



**The onset, prevalence, and developmental course of
personality disorders: Towards assessing and fostering
personality functioning**

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Delfine d'Huart

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Luxembourg

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Approved by the Faculty of Medicine

On application of

Prof. Dr. med. Dipl.-Psych. Klaus Schmeck

Prof. Dr. med. Marc Walter

Prof. Dr. med. Kerstin von Plessen

Dr. Cyril Boonmann

Basel, 27.05.2023

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Dean of the Medical Faculty

Prof. Dr. Primo Schär

Table of Contents

Acknowledgments	4
Abstract	5
Zusammenfassung	7
Chapter 1: General Introduction	10
1.1 The conceptualization of personality disorders: a multiplicity of notions	10
1.2 Prevalence of personality disorders	14
1.3 Risk factors for personality disorders	14
1.4 Onset of personality disorders	15
1.5 Temporal stability of personality disorders	17
1.6 Research focus	19
Chapter 2: The stability of personality disorders and personality disorder criteria: a systematic review and meta-analysis	21
Chapter 3: Prevalence and 10-year stability of personality disorders from adolescence to young adulthood in a high-risk sample	39
Chapter 4: Personality functioning and the pathogenic effect of childhood maltreatment in a high-risk sample	51
Chapter 5: General Discussion	65
5.1 Redefining stability in the context of personality disorders	65
5.2 Symptomatic remission and full recovery	66
5.3 Individual patterns of change	67
5.4 Mechanisms of change	68
5.5 Personality disorders from a developmental lens	70
5.6 Clinical implications	71
5.6 Conclusion	74
Chapter 6: Curriculum Vitae	76
Chapter 7: References	82

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Abstract

Background: Personality disorders (PDs) are among the most severe forms of mental disorders, characterized by an enduring, pervasive, and inflexible pattern of inner experience and behavior that deviates distinctly from general cultural expectations and causes significant distress or impairment. Yet, cumulative findings clearly challenge this notion, suggesting considerable improvement over time. In addition, the conceptualization of PDs is currently in transition, shifting from a categorical to a dimensional approach. As such, research is lagging behind, and clinical translation has yet to take place.

Aims: This thesis adds to the heterogenous body of literature by looking at the prevalence, onset, and course of PDs and PD symptoms over time. Moreover, the current thesis adds to the conceptualization of PDs by examining the extent to which impaired personality functioning mediates the pathogenic effect of childhood maltreatment. In line with the current shift in paradigm, this thesis incorporates both the categorical (Studies 1 and 2) and the dimensional model of PDs (Study 3).

Method: Following a systematic review and meta-analysis of the stability of PDs and PD symptoms over time (Study 1), the current thesis investigates data from a high-risk sample of young adults with a history of child welfare and juvenile-justice placements in Switzerland to examine a) the prevalence, onset and stability of PDs and PD symptoms from adolescence into adulthood (Study 2) and b), to investigate the pathogenic effect of impaired personality functioning between different types of childhood maltreatment and self-reported mental health problems (Study 3).

Results: Findings from Study 1 revealed that PDs, either assessed categorically or in terms of more dimensional symptom counts, decrease significantly over time, thus suggesting a notable trend towards improvement. Nevertheless, between-study heterogeneity is high, and stability itself depends on several methodological factors. Findings from Study 2 indicated that prevalence rates significantly increased from adolescence into adulthood, the onset of PDs occurred in late adolescence, and the stability of PD and PD symptoms was comparable to that in adulthood. Findings from Study 3 finally suggested overall childhood maltreatment and emotional neglect to be particularly relevant in the context of personality functioning, especially in relation to self-functioning. As such, impaired personality functioning, predominantly self-

functioning, was found to significantly mediate the pathogenic effect of overall childhood maltreatment and emotional neglect.

Discussion: The stability of PDs and PD symptoms depends on multiple factors which challenge our methodological understanding for capturing stability over time considerably. Future work should, thus, focus on how to redefine ‘stability’ in the context of PDs, and whether the new conceptualization will clarify some of the issues related to the stability of PDs. Nevertheless, it is of the utmost importance to acknowledge that a symptomatic remission is not necessarily accompanied by a full recovery, with most PD patients never managing to fully participate in society despite considerable remission. Specifically targeted intervention methods are, therefore, needed to enable participants to fully engage in society. In addition, more sophisticated analyses, especially person-centered approaches, hold promise for improving our understanding of individual patterns of change and, thus, elucidate the complex nature of mechanisms of change by focusing on protective factors. From a developmental lens, maladaptive PD traits already manifest in early childhood, although the more severe forms of PDs only become clinically apparent in (late) adolescence when adolescents become emotionally, cognitively, and socially able to integrate knowledge about themselves and others into a coherent whole. PDs should, thus, be diagnosed prior to the age of 18 in order to provide the best possible outcomes. The new conceptualization enables clinicians to target unique difficulties by drawing an individualized picture of the patient. This might contribute to developing specifically targeted prevention and treatment methods. Children and adolescents involved in the child welfare and/or juvenile-justice system should, moreover, be systematically assessed for childhood maltreatment, personality functioning, and other mental health problems. Combining interventions designed for personality functioning with trauma-informed practices might counteract the psychopathological outcomes.

Conclusion: The present thesis argues in favor of the new conceptualization by leaving the rather artificial PD categories behind and reintroducing the idea of self and interpersonal functioning as the core feature of PDs. This may enable clinicians to perceive the patient more holistically, with specific traits helping to identify individual problems. This, eventually, may contribute to more personalized and tailor-made treatments. As a matter of fact, we have ignored the individual for far too long and it is time to look at the patient behind the disorder by bringing back into focus the original meaning of personality, namely “the subjective experience of what it means to be human” (Sharp & Wall, 2021, p. 1).

Zusammenfassung

Hintergrund: Persönlichkeitsstörungen (PS) gehören zu den schwersten Formen psychischer Störungen, die durch tiefverwurzelte, zeitlich überdauernde Erlebens- und Verhaltensmuster gekennzeichnet sind, die deutlich von den gesellschaftlichen Erwartungen abweichen und zu wesentlichen Beeinträchtigungen in unterschiedlichen Lebensbereichen führen. Tatsächlich häufen sich jedoch die wissenschaftlichen Befunde, dass PS gar nicht so stabil sind, wie bisher immer angenommen wurde und es im Laufe der Zeit zu einer erheblichen Verbesserung der Symptome kommt. Darüber hinaus befindet sich die Konzeptualisierung von PS derzeit im Übergang von einem kategorialen zu einem dimensionalen Ansatz. Die Forschung aber, hinkt hinterher, und die klinische Umsetzung steht noch aus.

Ziele: Die vorliegende kumulative Dissertation ergänzt die heterogene Literatur, indem sie die Prävalenz, das Auftreten und den Verlauf von PS-Diagnosen und PS-Symptomen über die Zeit hinweg untersucht. Ausserdem trägt die vorliegende Arbeit zur Konzeptualisierung von PS bei, indem sie untersucht, inwieweit beeinträchtigte Persönlichkeitsfunktionen die pathogenen Auswirkungen von Misshandlungen in der Kindheit vermitteln. Im Einklang mit dem aktuellen Paradigmenwechsel beinhaltet diese Dissertation daher sowohl das kategoriale (Studie 1 und 2) als auch das dimensionale Modell von PS (Studie 3).

Methode: Neben einer systematischen Übersichtsarbeit und Metaanalyse zur Stabilität von PS und PS-Symptomen über die Zeit hinweg (Studie 1) werden in der vorliegenden Arbeit Daten einer Hochrisikostichprobe ehemalig fremdplatzierter jungen Erwachsene in der Schweiz untersucht um a) PS-Diagnosen und PS-Symptomen von der Adoleszenz bis ins junge Erwachsenenalter zu untersuchen (Studie 2) und b) den pathogenen Effekt beeinträchtigter Persönlichkeitsfunktionen zwischen verschiedenen Arten von Misshandlungen in der Kindheit und selbstberichteten psychischen Problemen zu erfassen (Studie 3).

