the problems observed by adolescents in the YSR except of rule breaking; (ii) anxiety-depression, withdrawal-depression and somatic complaints observed by parents in CBCL; (ii) affective empathy, experiential avoidance, hypermentalizing and low levels of reflective functioning in children. The highest loadings (higher than .6) were for: anxiety-depression, anxiety-withdrawal, social problems, thought problems, somatic complaints and experiential avoidance as reported by adolescents.

The second component was best described as a Predominantly-externalizing component which included (i) all of the problems observed by parents in CBCL except of withdrawal-depression; (ii) attention problems, aggressive behaviors, rule-breaking and low level of anxiety-depression and anxiety-withdrawal observed by adolescents; (iii) undermentalizing, no-mentalizing and low reflective functioning; (iv) corporal punishment, the use of other discipline methods declared by both parents and adolescents, poor monitoring and inconsistent discipline declared by parents. The highest loadings (higher than .6) were for aggressive behavior, attention problems, social problems and using other discipline methods reported by parents.

The third component was best described as a Positive parenting component which included (i) parental involvement, positive parenting, high monitoring and low inconsistent discipline, high attachment security (dependency and availability); (ii) low levels of attention problems, aggressive behavior and rule breaking observed by adolescents; (iii) high level of anxiety-depression, social problems and somatic complaints and low level of rule-breaking observed by parents. The highest loadings

Table 1
Results of principal component analysis.

	Pred-intern.	Pred-extrn.	Positive parenting
Anxiety-depression (Y)	**.87**	−.18	.03
Social problems (Y)	**.81**	.00	−.01
Experiential avoidance	**.79**	−.09	−.01
Thought problems (Y)	**.78**	.03	−.15
Withdrawal-depression (Y)	**.74**	**−.23**	−.12
Somatic complaints (Y)	**.71**	−.03	−.04
Attention problems (Y)	**.59**	**.26**	**−.26**
Anxiety-depression (P)	**.51**	**.33**	**.29**
Aggressive behavior (Y)	**.50**	**.36**	**−.35**
Somatic complaints (P)	**.40**	**.30**	**.25**
Affective empathy	**.37**	−.03	.15
Withdrawal-depression (P)	**.28**	.09	−.04
Reflective functioning (Y)	**−.26**	**−.20**	.15
Hypermentalizing (MASC)	**.24**	.17	−.02
Cognitive empathy	.07	−.06	.06
Aggressive behavior (P)	.04	**.79**	−.17
Attention problems (P)	.03	**.74**	−.06
Rule-breaking (P)	**−.23**	**.61**	**−.47**
Social problems (P)	**.31**	**.60**	**.29**
Other discipline (P)	−.06	**.59**	.05
Thought Problems (P)	**.29**	**.56**	.08
Inconsistent discipline (P)	.04	**.39**	**−.29**
Corporal punishment (P)	.02	**.38**	−.08
Other discipline (Y)	.14	**.32**	.01
No-mentalizing (MASC)	.04	**.26**	.09
Undermentalizing (MASC)	−.14	**.26**	.11
Corporal punishment (Y)	.02	**.21**	−.11
CET	.06	−.15	.07
Mom involvement (Y)	.06	.04	**.68**
Positive parenting (Y)	−.01	.10	**.66**
Attachm. sec.-dependency	−.08	.14	**.64**
Rule breaking (Y)	.17	.27	**−.62**
Poor monitoring (P)	**−.20**	**.29**	**−.46**
Poor monitoring (Y)	−.04	.11	**−.46**
Parental involvement (P)	.09	−.12	**.45**
Attachm. sec.-availability	−.17	−.02	**.44**
Dad involvement (Y)	−.06	−.02	**.42**
Positive parenting (P)	.01	−.03	**.33**
Inconsistent discipline (Y)	.18	.07	**−.24**

Note. Values greater than .20 are highlighted (bold). Y – youth, P – parent.

(higher than .6) were for maternal involvement, positive parenting, low rule-breaking, high attachment security as reported by adolescents.

Latent class analysis results

The information contained within the original variables was projected onto the three principal components described above. Next, LCA was performed using these three projected variables and BIC were computed for different numbers of groups (2–10). BIC reached its lowest value −5755.66 (lower values indicate a better fit) when the data were clustered into 2 groups basing on spherical, equal volume multivariate model whereas the BLRT supported the existence of 5 classes (Appendix A). Since BLRT was shown to outperform BIC (Nylund et al., 2007) we decided to choose five classes solution.

Group mean differences in observed variables to characterize latent classes

Characteristics of groups are shown in Appendix B. Comparison of groups using ANOVA and Tukey's HSD post hoc tests were performed for all the variables included in the PCA. Mean values, standard deviations and results of the comparison of groups are shown in Appendix C. Average values for the three variables derived from PCA for all the five groups are presented in Appendix D.

The five groups have the following characteristics. Group 1 (High Internalizing group; n = 97; girls = 75, boys = 22, mean age: 15.14) was characterized by high intensity of internalizing symptoms reported by both parents and adolescents, high aggressive behavior, social problems and thought problems observed by adolescents and middle intensity of externalizing symptoms, thought problems and social problems reported by parents. Children from this group manifested high affective empathy, experiential avoidance, hypermentalizing and adequate explicit mentalizing/emotion recognition capacities as measured by the CET and reflective functioning capacity in the mid-range. Family functioning of the Internalizing group was characterized by high parental involvement, high monitoring, and lower attachment availability.

Group 2 (Moderate-internalizing group; n = 65; girls = 41, boys = 24, mean age: 15.44) displayed medium intensity of internalizing symptoms and low intensity of other psychopathological symptoms in the perception of parents and adolescents. Children from this group had good social-cognitive abilities: good mentalizing skills in the MASC, high reflective functioning, middle intensity of affective empathy and experiential avoidance. All aspects of the family functioning were positive: high attachment security and positive parenting practices.

Group 3 (the Externalizing-emotional group; n = 94; girls = 50, boys = 44, mean age: 15.50) manifested very high intensity of externalizing symptoms, middle internalizing symptoms, thought problems and social problems observed by both parents and adolescents. Adolescents from this group were characterized by medium range affective empathy and experiential avoidance, reduced emotion recognition capacity on the CET, higher hypermentalizing, and lower reflective functioning. Their attachment security was relatively low and characteristics of parenting practices included poor monitoring, inconsistent discipline, corporal and other punishments, low parental involvement and low positive parenting.

