

# Psychodiagnostic Chart-Child (PDC-C): a valid and clinically sensitive diagnostic tool for patient-tailored intervention planning

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Citation: Fortunato, A., Tanzilli, A., Lingiardi, V., & Speranza, A. M. (2022). Psychodiagnostic Chart-Child (PDC-C): a valid and clinically sensitive diagnostic tool for patient-tailored intervention planning. *Research in Psychotherapy: Psychopathology, Process and Outcome*, 25(1), 19-33. doi: 10.4081/ripppo.2022.591

Funding: the present study was funded by research grants to support PDM-oriented research, from the Scientific Committee of the Psychodynamic Diagnostic Manual, Second Edition (PDM-2) and the Interdisciplinary Council on Developmental and Learning Disorders.

Contributions: all authors contributed substantially to the study conception and design, as well as the data acquisition, analysis, and interpretation. AF, conceptualization and data curation; AT, formal analysis; AF, AT, AMS and VL, methodology; AF, AT, original draft writing, reviewing and editing. All authors agree that all parts of the work were appropriately investigated and resolved, with accuracy and integrity.

Conflict of interest: the authors declare no conflict of interest. The funding bodies was not involved in the study design; the collection, analysis, and interpretation of the data; the writing of the manuscript; or the decision to publish the results.

Availability of data and material: the research data are not currently available due to ongoing research projects.

Institutional Review Board Statement: the present study was conducted according to the guidelines of the Declaration of Helsinki and approved by the ethical committee of the Department of Dynamic and Clinical Psychology, and Health Studies, Faculty of Medicine and Psychology, Sapienza University of Rome, Italy (protocol code n. 25/2017).

Consent for publication: all authors read the manuscript and agreed to its publication.

Received for publication: 25 September 2021.

Revision received: 25 January 2022.

Accepted for publication: 3 February 2022.

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Research in Psychotherapy:

Psychopathology, Process and Outcome 2022; 25:19-33

doi:10.4081/ripppo.2022.591

## ABSTRACT

The reliable clinical-diagnostic evaluation of child patients is crucial. The present research sought to examine the validity of the Psychodiagnostic Chart-Child (PDC-C) in assessing children's mental functioning and personality organization, according to the framework of the *Psychodynamic Diagnostic Manual, Second Edition* (PDM-2). A sample of 209 clinicians assessed 209 children (aged 4-11 years) who had been in their care between 2-12 months, using the PDC-C. Each clinician also completed a clinical questionnaire to provide demographic information, the Child Behavior Checklist to evaluate children's behavioral problems and social competences, and the Childhood Personality Assessment Q-Sort measure to assess children's emerging personality patterns. The findings suggest that the PDC-C is a valid diagnostic tool that considers children's full range of functioning. Moreover, the measure has good sensitivity and appears clinically useful in differentiating between certain clinical populations according to psychological characteristics. The PDC-C could promote more accurate assessment during childhood and inform the development of individualized therapies. One of the advantages of the tool is its ability to capture individual variations in child functioning (illuminating strengths and psychological vulnerabilities), even within children in the same diagnostic group. Of note, additional research is needed to establish the utility of PDC-C ratings in predicting clinically relevant constructs and to monitor the processes and outcomes of interventions.

**Key words:** Assessment; childhood; treatment; personality; mental functioning.

## Introduction

Accurate and comprehensive diagnostic-clinical assessment of children is crucial for determining effective and individualized treatment plans. However, the sensitive diagnosis of child patients represents a significant challenge for clinicians and mental health professionals, due to the relational nature of most childhood disorders, the specificity of children's symptomatology, the potentially unpredictable developmental trajectories of children's psychopathological constellations, and children's differing functioning levels. Moreover, as psychological and maturational processes vary considerably, diagnoses must be dynamic and fluid (Speranza & Fortunato, 2012; Speranza et al., 2018). The *Psychodynamic Diagnostic Manual, Second Edition* (PDM-2; Lingiardi & McWilliams, 2017) represents the only complex and nuanced diagnostic framework

for children aged 4-11 years. Its multidimensional approach draws on three axes of functioning: i) mental functioning (MC Axis), which considers cognitive and affective processes, identity and relationships, defense and coping, and self-awareness and self-direction; ii) emerging personality patterns and difficulties (PC Axis), which considers epigenetics, temperament, neuropsychology, attachment style, defensive style, and sociocultural influences; and iii) child symptom patterns, reflecting their subjective experiences (SC Axis).

The PDM-2 approaches the diagnosis of children differently from the diagnosis of adults. Consistent with the clinical literature (e.g., Fortunato & Speranza, 2018), it prioritizes children's mental capacities (MC Axis) over their emerging personality patterns and difficulties (PC Axis); however, for adults, it takes the opposite approach, given that adults' personality tends to be more stable, and thus more useful as a clinical focus. From a clinical perspective, child personality can only be evaluated after crucial aspects of mental functioning are considered. The SC Axis is the final dimension to be considered because, according to the PDM-2, symptoms are better understood in the context of a profile of mental functioning and an overall personality configuration (Westen *et al.*, 2006).

The PDM-2 manual represents a useful tool for psychodynamic diagnosis and case formulation with child patients, as well as the planning of patient-tailored treatment plans that appropriately respond to the complexities of this developmental period. Of note, its diagnostic approach takes the uniqueness and specificities of childhood into account and recognizes the deep links between early adjustment and later disorders (Speranza & Fortunato, 2012). Its great innovation is its prospective understanding of development, emphasizing the interaction between various factors underlying different psycho(patho)logies in children (*i.e.*, physiological, neuropsychological, cognitive, social, emotional, representational) (Cicchetti & Cohen, 1995; Sroufe, 1997). Specifically, its childhood assessment considers: i) homotypic and heterotypic continuity (*i.e.*, Costello & Angold, 1995; Costello *et al.*, 2003) in children's functioning, to justify early interventions and the monitoring of therapeutic processes and outcomes in light of expected development pathways; ii) the link between early infancy and childhood, especially with regards to cognitive and social functioning and the extent to which these aspects affect children's functioning during therapeutic treatment; iii) the importance of caregiver-child relationships in predicting problems during development (*i.e.*, Sameroff & Emde, 1989; Speranza *et al.*, 2020; Quintigliano *et al.*, 2021); and iv) emerging personality patterns (*i.e.*, Caspi *et al.*, 2005; Fortunato *et al.*, 2021; Lingardi *et al.*, 2010; McAdams & Olson 2010; Tackett *et al.*, 2012; Widiger *et al.*, 2009), with an understanding that personality falls along a continuum ranging from relatively healthy to more compromised patterns, including conditions that do not reach the threshold for a personality disorder.

Thus, the PDM-2 facilitates a more comprehensive and clinically useful conceptualization of psychological function and dysfunction than alternative diagnostic manuals, which tend to be symptom-focused. Accordingly, it supports more rigorous multimethod psychological assessment, and thereby enhanced case conceptualization and treatment (Bornstein, 2018). Moreover, the diagnostic framework supports the planning of clinically sophisticated and methodologically robust research examining the processes and outcomes of psychotherapy (Hilsenroth *et al.*, 2018).

Drawing on the PDM-2 section on childhood, Malberg *et al.* (2017) developed the Psychodiagnostic Chart-Child (PDC-C) to operationalize the main assessment constructs. The PDC-C is a clinician-report measure of children's mental functioning, emerging personality patterns, and subjective experiences of symptoms. It was designed to guide clinicians in their formulation of psychodynamically-oriented diagnoses, integrating the PDM diagnostic approach with those of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; APA, 2013) and the *International Classification of Diseases* (ICD-11; WHO, 2019).