Ergebnisse: Die Ergebnisse von Studie 1 zeigen, dass PS, die entweder kategorial oder in Form von dimensional Symptomzählungen erfasst werden, nicht so stabil sind, wie bisher immer angenommen wurde. Tatsächlich nehmen die meisten PS-Diagnosen und PS-Symptome im Laufe der Zeit deutlich ab. Dennoch hängt die Stabilität von einer Vielzahl an methodologischen Faktoren ab. Die Ergebnisse von Studie 2 deuten darauf hin, dass die Prävalenzraten vom Jugend- bis ins Erwachsenenalter signifikant ansteigen, während der

Beginn einer PS im späten Jugendalter liegt und die Stabilität von PS-Diagnosen und PS-Symptomen mit der im Erwachsenenalter vergleichbar ist. Die Ergebnisse von Studie 3 schließlich legen nahe, dass allgemeine Misshandlungserfahrungen in der Kindheit, insbesondere emotionale Vernachlässigung, im Zusammenhang mit Persönlichkeitsfunktionen äußerst relevant sind. Dementsprechend wurde festgestellt, dass beeinträchtigte Persönlichkeitsfunktionen, insbesondere beeinträchtigte selbstbezogene Persönlichkeitsfunktionen, den pathogenen Effekt von allgemeinen Misshandlungserfahrungen und emotionaler Vernachlässigung in der Kindheit signifikant vermitteln.

Diskussion: Die Stabilität von PS-Diagnosen und PS-Symptomen hängt von mehreren Faktoren ab, was unser methodisches Verständnis für die Erfassung der Stabilität über die Zeit hinweg vor erhebliche Herausforderungen stellt. Zukünftige Arbeiten sollten sich daher damit befassen, wie "Stabilität" im Zusammenhang mit PS neu definiert werden kann und ob die neue Konzeptualisierung einige der mit der Stabilität von PS verbundenen Aspekte klären wird. Nichtsdestotrotz gilt es zu berücksichtigen, dass eine symptomatische Remission nicht zwangsläufig mit einer vollständigen Genesung einhergeht. Daher sind gezielte Interventionsmethoden erforderlich, um PS-Patienten eine soziale Teilhabe zu ermöglichen. Darüber hinaus versprechen differenziertere Analysen, vor allem personenzentrierte Ansätze, ein besseres Verständnis der individuellen Veränderungsmuster und damit der komplexen Natur von Veränderungsmechanismen, indem zukünftige Arbeiten sich vor allem auf Schutzfaktoren fokussieren sollten. Aus entwicklungspsychologischer Sicht manifestieren sich maladaptive PS-Züge bereits in der frühen Kindheit, obwohl die schwereren Formen von PS erst in der (späten) Adoleszenz klinisch sichtbar werden, wenn Jugendliche emotional, kognitiv und sozial in der Lage sind, das Wissen über sich selbst und andere zu einem kohärenten Ganzen zu integrieren. PS sollten daher unbedingt bereits vor dem 18. Lebensjahr diagnostiziert werden, um bestmögliche Ergebnisse zu erzielen. Die neue Konzeptualisierung ermöglicht es Klinikern zudem auf individuelle Schwierigkeiten einzugehen, indem sie ein sehr persönliches Bild vom Patienten ableiten können. Dies könnte dazu beitragen, zielgerichtete Präventions- und Behandlungsmethoden zu entwickeln. Fremdplatzierte Kinder und Jugendliche, sollten zudem systematisch auf Misshandlungserfahrungen in der Kindheit, beeinträchtigte Persönlichkeitsfunktionen und andere psychische Probleme untersucht werden. Die Kombination von Interventionen, die auf beeinträchtigte Persönlichkeitsfunktionen abzielen, mit Traumapädagogischen Massnahmen könnte schwerwiegenden Folgen entgegenwirken.

Schlussfolgerung: Die vorliegende Dissertation plädiert für die neue Konzeptualisierung, indem die eher künstlichen PS-Kategorien hinter sich gelassen und die Idee der selbstbezogenen und zwischenmenschlichen Persönlichkeitsfunktionen als Kernmerkmal von PS wieder eingeführt werden. Dies könnte es Klinikern ermöglichen, den Patienten ganzheitlicher zu betrachten, wobei spezifische Merkmale helfen, individuelle Probleme zu identifizieren. Dies könnte letzten Endes zu einer stärker personalisierten und maßgeschneiderten Behandlung beitragen. Tatsächlich haben wir das Individuum schon viel zu lange ignoriert, und es ist an der Zeit, den Patienten hinter seiner Störung wahrzunehmen, indem wir die ursprüngliche Bedeutung der Persönlichkeit wieder in den Mittelpunkt rücken, nämlich "die subjektive Erfahrung dessen, was es bedeutet, ein Mensch zu sein" (Sharp & Wall, 2021, p. 1).

Chapter 1 – General Introduction

The most recent edition of the Diagnostic and Statistical Manual of Mental Disorders – fifth edition (DSM-5; American Psychiatric Association [APA], 2013) describes a personality disorder (PD) as an “enduring pattern of inner experience and behavior” that deviates distinctly from general cultural expectations, “is pervasive and inflexible” over time, and leads to significant “distress or impairment” (American Psychiatric Association [APA], 2013). PDs are globally prevalent in the general population (Winsper et al., 2020) and are among the most frequently diagnosed disorders in clinical and forensic settings (Beckwith et al., 2014; Fazel & Danesh, 2002). In addition, the personal, social, and economic burden of PDs is severe, including low occupational functioning, poor physical and mental health, dependence on social welfare services, recurrent self-harm and suicidality (Chanen et al., 2017; Hastrup et al., 2019; Soeteman et al., 2008; Wertz et al., 2019; Winsper et al., 2015). As such, the term PD has long been associated with a lifelong pattern and a poor prognosis and is often used as a label for difficult patients considered to be untreatable (Tyrer et al., 2015). Indeed, psychotherapy drop-out rates are high (Iliakis et al., 2021) and response to pharmacotherapy is modest and limited in scope (Stoffers-Winterling et al., 2021). Owing to their widespread stigmatization (Sheehan et al., 2022; Sheehan et al., 2016), PDs, thus, have long been hidden in the undergrowth of practice (Tyrer et al., 2015). Cumulative findings, however, clearly challenge earlier notions, suggesting considerable improvement over time (e.g., Clark, 2005; Grilo et al., 1998; Hopwood et al., 2013; Shea & Yen, 2003). In addition, the conceptualization of PDs is currently in transition, shifting from a categorical to a dimensional approach. Yet, findings on the course of PDs are heterogenous and research is lagging behind.

A comprehensive understanding of the latest concepts, onset and course of PDs is crucial to overcome outdated beliefs and support the current shift in paradigm. This may inform translation into clinical praxis, which ultimately may help to develop early prevention programs and specifically targeted intervention methods.

1.1 The conceptualization of personality disorders: a multiplicity of notions

1.1.1 The categorical classification model of personality disorders

Although interest in maladaptive personality dates back to antiquity, the modern conceptualization of PDs – as retained in Section II of the DSM-5 (APA, 2013) – is based on the medical model, which perceives mental disorders as distinct groups of symptoms, delineating healthy states from mental illness (Trull & Durrett, 2005). PDs are, thus, described

as ten discrete categories, each with a distinct set of diagnostic criteria, of which a subset must be fulfilled to meet the diagnostic threshold. To facilitate clinical use by grouping PDs with similar symptoms, Section II of the DSM-5 provides a hierarchical framework based on three clusters: Cluster A, defined as the odd/eccentric cluster, includes schizotypal, schizoid, and paranoid PD; Cluster B, referred to as the dramatic/erratic cluster, includes antisocial, borderline, histrionic, and narcissistic PD; and Cluster C, referred to as the anxious/inhibited cluster, includes avoidant, dependent, and obsessive-compulsive PD. Although there are some benefits to the use of a categorical conceptualization (e.g., clinical decision making or diagnostic coding for insurance reimbursement), the shortcomings of such a model have become increasingly apparent. Substantial concerns include a) high heterogeneity within categories, b) excessive comorbidity across categories, c) arbitrary diagnostic thresholds, d) inadequate coverage of the full range of personality difficulties (i.e., high rates of PDs ‘Not Otherwise Specified’), e) limited scientific evidence for ten distinct categories and, perhaps most important for this thesis, f) questionable stability of PD diagnoses over time (Morey et al., 2015; Mulder & Tyrer, 2019; Samuel & Griffin, 2015; Skodol, 2018).