Group 4 (the Externalizing-unemotional group; n = 39; girls = 16, boys = 23, mean age: 15.92) displayed very low intensity of internalizing symptoms especially low anxiety-depression, high intensity of rule breaking, moderate intensity of aggressive behaviors and attention disorders observed by parents; and moderate intensity of rule-breaking assessed through self-report. Children from this group displayed low affective empathy, very low experiential avoidance, low hypermentalizing, high undermentalizing and high reflective functioning. Their family functioning was characterized by high attachment availability, moderate attachment dependency, low positive parenting and parental involvement, and poor monitoring.

Group 5 (the Severe group; n = 33, girls = 27, boys = 6, mean age: 15.21) manifested high intensity of all psychopathological symptoms. They were furthermore characterized by high affective empathy, experiential avoidance, hypermentalizing, and low reflective functioning. All characteristics of family functioning were negative: very low attachment security and negative parenting practices in all subscales of APQ were observed (e.g. very low parental involvement, high inconsistent discipline, and high corporal punishment).

We found significant differences between proportions of boys and girls in the latent classes (Chi-square = 25.64, $p < .001$). Severe and high-internalizing groups included the largest proportion of girls, whereas externalizing-unemotional group the largest proportion of boys.

Discussion

Clinical assessment in practice relies heavily on clinical case formulation which includes understanding the patterns of thinking, feeling, behaving, attaching, relating, experiencing the self and others, and so on (Shedler, 2015). This process is highly complex and implicit. It also stands in contrast to approaches taken in academic psychology which necessarily relies on a more piecemeal approach to understanding humans. It is not uncommon for research studies to focus on exclusively one form of psychopathology, or one domain of functioning, with the consequence that current nosological systems for diagnosing disorder have become heavily criticized. The debates around the revision of the DSM 5 (Kaplan, 2009) have highlighted the need for more research that cuts across traditional boundaries between disorders. This is also consistent with the National Institute of Mental Health Research Domain Criteria initiative which has called for research of psychopathology that ignores traditional boundaries of disorders. Fortunately, in child and adolescent psychopathology there is a long tradition of

using dimensional models to elucidate the classification of disorders. The aim of the current study was to simultaneously assess and model the relationships between social cognition, family functioning and psychopathology with the ultimate goal of identifying classes of adolescents who are similar in patterns of covariation across these variables.

To reduce the number of dimensions on which clustering was performed, three components were extracted: Predominantly Internalizing, Predominantly Externalizing and Positive Parenting. The clustering of internalizing symptoms, affective empathy, experiential avoidance, hypermentalizing and low levels of reflective functioning in one component fits with the previous research showing that anxiety and/or depression are related to experiential avoidance (Venta et al., 2012) and empathy (Batanova & Loukas, 2011). Furthermore, ToM deficits, that lead to social skills problems and hypervigilance in absence of knowledge about the mental states of other people, were found in children with anxiety disorders (Banerjee, 2008; Sharp & Venta, 2012). In addition, many studies have shown that depression is associated with impairment in multiple domains affecting social information processing (Sharp & Venta, 2012). While our data does not directly speak to this, we hypothesize that problems that covaried to form this component are related to high reactivity to emotional stimuli and stressful events which was shown to be associated with a tendency to hypermentalize (Sharp, 2014), affective empathy (Davis, 1980) and anxiety (Goldin, Manber, Shabnam, Canli, & Gross, 2009; Pine, Cohen, & Brook, 2001; Sharp, Peterson, & Goodyer, 2008).

The second component (Predominantly-externalizing) combined externalizing problems with undermentalizing, nomentalizing, low reflective functioning and negative parenting practices These findings are consistent with studies showing an association between externalizing disorders and harsh parenting and low attachment security (Bailey et al., 2009; Guttmann-Steinmetz & Crowell, 2006; Shelton et al., 1996). Moreover, studies have also demonstrated various kinds of problems in social cognition with externalizing disorders among others, namely a tendency to attribute hostile intentions to others in ambiguous situations (Dodge et al., 2002), an overly positive mentalizing style in interpreting others' thoughts in relation to themselves (Sharp, Fonagy, & Goodyer, 2006; Sharp et al., 2007; Sharp & Venta, 2012), deficits in emotion understanding (Pelc, Kornreich, Foisy, & Dan, 2006; Sharp, 2008), anomalies in trust behavior, especially with regard to trustworthiness (Malti, Averdijk, Ribeaud, Rotenberg, & Eisner, 2013; Sharp et al., 2011), and reduced empathy (Sterzer et al., 2007).

The third component (Positive parenting) combined variables associated with positive parenting and secure attachment. However, factor loadings for anxiety-depression, somatic complaints and social problems observed by parents were also a little bit higher in this component. Previous studies revealed that internalizing disorders are associated with parental overprotection and high control (Hudson & Rapee, 2001; McLeod, Wood, & Weisz, 2007; Wood et al., 2003). Perhaps the association between internalizing symptoms and such aspects of parenting like high monitoring, parental involvement revealed in our study indicates that parents of children with depression and anxiety in our sample have a tendency to be overprotective and controlling.

Using the PCA results, latent class analysis revealed five groups differing in patterns of psychopathological symptoms, social cognition and family functioning: two internalizing groups (high-internalizing and moderate-internalizing), two externalizing groups (externalizing-emotional and externalizing-unemotional) and a severe psychopathology group. It is striking that a pattern emerges for the relationships between social cognition, family functioning and psychopathological symptoms in these groups that echoes patterns observed in research that focus on creating two dimensions that characterize clinical disorders in children, namely under-responsivity or over-responsivity to emotional stimuli (Frick & Ellis, 1999; Goldin et al., 2009; Pine et al., 2001; Sharp, Peterson, et al., 2008). Various models and theories concerning child development indicate over-responsivity and under-responsivity to emotional stimuli and/or stressors as one of the risk factors of different clinical disorders (Del Giudice, Ellis, & Shirtcliff, 2011; Derryberry & Tucker, 2006; Gray, 1990).