Studies on the Psychodiagnostic Chart for adults (PDC-2; Gordon & Bornstein, 2015) and adolescents (PDC-A; Malberg, Malone, Rossberg, & Speranza, 2017) have shown it to be a valid and reliable instrument for initial diagnoses, identifying treatment targets and tracking progress throughout and after treatment; they have also shown it to be applicable to various teaching and research contexts (see, Brabender & Whitehead, 2011; Gordon & Bornstein, 2018; Gordon *et al.*, 2013; Spektor *et al.*, 2015; Tanzilli *et al.*, 2021b). However, to the best of our knowledge, no research has empirically explored the psychometric properties of the PDC-C and its use in child clinical populations.

The systematic assessment of patients' psychological dimensions using gold standard tools included in the PDM-2 can support clinicians in their efforts to develop effective and tailored therapeutic interventions (e.g., Tanzilli *et al.*, 2021a). However, there are several challenges involved in identifying standardized and psychometrically robust tools for use with child patients. In particular, current tools are typically unable to provide complex and comprehensive diagnoses, as they tend to focus on symptomatology. Furthermore, they often refer to adolescent or adult symptomatology, while failing to grasp the specificity of childhood symptoms. Finally, they commonly use parents as informants, without considering parents' tendency to underestimate or underreport the difficulties faced by their children.

Particularly in late childhood, children are able to provide valid and reliable descriptions of themselves and peers (Lingardi & McWilliams, 2017). However, specific communication problems may be evident. Moreover, similar to parent reports, child reports may be affected by a lack of insight, implicit defense mechanisms, or social desirability bias. Since no single-informant method can be considered

a gold standard, multi-informant research designs may be most appropriate for research on this population. Among the possible informants in such research, clinicians may be considered one of the most trustworthy (Westen & Shedler, 1999a, 1999b).

## Aims

The present study had two main research goals. The first objective was to provide preliminary data on the validity of the PDC-C as a childhood assessment instrument based on the PDM-2 clinical-diagnostic framework. The second goal was to test the clinical utility (sensitivity) of the PDC-C in promoting comprehensive diagnoses and enhancing treatment planning within specific clinical populations.

Consistent with the clinical and empirical literature, the following two hypotheses were tested:

*Hypothesis 1:* The PDC-C would be a valid assessment tool that operationalized and assessed several psycho(patho)logical dimensions to produce an accurate psychodynamic diagnosis. In particular, preliminary data on the criterion validity of the PDC-C would confirm its psychometric soundness.

*Hypothesis 2:* The PDC-C would be clinically useful for developing treatment plans for three very common childhood diagnoses, according to the clinical literature: attention deficit hyperactivity disorder (ADHD); specific learning disorder (SLD); and disruptive, impulse control, and conduct disorders (DICC) (including conduct disorder [CD] and oppositional defiant disorder [ODD]). Furthermore, each of these diagnoses would represent a distinct diagnostic category on the basis of mental functioning and personality organization, with differences highlighting individual strengths and weaknesses, informing individualized treatment plans.

## Methods

### Participant sampling

An Italian sample of experienced clinicians was recruited from the membership rosters of national associations of developmental psychotherapy and centers specialized in the treatment of children, using a practice network approach. Clinicians had at least 3 years of post-psychotherapy licensure experience and treated children for at least 10 hours per week. They agreed to participate in a study on psychological assessment in childhood and collected data of children in their care without patient involvement.

Clinicians were directed to select one patient in their caseload according to the following inclusion/exclusion criteria: i) aged 4-11 years; ii) no psychotic psychiatric disorder based on the DSM-5 (APA, 2013) classification system; iii) not receiving drug therapy for psychotic symptoms; iv) no traumatic brain injury, neurological disorder, and/or clin-

ically significant cognitive impairment; v) no autistic spectrum disorder; and vi) in treatment between 2-12 months. To minimize patient selection bias, clinicians were asked to provide data on the last patient they saw in the previous week who met the study criteria. Initially, clinicians were sent a link to access the clinical questionnaire, the Childhood Personality Assessment Q-Sort assessment, and the Child Behavior Checklist, online. Once they completed these measures, they were sent a second link to access the PDC-C and other tools not analysed in this study (see 'Measures' section). Overall response rate was approximately 20%.

All clinicians provided informed written consent to participate in the research project without compensation. Study approval was obtained from the Ethical Committee of the Department of Dynamic and Clinical Psychology, and Health Studies, Faculty of Medicine and Psychology, Sapienza University of Rome, Italy (n. 25/2017).

### Clinician characteristics

The sample comprised 209 clinicians, of whom 144 (69%) were women and 65 (31%) were men. Clinicians' principal theoretical and clinical approaches included psychodynamic/psychoanalytic ( $N=104$ ), cognitive/behavioral ( $N=51$ ), systemic/relational ( $N=10$ ), integrated ( $N=23$ ), and other ( $N=21$ ). Average length of clinical experience was 12.27 years ( $SD=7.5$ ; range=3-35) and average length of treatment was 7.83 months ( $SD=3.21$ ; range=2-12).

### Patient characteristics

The clinical sample included 209 patients, of whom 81 (38.8%) were female and 128 were male (61.2%). Children's average age was 9.1 years ( $SD=1.53$ ; range 4-11). Amongst them, 152 (72.7%) had a DSM-5 (APA, 2013) psychiatric diagnosis, including DICC ( $N=28$ , 18.42%), anxiety disorder ( $N=17$ , 11.18%), SLD ( $N=29$ , 19.08%), depressive disorder ( $N=10$ , 6.58%), ADHD ( $N=33$ , 21.71%), obsessive-compulsive disorder (OCD;  $N=12$ , 7.89%), or suspected autism spectrum disorder (ASD;  $N=11$ , 7.23%). The remaining 7.89% were diagnosed with a sleep-wake disorder, motor disorder, communication disorder, or evacuation disorder.

## Measures

### Clinical questionnaire

We designed an ad hoc questionnaire for clinicians to report general information about themselves, their patients, and their therapies (see Fortunato *et al.*, 2021). Specifically, clinicians provided basic demographic data, referring to their age, gender, race, profession (*i.e.*, psychiatrist or psychologist), years of experience, and theoretical orientation. They also provided information on their patients' demographic, diagnostic, developmental, and family history, cit-

ing the presence of any traumatic experiences or events (e.g., neglect or mistreatment, parental abandonment, early separation) and indicating the length of treatment.

### Psychodiagnostic Chart-Child

The Psychodiagnostic Chart-Child (PDC-C; Malberg *et al.*, 2017) operationalizes the childhood diagnostic assessment of the PDM-2. As described above, it includes the following sections: mental functioning (MC Axis), emerging personality patterns and difficulties (PC Axis), symptom patterns (SC Axis), influencing factors, and relevant clinical observations informing the diagnosis. To determine mental functioning, clinicians rate the child's level of strength or weakness with respect to 11 mental functions (see Table 1), on a scale from 1 (*severe deficits*) to 5 (*healthy*). The summation of the 11 ratings provides a level-of-severity score.

To determine emerging personality patterns and difficulties, clinicians assign a score for each of four mental functions (*i.e.*, identity, object relations, defense mechanisms, reality testing) on a scale from 1 (*severely impaired*) to 10 (*healthy*). In doing so, they consider age-specific characteristics, the high degree of fluidity in symptomatology during this stage of development, and other external factors influencing the clinical presentation. Following this, clinicians indicate the overall emerging personality pattern (see Table 2) on a spectrum of person-

ality ranging from healthy to neurotic/borderline and psychotic functioning.

To determine symptom patterns, clinicians apply the PDM-2 diagnostic framework for the main psychopathological syndromes (related to predominantly psychotic disorders, mood disorders, anxiety disorders, and event- and stressor-related disorders), with further reference to the DSM and ICD symptoms and codes, where necessary. Finally, in the last section of the PDC-C, clinicians indicate other relevant aspects of the child (referring to epigenetics, temperament, neuropsychology, attachment style, sociocultural influences, and countertransference-transference manifestations).