An attempt to overcome some of these shortcomings is to perceive PDs in terms of more dimensional symptom (i.e., criteria) counts (First et al., 1994). This involves ‘quantifying’ each PD category, such that a dimensional score indicates the extent of the actual number of criteria present for each PD category, with each criterion being equally weighted (Trull et al., 2005). While this allows for the assessment of PD severity, clinical decision making still relies on diagnostic thresholds. Nevertheless, compelling evidence suggests that although patients do not meet the diagnostic threshold, the subclinical expression of their symptoms may remain high (Kaess et al., 2017). As a result, a shift to a more dimensional model, in which PDs are perceived as extreme variants of normal personality dimensions, became inevitable (Frances, 1993; Hopwood et al., 2018).

1.1.2 The Alternative Model of Personality Disorders: a hybrid model

The DSM-5 Personality and Personality Disorders Work Group proposed an ‘alternative’ model for conceptualizing and diagnosing PDs (Skodol et al., 2011). However, this model was rejected by the American Psychiatric Association Board of Trustees and eventually placed in Section III of the DSM-5, “Emerging Measures and Models”. The Alternative Model of PDs (AMPD; APA, 2013), actually, sought to reconceptualize excessive comorbidity between categories as reflecting essential commonalities among PD categories (Krueger & Hobbs, 2020; Morey et al., 2015). As such, a thorough literature review by Bender and colleagues (2011)

revealed core impairments in self- and interpersonal functioning as the core features of PDs. As increasingly recognized, the general severity of personality dysfunction has a greater impact on the course and treatment of PDs compared to specific PD symptoms (Bach et al., 2015). Therefore, describing these commonalities as varying along a continuum of severity was a major goal of the AMPD. The assessment for diagnosing a PD in the AMPD, thus, follows a stepwise procedure. Clinicians start by assessing impairments in self- and interpersonal functioning (Criterion A), using the Level of Personality Functioning Scale (LPFS; Bender et al., 2011). The LPFS provides a reliable operationalization of self- and interpersonal functioning in the form of a 5-point Likert scale. Self-functioning refers to a range of adaptive abilities related to the subdomains of Identity (i.e., experience of oneself as unique, the stability of self-esteem, and the ability to regulate emotions) and Self-direction (i.e., the pursuit of meaningful goals, the utilization of prosocial internal standards of behavior, and the ability to self-reflect). Interpersonal functioning refers to abilities related to the subdomains of Empathy (i.e., ability to understand others' experiences and motivations, to tolerate differing perspectives, and to understand the impact of one's behavior on others) and Intimacy (i.e., the ability to establish durable and meaningful relationships, to desire and tolerate closeness, and mutual regard). The four subdomains are each rated on a continuum ranging from healthy functioning (level = 0) to extreme impairment (level = 4). Given that personality functioning may be impaired in various ways, clinicians subsequently have to specify 25 pathological trait facets (Criterion B), organized within the five broad domains of Negative Affectivity, Detachment, Antagonism, Disinhibition, and Psychoticism, using the Personality Inventory for DSM-5 (PID-5; Krueger et al., 2012). A diagnosis is assigned when there is at least moderate impairment, provided that it is relatively inflexible and pervasive across a broad range of personal and social situations (Criterion C), is relatively stable over time with an onset in adolescence or early adulthood (Criterion D), is not better explained by another mental disorder (Criterion E), is not attributable to the effects of a substance or medical condition (Criterion F) and is not better understood as normal for an individual's developmental stage or socio-cultural environment (Criterion G). In order to keep continuity with current clinical practice, six PD categories (i.e., antisocial, avoidant, borderline, narcissistic, obsessive-compulsive, and schizotypal PD) have been retained in the AMPD, with each category being defined by a specific pattern of impairment and pathological traits (Bach et al., 2015). To be diagnosed with a PD, an individual, thus, has to exhibit high levels of four trait facets of Negative Affectivity (i.e., emotional lability, anxiousness, separation insecurity, and depressivity), as well as two trait facets of Disinhibition (i.e., impulsivity and risk-taking) and one trait facet of Antagonism

(i.e., hostility; Lilienfeld & Latzman, 2018). If none of these six prototypical combinations correspond to the individual pattern, the diagnosis of a PD Trait Specified (i.e., PD-TS) can be assigned (Zimmermann et al., 2019). As a result, the AMPD consists in a hybrid dimensional/categorical model encompassing personality functioning as a unidimensional severity continuum (Criterion A) and a pathological trait perspective (Criterion B), while offering the opportunity to match these dimensions with six specific PD categories.

1.1.3 Personality disorders in the ICD-11: a fully dimensional model

With the 11th edition of the International Classification of Diseases (ICD-11; World Health Organization), a fully dimensional system was finally introduced. Similar to the AMPD, the ICD-11 describes PDs as core impairments in self- and interpersonal personality functioning, classified according to the degree of severity (i.e., personality difficulty, mild, moderate and severe PD) and specified with one or more specific trait domain qualifiers (i.e., Negative Affectivity, Detachment, Disinhibition, Dissociality, and Anankastia). In addition, the ICD-11 allows clinicians to code subthreshold personality difficulty, as well as a borderline pattern qualifier (e.g., moderate PD with borderline pattern with Negative Affectivity, Disinhibition, and Dissociality) if the clinical manifestation matches this pattern. This essentially corresponds to the borderline PD in section II of the DSM-5 and can be understood as an indicator for a patient's responsiveness to a certain psychotherapeutic treatment, consistent with established evidence. Unlike the AMPD, none of the ten polyethnic categories were retained in the ICD-11 and the assessment of pathological traits is not a mandatory part of the diagnosis (Bach & First, 2018). In addition, the ICD-11 includes neither the trait qualifier psychoticism – an omission that is consistent with the absence of schizotypal PD in the ICD-10 (Sharp & Wall, 2021) – nor the subordinate level of trait facets as defined in the AMPD.

From a child and adolescent psychiatric perspective, the most important change in the AMPD and ICD-11 consists in a developmental approach. Accordingly, both models suggest that PDs have their onset in adolescence, and thus have abolished the age limit and caution against diagnosing PDs prior to the age of 18 years. In addition, both models acknowledge PDs to be only 'relatively' stable (e.g., Criterion D of the AMPD). Critically appraised, however, both models are new, empirical research is lagging behind, and clinical translation has yet to take place. As a result, there is an ongoing debate about the onset and course of PDs and controversies appear to remain. This thesis aims to address these controversies by incorporating both the categorical and dimensional conceptualization of PDs. To reflect the current shift in

paradigm, the term ‘PDs’ will be used to refer to categorically defined PDs, and the term ‘personality functioning’ will be used to refer to PDs in the context of the AMPD or ICD-11.

1.2 Prevalence of personality disorders

A recent systematic review and meta-analysis including 46 studies revealed a global pooled prevalence rate for any PD of 7.6% in community-based samples. The most frequently diagnosed PDs were obsessive-compulsive (3.2%), avoidant (2.7%) and paranoid (2.3%) PDs, while schizotypal (0.8%), dependent (0.8%) and histrionic (0.6%) were among the least frequently diagnosed disorders (Winsper et al., 2020). In Western adult populations, the pooled prevalence rate is even higher with 12.6% (Volkert et al., 2018). Among clinical outpatients and incarcerated adults, prevalence rates even range between 40 and 92% across studies (Beckwith et al., 2014; Fazel & Danesh, 2002). Comparably few studies have investigated the prevalence rate of PDs in children and adolescents. A narrative review reported PD prevalence rates between 6 and 17% in community settings, between 41 and 64% in clinical settings, and between 36 and 88% in juvenile-justice samples, with cluster B disorders, foremost borderline PD and antisocial PD being among the most frequently diagnosed disorders (Kongerslev et al., 2015; Livanou et al., 2019). PD prevalence rates in adolescence are thus comparable to or even slightly higher than those reported in adulthood (Kongerslev et al., 2015), ranking PDs among the most common disorders in youth psychiatry (Chanen & Thompson, 2019).