High emotional reactivity was shown to be a risk factor for internalizing disorders (especially anxiety) (Goldin et al., 2009; Pine et al., 2001; Sharp, Peterson, et al., 2008) which is in line with results of our study showing that high-internalizing group is characterized by high level of anxiety, depression, affective empathy, experiential avoidance and hypermentalizing. Moreover, two subgroups of children with externalizing disorders are described in the literature (Frick & Ellis, 1999) which differ in the reactivity to emotional and threatening stimuli: children with conduct problems with CU traits are characterized by low fearfulness to novel or threatening situations and poor responsiveness to cues of punishment, whereas children with conduct problems without CU traits tend to be highly reactive to threatening and emotional stimuli. Similarly in our study, externalizing-emotional group is characterized by elevated internalizing symptoms, higher affective empathy and hypermentalizing. In contrast, externalizing-unemotional group displays very low level of anxiety, depression and affective empathy. Surprisingly, children from this group obtained high scores in Reflective Function Questionnaire. Previous studies show that children with psychopathic traits have the ability to mentalize, however without associated emotional response (Blair, Peschardt, Budhani, Mitchell, & Pine, 2006; Sharp & Venta, 2012). Likewise, in our study children from externalizing-unemotional group obtained low results in MASC, which requires not only perspective taking, but also emotional involvement to obtain correct responses. However, they have high results in reflective functioning, which is an explicit task of mentalizing, and are presumably therefore easily influenced in providing socially desirable responses typical of those with high psychopathy traits (Edens, Buffington, Tomicic, & Riley, 2001).

One of the characteristics of hypermentalizing is that it occurs under conditions of high arousal (Sharp, 2014). However, as yet, empirical support for the links between overarousal and hypermentalizing on the one hand, and underarousal and under- or no mentalizing on the other hand has not been provided. In terms of general cognitive functioning, previous studies have shown that cognitive performance increases with emotional arousal, but only up to a point. When levels of arousal become

too high, cognitive performance decreases (Mayes, 2006). We can therefore assume that the most beneficial conditions for mentalizing are associated with optimal levels of arousal. In these conditions, an individual can engage in optimal mentalizing which implies maintaining executive control over integrated cognitive processing during emotionally intense interpersonal interactions. This allows the individual to move fluidly between automatic-implicit and controlled-explicit social-cognitive processing as demanded by the situation. The optimal mentalizer is able to efficiently mentalize even under adverse conditions of either elevated or decreased emotional arousal.

Broadly speaking then, our results seem to arrange in patterns of general hyperfunctioning (characterized by hypermentalizing and hypervigilance to emotional stimuli) and hypofunctioning (manifested in undermentalizing and underreactivity to emotional stimuli). Severe, internalizing and externalizing-emotional groups seem to be characterized by hyperfunctioning, whereas externalizing-unemotional group manifests hypofunctioning (see Fig. 1). Groups that are characterized by the highest level of hyperfunctioning (high-internalizing and severe groups) include the largest proportion of girls, whereas hypofunctioning group (externalizing-unemotional) consists of the largest proportion of boys. Thus, we can assume that hyperfunctioning is more characteristic for girls and hypofunctioning can be more often observed in boys.

There are several limitations to this study. First, the vast majority of the participants were Caucasian adolescents (91%) from well-educated and financially stable environments who were patients of the private psychiatric hospital. Thus, we cannot generalize these findings to other adolescent populations including community and outpatient samples from diverse backgrounds. Second, no conclusions on cause–effect relations can be drawn based on our results.

Despite these limitations, the current study provides important research and clinical implications. The analytic approach applied in this paper can be used in future studies to tighten links between clinical practice and research. Since differences in social cognition were found in previous research among various cultures (Hong & Chiu, 2001), it would be interesting to apply our analytic approach also in different clinical samples from United States and other countries taking into account variability in ethnic and cultural background of participants.

Locating patients on the dimensions in various spheres of functioning (mentalizing, family functioning, psychopathological symptoms) across self-report and parent report measures, and identifying to which of the classes they belong, could validate and further refine the clinical process of case conceptualization. Moreover, we propose that different therapeutic approaches should be evaluated in future research for various groups of patients. Externalizing-unemotional group may benefit from therapeutic approaches focused on decreasing their hypofunctioning in terms of undermentalizing and low emotional arousal, whereas for severe, high-internalizing and externalizing-emotional groups decreasing their hyperfunctioning would be valuable. We can assume that all of the patients would benefit from strengthening attachment security and the quality of their relationship with parents; however in some of the groups (severe, externalizing-emotional and externalizing-unemotional) it would be important to enhance parental involvement, monitoring and positive parenting. In contrast, for the high-internalizing group it would be beneficial to decrease parental protection, monitoring and promote adolescent's independence.

In addition, future studies may incorporate other domains of function in phenotypic measurement to build more comprehensive integrative models of child psychopathology and correlates. A promising agenda in this regard is to explore the relationship of mentalizing to the approach/avoidance reward domains – in particular the two motivational styles

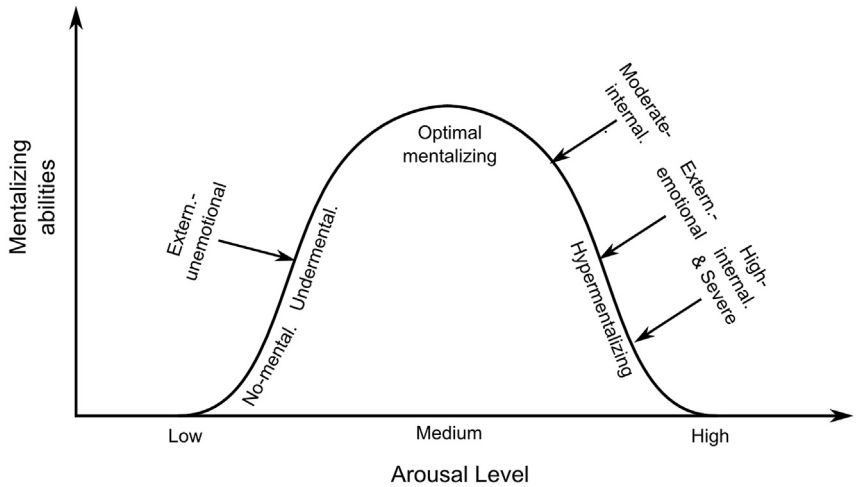

Fig. 1. Model of hypo- and hyperfunctioning. Low and high levels of arousal are associated with less adequate mentalizing. Low level of arousal is related to no-mentalizing and undermentalizing, whereas high level of arousal is associated with hypermentalizing. Externalizing-unemotional group is characterized by low level of arousal and undermentalizing (hypofunctioning). Externalizing-emotional, high-internalizing and severe groups are characterized by high level of arousal and hypermentalizng (hyperfunctioning).

differentiated by Gray (1990), Derryberry and Tucker (2006): sensitivity to positive emotions/reward associated with approach vs. reactivity to negative emotions/threatening stimuli associated with avoidance.