### Childhood personality assessment procedure-Q sort

The Childhood Personality Assessment Procedure-Q sort (CPAP-Q; Fortunato *et al.*, 2021) is employed to assess emerging personality patterns in childhood. It is based on a Q-sort method, which is frequently utilized in the context of personality pathology (Tanzilli *et al.*, 2020; Westen *et al.*, 2003, 2014; Westen & Shedler, 1999a, 1999b). The measure is comprised of 200 descriptive statements, which raters sort into eight categories according to the degree to which they accurately describe the child. Scores of 0 are assigned to statements that are irrelevant or not descriptive of the child; scores of 7 are assigned to statements that are highly descriptive of the child; and intermediate scores rep-

**Table 1. PDM-2 MC axis: mental functions.**

#### Cognitive and affective processes

1. Capacity for regulation, attention, and learning (*ability to attend to and process internal and external information, regulate focus, and learn from experiences*)
2. Capacity for affective range, communication, and understanding (*ability to experience, express, and comprehend the full range of affects appropriately*)
3. Capacity for mentalization and reflective functioning (*ability to infer and reflect on one's own and others' mental states, and to use ideas to experience, describe, and express one's internal life*)

#### Identity and relationships

4. Capacity for differentiation and integration (identity) (*ability to distinguish oneself from others, fantasy from reality, internal representations from objects and external circumstances, and the present from the past and future; and to build links between these elements without confusing them*)
5. Capacity for relationships and intimacy (*ability to form deep and stable interpersonal relationships*)
6. Capacity for self-esteem regulation and quality of internal experience (*level of confidence and self-regard*)

#### Defense and coping

7. Capacity for impulse control and regulation (*ability to modulate impulses and express them adaptively*)
8. Capacity for defensive functioning (*ability to manage and express desires, affects, and internal experience, and to modulate anxiety deriving from internal conflicts, external challenges, or threats to the self without excessive distortion in self-perception and reality testing*)
9. Capacity for adaptation, resiliency, and strength (*ability to adapt to unforeseen events and changing circumstances, and to deal effectively and creatively with uncertainty, loss, stress, and challenges*)

#### Self-awareness and self-direction

10. Capacity for self-observing (psychological mindedness) (*ability to observe one's inner mental life in a conscious and realistic way and to use this information adaptively*)
11. Capacity for constructing and using internal standards and ideals (*ability to formulate internal values and ideals and make decisions based on coherent and internally consistent underlying moral principles*)

resent statements that describe the child to varying degrees. All items are written in simple, atheoretical, and jargon-free language and describe all eight emerging personality prototypes and other clinical conditions, referring to sleep, feeding, and neurodevelopment. The measure produces seven empirically derived diagnostic prototypes of personality: psychological health, borderline/impulsive, borderline/dysregulated, schizoid, inhibited/self-critical, obsessive, and dysphoric/dependent. These patterns revealed good levels of validity and reliability (Fortunato *et al.*, 2021).

### Child behaviour checklist-clinician version

The Child Behavior Checklist-Clinician version (CBCL, 4-18; Achenbach, 1991) is a clinician-report measure of children's behavioral and emotional difficulties and social competencies. It is used to investigate a broad spectrum of developmental characteristics in children and adolescents. The measure evaluates behaviour using two 'broad band' scales, referring to internalizing and externalizing symptomatology, respectively. The entire checklist is comprised of 128 items, which are grouped into 11 problem scales and four competence scales. The CBCL has been shown to have high levels of validity and reliability, similar to those of the parent- and teacher-report versions (Achenbach, 1991; Achenbach & Rescorla, 2000).

### Statistical analysis

Statistical analyses were performed using SPSS 24 for Windows (IBM, Armonk, NY). Bivariate correlations (Pearson's  $r$ , two-tailed) between the PDC-C scales, CPAP-Q emerging personality pattern scales, and CBCL internalizing and externalizing symptomatology scales were calculated to investigate the concurrent (criterion) validity of the PDC-C.

To ensure a thorough and psychometrically robust exploration of the convergent and discriminant validity of

the PDC-C, a series of stepwise multiple regression analyses were performed to identify which specific dimensions of the PDC-C predicted distinct emerging personality patterns and psychopathological symptoms. In these regression analyses (in which emerging personality and symptomatology variables were used as criterion variables), all PDC-C scales and global indexes of mental functioning and personality were entered as potential predictors. Change in  $R^2$  was used to determine the predictive power of each variable. The F test (*i.e.*,  $F$ -change) was used to determine whether change in  $R^2$  was statistically significant (at  $P \leq 0.05$ ).

Finally, a multivariate analysis of variance (MANOVA) was performed to verify the clinical utility (sensitivity) of the PDC-C in identifying specific characteristics of mental functioning and personality organization attributable to ADHD, DCD, and SLD clinical populations. Group differences were determined in terms of mental capacity (aggregated into four domains: cognitive and affective processes, identity and relationships, defense and coping, and self-awareness and self-direction), a global index of mental functioning (ranging from healthy/optimal to major impairments in almost all domains), and correlated level of personality organization.

## Results

### PDC-C concurrent (Criterion) validity

The first aim of the present study was to examine the criterion validity of the PDC-C, investigating the relationships between children's mental functioning and level of personality organization (as assessed by the PDM-2), emerging personality patterns (as assessed by the CPAP-Q), and a wide range of symptoms and dysfunctional behaviours (as assessed by the CBCL). In more detail, the 11 scales of the MC Axis, the global index of mental functioning, and the PC Axis level of personality organization

**Table 2. PDM-2 PC axis: emerging personality patterns.**

*Normal' emerging personality patterns (Healthy):* Characterized by mostly scores of 9-10. These children demonstrate a cohesive emerging personality pattern, in which their biological endowments - including their temperamental vulnerabilities - are managed adaptively within developmentally appropriate relationships with family members, peers, and others. Their sense of self is organized in accordance with their stage of development, comprising age-appropriate coping skills and empathic, conscientious ways of dealing with feelings about their self and others.

*Mildly dysfunctional emerging personality patterns (Neurotic):* Characterized by mostly scores of 6-8. These children demonstrate a less cohesive emerging personality pattern, in which their biological endowments - including their temperamental vulnerabilities - are managed less adaptively. Early in life, their primary caregivers may have had trouble helping them manage their constitutional dispositions. Thus, relationships with family members, peers, and others are more fraught with problems. Such children do not navigate the various developmental levels as successfully as those with less problematic endowments and/or more responsive caregivers. However, their sense of self and sense of reality develop in an age-appropriate manner. As their development proceeds, adaptive mechanisms may manifest in moderately rigid defensive patterns and somewhat dysfunctional reactions to adversity.

*Dysfunctional emerging personality patterns (Borderline):* Characterized by mostly scores of 3-5. These children demonstrate vulnerabilities in reality testing and a sense of self, which may manifest in maladaptive ways of dealing with feelings about the self and others. Their defensive operations may distort reality (*e.g.*, they may perceive their own feelings in others, rather than in themselves, and they may misperceive the intentions of others).

*Severely dysfunctional emerging personality patterns (Psychotic):* Characterized by mostly scores of 1-2. These children demonstrate significant deficits in their capacity for reality testing and formulating a sense of self, manifested in consistently maladaptive ways of dealing with feelings about the self and others. Their defensive operations interfere with their basic capacity to relate to others and to separate their own feelings and wishes from those of others.

of the PDM-2 were correlated with all CPAP-Q and CBCL scales.

Table 3 presents the results of these correlation analyses, which demonstrated good concurrent validity. Overall, higher levels of mental functioning and personality organization were strongly and positively associated with CPAP-Q psychological health, whereas major impairments in mental functioning (in particular, relevant defects in specific basic mental capacities) and more severe personality organization were related to CPAP-Q schizoid, borderline/impulsive, and borderline/dysregulated personality patterns.