1.3 Risk factors for personality disorders

Decades of research have revealed a number of risk factors as potentially relevant for the development of PDs, but the exact etiology and extent to which each risk factor contributes to the development of PDs still remains largely unclear. Genetic epidemiological studies suggest that PDs are moderately heritable (Kendler et al., 2007; Reichborn-Kjennerud et al., 2007; Torgersen et al., 2012). In a recent Swedish nationwide register-based study of 1,851,755 individuals, the heritability of borderline PDs, for instance, was estimated at 46%, with the remaining variance being explained by individually unique (i.e., non-shared) environmental factors (Skoglund et al., 2021). As such, childhood maltreatment has often been observed as a potential risk factor for the onset of PDs, specifically borderline PD. In fact, a recent systematic review and meta-analysis by Porter and colleagues (2020) revealed that borderline PD patients were almost 14 times more likely to report a history of childhood maltreatment than non-clinical controls, with emotional abuse and neglect being the most prevalent. Furthermore, several findings indicated a notable correlation between childhood maltreatment and specific

borderline PD symptoms, including affective instability, interpersonal problems, identity issues, impulsivity, and suicidal behavior (Hecht et al., 2014; Ibrahim et al., 2018; Liu, 2019; MacIntosh et al., 2015; Steele et al., 2019). In addition, maladaptive parenting practices, such as a lack of parental closeness, low warmth, rejection and maternal overcontrol (Cohen et al., 2005; Crawford et al., 2009; Levy, 2005; Stepp et al., 2016), as well as the use of cold, hostile or harsh punishment (Hallquist et al., 2015; Stepp et al., 2016; Winsper et al., 2012; Wolke et al., 2012), have been found to be associated with future PD development. A recent overview of eight systematic reviews, including 121,895 participants, revealed, for instance, maladaptive parenting as a major risk factor for the development of a borderline PD (Steele et al., 2019). Besides childhood maltreatment and maladaptive parenting practices, temperamental traits and behavioral problems such as negative emotionality, affective instability, anger, and impulsivity have also been found to significantly predict borderline PD (Bozzatello et al., 2021; Chanen & McCutcheon, 2013; Stepp et al., 2016). Similarly, early mental health problems (e.g., ADHD, oppositional defiant disorders, and attachment disorders) as well as symptoms of depression and anxiety (Bernstein et al., 1996), substance use (Thatcher et al., 2005), self-harming behavior (Zanarini et al., 2006), psychopathic traits and youth delinquency (Salekin et al., 2008; Soderstrom et al., 2005) have also been reported to predict the onset of any PD over time. Finally, low socioeconomic status, family welfare support, single family households, and parental psychopathology were found to be significantly related to later PD symptoms in young adults (Chanen & Kaess, 2012; Tackett et al., 2009). From a lifespan perspective, the complex relationship between genetic and environmental factors suggests a gene–environment interaction in which genetic variability influences the way individuals respond to their environment, whereas environmental factors influence gene expression (e.g., Byrd & Manuck, 2014).

In sum, the etiology of PDs is highly complex and multifactorial in nature. None of the aforementioned risk factors is either a necessary or a sufficient condition for the development of a PD. Rather, it is the interplay between genetic predisposition and temperamental, psychological, and environmental factors that seems to favor the development of a PD over time.

1.4 Onset of personality disorders

Although there is general acknowledgement that the onset of PDs lies in adolescence (Chanen & Kaess, 2012), many clinicians remain uncomfortable diagnosing a PD prior to the age of 18 (Laurensen et al., 2013). Clinical concerns include a) the belief that personality in adolescence

is too unstable to warrant a diagnosis; b) beliefs that certain PD symptoms such as impulsivity, affective instability, and identity problems are normative in adolescence, often referred to as the “storm and stress” of adolescence (Hall, 1905); c) beliefs that PD symptoms in adolescence are better explained by internalizing and externalizing disorders; d) uncertainty whether the diagnosis in adolescents is recognized by psychiatric nomenclature; and e) the stigmatization associated with early PD diagnosis, as the diagnosis itself is thought to be persistent and treatment resistant (Sharp & De Clercq, 2020; Sharp et al., 2018). Accordingly, Section II in the DSM-5 still recommends being cautious when diagnosing a PD prior to the age of 18 (Chanen & Thompson, 2019). Recent research, however, emphasizes that PDs can be validly and reliably diagnosed among juveniles (Chanen et al., 2017). In fact, as illustrated in section 1.2, prevalence rates in adolescence are similar to those found in adulthood. Regarding borderline PD, Zanarini et al. (2006) revealed that over 30% of adult patients retrospectively reported self-injurious behavior before the age of 12, while another 30% reported that this behavior first occurred between 13 and 17 years. In addition, the temporal stability of PDs in youth has been found to be comparable to that in adulthood (Bornovalova et al., 2009; Chanen et al., 2004; Hamlat et al., 2020; Sharp et al., 2018), and psychosocial dysfunction can be limited through early intervention, especially before the age of 18 (Chanen et al., 2017; Kaess et al., 2014; Sharp & Fonagy, 2015). As such, delaying appropriate diagnoses carries clinical risks, as evidence suggests that many of the harms (e.g., recurrent self-harm or suicidality) occur early in the course of the disorder (Chanen & Thompson, 2019) and delay tends to lead to greater impairments and poorer outcomes. Accordingly, high borderline symptoms at 12 years tend to predict difficult personality (i.e., low openness, low agreeableness, high neuroticism, and low conscientiousness), poor mental health, as well as poor educational outcomes, and higher rates of victimization (Wertz et al., 2020). These findings dispel earlier notions and argue in favor of assessing and diagnosing PDs in adolescence to prevent adverse outcomes and promote meaningful changes in young people’s lives.

From a dimensional trait perspective, as adopted in the AMPD and ICD-11, maladaptive personality traits (e.g., emotional instability, introversion, compulsivity, and disagreeableness) may already manifest in early childhood (De Clercq et al., 2006; Sharp et al., 2018). In fact, significant and meaningful associations have been found with AMPD trait measures, indicating that maladaptive personality traits in children may, indeed, represent developmental antecedents of AMPD traits (De Clercq et al., 2014). Nevertheless, it is reasonable to assume that the more severe forms of PDs only become clinically apparent in later adolescence, when

individuals become emotionally, cognitively, and socially able to integrate knowledge about themselves and others into a coherent self-identity (Chanen & Thompson, 2019).

1.5 Temporal stability of personality disorders

While the diagnostic construct of PDs has substantially evolved over the past few decades, temporal stability has consistently remained a defining feature ever since the introduction of PDs into the DSM, dating back to 1952 (APA, 1952). With the release of the DSM-III (APA, 1980), PDs were placed on a separate axis (i.e., Axis II) in order to differentiate them from the more episodic disorders placed on Axis I, based on the assumption that the stability of PDs was substantially higher than that for other mental disorders. Yet, with a considerable increase in interest in PD research, cumulative findings slowly appeared to question the stability of PDs by suggesting considerable improvement over time (Grilo et al., 1998; McDavid & Pilkonis, 1996). Unlike the general definition retained in section II of the DSM-5, which emphasizes that PDs are “enduring”, “inflexible”, and “stable over time” (APA, 2013), the stability of PDs has been found to be not much higher than the stability of other mental disorders (Shea & Yen, 2003). Nevertheless, study findings are heterogeneous and stability itself is a complex notion that has to be examined in the light of several factors (Hopwood & Bleidorn, 2018; Morey & Hopwood, 2013).

1.5.1 Personality disorder constructs

First, as outlined in section 1.1, PDs can be conceptualized according to differing constructs and frameworks. Based on the categorical model, PDs can either be perceived as distinct polyethnic categories or in terms of more dimensional symptom counts. Based on the dimensional model, as in the AMPD and ICD-11, PDs are perceived in terms of core impairments in personality functioning, specified by a set of pathological traits. Each of these differing constructs obviously affects stability estimates, as the nature of what is considered to be stable changes substantially depending on the construct being studied. Indeed, cumulative evidence suggests higher stability estimates for dimensional symptom counts (Durbin & Klein, 2006; Samuel et al., 2011) and pathological traits (Rodriguez-Seijas et al., 2020; A. G. C. Wright et al., 2015) than for discrete categories. However, it should be emphasized that studies on the stability of core impairments in personality functioning and pathological PD traits are scarce. Therefore, previous research is mainly based on PD categories and PD symptom counts. As a result, this thesis focuses exclusively on these two constructs.