In summary, our study shows that it is valuable to simultaneously assess the relationships between social cognition, family functioning, psychopathology and other domains of functioning to identify classes of adolescents who are similar in patterns of covariation. The approach applied in this study may facilitate closer links between clinical practice and research and ultimately propose intervention approaches adjusted to profiles of functioning of various classes of adolescents.

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Appendix A

Table A1
Determination of the number of classes: Bayesian information criterion and p value for bootstrap likelihood ratio test.

Number of classes	Bayesian information criterion	p Value for bootstrap likelihood ratio test
1	−5806.270	
2	−5742.810	.001
3	−5755.667	.043
4	−5755.852	.001
5	−5758.606	.003
6	−5774.100	.181

Appendix B

Table B1
Characteristics of groups.

	Group 1 High internalizing N = 97	Group 2 Moderate internalizing N = 65	Group 3 Externalizing-emotional N = 94	Group 4 Externalizing-unemotional N = 39	Group 5 Severe N = 35
Psychopathology	High internalizing problems High aggression (Y) High social problems (Y) High thought problems (Y) Medium aggression (P) Medium social problems (P) Medium thought problems (P)	Mid-level internalizing problems (Y and P) Low other psychopathology	High levels of externalizing problems Average levels of internalizing problems Social problems Thought problems	Low levels of internalizing problems (Y) High levels of rule-breaking (Y) Medium levels of aggression and attention problems and rule breaking (P)	High intensity of all psychopathological symptoms
Social cognition	High affective empathy Hypermetnalizing High EA Adequate emotion recognition RF in mid range	Good mentalizing High RF Adequate affective empathy Average EA Good emotion recognition	Average EA Average affective empathy Poor emotion recognition Hypermentalizing Low RF	Low empathy Low EA Undermentalizing Low hypermentalizing High RF	High empathy High EA Hypermentalizing Low RF
Family functioning	Parental involvement Parental monitoring Low attachment dependency	High attachment security and dependency Positive parenting practices	Low attachment security Poor parental monitoring Inconsistent discipline Corporal/other punishment Low parental involvement Low positive parenting	High attachment availability Medium attachment dependency Lower positive parenting and parental involvement Poor monitoring	Low attachment security Low parental involvement Inconsistent discipline Corporal punishment

Note. Y – youth, P – parent, EA – experiential avoidance, RF – reflective functioning.

Appendix C

Table C1
Descriptive statistics, ANOVA and Tukey's HSD test for the five groups.