Moreover, several of the PDC-C MC Axis scales were significantly associated with CPAP-Q factors in a clinically coherent and psychometrically robust way. Of note, strong negative associations were found between PDC-C limited capacity for impulse control and regulation and the CPAP-Q borderline/impulsive personality pattern, PDC-C poor capacity for relationships and intimacy and the CPAP-Q schizoid personality pattern, and PDC-C low capacity for self-esteem regulation and quality of internal experience and the CPAP-Q dysphoric/dependent personality pattern.

The results presented in Table 4 confirm the concurrent validity of the PDC-C. In more detail, major impairments in global mental functioning and lower levels of personality

organization were significantly related to more severe levels of psychopathology and symptomatology in the child patients. Overall, mental capacities related to cognitive and affective processes (as assessed by the PDC-C MC Axis) were significantly and strongly associated with attention problems; capacities related to identity and relationships were significantly and strongly associated with social problems; capacities related to defense and coping were significantly and strongly associated with delinquent and aggressive behaviours; and capacities related to self-awareness and self-direction were significantly and strongly associated with attention problems and delinquent behaviour.

Two stepwise multiple regressions were performed to test convergent and discriminant validity at a different and more specific level of analysis. Of note, distinct dimensions of the PDC-C predicting children's emerging personality patterns, behavioral and emotional difficulties, and social problems were identified.

Table 5 shows that some mental functions and personality organizations predicted distinct personality patterns, supporting good convergent and discriminant validity of the PDC-C. For example, a healthy personality configuration (characterized by psychological strengths and inner resources promoting good adaptation to the environmental context) was predicted by the capacity for affective range,

**Table 3. Bivariate correlations between CPAP-Q emerging personality patterns and PDC-C mental functioning and personality organization (N=209).**

| PDC-C mental functioning and personality organization                     | CPAP-Q factors       |                      |                         |          |                         |           |                     |
|---|----------------------|----------------------|-------------------------|----------|-------------------------|-----------|---------------------|
|   | Psychological health | Borderline/impulsive | Borderline/dysregulated | Schizoid | Inhibited/self-critical | Obsessive | Dysphoric/dependent |
| 1. Capacity for regulation, attention, and learning                       | 0.40***              | -0.46***             | -0.32***                | -0.45*** | -0.05                   | 0.17*     | -0.27***            |
| 2. Capacity for affective range, communication, and understanding         | 0.49***              | -0.44***             | -0.55***                | -0.47*** | -0.23***                | -0.03     | -0.27***            |
| 3. Capacity for mentalization and reflective functioning                  | 0.48***              | -0.44***             | -0.39***                | -0.48*** | -0.12                   | 0.01      | -0.22***            |
| 4. Capacity for differentiation and integration (identity)                | 0.32***              | -0.39***             | -0.40***                | -0.42*** | -0.23***                | -0.04     | -0.35***            |
| 5. Capacity for relationships and intimacy                                | 0.49***              | -0.38***             | -0.33***                | -0.50*** | -0.25***                | 0.03      | -0.26***            |
| 6. Capacity for self-esteem regulation and quality of internal experience | 0.34***              | -0.24***             | -0.35***                | -0.34*** | -0.34***                | -0.10     | -0.39***            |
| 7. Capacity for impulse control and regulation                            | 0.34***              | -0.55***             | -0.44***                | -0.27*** | -0.03                   | 0.11      | -0.10               |
| 8. Capacity for defensive functioning                                     | 0.38***              | -0.26***             | -0.30***                | -0.33*** | -0.18**                 | -0.06     | -0.27***            |
| 9. Capacity for adaptation, resiliency, and strength                      | 0.41***              | -0.28***             | -0.27***                | -0.32*** | -0.17*                  | -0.02     | -0.25***            |
| 10. Capacity for self-observing (psychological mindedness)                | 0.43***              | -0.33***             | -0.30***                | -0.45*** | -0.17*                  | -0.02     | -0.24***            |
| 11. Capacity for constructing and using internal standards and ideals     | 0.31***              | -0.39***             | -0.26***                | -0.32*** | -0.12                   | 0.01      | -0.16*              |
| Overall level of mental functioning                                       | 0.56***              | -0.50***             | -0.47***                | -0.55*** | -0.23***                | 0.01      | -0.34***            |
| Level of personality organization   | 0.41***              | -0.40***             | -0.50***                | -0.49*** | -0.26***                | -0.03     | -0.27***            |

CPAP-Q, Childhood Personality Assessment Q-Sort (Fortunato *et al.*, 2021); PDC-C, Psychodiagnostic Chart-Child (Malberg *et al.*, 2017). \*P≤0.05; \*\*P≤0.01; \*\*\*P≤0.001.

communication, and understanding; capacity for relationships and intimacy; capacity for self-esteem regulation and quality of internal experience; and capacity for adaptation, resiliency and strength. Conversely, these same mental functions showed negative and strong associations with dysfunctional and psychopathological personality syndromes (*i.e.*, borderline/impulsive, borderline/dysregulated, and schizoid personality patterns). PDC-C mental functioning and personality organization accounted for a mean variance of ~0.26% ( $R^2$  range: 6-40%) in emerging personality patterns (see Table 5).

The results presented in Table 6 support the concurrent (criterion) validity of the PDC-C. In particular, children's internalizing problems were strongly and negatively associated with the capacity for self-esteem regulation and quality of internal experience, the capacity for constructing and using internal standards and ideals, and the capacity for defensive functioning. In particular, severe impairments in self-esteem regulation and a low quality of internal experience represented the most important predictors of internalizing difficulties and symptoms in child patients. Conversely, children's externalizing problems were negatively associated with the capacity for impulse control and

regulation and the capacity for personality organization (with respect to four domains: identification, object relations, defenses, and reality testing). Of note, the most important predictor of children's externalizing psychopathology was the dysregulation of impulses.

### Clinical utility of the PDC-C

The second aim of the present research was to investigate the clinical utility of the PDC-C and, in particular, the sensitivity of the mental functioning (MC Axis) and personality organization (PC Axis) scales in distinguishing between the psycho(patho)logical characteristics of child patients presenting with three different clinical conditions: ADHD, DCD, and SLD. Group differences were examined according to mental capacity, with reference to the four domains of the PDM-2: cognitive and affective processes, identity and relationships, defense and coping, and self-awareness and self-direction. Global indexes of mental functioning and correlated level of personality organization were also considered. Thus, a MANOVA was carried out using the distinct patient groups as independent variables and PDC-C mental functioning domains and personality organization as dependent variables.

**Table 4. Bivariate correlations between PDC-C scales and global indexes and CBCL behavioral and emotional difficulties and social problems (N=209).**