1.5.2 Types of stability

Aside from the aforementioned constructs, numerous ways to describe stability over time are common, and stability itself usually differs according to the type of stability being assessed (d'Huart et al., 2023). Throughout this thesis, the two types of stability that have been studied most frequently, namely, mean-level and rank-order stability, will be the focus. Mean-level stability (i.e., absolute stability) refers to the extent to which the average level of a PD or PD symptom (i.e., criteria) changes over time in a given sample. Rank-order stability (i.e., differential stability) refers to the consistency of an individual's rank order compared to others in a given sample, thus indicating the stability of interindividual differences over time. Rank-order stability is high if participants maintain their relative order with respect to a specific PD or PD symptom over time, regardless of whether the average level of that PD or PD symptom increases or decreases over time. Rank-order changes are, therefore, independent of mean-level changes (Morey & Hopwood, 2013). According to Grilo et al. (2004), mean-level stability, as assessed by symptom counts, tends to be generally lower than rank-order stability, suggesting that PD symptoms typically decrease on average, but individuals' rank order within a given sample remains roughly the same.

1.5.3 Study-specific factors

In addition to differing stability estimates due to different PD constructs and different methodological approaches to assess stability, several study-specific factors have been found to influence the stability of PDs over time. As such, the type of measurement instrument seems to play a particular role, as each assessment differs regarding its reliability, the type of PD construct being assessed, and the type of modality being used (i.e., self-report vs. clinical interview). For instance, self-report questionnaires have been found to show higher mean-level and rank-order stability estimates than clinical interviews (Samuel et al., 2011). In addition, the type of study sample being assessed may also affect stability estimates, depending on the clinical status (e.g., clinical patients vs. community), and the age range of the included participants. Participants in clinical settings, thus, tend to show faster declines (i.e., lower stability) in PD diagnoses and PD symptoms than in other settings, and study findings regarding the age range generally indicate that PD symptoms tend to be highest in early adolescence and steadily decline into adulthood (Gutiérrez et al., 2012; Johnson et al., 2000). Finally, the time interval between both measurement points has also been found to affect stability estimates. As such, stability estimates tend to be higher if participants are sampled at shorter time intervals,

as personality itself is more likely to change over many years than over a few weeks (Morey & Hopwood, 2013).

Taken together, investigating the stability of PD diagnoses and PD symptoms is not only a conceptual but foremost a methodological endeavor. As a result, study findings are heterogenous, and a consistent overview of the stability of PDs over time is currently lacking.

1.6 Research focus

In line with the previously introduced literature, this thesis seeks to contribute to the heterogenous body of literature by examining long-standing controversies regarding the conceptualization, onset, and course of PDs over time. Consistent with the current shift in paradigm, this thesis, thus, incorporates both the categorical (Studies 1 and 2) and the dimensional model of PDs (Study 3). More specifically, this thesis investigates a) the prevalence, onset, and stability of PDs over time and b) the extent to which impaired personality functioning mediates the pathogenic effect of childhood maltreatment. This will inform translation into clinical praxis, which in the long run will help to develop early prevention programs and specifically targeted intervention methods. Following a systematic review and meta-analysis (Study 1), the current thesis investigates data from a high-risk sample of young adults with a history of child welfare and juvenile-justice placements in Switzerland (Studies 2 and 3). Children and adolescents placed in the child welfare or juvenile-justice system are particularly at risk of developing a PD due to multiple risk factors (outlined in section 1.3), and are, thus, particularly in need of early prevention and targeted intervention methods. In fact, three-quarters of out-of-home placed adolescents report some type of childhood adversity, with most reporting multiple types (Fischer et al., 2016; Garcia et al., 2017; Woods et al., 2013). In addition, the pooled prevalence rate of mental disorders is about 30% among young adults with a history of child welfare and about 45% among young adults with a history of juvenile-justice placements (Seker et al., 2021). PD prevalence rates range between 18 and 40% across studies (Krabbendam et al., 2015; van der Molen et al., 2013; Washburn et al., 2007). Thus, studying young adults with a history of child welfare and juvenile-justice placements is particularly valuable for gaining insights into PDs.

The current thesis incorporates three original studies within the main body of the thesis:

Study 1: ‘The stability of personality disorders and personality disorder criteria: A systematic review and meta-analysis’

The aim of this systematic review and meta-analysis was to investigate the stability of PD diagnoses and PD symptoms over time in order to provide a comprehensive overview on pooled stability estimates, differentiating between PD constructs, types of stability, types of PD diagnosis and study-specific factors. Specifically, this systematic review and meta-analysis sought to investigate the categorical mean-level stability, the dimensional mean-level stability, and the dimensional rank-order stability over time.

Study 2: ‘Prevalence and 10-year stability of personality disorders from adolescence to young adulthood in a high-risk sample’

The aim of this study was to examine the prevalence rates, onset, and stability of PDs over a 10-year follow-up period from adolescence to adulthood in a high-risk sample, including young adults with a history of residential child welfare and juvenile-justice placements in Switzerland. Both the categorical and dimensional mean-level stability and rank-order stability were investigated.

Study 3: ‘Personality functioning and the pathogenic effect of childhood maltreatment in a high-risk sample’

This study sought to extend the current literature on the underlying pathways of the pathogenic impact of childhood maltreatment by investigating the mediating effect of impaired personality functioning between different types of childhood maltreatment (i.e., emotional neglect, physical neglect, emotional abuse, physical abuse, and sexual abuse) and self-reported mental health problems in young adults with a history of residential child welfare and juvenile-justice placements in Switzerland.

Chapter 2 – The stability of personality disorders and personality disorder criteria: A systematic review and meta-analysis

Delfine d'Huart^{1*}, Süheyla Seker¹, David Bürgin^{1,2}, Marc Birkhölzer³, Cyril Boonmann^{1,3,4}, Marc Schmid¹, & Klaus Schmeck⁵

¹ Department of Child and Adolescent Psychiatric Research, Psychiatric University Hospitals Basel, Basel, Switzerland

² Department of Child and Adolescent Psychiatry and Psychotherapy, Ulm University, Ulm, Germany.

³ Department of Forensic Child and Adolescent Psychiatry, University Psychiatric Clinics Basel, Basel, Switzerland

⁴ LUMC Curium – Department of Child and Adolescent Psychiatry, Leiden University Medical Center, Leiden, The Netherlands

⁵ Department of Clinical Research, Medical Faculty, University of Basel, Basel, Switzerland

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Review

The stability of personality disorders and personality disorder criteria: A systematic review and meta-analysis

Delfine d'Huart^{a,*}, Süheyla Seker^a, David Bürgin^{a,b}, Marc Birkhölzer^c, Cyril Boonmann^{a,c,d}, Marc Schmid^a, Klaus Schmeck^e

^a Department of Child and Adolescent Psychiatric Research, Psychiatric University Hospitals Basel, Basel, Switzerland

^b Department of Child and Adolescent Psychiatry and Psychotherapy, Ulm University, Ulm, Germany

^c Department of Forensic Child and Adolescent Psychiatry, University Psychiatric Clinics Basel, Basel, Switzerland

^d LUMC Curium – Department of Child and Adolescent Psychiatry, Leiden University Medical Center, Leiden, the Netherlands

^e Department of Clinical Research, Medical Faculty, University of Basel, Basel, Switzerland



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ABSTRACT

The aim of this systematic review and meta-analysis was to investigate the diagnostic, the dimensional mean-level, and rank-order stability of personality disorders (PDs) and PD criteria over time. EMBASE, PsycInfo, PubMed, and Web of Science were searched for peer-reviewed studies published in either English, German, or French between the first publication of the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III) in 1980 and December 20, 2022. Inclusion criteria were a prospective longitudinal study design, assessing the stability of PDs or PD criteria over at least two measurement occasions at least one month apart, and using the same assessment at baseline and follow-up. Effect sizes included proportion of enduring cases (i.e., diagnostic stability), test-retest correlations (i.e., dimensional rank-order stability), and within-group standardized mean differences (i.e., dimensional mean-level stability), based on the first and last available measurement occasion. From an initial pool of 1473 studies, 40 were included in our analyses, covering 38,432 participants. 56.7% maintained the diagnosis of any PD, and 45.2% maintained the diagnosis of borderline PD over time. Findings on the dimensional mean-level stability indicate that most PD criteria significantly decreased from baseline to follow-up, except for antisocial, obsessive-compulsive, and schizoid PD criteria. Findings on the dimensional rank-order stability suggested moderate estimates, except for antisocial PD criteria, which were found to be high. Findings indicated that both PDs and PD criteria were only moderately stable, although between study heterogeneity was high, and stability itself depended on several methodological factors.