	High internalizing M (SD)	Moderate-internalizing M (SD)	Externalizing-emotional M (SD)	Rule-breaking-unemotional M (SD)	Severe M (SD)	ANOVA		Tukey's HSD test
						F value	*p*	
Age in months	15.14 (1.49)	15.44 (1.29)	15.50 (1.44)	15.92 (1.34)	15.21 (1.49)	2.34	.052	
Anxiety-depression (P)	13.59 (5.10)	10.05 (4.86)	10.24 (4.51)	7.23 (4.01)	16.39 (4.98)	24.41	<.001	1 > 2, 1 > 3, 1 > 4, 5 > 1, 2 > 4, 5 > 2, 3 > 4, 5 > 3, 5 > 4
Withdrawal-depression (P)	8.26 (3.68)	7.03 (3.19)	7.51 (3.15)	5.87 (2.58)	9.64 (2.66)	7.61	<.001	1 > 4, 5 > 2, 5 > 3, 5 > 4
Somatic complaints (P)	6.08 (4.05)	4.92 (3.31)	5.15 (3.40)	3.03 (2.93)	9.12 (4.09)	14.15	<.001	1 > 4, 5 > 1, 5 > 2, 3 > 4, 5 > 3, 5 > 4
Attention problems (P)	8.67 (4.36)	5.88 (3.92)	12.06 (3.73)	9.59 (3.61)	12.79 (3.07)	31.17	<.001	1 > 2, 3 > 1, 5 > 1, 3 > 2, 4 > 2, 5 > 2, 3 > 4, 5 > 4
Rule-breaking (P)	5.54 (3.87)	3.68 (3.17)	12.91 (5.47)	12.41 (4.85)	12.45 (5.21)	64.28	<.001	3 > 1, 4 > 1, 5 > 1, 3 > 2, 4 > 2, 5 > 2
Aggressive behavior (P)	10.45 (5.11)	6.35 (4.89)	16.45 (6.52)	11.87 (6.87)	17.85 (5.56)	39.50	<.001	1 > 2, 3 > 1, 5 > 1, 3 > 2, 4 > 2, 5 > 2, 3 > 4, 5 > 4
Social problems (P)	6.03 (3.75)	3.66 (3.19)	5.79 (3.48)	4.26 (2.86)	9.09 (5.02)	14.04	<.001	1 > 2, 5 > 1, 3 > 2, 5 > 2, 5 > 3, 5 > 4
Thought problems (P)	7.93 (3.52)	5.77 (2.98)	8.36 (4.18)	5.67 (2.49)	11.45 (4.50)	17.32	<.001	1 > 2, 1 > 4, 5 > 1, 3 > 2, 5 > 2, 3 > 4, 5 > 3, 5 > 4
Anxiety-depression (Y)	17.34 (4.18)	9.86 (5.02)	9.15 (4.22)	1.97 (1.77)	17.27 (4.16)	123.94	<.001	1 > 2, 1 > 3, 1 > 4, 2 > 4, 5 > 2, 3 > 4, 5 > 3, 5 > 4
Withdrawal-depression (Y)	9.20 (2.90)	6.09 (3.15)	5.39 (2.81)	2.10 (2.20)	10.39 (2.55)	64.82	<.001	1 > 2, 1 > 3, 1 > 4, 2 > 4, 5 > 2, 3 > 4, 5 > 3, 5 > 4
Somatic complaints (Y)	7.67 (3.55)	3.60 (2.37)	3.87 (3.10)	1.10 (1.55)	10.24 (3.90)	64.13	<.001	1 > 2, 1 > 3, 1 > 4, 5 > 1, 2 > 4, 5 > 2, 3 > 4, 5 > 3, 5 > 4
Attention problems (Y)	10.33 (2.77)	5.77 (3.22)	9.35 (3.11)	5.38 (3.01)	12.30 (2.36)	48.94	<.001	1 > 2, 1 > 4, 5 > 1, 3 > 2, 5 > 2, 3 > 4, 5 > 3, 5 > 4
Rule-breaking (Y)	7.99 (4.95)	4.66 (3.71)	11.71 (5.28)	8.08 (3.72)	14.91 (5.80)	34.74	<.001	1 > 2, 3 > 1, 5 > 1, 3 > 2, 4 > 2, 5 > 2, 3 > 4, 5 > 3, 5 > 4
Aggressive behavior (Y)	11.20 (4.90)	5.85 (3.88)	11.94 (5.31)	5.62 (3.64)	17.55 (5.48)	46.23	<.001	1 > 2, 1 > 4, 5 > 1, 3 > 2, 5 > 2, 3 > 4, 5 > 3, 5 > 4
Social problems (Y)	9.12 (2.98)	4.38 (2.19)	5.33 (3.02)	1.49 (1.17)	10.12 (3.46)	82.12	<.001	1 > 2, 1 > 3, 1 > 4, 2 > 4, 5 > 2, 3 > 4, 5 > 3, 5 > 4
Thought problems (Y)	11.56 (3.53)	6.32 (3.13)	8.02 (3.56)	2.46 (2.10)	14.12 (3.65)	82.78	<.001	1 > 2, 1 > 3, 1 > 4, 5 > 1, 3 > 2, 2 > 4, 5 > 2, 3 > 4, 5 > 3, 5 > 4
Cognitive empathy	36.60 (5.01)	36.00 (4.05)	35.27 (4.24)	35.56 (4.61)	36.27 (5.25)	1.11	.35	
Affective empathy	40.80 (8.19)	36.88 (7.34)	36.44 (6.28)	32.59 (7.07)	40.82 (9.20)	10.96	<.001	1 > 2, 1 > 3, 1 > 4, 2 > 4, 5 > 3, 5 > 4
Experiential avoidance	38.08 (10.28)	24.17 (10.77)	23.95 (8.83)	9.31 (7.28)	43.82 (8.99)	93.81	<.001	1 > 2, 1 > 3, 1 > 4, 5 > 1, 2 > 4, 5 > 2, 3 > 4, 5 > 3, 5 > 4
CET	20.47 (2.65)	20.38 (2.34)	19.34 (3.26)	19.95 (2.58)	19.36 (3.25)	2.64	.03	1 > 3
Hypermentalizing (MASC)	8.89 (3.68)	6.57 (3.44)	8.33 (3.17)	6.59 (3.28)	8.88 (4.95)	6.23	<.001	1 > 2, 1 > 4, 3 > 2, 5 > 2
No-mentalizing (MASC)	1.67 (1.69)	1.63 (1.33)	1.81 (1.72)	1.85 (1.73)	2.58 (2.12)	2.06	.09	
Undermentalizing (MASC)	2.84 (2.08)	2.69 (1.53)	3.59 (2.15)	4.00 (3.11)	3.00 (2.05)	3.76	.01	4 > 1, 4 > 2
Reflective functioning (Y)	6.41 (.65)	6.68 (.55)	6.38 (.61)	6.63 (.83)	6.02 (.72)	6.58	<.001	1 > 5, 2 > 3, 2 > 5, 4 > 5
Sec. attach.-availability	3.13 (.68)	3.45 (.62)	3.06 (.75)	3.41 (.72)	2.82 (.96)	5.99	<.001	2 > 1, 2 > 3, 2 > 5, 4 > 5
Sec. attach.-dependency	2.64 (.89)	2.96 (.81)	2.48 (.86)	2.68 (.89)	2.22 (.99)	4.82	<.001	2 > 3, 2 > 5
Parental involvement (P)	39.13 (4.04)	39.40 (3.25)	37.34 (4.41)	35.74 (4.76)	34.27 (5.15)	13.10	<.001	1 > 3, 1 > 4, 1 > 5, 2 > 3, 2 > 4, 2 > 5, 3 > 5
Positive parenting (P)	23.78 (2.81)	24.26 (2.90)	23.14 (3.32)	22.56 (2.99)	22.24 (3.58)	3.70	.01	2 > 5
Poor monitoring (P)	17.59 (4.25)	17.49 (4.78)	23.45 (6.68)	22.72 (5.08)	23.42 (8.63)	20.36	<.001	3 > 1, 4 > 1, 5 > 1, 3 > 2, 4 > 2, 5 > 2
Inconsistent discipline (P)	15.19 (3.10)	13.45 (3.58)	16.93 (3.30)	15.13 (3.25)	17.70 (3.70)	14.28	<.001	1 > 2, 3 > 1, 5 > 1, 3 > 2, 5 > 2, 3 > 4, 5 > 4
Corporal punishment (P)	3.46 (.94)	3.34 (.97)	4.53 (2.47)	3.38 (.85)	4.64 (3.40)	7.59	<.001	3 > 1, 5 > 1, 3 > 2, 5 > 2, 3 > 4, 5 > 4
Other discipline (Y)	16.52 (2.68)	15.74 (2.90)	18.41 (2.74)	17.00 (2.53)	17.58 (3.09)	10.56	<.001	3 > 1, 3 > 2, 5 > 2
Mom involvement (Y)	32.30 (7.84)	35.62 (7.02)	26.14 (9.81)	28.49 (9.11)	29.39 (9.65)	13.38	<.001	1 > 3, 2 > 3, 2 > 4, 2 > 5
Dad involvement (Y)	26.04 (10.69)	28.23 (9.83)	24.31 (9.96)	24.13 (10.64)	17.39 (10.75)	6.49	<.001	1 > 5, 2 > 5, 3 > 5, 4 > 5
Positive parenting (Y)	19.43 (5.71)	21.82 (4.40)	17.76 (5.47)	18.31 (4.55)	17.76 (5.37)	6.78	<.001	2 > 1, 2 > 3, 2 > 4, 2 > 5
Poor monitoring (Y)	23.61 (7.18)	21.15 (6.30)	27.62 (7.69)	26.15 (6.84)	27.12 (7.26)	9.78	<.001	3 > 1, 3 > 2, 4 > 2, 5 > 2
Inconsistent discipline (Y)	16.42 (4.47)	14.69 (3.81)	16.40 (4.74)	15.26 (4.37)	18.91 (5.13)	5.38	<.001	5 > 1, 5 > 2, 5 > 3, 5 > 4
Corporal punishment (Y)	4.61 (2.73)	3.69 (1.92)	5.55 (3.60)	4.74 (3.47)	5.21 (3.54)	3.80	<.01	3 > 2
Other discipline (Y)	17.13 (3.08)	15.17 (3.35)	17.41 (3.97)	16.00 (2.13)	17.82 (3.84)	6.01	<.001	1 > 2, 3 > 2, 5 > 2

Note. Y – youth, P – parent.