| PDC-C mental functioning and personality organization                     | CBCL                |           |                 |                  |                    |                      |                      |               |               |                |
|---|---------------------|-----------|-----------------|------------------|--------------------|----------------------|----------------------|---------------|---------------|----------------|
|   | Anxious/ depression | Withdrawn | Social problems | Thought problems | Attention problems | Delinquent behaviour | Aggressive behaviour | Internalizing | Externalizing | Total problems |
| 1. Capacity for regulation, attention, and learning                       | .02                 | -0.03     | -0.39***        | -0.12            | -0.58***           | -0.35***             | -0.31***             | -0.02         | -0.28***      | -0.40***       |
| 2. Capacity for affective range, communication, and understanding         | -0.32***            | -0.31***  | -0.41***        | -0.10            | -0.42***           | -0.34***             | -0.28***             | -0.14         | -0.26***      | -0.43***       |
| 3. Capacity for mentalization and reflective functioning                  | -0.11               | -0.15*    | -0.40***        | -0.21**          | -0.48***           | -0.33***             | -0.35***             | -0.12         | -0.32***      | -0.47***       |
| 4. Capacity for differentiation and integration (identity)                | -0.14*              | -0.15*    | -0.38***        | -0.22**          | -0.31***           | -0.31***             | -0.28***             | -0.15*        | -0.28***      | -0.40***       |
| 5. Capacity for relationships and intimacy                                | -0.15*              | -0.35***  | -0.48***        | -0.23***         | -0.32***           | -0.30***             | -0.30***             | -0.15*        | -0.28***      | -0.42***       |
| 6. Capacity for self-esteem regulation and quality of internal experience | -0.27***            | -0.23***  | -0.39***        | -0.28***         | -0.27***           | -0.19**              | -0.23***             | -0.22**       | -0.20**       | -0.39***       |
| 7. Capacity for impulse control and regulation                            | -0.05               | -0.02     | -0.32***        | -0.29***         | -0.44***           | -0.39***             | -0.43***             | -0.03         | -0.41***      | -0.43***       |
| 8. Capacity for defensive functioning                                     | -0.17*              | -0.16*    | -0.31***        | -0.21**          | -0.30***           | -0.29**              | -0.30**              | -0.18**       | -0.17*        | -0.35***       |
| 9. Capacity for adaptation, resiliency, and strength                      | -0.14*              | -0.19**   | -0.28***        | -0.21**          | -0.25***           | -0.37***             | -0.32***             | -0.14*        | -0.21**       | -0.39***       |
| 10. Capacity for self-observing (psychological mindedness)                | -0.04               | -0.16*    | -0.28***        | -0.11            | -0.36***           | -0.19**              | -0.20**              | -0.02         | -0.16*        | -0.28***       |
| 11. Capacity for constructing and using internal standards and ideals     | -0.08               | -0.09     | -0.28***        | -0.17*           | -0.24***           | -0.37***             | -0.27***             | -0.05         | -0.25***      | -0.30***       |
| Overall level of mental functioning                                       | -0.14*              | -0.21**   | -0.48***        | -0.28***         | -0.50***           | -0.44***             | -0.39***             | -0.12         | -0.36***      | -0.52***       |
| Level of personality organization   | -0.19**             | -0.25***  | -0.47***        | -0.42***         | -0.38***           | -0.31***             | -0.38***             | -0.18**       | -0.33***      | -0.53***       |

PDC-C, Psychodiagnostic Chart-Child (Malberg *et al.*, 2017); CBCL (4-18), Child Behavior Checklist-Clinician Version (Achenbach, 1991). \* $P \leq 0.05$ ; \*\* $P \leq 0.01$ ; \*\*\* $P \leq 0.001$ .

**Table 5. Stepwise multiple regression analyses predicting children's CPAP-Q emerging personality patterns on the basis of PDC-C mental functioning and personality organization (n=209).**

| Children's personality patterns, mental functioning, and personality organization | R    | R <sup>2</sup> | Standardized $\beta$ | F-change (Model) | P      |
|---|------|----------------|----------------------|------------------|--------|
| <b>Criterion variable: Psychological health</b>                                   |      |                |                      |                  |        |
| Step 1  | 0.49 | 0.24           |                      | 640.89           | <0.01  |
| 2. Capacity for affective range, communication, and understanding                 |      |                | 0.49                 |                  |        |
| Step 2  | 0.53 | 0.29           |                      | 130.01           | <0.01  |
| 2. Capacity for affective range, communication, and understanding                 |      |                | 0.30                 |                  |        |
| 5. Capacity for relationships and intimacy  |      |                | 0.29                 |                  |        |
| Step 3  | 0.57 | 0.32           |                      | 110.24           | 0.01   |
| 2. Capacity for affective range, communication, and understanding                 |      |                | 0.20                 |                  |        |
| 5. Capacity for relationships and intimacy  |      |                | 0.28                 |                  |        |
| 6. Capacity for self-esteem regulation and quality of internal experience         |      |                | 0.22                 |                  |        |
| Step 4  | 0.59 | 0.35           |                      | 70.11            | 0.08   |
| 2. Capacity for affective range, communication, and understanding                 |      |                | 0.16                 |                  |        |
| 5. Capacity for relationships and intimacy  |      |                | 0.24                 |                  |        |
| 6. Capacity for self-esteem regulation and quality of internal experience         |      |                | 0.20                 |                  |        |
| 9. Capacity for adaptation, resiliency, and strength                              |      |                | 0.18                 |                  |        |
| <b>Criterion variable: Borderline/impulsive</b>                                   |      |                |                      |                  |        |
| Step 1  | 0.46 | 0.21           |                      | 560.20           | <0.01  |
| 1. Capacity for regulation, attention, and learning                               |      |                | -0.46                |                  |        |
| Step 2  | 0.53 | 0.28           |                      | 170.66           | <0.01  |
| 1. Capacity for regulation, attention, and learning                               |      |                | -0.33                |                  |        |
| 2. Capacity for affective range, communication, and understanding                 |      |                | -0.28                |                  |        |
| Step 3  | 0.56 | 0.32           |                      | 110.75           | 0.01   |
| 1. Capacity for regulation, attention, and learning                               |      |                | -0.23                |                  |        |
| 2. Capacity for affective range, communication, and understanding                 |      |                | -0.24                |                  |        |
| 7. Capacity for impulse control and regulation                                    |      |                | -0.24                |                  |        |
| Step 4  | 0.57 | 0.33           |                      | 40.21            | 0.042  |
| 1. Capacity for regulation, attention, and learning                               |      |                | -0.21                |                  |        |
| 2. Capacity for affective range, communication, and understanding                 |      |                | -0.17                |                  |        |
| 7. Capacity for impulse control and regulation                                    |      |                | -0.23                |                  |        |
| 4. Capacity for differentiation and integration (identity)                        |      |                | -0.14                |                  |        |
| Step 5  | 0.59 | 0.35           |                      | 50.42            | 0.021  |
| 1. Capacity for regulation, attention, and learning                               |      |                | -0.21                |                  |        |
| 2. Capacity for affective range, communication, and understanding                 |      |                | -0.23                |                  |        |
| 7. Capacity for impulse control and regulation                                    |      |                | -0.27                |                  |        |
| 4. Capacity for differentiation and integration (identity)                        |      |                | -0.17                |                  |        |
| 6. Capacity for self-esteem regulation and quality of internal experience         |      |                | -0.17                |                  |        |
| <b>Criterion variable: Borderline/dysregulated</b>                                |      |                |                      |                  |        |
| Step 1  | 0.50 | 0.25           |                      | 690.75           | <0.01  |
| Level of personality organization   |      |                | -0.50                |                  |        |
| Step 2  | 0.56 | 0.31           |                      | 160.51           | <0.01  |
| Level of personality organization   |      |                | -0.38                |                  |        |
| 2. Capacity for affective range, communication, and understanding                 |      |                | -0.27                |                  |        |
| Step 3  | 0.57 | 0.33           |                      | 50.22            | <0.023 |
| Level of personality organization   |      |                | -0.31                |                  |        |
| 2. Capacity for affective range, communication, and understanding                 |      |                | -0.25                |                  |        |
| 4. Capacity for differentiation and integration (identity)                        |      |                | -0.16                |                  |        |
| <b>Criterion variable: Schizoid</b>   |      |                |                      |                  |        |
| Step 1  | 0.55 | 0.30           |                      | 870.97           | <0.01  |
| 2. Capacity for affective range, communication, and understanding                 |      |                | -0.55                |                  |        |
| Step 2  | 0.60 | 0.35           |                      | 170.72           | <0.01  |
| 2. Capacity for affective range, communication, and understanding                 |      |                | -0.40                |                  |        |
| Level of personality organization   |      |                | -0.28                |                  |        |

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Table 5. Continued from previous page.