1. Introduction

Once a central tenet in the conceptualization of personality disorders (PDs), the stability of PDs quickly became an important debate underlying an ongoing controversy about the conceptualization and diagnosis of PDs. For decades, temporal stability was one of the major distinguishing features between PDs and other mental disorders, leading to a multiaxial approach with the introduction of the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III; American Psychiatric Association, 1980). Yet cumulative findings slowly appeared to question the stability of PDs, suggesting considerable improvement over time (Grilo, McGlashan, & Oldham, 1998; Zanarini et al., 2007). Thus, against the common assumption that PDs are “enduring”,

“inflexible” and “stable” over time (DSM-III; American Psychiatric Association, 1980), it has been found that the stability of PDs is not much higher than the stability of other mental disorders (Shea & Yen, 2003). Nevertheless, investigating the stability of PDs is foremost a methodological endeavor and stability estimates typically vary depending on several factors. As a result, study findings are heterogeneous (Morey & Hopwood, 2013) and the field lacks a coherent overview of the stability of PDs over time. We, therefore, conducted a comprehensive systematic review and meta-analysis to examine the current literature.

1.1. The PD construct

For decades, PDs have been classified into 10 discrete categories,

* Corresponding author at: Department of Child and Adolescent Psychiatric Research, Psychiatric University Hospitals Basel, Basel 4002, Switzerland.
E-mail address: Delfine.d'Huart@upk.ch (D. d'Huart).

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each with a distinct set of diagnostic criteria defined by approximately seven to nine items, a subset of which must be fulfilled to meet diagnostic thresholds. Within this categorical classification model, PDs can also be perceived more dimensionally in terms of criteria counts, indicating the degree to which the criteria for each disorder are present. In recent PD models, such as the Alternative Model for PDs in Section III of the DSM-5 (AMPD; American Psychiatric Association, 2013) and the 11th edition of the International Classification of Diseases (ICD-11; World Health Organization (2019)). PDs are, moreover, perceived in terms of core impairments in personality functioning (i.e., self-, and interpersonal functioning), specified by a set of pathological traits (i.e., extreme variants of normal personality dimensions, such as emotional lability, attention seeking, or impulsivity). While there is, indeed, cumulative evidence for a rather dimensional course of PDs, PD models such as the AMPD and the ICD-11 are relatively new, and thus, studies on the stability of PDs have mainly focused on PD categories and more dimensional PD criteria counts. Yet, perceiving PD in terms of binary categories (e.g., borderline PD), or in terms of more dimensional criteria counts (e.g., borderline PD criteria) considerably affects the stability of PDs, as a broad number of studies suggest higher stability estimates for dimensional criteria counts rather than for discrete categories (Durbin & Klein, 2006; Grilo & McGlashan, 1999; Samuel et al., 2011).

1.2. Different types of stability

Moreover, stability estimates depend on the research question and the specific statistical approaches used to address this question, resulting in different types of stability.

1.2.1. Mean-level stability

Mean-level stability refers to the degree to which the average level of a PD or PD criteria in a given sample changes over time. Thus, mean-level stability can either be examined in terms of categorical PDs, resulting in the categorical mean-level stability, or in terms of dimensional PD criteria counts resulting in the dimensional mean-level stability.

Categorical Mean-Level Stability. Categorical mean-level stability, also known as diagnostic stability, is generally assessed as the proportion of enduring cases (i.e., number of participants who met the diagnostic threshold for the same PD) between the first and the last available measurement occasion (e.g., number of participants meeting the criteria for a borderline PD diagnosis at both baseline and follow-up). Bernstein et al. (1993) were among the first who reported that most PDs did not persist over a two-year study period. Consistent findings were quickly reported by a broad number of other studies, indicating only low to moderate diagnostic stability over time (Chanen et al., 2004; Durbin & Klein, 2006; Ferro, Klein, Schwartz, Kasch, & Leader, 1998; Mulder, Joyce, & Frampton, 2010; Vetter & Köller, 1993; Vrabel, Ro, Martinsen, Hoffart, & Rosenvinge, 2010).

Dimensional Mean-Level Stability. Dimensional mean-level stability can be assessed by comparing mean PD criteria count scores across two measurement points resulting in a mean-difference score (i.e., the difference between the mean criteria count at follow-up and the mean criteria count at baseline). (Lenzenweger et al., (1999)) first reported significant declines in PD criteria over four years using data from the Longitudinal Study of Personality Disorders (LSPD). These findings were rapidly confirmed by a great number of other studies (Chanen et al., 2004; Durbin & Klein, 2006; Hamlat, Hankin, & Young, 2020; Mulder et al., 2010; Seifert, Rohrer, Egloff, & Schmukle, 2021; Strandholm et al., 2017).

1.2.2. Rank-order stability

Rank-order stability refers to the consistency of an individual's relative ordering compared to others in a given sample, capturing, thus, the extent to which interindividual differences persist over time (Seifert et al., 2021). Rank-order stability is high if participants in a given sample

maintain their ordering with regard to a specific PD (e.g., borderline PD) or PD criteria count (e.g., borderline PD criteria count) over time, even if the sample as a whole increases or decreases in that specific PD or PD criteria count. As such, rank-order changes are independent of mean-level changes (Durbin & Klein, 2006). Like mean-level stability, rank-order stability can be measured either for categorical PDs (i.e., categorical rank-order stability) or for dimensional PD criteria (i.e., dimensional rank-order stability).

Categorical Rank-Order Stability. Categorical rank-order stability is usually measured with Cohen's κ . In their narrative review, Grilo and McGlashan (1999) reported that the rank-order stability for meeting any PD diagnosis is fair to moderate, while individual PD diagnoses often exhibit lower stability.

Dimensional Rank-Order Stability. Dimensional rank-order stability, on the other hand, is commonly measured through test-retest correlations (e.g., Pearson's r). According to Grilo and McGlashan (1999), dimensional scores tend to show slightly higher rank-order stability estimates than categorical diagnoses. Indeed, the meta-analysis on the dimensional rank-order stability of healthy and pathological personality traits conducted by Ferguson (2010) indicated that dimensional PD criteria were highly stable across the life span.

1.3. Study-specific factors influencing the stability of PDs

Besides different PD constructs and different types of stability, there are various study-specific factors that may affect stability estimates (for a complete review see Morey & Hopwood, 2013). First, the type of measurement instrument used to assess PDs seems to play an important role, as each assessment differs regarding the nature of the PD construct being assessed. As a result, some instruments might assess the whole range of PDs, whereas others only assess a specific type of PD. In addition, some instruments tend to capture PDs only categorically, while others capture PDs only dimensionally, and yet others allow for both, categorical and dimensional scores. Second, assessment modality might also play an important role in calculating the stability of PDs and PD criteria over time. For example, self-report questionnaires tend to show relatively higher dimensional mean-level and rank-order stability than clinical interviews (Durbin & Klein, 2006; Hopwood et al., 2013; Samuel et al., 2011). Third, stability estimates may vary depending on the time frame used for determining the presence of PDs and PD criteria. As such, the temporal frame of the instrument used to assess PDs is critical in assessing the stability of PDs and PD criteria over time, as it considerably varies across instruments. While the International Personality Disorder Examination (IPDE; Loranger, Janca, & Sartorius, 1997) interview, for instance, covers a time frame of 5 years, the Diagnostic Interview for Personality Disorders (DIPD; Zanarini, Frankenburg, Sickel, & Yong, 1996) only covers a two-year time frame. This is a serious concern when thinking about the stability of PDs and PD criteria over shorter time intervals between measurement occasions (Zimmerman, 1994). Fourth, it has been found that the clinical status of study participants (e.g., inpatients, outpatients, or a community-based sample) also considerably affects stability estimates. According to Morey and Hopwood (2013), one possible reason could be that in clinical samples, participants are often recruited from treatment settings, targeting clinical remission. Therefore, participants in clinical settings tend to show faster declines (i.e., lower stability) in PDs and PD criteria compared to participants in other settings. Ferguson (2010), however, reported only small differences between patients and nonpatients regarding dimensional rank-order stability. Yet, it is unclear how clinical status might influence other types of stability over time. Fifth, as comorbid symptom disorders (i.e., formerly Axis I disorders, e.g., mood disorders, anxiety disorders, and eating disorders) are frequently observed in PDs (Grilo, McGlashan, & Skodol, 2000), these might influence stability estimates by potentially increasing clinical severity. Sixth, another critical factor may be the attrition rate between the first and last available measurement occasion, as this is one of the most serious issues in longitudinal research. While