Appendix D

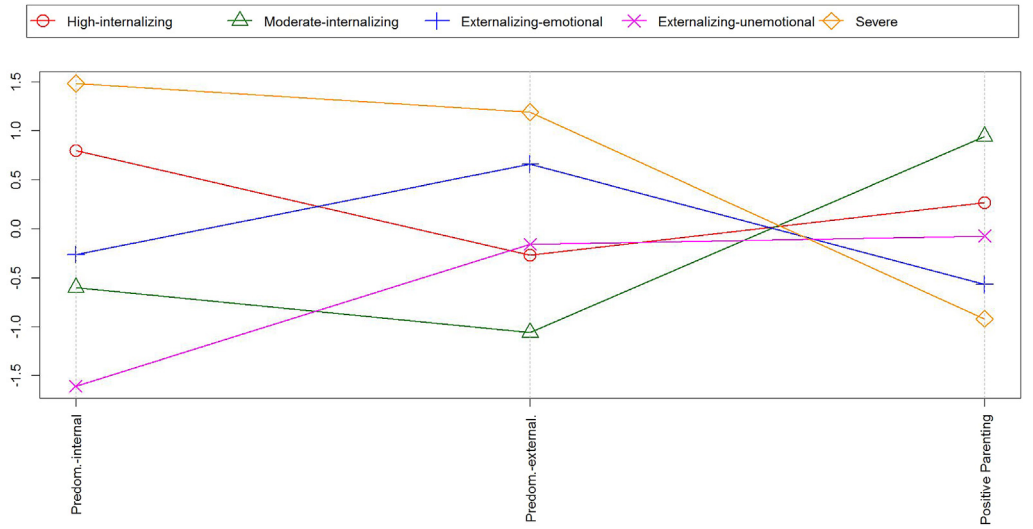

Fig. D1. Average values for the three variables derived from PCA on which clustering was performed for the five groups.

References

Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for ASEBA schoolage forms & profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families. Retrieved from http://www.aseba.org/.

Asen, E., & Fonagy, P. (2012). Mentalization-based family therapy. In A. Bateman, & P. Fonagy (Eds.), *Handbook of mentalizing in mental health practice* (pp. 107–128). Washington, DC: American Psychiatric Publishing.

Bailey, J. A., Hill, K. G., Oesterle, S., & Hawkins, J. D. (2009). Parenting practices and problem behavior across three generations: monitoring, harsh discipline, and drug use in the intergenerational transmission of externalizing behavior. *Developmental Psychology, 45*(5), 1214–1226.

Banerjee, R. (2008). Social cognition and anxiety in children. In C. Sharp, P. Fonagy, & I. Goodyer (Eds.), *Social cognition and developmental psychopathology* (pp. 239–269). New York: Oxford University Press.

Baron-Cohen, S. (2002). The extreme male brain theory of autism. *Trends in Cognitive Sciences, 6*(6), 248–254.

Baron-Cohen, S., Wheelwright, S., Scahill, V., Lawson, J., & Spong, A. (2001). Are intuitive physics and intuitive psychology independent? A test with children with Asperger's syndrome. *Journal of Developmental and Learning Disorders, 5*, 47–78.

Batanova, M. D., & Loukas, A. (2011). Social anxiety and aggression in early adolescents: examining the moderating roles of empathic concern and perspective taking. *Journal of Youth and Adolescence, 40*(11), 1534–1543.

Ben-Hur, A., & Guyon, I. (2003). Detecting stable clusters using principal component analysis. In W. M. J. Brownstein, & A. Khodursky (Eds.), *Functional genomics* (Vol. 224, pp. 159–182). New Jersey: Humana Press.

Bergman, L. R., & Magnusson, D. (1997). A person-oriented approach in research on developmental psychopathology. *Development and Psychopathology, 9*, 291–319.

Blair, R. J., Peschardt, K. S., Budhani, S., Mitchell, D. G., & Pine, D. S. (2006). The development of psychopathy. *Journal of Child Psychology and Psychiatry, 47*(3/4), 262–275.

Bradley, B., & Mathews, A. (1983). Negative self-schemata in clinical depression. *British Journal of Clinical Psychology, 22*(3), 173–181.

Choudhury, S., Blakemore, S. J., & Charman, T. (2006). Social cognitive development during adolescence. *Social Cognitive and Affective Neuroscience, 1*(3), 165–174.

Coyne, L. W., McHugh, L., & Martinez, E. R. (2011). Acceptance and commitment therapy (ACT): advances and applications with children, adolescents, and families. *Child and Adolescent Psychiatric Clinics of North America, 20*(2), 379–399.

Darling, N., & Steinberg, L. (1993). Parenting style as context: an integrative model. *Psychological Bulletin, 113*, 487–496.

Davis, M. H. (1980). A multidimensional approach to individual differences in empathy. *Catalog of Selected Documents in Psychology, 10*, 85.

Del Giudice, M., Ellis, B. J., & Shirtcliff, E. A. (2011). The adaptive calibration model of stress responsivity. *Neuroscience and Biobehavioral Reviews, 35*(7), 1562–1592.

Derryberry, D., & Tucker, D. (2006). Motivation, self-regulation, and self-organization. In D. Cicchetti, & D. Cohen (Eds.), *Developmental psychopathology* (pp. 502–532). New York: Wiley.

Dodge, K. A., Laird, R., Lochman, J. E., Zelli, A., &, Conduct Problems Prevention Research Group. (2002). Multidimensional latent-construct analysis of children's social information processing patterns: correlations with aggressive behavior problems. *Psychological Assessment, 14*, 60–73.

Dykas, M. J., & Cassidy, J. (2011). Attachment and the processing of social information across the life span: theory and evidence. *Psychological Bulletin, 137*(1), 19–46.