| Children's personality patterns, mental functioning, and personality organization                      | R    | R <sup>2</sup> | Standardized $\beta$ | F-change (Model) | P     |
|--|------|----------------|----------------------|------------------|-------|
| Step 3   | 0.62 | 0.38           |                      |                  | 0.02  |
| 2. Capacity for affective range, communication, and understanding<br>Level of personality organization |      |                | -0.33<br>-0.23       |                  |       |
| 1. Capacity for regulation, attention, and learning  |      |                | -0.20                |                  |       |
| Step 4   | 0.63 | 0.40           |                      | 60.56            | 0.011 |
| 2. Capacity for affective range, communication, and understanding<br>Level of personality organization |      |                | -0.22<br>-0.19       |                  |       |
| 1. Capacity for regulation, attention, and learning  |      |                | -0.21                |                  |       |
| 5. Capacity for relationships and intimacy   |      |                | -0.19                |                  |       |
| <b>Criterion variable: Inhibited/self-critical</b>   |      |                |                      |                  |       |
| Step 1   | 0.36 | 0.11           |                      | 260.14           | <0.01 |
| 6. Capacity for self-esteem regulation and quality of internal experience                              |      |                | -0.34                |                  |       |
| Step 2   | 0.36 | 0.13           |                      | 40.85            | 0.029 |
| 6. Capacity for self-esteem regulation and quality of internal experience                              |      |                | -0.41                |                  |       |
| 5. Capacity for relationships and intimacy   |      |                | -0.16                |                  |       |
| Step 3   | 0.40 | 0.16           |                      | 60.17            | 0.014 |
| 6. Capacity for self-esteem regulation and quality of internal experience                              |      |                | -0.35                |                  |       |
| 5. Capacity for relationships and intimacy   |      |                | -0.22                |                  |       |
| 11. Capacity for constructing and using internal standards and ideals                                  |      |                | -0.19                |                  |       |
| <b>Criterion variable: Obsessive</b>   |      |                |                      |                  |       |
| Step 1   | 0.17 | 0.03           |                      | 60.15            | 0.014 |
| 1. Capacity for regulation, attention, and learning  |      |                | 0.17                 |                  |       |
| Step 2   | 0.24 | 0.06           |                      | 60.28            | 0.013 |
| 1. Capacity for regulation, attention, and learning  |      |                | 0.24                 |                  |       |
| 6. Capacity for self-esteem regulation and quality of internal experience                              |      |                | -0.18                |                  |       |
| <b>Criterion variable: Dysphoric/dependent</b>   |      |                |                      |                  |       |
| Step 1   | 0.37 | 0.14           |                      | 320.85           | <0.01 |
| 6. Capacity for self-esteem regulation and quality of internal experience                              |      |                | -0.37                |                  |       |
| Step 2   | 0.43 | 0.18           |                      | 10.53            | 0.01  |
| 6. Capacity for self-esteem regulation and quality of internal experience                              |      |                | -0.26                |                  |       |
| 4. Capacity for differentiation and integration (identity)   |      |                | -0.23                |                  |       |

CPAP-Q, Childhood Personality Assessment Q-Sort (Fortunato *et al.*, 2021); PDC-C, Psychodiagnostic Chart-Child (Malberg *et al.*, 2017).

Table 6. Stepwise multiple regression analyses predicting children's CBCL behavioral and emotional difficulties and social problems on the basis of PDC-C mental functioning and personality organization (N=209).

| Children's behavioral and emotional difficulties and social problems, mental functioning, and personality organization | R    | R <sup>2</sup> | Standardized $\beta$ | F-change (Model) | P     |
|--|------|----------------|----------------------|------------------|-------|
| <b>Criterion variable: Anxious/depressed</b>   |      |                |                      |                  |       |
| Step 1   | 0.27 | 0.07           |                      | 150.95           | <0.01 |
| 6. Capacity for self-esteem regulation and quality of internal experience  |      |                | -0.27                |                  |       |
| Step 2   | 0.30 | 0.09           |                      | 40.15            | 0.043 |
| 6. Capacity for self-esteem regulation and quality of internal experience  |      |                | -0.36                |                  |       |
| 10. Self-observing capacities (psychological mindedness)   |      |                | -0.17                |                  |       |
| <b>Criterion variable: Withdrawn</b>   |      |                |                      |                  |       |
| Step 1   | 0.31 | 0.09           |                      | 210.59           | <0.01 |
| 2. Capacity for affective range, communication, and understanding  |      |                | -0.31                |                  |       |
| <b>Criterion variable: Social problems</b>   |      |                |                      |                  |       |
| Step 1   | 0.47 | 0.22           |                      | 580.64           | <0.01 |
| Level of personality organization  |      |                | -0.47                |                  |       |

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Table 6. Continued from previous page.

| Children's behavioral and emotional difficulties and social problems, mental functioning, and personality organization | <i>R</i> | <i>R</i> <sup>2</sup> | Standardized $\beta$ | <i>F</i> -change (Model) | <i>P</i> |
|--|----------|-----------------------|----------------------|--------------------------|----------|
| Step 2   | 0.53     | 0.28                  |                      | 170.73                   | <0.01    |
| Level of personality organization  |          |                       | -0.34                |                          |          |
| 5. Capacity for relationships and intimacy   |          |                       | -0.28                |                          |          |
| Step 3   | 0.56     | 0.32                  |                      | 90.16                    | 0.03     |
| Level of personality organization  |          |                       | -0.27                |                          |          |
| 5. Capacity for relationships and intimacy   |          |                       | -0.25                |                          |          |
| 3. Capacity for mentalization and reflective functioning   |          |                       | -0.20                |                          |          |
| <b>Criterion variable: Thought problems</b>  |          |                       |                      |                          |          |
| Step 1   | 0.42     | 0.18                  |                      | 440.84                   | <0.01    |
| Level of personality organization  |          |                       | -0.42                |                          |          |
| <b>Criterion variable: Attention problems</b>  |          |                       |                      |                          |          |
| Step 1   | 0.58     | 0.34                  |                      | 1050.17                  | <0.01    |
| 1. Capacity for regulation, attention, and learning  |          |                       | -0.58                |                          |          |
| Step 2   | 0.61     | 0.38                  |                      | 130.26                   | <0.01    |
| 1. Capacity for regulation, attention, and learning  |          |                       | -0.46                |                          |          |
| 3. Capacity for mentalization and reflective functioning   |          |                       | -0.24                |                          |          |
| Step 3   | 0.63     | 0.39                  |                      | 40.96                    | 0.027    |
| 1. Capacity for regulation, attention, and learning  |          |                       | -0.40                |                          |          |
| 3. Capacity for mentalization and reflective functioning   |          |                       | -0.20                |                          |          |
| 7. Capacity for impulse control and regulation   |          |                       | -0.15                |                          |          |
| <b>Criterion variable: Delinquent behaviour</b>  |          |                       |                      |                          |          |
| Step 1   | 0.39     | 0.15                  |                      | 360.51                   | <0.01    |
| 7. Capacity for impulse control and regulation   |          |                       | -0.39                |                          |          |
| Step 2   | 0.44     | 0.19                  |                      | 110.07                   | 0.01     |
| 7. Capacity for impulse control and regulation   |          |                       | -0.30                |                          |          |
| 2. Capacity for affective range, communication, and understanding  |          |                       | -0.23                |                          |          |
| Step 3   | 0.46     | 0.21                  |                      | 40.43                    | 0.037    |
| 7. Capacity for impulse control and regulation   |          |                       | -0.35                |                          |          |
| 2. Capacity for affective range, communication, and understanding  |          |                       | -0.32                |                          |          |
| 10. Self-observing capacities (psychological mindedness)   |          |                       | -0.18                |                          |          |
| Step 4   | 0.48     | 0.23                  |                      | 40.86                    | 0.029    |
| 7. Capacity for impulse control and regulation   |          |                       | -0.34                |                          |          |
| 2. Capacity for affective range, communication, and understanding  |          |                       | -0.25                |                          |          |
| 10. Self-observing capacities (psychological mindedness)   |          |                       | -0.21                |                          |          |
| 4. Capacity for differentiation and integration (identity)   |          |                       | -0.17                |                          |          |
| <b>Criterion variable: Aggressive behaviour</b>  |          |                       |                      |                          |          |
| Step 1   | 0.43     | 0.19                  |                      | 470.29                   | <0.01    |
| 7. Capacity for impulse control and regulation   |          |                       | -0.43                |                          |          |
| Step 2   | 0.46     | 0.22                  |                      | 70.81                    | 0.06     |
| 7. Capacity for impulse control and regulation   |          |                       | -0.35                |                          |          |
| 2. Capacity for affective range, communication, and understanding  |          |                       | -0.19                |                          |          |
| Step 3   | 0.49     | 0.24                  |                      | 50.81                    | 0.017    |
| 7. Capacity for impulse control and regulation   |          |                       | -0.39                |                          |          |
| 3. Capacity for mentalization and reflective functioning   |          |                       | -0.32                |                          |          |
| 10. Capacity for self-observing (psychological mindedness)   |          |                       | -0.21                |                          |          |
| Step 4   | 0.51     | 0.26                  |                      | 40.92                    | 0.028    |
| 7. Capacity for impulse control and regulation   |          |                       | -0.39                |                          |          |
| 3. Capacity for mentalization and reflective functioning   |          |                       | -0.26                |                          |          |
| 10. Capacity for self-observing (psychological mindedness)   |          |                       | -0.25                |                          |          |
| 5. Capacity for relationships and intimacy   |          |                       | -0.16                |                          |          |
| <b>Criterion variable: Internalizing</b>   |          |                       |                      |                          |          |
| Step 1   | 0.22     | 0.05                  |                      | 10.0                     | <0.01    |
| 6. Capacity for self-esteem regulation and quality of internal experience  |          |                       | -0.22                |                          |          |