attrition apparently has little effect on mean-level and rank-order stability estimates in healthy personality traits (Roberts & DelVecchio, 2000; Roberts, Walton, & Viechtbauer, 2006), it is yet unclear whether attrition influences categorical and dimensional stability estimates of PDs and PD criteria. Seventh, study findings generally depend on the age range of the sample being assessed. In fact, studies investigating the course of PDs over time seem to focus mainly on adult samples, and studies on children and adolescents are scarce. This paucity of research has been in part due to the widespread reluctance to diagnose PDs in youth (Chanen & McCutcheon, 2008; Miller, Muehlenkamp, & Jacobson, 2008) and the belief that personality in adolescence is characterized by emotional outbursts and impulsive behavior (Chanen, Sharp, Hoffman, & for Prevention, G. A., 2017; Shiner & Allen, 2013). Existing literature, however, clearly states that PDs can be validly and reliably diagnosed in adolescence (Chanen et al., 2017; Sharp, Vanwoerden, & Wall, 2018) and that the stability of PDs is found to be comparable to the stability in adulthood (Grilo, Becker, Edell, & McGlashan, 2001). Gutiérrez et al. (2012) have outlined, that PD symptoms seem to be highest before the age of 20, with a decline in most of the pathological features over time. A narrative review of Debast et al. (2014) examining the stability of PDs and PD criteria in older age suggested a considerable decline in most of the PDs over time. The meta-analysis by Ferguson (2010), however, indicates that dimensional rank-order stability is relatively low in younger ages, whereas it becomes higher throughout adulthood. Finally, the time interval between the first and last available measurement occasion has been found to affect stability estimates (Morey & Hopwood, 2013). As such, stability estimates tend to be higher if participants are sampled at shorter time intervals, as personality itself is more likely to change over many years than over a few weeks. Indeed, the findings by Ferguson (2010) indicate that longer time intervals do produce smaller dimensional rank-order stability estimates, although the overall effect was small.

While the stability of PDs has long been taken for granted, an increasing number of studies in recent years challenged the assumption that PDs are “enduring”, “inflexible” and “stable” over time. Yet stability is a complex notion, as outlined above, making it difficult to find a single answer to the question “How stable are PDs and PD criteria over time?” (Morey & Hopwood, 2013). The aim of the current systematic review and meta-analysis is, therefore, to address this question by investigating a) the categorical mean-level stability (i.e., diagnostic stability), b) the dimensional mean-level stability, and c) the dimensional rank-order stability of PDs and PD criteria over time. Due to a lack of studies, categorical rank-order stability could not be considered. With the present work, we extend the previous meta-analysis by Ferguson (2010) by a) conducting a comprehensive and systematic literature review, b) focusing exclusively on PDs and PD criteria (and not on healthy personality traits, as well), c) investigating individual PDs and PD criteria, d) examining a larger number of moderators, and e) investigating other types of stability in addition to dimensional rank-order stability.

2. Methods

The present systematic review and meta-analysis was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards (Moher et al., 2015) as well as the Meta-Analyses of Observational Studies in Epidemiology (MOOSE) guidelines (see Appendix A; Stroup et al., 2000). The review protocol was preregistered with PROSPERO (International Prospective Register of Systematic Reviews; <https://www.crd.york.ac.uk/prospero/>) before conducting the literature search (registration number: CRD42020215840). The completed review and meta-analysis remained aligned with the original PROSPERO protocol in terms of search strategy and methodology, except for the quality assessment for which we decided to use the Quality Assessment Tool for Before-After (Pre-Post) Studies With No Control Group from the National Heart, Lung and Blood Institute (NHLBI, 2014), as this tool is particularly suitable for long-term

studies, as described below.

2.1. Literature search

Bibliographic literature searches were conducted in four electronic databases (EMBASE, PsycInfo, PubMed, and Web of Science) on October 26, 2020, and updated on December 20, 2022. Keywords and Medical Subject Headings (MeSH) terms were used to identify peer-reviewed articles reporting on the stability of PDs between the first publication of the DSM-III in 1980 and 2021. The search terms used in the individual databases are presented in Appendix B. In addition, we thoroughly scrutinized the reference list from both, a previous meta-analysis by Ferguson (2010) and a narrative review paper by Morey and Hopwood (2013). The advice of a research librarian was sought for the literature search.

2.2. Inclusion and exclusion criteria

Studies were required to meet four criteria to be included in the current meta-analysis. First, studies were only included if they were of a prospective longitudinal design, assessing the stability of PDs or PD criteria over two measurement time points at least one month apart. This criterion was chosen to ensure that the observed changes in mean level or rank-ordering reflect permanent changes rather than temporary, state-like fluctuations. Second, the stability of PDs or PD criteria was required to be measured through the same validated assessment method (i.e., clinical interviews or self-reports) at both, baseline and follow-up, according to either ICD or DSM diagnoses. Third, studies were required to be published in either English, German, or French. Fourth, studies were only included if they were published in peer-reviewed journals. In addition to these primary inclusion criteria, studies could only be included if they reported sufficient information on a) sample characteristics, and b) the proportion of enduring cases, test-retest correlations, raw means, and standard deviations, or all the previous at the first and final measurement occasion.

The following two exclusion criteria were set for study selection. First, unpublished manuscripts, dissertations, and other types of gray literature were excluded. Second, cross-sectional studies, retrospective studies, qualitative research, narrative reviews, comments, and interventional studies (i.e., studies with the explicit aim of examining the effectiveness of a specific PD treatment) were excluded from the current meta-analysis.

Based on the evidence that PDs can be validly and reliably diagnosed among children and adolescents (Chanen et al., 2004; Crick, Murray-Close, & Woods, 2005; De Clercq, De Fruyt, Van Leeuwen, & Mer-vielde, 2006), no age limit was set for study inclusion. Various studies were based on the same overarching dataset (referred to as statistical twins in Fig. 1). In such cases, preference was given to a) the most recent study, b) the study with the longest time interval, or c) studies with information on both mean-level and rank-order stability.

2.3. Screening procedure

The studies obtained through the literature search were screened independently by two authors (DH, and SS) using Covidence (<https://www.covidence.org/home>), a web-based review management tool for screening and data extraction. The screening process was carried out in two stages: First, studies were screened by abstract and title, followed by a rigorous full-text screening of the eligible studies. Discrepancies were resolved through discussion according to the eligibility criteria previously defined. A flowchart of the literature search is displayed in Fig. 1. From an initial pool of 1473 studies, 40 were eligible for data extraction and entered the final analyses.

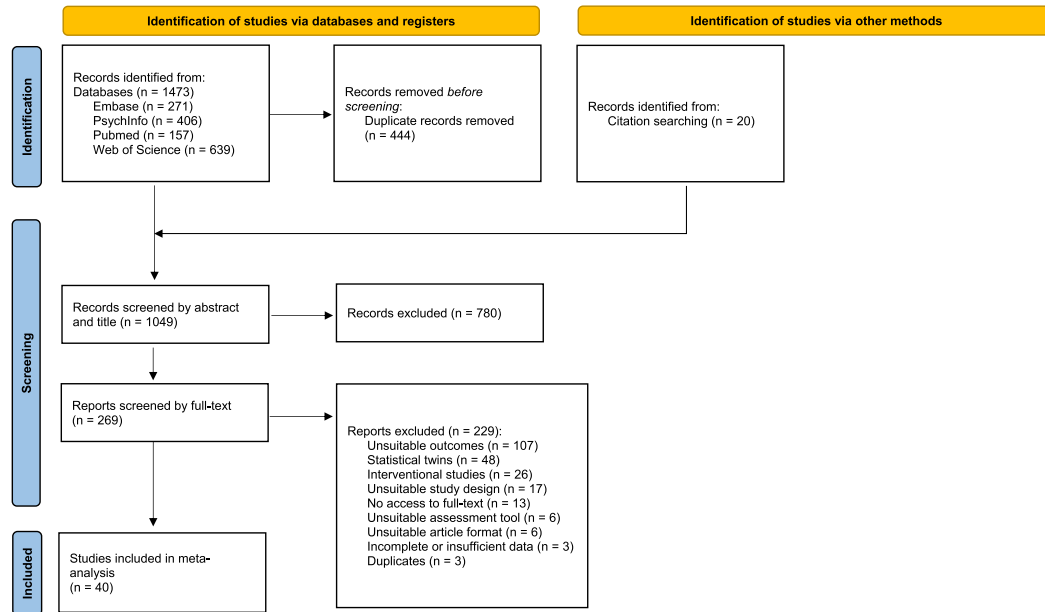


Fig. 1. Flowchart of the literature search.