Dziobek, I., Fleck, S., Kalbe, E., Rogers, K., Hassenstab, J., Brand, M., et al. (2006). Introducing MASC: a movie for the assessment of social cognition. *Journal of Autism and Developmental Disorders, 36*, 623–636.

Edens, J. F., Buffington, J. K., Tomicic, T. L., & Riley, B. D. (2001). Effects of positive impression management on the psychopathic personality inventory. *Law and Human Behavior, 25*, 235–256.

Fonagy, P., Gergely, G., Jurist, E. L., & Target, M. (2002). *Affect regulation, mentalization, and the development of self*. New York: Other Press.

Fonagy, P., & Ghinai, R. *A self-report measure of mentalizing: Development and preliminary test of the reliability and validity of the reflective function questionnaire (RFQ)*. UK: Unpublished manuscript. University College London.

Fonagy, P., & Luyten, P. (2009). A developmental, mentalization-based approach to the understanding and treatment of borderline personality disorder. *Development and Psychopathology, 21*, 1355–1381.

Fonagy, P., Rossouw, T., Sharp, C., Bateman, A., Allison, L., & Farrar, C. (2014). Mentalization-based treatment for adolescents with borderline traits. In *Handbook of borderline personality disorder in children and adolescents* (pp. 313–332). Springer New York.

Fonagy, P., Steele, M., Steele, H., Moran, G., & Higgit, A. (1991). The capacity for understanding mental states: the reflective self in parent and child and its significance for security of attachment. *Infant Mental Health Journal, 12*, 201–217.
Fraley, C., Raftery, A. E., & Scrucca, L. (2013). *Mclust version 4.2 for R: Normal mixture modeling for model-based clustering, classification, and density estimation*. Department of Statistics, University of Washington.
Frick, P. J. (1991). *The Alabama parenting questionnaire. Unpublished rating scale*. University of Alabama.
Frick, P. J., & Ellis, M. (1999). Callous–unemotional traits and subtypes of conduct disorder. *Clinical Child and Family Psychology Review, 2*, 149–168.
Goldin, P. R., Manber, T., Shabnam, H., Canli, T., & Gross, J. J. (2009). Neural bases of social anxiety disorder. Emotional reactivity and cognitive regulation during social and physical treatment. *Archives of General Psychiatry, 66*(2), 170–180.
Gotlib, I. H., Krasnoperova, E., Yue, D. N., & Joormann, J. (2004). Attentional biases for negative interpersonal stimuli in clinical depression. *Journal of Abnormal Psychology, 113*(1), 127–135.
Graham, P., & Reynolds, S. (Eds.). (2013). *Cognitive behaviour therapy for children and families*. Cambridge University Press.
Gray, J. A. (1990). Brain systems that mediate both emotion and cognition. Special issue: development of relationships between emotion and cognition. *Cognition and Emotion, 4*, 269–288.
Greco, L. A., Lambert, W., & Baer, R. A. (2008). Psychological inflexibility in childhood and adolescence: development and evaluation of the avoidance and fusion questionnaire for youth. *Psychological Assessment, 20*, 93–102. http://dx.doi.org/10.1037/1040-3590.20.2.93.
Guttmann-Steinmetz, S., & Crowell, J. A. (2006). Attachment and externalizing disorders: a developmental psychopathology perspective. *Journal of the American Academy of Child and Adolescent Psychiatry, 45*, 440–451.
Ha, C., Sharp, C., Ensink, K., Fonagy, P., & Cirino, P. (2013). The measurement of reflective function in adolescents with and without borderline traits. *Journal of Adolescence, 36*, 1215–1223.
Haughton, D., Legrand, P., & Woolford, S. (2009). Review of three latent class cluster analysis packages: latent gold, polca, and mclust. *The American Statistician, 63*(1), 81–91.
Hayes, S. C., Strosahl, K. D., Wilson, K. G., Bissett, R. T., Pistorello, J., Toarmino, D., et al. (2004). Measuring experimental avoidance: a preliminary test of a working model. *The Psychological Record, 54*(4), 553–578.
Hong, Y. Y., & Chiu, C. Y. (2001). Toward a paradigm shift: from cross-cultural differences in social cognition to social-cognitive mediation of cultural differences. *Social Cognition, 19*(3 Special issue), 181–196.
Hudson, J. L., & Rapee, R. M. (2001). Parent–child interactions and anxiety disorders: an observational study. *Behaviour Research and Therapy, 39*, 1411–1427.
Hudziak, J. J., Achenbach, T. M., Althoff, R. R., & Spine, D. S. (2007). A dimensional approach to developmental psychopathology. *International Journal of Methods in Psychiatric Research, 16*(S1), S16–S23.
Hughes, C., Deater-Deckard, K., & Cutting, A. L. (1999). "Speak roughly to your little boy"? Sex differences in the relations between parenting and pre-schoolers' understanding of mind. *Social Development, 8*, 143–160.
Jackson, J. E. (1991). *A user's guide to principal components*. John Wiley and Sons.
Jolliffe, D., & Farrington, D. P. (2006). Development and validation of the basic empathy scale. *Journal of Adolescence, 29*, 589–611.
Jolliffe, I. T. (2002). *Principal component analysis*. Springer.
Kaplan, A. (2009). DSM-V controversies. *Psychiatric Times, 26*(1). Retrieved from http://www.psychiatrictimes.com/display/article/10168/1364926.
Kaslow, N. J., Broth, M. R., Smith, C. O., & Collins, M. H. (2012). Family-based interventions for child and adolescent disorders. *Journal of Marital and Family Therapy, 38*(1), 82–100.
Kendall, P. C. (Ed.). (2011). *Child and adolescent therapy: Cognitive-behavioral procedures*. Guilford Press.
Kerns, K. A., Klepac, L., & Cole, A. (1996). Peer relationships and preadolescents' perceptions of security in the child–mother relationship. *Developmental Psychology, 32*, 457–466.
Lieberman, M. D. (2007). Social cognitive neuroscience. In R. F. Baumeister, & K. D. Vohs (Eds.), *Encyclopedia of social psychology*. Thousand Oaks, CA: Sage Press.
Malti, T., Averdijk, M., Ribeaud, D., Rotenberg, K. J., & Eisner, M. P. (2013). "Do you trust him?" Children's trust beliefs and developmental trajectories of aggressive behavior in an ethnically diverse sample. *Journal of Abnormal Child Psychology, 41*(3), 445–456.
Martel, M. M., Goth-Owens, T., Martinez-Torteya, C., & Nigg, J. T. (2010). A person-centered personality approach to heterogeneity in attention-deficit/hyperactivity disorder (ADHD). *Journal of Abnormal Psychology, 119*(1), 186–196.
Mayes, L. C. (2006). Arousal regulation, emotional flexibility, medial amygdala function, and the impact of early experience: comments on the paper of Lewis et al. *Annals of the New York Academy of Sciences, 1094*, 178–192.
McLachlan, G., & Peel, D. (2000). *Finite mixture models*. New York: Wiley.
McLeod, B. D., Wood, J. J., & Weisz, J. R. (2007). Examining the association between parenting and childhood anxiety: a meta-analysis. *Clinical Psychology Review, 27*, 155–172.
Mezzich, J. E., & Salloum, I. M. (2008). Clinical complexity and person-centered integrative diagnosis. *World Psychiatry, 7*(1), 1–2.
Moskowitz, G. B. (2005). *Social cognition: Understanding self and others*. New York: Guilford Press.
Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: a Monte Carlo simulation study. *Structural Equation Modeling, 14*, 535–569.
Olino, T. M., Klein, D. N., Farmer, R. F., Seeley, J. R., & Lewinsohn, P. M. (2012). Examination of the structure of psychopathology using latent class analysis. *Comprehensive Psychiatry, 53*(4), 323–332.
Pears, K. C., & Moses, L. J. (2003). Demographics, parenting, and theory of mind in preschool children. *Social Development, 12*, 1–20.
Pelc, K., Kornreich, C., Foisy, M. L., & Dan, B. (2006). Recognition of emotional facial expressions in attention-deficit hyperactivity. *Pediatric Neurology, 35*(2), 93–97.
Pine, D. S., Cohen, P., & Brook, J. S. (2001). Emotional reactivity and risk for psychopathology among adolescents. *CNS Spectrums, 6*(1), 27–35.
Raftery, A. E. (1995). Bayesian model selection in social research. *Sociological Methodology, 25*, 111–195.
Rose, A. J., & Rudolph, K. D. (2006). A review of sex differences in peer relationship processes: potential trade-offs for the emotional and behavioral development of girls and boys. *Psychological Bulletin, 132*(1), 98.
Semple, R. J., & Burke, C. A. (2012). Mindfulness-based treatment for children and adolescents. *Child and Adolescent Therapy: Cognitive-Behavioral Procedures*, 411–428.
Sharp, C. (2008). Theory of mind and conduct problems in children: deficits in reading the 'emotions of the eyes'. *Cognition and Emotion, 22*(6), 1149–1158.
Sharp, C. (2014). The social-cognitive basis of BPD: a theory of hypermentalizing. In C. Sharp, & J. L. Tacket (Eds.), *Handbook of borderline personality disorder in children and adolescents* (pp. 211–225). Springer New York.
Sharp, C., Croudace, T. J., & Goodyer, I. M. (2007). Biased mentalising in children aged 7–11: latent class confirmation of response styles to social scenarios and associations with psychopathology. *Social Development, 16*(1), 81–202.
Sharp, C., & Fonagy, P. (2008). The parent's capacity to treat the child as a psychological agent: constructs, measures and implications for developmental psychopathology. *Social Development, 17*(3), 737–754.
Sharp, C., Fonagy, P., & Goodyer, I. (2006). Imagining your child's mind: psychosocial adjustment and mothers' ability to predict their children's attributional response styles. *British Journal of Developmental Psychology, 24*, 197–214.
Sharp, C., Fonagy, P., & Goodyer, I. (2008). Introduction. In C. Sharp, P. Fonagy, I. Goodyer, C. Sharp, P. Fonagy, & I. Goodyer (Eds.), *Social cognition and developmental psychopathology* (pp. 1–25). New York, NY: Oxford University Press.
Sharp, C., Pane, H., Ha, C., Venta, A., Patel, B., Sturek, J., et al. (2011). Theory of mind and emotion regulation difficulties in adolescents with borderline traits. *Journal of the American Academy of Child and Adolescent Psychiatry, 50*, 563–573.