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Table 6. Continued from previous page.

| Children's behavioral and emotional difficulties and social problems, mental functioning, and personality organization | R    | R <sup>2</sup> | Standardized $\beta$ | F-change (Model) | P     |
|--|------|----------------|----------------------|------------------|-------|
| Step 2   | 0.26 | 0.07           |                      | 40.77            | <0.01 |
| 6. Capacity for self-esteem regulation and quality of internal experience  |      |                | -0.29                |                  |       |
| 11. Capacity for constructing and using internal standards and ideals  |      |                | -0.17                |                  |       |
| Step 3   | 0.29 | 0.09           |                      | 30.99            | 0.027 |
| 6. Capacity for self-esteem regulation and quality of internal experience  |      |                | -0.24                |                  |       |
| 11. Capacity for constructing and using internal standards and ideals  |      |                | -0.22                |                  |       |
| 8. Capacity for defensive functioning  |      |                | -0.17                |                  |       |
| <b>Criterion variable: Externalizing</b>   |      |                |                      |                  |       |
| Step 1   | 0.41 | 0.17           |                      | 410.33           | <0.01 |
| 7. Capacity for impulse control and regulation   |      |                | -0.41                |                  |       |
| Step 2   | 0.44 | 0.19           |                      | 60.79            | 0.010 |
| 7. Capacity for impulse control and regulation   |      |                | -0.32                |                  |       |
| Level of personality organization  |      |                | -0.18                |                  |       |
| <b>Criterion variable: Total problems</b>  |      |                |                      |                  |       |
| Step 1   | 0.53 | 0.28           |                      | 810.19           | <0.01 |
| Level of personality organization  |      |                | -0.53                |                  |       |
| Step 2   | 0.57 | 0.33           |                      | 130.35           | <0.01 |
| Level of personality organization  |      |                | -0.42                |                  |       |
| 7. Capacity for impulse control and regulation   |      |                | -0.24                |                  |       |
| Step 3   | 0.59 | 0.35           |                      | 80.15            | 0.05  |
| Level of personality organization  |      |                | -0.34                |                  |       |
| 7. Capacity for impulse control and regulation   |      |                | -0.21                |                  |       |
| 5. Capacity for relationships and intimacy   |      |                | -0.19                |                  |       |

CBCL (4-18), Child Behavior Checklist-Clinician Version (Achenbach, 1991); PDC-C, Psychodiagnostic Chart-Child (Malberg *et al.*, 2017).

As depicted in Table 7, there was a significant effect of diagnostic group on mental functioning and personality organization, Wilks's  $\lambda=0.64$ ,  $F(12, 164)=3.44$ ,  $P<0.001$ ,  $\eta^2=0.201$ , Cohen's  $d=1.003$ . Follow-up univariate analyses with Bonferroni post-hoc tests ( $P<0.05$ ) revealed that SLD patients significantly differed from DCD and ADHD patients on PDC-C defense and coping and personality organization. Moreover, these patients differed from ADHD patients on PDC-C cognitive and affective processes and overall mental functioning. Overall, SLD patients showed higher mean scores on defense and coping strategies and personality organization, relative to DCD and ADHD pa-

tients; in addition, they had higher mean scores for cognitive and affective processes and overall mental functioning, compared to ADHD patients. No statistically significant differences on any PDC-C dimension emerged between DCD and ADHD patients.

## Discussion

The present research sought to examine the validity of the PDC-C as an assessment of children's mental functioning and personality organization, according to the PDM-2

Table 7. Differences among patient groups on PDC-C mental functioning and personality organization (N=209).

| PDC-C mental functioning and personality organization | DICD (N=28)          |      | SLD (N=29)         |      | ADHD (N=33)        |      | F (2,87) | $\eta^2$ | Cohen's d |
|---|----------------------|------|--------------------|------|--------------------|------|----------|----------|-----------|
|   | M                    | SD   | M                  | SD   | M                  | SD   |          |          |           |
| Cognitive and affective processes                     | 9.36 <sup>a,b</sup>  | 2.97 | 10.33 <sup>a</sup> | 2.34 | 8.55 <sup>b</sup>  | 1.84 | 4.22*    | 0.09     | 0.63      |
| Identity and relationships                            | 9.21                 | 2.71 | 10.33              | 2.59 | 9.24               | 2.43 | 1.92     | 0.04     | 0.41      |
| Defense and coping                                    | 8.50 <sup>a</sup>    | 2.35 | 10.06 <sup>b</sup> | 2.59 | 8.07 <sup>a</sup>  | 2.60 | 5.42**   | 0.11     | 0.70      |
| Self-awareness and self-direction                     | 6.14                 | 1.96 | 6.91               | 1.76 | 6.41               | 1.50 | 1.53     | 0.03     | 0.35      |
| Overall level of mental functioning                   | 33.36 <sup>a,b</sup> | 8.77 | 37.64 <sup>a</sup> | 7.98 | 32.28 <sup>b</sup> | 6.77 | 4.06*    | 0.09     | 0.63      |
| Level of personality organization                     | 5.64 <sup>a</sup>    | 1.87 | 7.33 <sup>b</sup>  | 1.34 | 6.21 <sup>a</sup>  | 1.63 | 8.78***  | 0.17     | 0.91      |

DICD, conduct disorder and oppositional defiant disorder group; SLD, specific learning disorder; ADHD, attention deficit hyperactivity disorder; PDC-C, Psychodiagnostic Chart-Child (Malberg *et al.*, 2017);  $\eta^2$ , measure of effect size in analysis of covariance. Alphabetical superscripts indicate significant differences in the *post-hoc* analyses. Means with different alphabetic superscripts (*a* and *b*) were statistically significant, while means with identical alphabetic superscripts were not significantly different. \* $P<0.05$ ; \*\* $P<0.01$ ; \*\*\* $P<0.001$ .

diagnostic approach (Lingiardi & McWilliams, 2017). The results support the validity of the PDC-C as an accurate and comprehensive diagnostic instrument, considering children's full range of functioning, including emotional, cognitive, interpersonal, and social patterns. Moreover, the measure showed good sensitivity and clinical utility for the psychological differentiation of certain clinical populations.