Sharp, C., Peterson, N., & Goodyer, I. M. (2008). Emotional reactivity and the emergence of conduct problems and internalizing symptoms in children: a longitudinal investigation. *Journal of American Academy for Child and Adolescent Psychiatry, 47*(5), 565–573.
Sharp, C., & Venta, A. (2012). Mentalizing problems in children and adolescents. In N. Midgley, & I. Vrouva (Eds.), *Minding the child: Mentalization-based interventions with children, young people and their families*. London, UK: Routledge.
Sharp, C., Williams, L., Ha, C., Baumgardner, J., Michonski, J., Seals, R., et al. (2009). The development of a mentalization-based outcomes and research protocol for an adolescent in-patient unit. *The Bulletin of the Menninger Clinic, 73*(4), 311–338.
Shedler, J. (2015). Integrating clinical and empirical perspectives on personality: the Shedler–Western assessment procedure (SWAP). In S. K. Huprich (Ed.), *Personality disorders: Toward theoretical and empirical integration in diagnosis and assessment* (pp. 225–252). American Psychological Association.
Shelton, K. K., Frick, P. J., & Wootten, J. (1996). Assessment of parenting practices in families of elementary school-age children. *Journal of Clinical Child Psychology, 25*, 317–329.
Sterzer, P., Stadler, C., Poustka, F., & Kleinschmidt, A. (2007). A structural neural deficit in adolescents with conduct disorder and its association with lack of empathy. *NeuroImage, 37*(1), 335–342.
Venta, A., Sharp, C., & Hart, J. (2012). The relation between anxiety disorder and experiential avoidance in inpatient adolescents. *Psychological Assessment, 24*(1), 240–248.
Westen, D. (2012). Prototype diagnosis of psychiatric syndromes. *World Psychiatry, 11*(1), 16–21.
Wood, J. J., McLeod, B. D., Sigman, M., Hwang, W. C., & Chu, B. C. (2003). Parenting and childhood depression: theory, empirical findings, and future directions. *Journal of Child Psychology and Psychiatry, 44*, 134–151.
Zahn-Waxler, C. (1993). Warriors and worriers: gender and psychopathology. *Development and Psychopathology, 5*(1–2), 79–89.