The first aim of the study was to identify any significant and consistent association among PDC-C MC Axis dimensions, PDC-C PC Axis levels of personality organization, CPAP-Q emerging personality patterns, and several psychopathological problems. The results confirmed our hypothesis, revealing good concurrent (convergent and discriminant) validity (Tables 3 and 4).

Consistent with a previous study (Fortunato *et al.*, 2021), children's psychological health was found to be strongly and positively correlated to all mental functions included in the MC Axis and all levels of personality organization in the PC Axis, confirming a specific personality configuration primarily linked to individual resources and strengths. As shown in Table 5, children's capacity for emotional regulation (*i.e.*, expression of needs and use of symbolic means to communicate affect); capacity for experiencing intimacy, caring, and empathy in relationships; capacity for maintaining a stable sense of well-being, confidence, and realistic (not grandiose) self-esteem; and capacity for resiliency promoted optimal levels of personality functioning, with high variations in flexibility and adaptation across several contexts. On the contrary, severe impairments in many domains of mental functioning (*i.e.*, a tendency toward fragmentation and difficulties in self-object differentiation; disturbances in the perception, integration, and regulation of affects; limitations in the experience of feelings and/or thoughts in major life areas, including love, school, and play) were strongly related to the borderline/dysregulated emerging personality pattern (Fonagy & Target, 1997).

Of note, there were strong and negative correlations between children's borderline/impulsive, borderline/dysregulated, and schizoid emerging personality patterns and several dimensions of mental functioning and global levels of personality organization (Table 5). Consistent with Fortunato *et al.*'s (2021) study, these three personality patterns were more compromised than the inhibited/self-critical, dysphoric/dependent, and obsessive patterns.

The findings demonstrated strong associations between all PDC-C domains and symptomatic patterns (see Tables 4 and 6). In more detail, significant relationships were found between: i) the capacity for regulation, attention, and learning, and attention problems (*cf.*, Clarebout *et al.*, 2010; Montalvo & Torres, 2008); ii) the capacity for affective range, communication, and understanding, and anxious/depressed and withdrawal patterns (*cf.*, Bamford & Lagattuta, 2012; Eggum *et al.*, 2009); iii) the capacity for mentalization and reflective functioning, and social and attention problems (*cf.*, Fonagy & Target, 1997; Hughes & Leekam, 2004); iv) the capacity for relationships and intimacy, and

withdrawal and social problems (*cf.*, Booth-LaForce & Oxford, 2008); v) the capacity for self-esteem regulation and quality of internal experience, and anxious/depressed and withdrawal patterns (*cf.*, Buhs *et al.*, 2006; Lingiardi *et al.*, 2017); and vi) the capacity for impulse control and regulation, and attention problems and delinquent and aggressive behaviour (*cf.*, Lahey *et al.*, 2003; Posner & Rothbart, 2000; Rothbart & Ahadi, 1994).

These results have clinical implications, as they suggest that specific capacities are particularly relevant in promoting children's psychological health and certain psychopathological syndromes (Lingiardi & McWilliams, 2017). Specifically, some mental functions were found to be predictive of distinct symptom patterns: i) the capacity for impulse control and regulation predicted delinquent and aggressive behaviour (Lahey *et al.*, 2003; Posner & Rothbart, 2000; Rothbart & Ahadi, 1994); ii) the capacity for self-esteem regulation and quality of internal experience predicted anxious/depressed symptoms to a clinically very significant degree (Battle, 1978; Sowislo & Orth, 2013); iii) the capacity for affective range, communication, and understanding predicted withdrawal (Bernstein *et al.*, 2009; Boldrini *et al.*, 2020; Olin *et al.*, 1997); iv) the capacity for relationships and intimacy and the capacity for mentalization and reflective functioning predicted social problems (Ha *et al.*, 2011); v) the capacity for impulse control and regulation and the capacity for relationships and intimacy predicted thought problems; failure to control impulses impeded both children's thinking and caregivers' capacity for impulse control regulation (Caye *et al.*, 2016; Stepp *et al.*, 2012); and vi) the capacity for regulation, attention, and learning; the capacity for mentalization and reflective functioning; and the capacity for impulse control and regulation predicted attention problems (Clarebout *et al.*, 2010; Fonagy & Target, 1997; Hughes & Leekam, 2004; Montalvo & Torres, 2008; Posner & Rothbart, 2000).

Overall, internalizing problems were predicted by: i) the capacity for self-esteem regulation and quality of internal experience; ii) the capacity to construct and use internal standards and ideals, and iii) the capacity for defensive functioning (Mann *et al.*, 2004); whereas externalizing problems were predicted by: i) the capacity for impulse control and regulation; and ii) the capacity for differentiation and integration (identity) (Mezzacappa *et al.*, 1999; *cf.* also Tanzilli & Gualco, 2020). PDC-C total problems were predicted by: i) the capacity for mentalization and reflective functioning; ii) the capacity for impulse control and regulation; iii) the capacity for relationships and intimacy; and iv) the capacity for self-observing (psychological mindedness). These findings have clinical implications for child assessment, as they underline certain characteristics of the inner world as useful indicators of both symptoms and personality problems.

The second aim of the present study was to verify the clinical sensitivity of the PDC-C in differentiating patients according to the common childhood diagnoses of neurode-

velopmental (*i.e.*, ADHD and SLD) *versus* behavioral disorders (DICD). Our hypothesis was globally confirmed, given that these diagnostic categories were strongly associated with specific mental functioning patterns and levels of personality organization, as assessed by the PDC-C. Children with SLD differed significantly from children with ADHD with respect to the first and third domains of mental functioning (*i.e.*, cognitive and affective processes, defense and coping), as well as in global mental functioning and level of personality organization. These differences mainly related to the capacity for impulse control and regulation and the capacity for mentalization and reflective functioning (Migden, 1998; Palombo, 2006).

Although both SLD and ADHD are neurodevelopmental disorders (APA, 2013), they present as different psychopathological syndromes, impacting different processes and levels of functioning. Of note, the present study found that children with SLD showed better functioning on every capacity relative to children in the other diagnostic groups. A possible explanation for this finding is that ADHD and DICD share similar external manifestations and have a high degree of comorbidity (Ostrander *et al.*, 2008). In fact, ADHD was previously categorized in the PDM-2 as a behavioral, rather than a neurodevelopmental, disorder.

Overall, the differences that emerged in children's psychopathological vulnerabilities and resources between diagnostic groups allow us to better understand the specific features of each categorical diagnosis. Moreover, the findings suggest that the PDC-C can generate clinically meaningful diagnoses to inform individualized clinical interventions tailored to children's core psychological features. Thus, in line with the literature (Bornstein & Gordon, 2012; Gordon & Bornstein, 2018; Tanzilli *et al.*, 2021b), the present results provide empirical support for the clinical utility of the PDC-C as a valid assessment of psycho(patho)logical constructs.

## Conclusions

The present study suggests that the PDC-C is an appropriate and reliable tool for assessing children. The findings showed strong associations among all of the investigated variables, supporting the construct validity of the measure. Good preliminary evidence was also generated for the validity and clinical utility of the PDC-C, with respect to clinicians of various theoretical orientations. In detail, one strength of the PDC-C is its ability to capture variations in child functioning, even within the same diagnostic category, illuminating individual strengths and limitations. Indeed, no two children are exactly alike in mental functioning.

## Limitations and future directions

Some limitations of the research design should be acknowledged, including the use of only one informant and

the lack of actual treatment data. Accordingly, further research incorporating multiple observers is needed to establish the utility of PDC-C ratings in predicting relevant clinical constructs. Moreover, criterion contamination can bias clinicians' views on and reports of personality traits and symptoms. Thus, future studies should include multi-method assessments to replicate and verify the magnitude of the relationships found in this study. Finally, we hope that the PDC-C will be widely used in future studies to examine treatment processes and outcomes in the context of psychotherapy research.

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