2.4. Data extraction

Two authors (DH and SS) independently extracted information on effect sizes and study characteristics from the primary studies (i.e., individual studies included in the current systematic review and meta-analysis) using Covidence.

2.4.1. Descriptive characteristics

The following information was coded as descriptive characteristics: a) the total sample size at baseline; b) the type of PD and PD criteria as defined by the DSM-5; c) the type of stability (i.e., diagnostic stability, dimensional mean-level stability, and dimensional rank-order stability); and d) the applied scoring procedure (i.e., categorical vs. dimensional).

2.4.2. Study-specific factors influencing the stability of PDs

The following study-specific factors were coded in order to perform moderator analyses, where appropriate, to identify factors that influence stability estimates over time: a) the mean age of the sample; b) the proportion of females in the sample; c) the specific instrument used to assess PDs and PD criteria; d) the assessment modality (i.e., clinical interview vs. self-report); e) the clinical setting (i.e., inpatients, outpatients, community-based sample, psychiatric emergency sample, or mixed sample); f) the type of symptom disorder comorbidities (i.e., mood disorders, substance abuse disorders, eating disorders, post-traumatic stress disorders [PTSD] and mixed symptom disorders) and PD comorbidities (i.e., cluster A, B, and C PD and PD criteria) at baseline; g) the attrition rate, operationalized as the total sample size at follow-up minus the total sample at baseline; h) the time interval between the first and the last measurement occasion, in months; i) the continent in which the study was conducted; and j) the year in which the study was published. Author coding disagreements were discussed and resolved until consensus was reached. If needed, attempts were made to contact the authors of studies with incomplete or insufficient data.

2.4.3. Effect sizes

Three types of effect sizes were coded: a) the proportions of enduring cases for categorical PDs from baseline to follow-up to examine diagnostic stability; b) the within-group standardized mean difference of PD criteria counts between the first and last available measurement occasion, to examine mean-level trends; and c) test-retest correlations (i.e., Pearson's r) of PD criteria counts between the first and last measurement occasion, to examine rank-order stability.

2.5. Quality assessment

The methodologic quality of the included studies was independently rated by two authors (DH, and SS) using the Quality Assessment Tool for Before-After (Pre-Post) Studies With No Control Group from the [NHLBI \(2014\)](#). This tool was specifically developed for quality assessment of non-randomized, longitudinal pre-post studies without a separate control group and recently recommended by [Ma et al. \(2020\)](#). The tool allows assessing the risk for different types of bias, such as selection bias, reporting bias and observer bias. Studies are evaluated based on 12 questions, each of which is answered with "yes" (i.e., one point) or "no" (i.e., zero points). Discrepancies in author coding assignments were discussed and resolved until consensus was reached. The quality of a study was assessed as *good* if nine to 12 criteria were met, *fair* if five to eight criteria were met, and *low* when four or fewer criteria were met. An overview of the quality assessment of the included studies is shown in Appendix E.

2.6. Statistical analyses

2.6.1. Diagnostic stability

To estimate the diagnostic stability (i.e., categorical mean-level stability) of PDs over time, we used the proportion of enduring cases from the first to the last measurement occasion as effect size. Based on the current shift from a categorical to a dimensional model of PDs and

the subsequent omission of individual PD categories, except for borderline PD, diagnostic stability was calculated only for any PD and borderline PD, resulting, thus, in two aggregated proportions of enduring cases.

2.6.2. Mean-level stability

To estimate dimensional mean-level stability, we used the within-group standardized mean difference (i.e., SMD_{within}) as effect size. SMD_{within} can be calculated when a difference within one group is examined (e.g., when the same group of people is measured at two different time points). In contrast to a between-group standardized mean difference, traditionally known as Cohen's d , the SMD_{within} is calculated based on data that is not independent:

$$SMD_{within} = \frac{\text{raw mean score at follow up} - \text{raw mean score at baseline}}{\text{standardized deviation of the baseline score}}$$

The standard errors of this effect size are adjusted based on the correlation between the means at baseline and the means at follow-up (Morris & DeShon, 2002). If the included studies did not provide information on these correlations, we used the correlation coefficient obtained in the meta-analysis on the rank-order stability, following the procedure established in a previous meta-analysis (Mund, Freuding, Möbius, Horn, & Neyer, 2020). The SMD_{within} is interpreted as follows: The larger the difference, the greater the change, while a positive score represents an improvement, and a negative score a worsening over time. As for the rank-order stability, the aggregated effect size for the mean-level stability was calculated for each of the 10 PDs defined by the DSM-5, resulting in 10 aggregated SMD_{within} .

2.6.3. Rank-order stability

To estimate dimensional rank-order stability, we used the correlation coefficient (i.e., Pearson's r) as effect size. To obtain unbiased estimates of the correlation coefficient, we first performed an r -to- z transformation for all correlations. The meta-analysis was then conducted based on these z -values. For reporting purposes, we converted the obtained z -scores back to r , as has been done in a previous meta-analysis (Mund et al., 2020; Roberts & DelVecchio, 2000). An r between 0.1 and 0.3 is considered to be low, an r between 0.3 and 0.5 moderate, and an r between 0.5 and 0.8 is considered to be high. The aggregated rank-order stability was calculated for each of the 10 PDs defined by the DSM-5, resulting in 10 aggregated correlation coefficients (i.e., Pearson's r).

2.7. Meta-analytical procedure

In total, we ran 22 separate meta-analyses, one for each specific outcome variable of interest. As such, we ran two separate meta-analyses for diagnostic stability, 10 separate meta-analyses for mean-level stability, and 10 separate meta-analyses for rank-order stability. We applied a traditional two-level meta-analytic procedure and chose random-effect models rather than fixed-effect models for pooling effect sizes, as we assumed significant variability in terms of the general methodology between the included studies (Cuijpers, 2016). Between-study heterogeneity was assessed by calculating Q , τ^2 , and I^2 statistics. While Q heavily depends on the number of included studies, and I^2 is sensitive to the sample size of the included studies, τ^2 offers a reliable estimate of the variability between true effect sizes, although it is often hard to interpret (Borenstein, Higgins, Hedges, & Rothstein, 2017; Higgins et al., 2019). On the other hand, I^2 is defined as the proportion of variability in the effect sizes that is not caused by sampling error and is generally easy to interpret: A percentage of 25% is assumed to indicate low, 50% moderate, and 75% substantial heterogeneity. To explore the sources of study heterogeneity, we conducted 22 separate subgroup analyses for four categorical moderators (i.e., the country in which the study was conducted, the clinical setting of the primary studies, the specific instrument used to assess PDs and PD criteria, and the type of symptom disorder comorbidities at baseline). Subgroup analyses for

continuous moderators (i.e., mean age, time interval, and attrition rate) - generally known as meta-regression analyses - were omitted, as the included subgroups contained generally fewer than ten studies. As is true in primary studies, which require an appropriately large ratio of participants to form meaningful subgroups, meta-analyses require an appropriately large number of studies. As a general guideline, the use of meta-regression analyses is, thus, not recommended when the number of studies is <10 (Cuijpers, 2016). Sensitivity analyses to reduce heterogeneity were conducted by excluding outlier studies, defined as studies falling outside the aggregated confidence interval range of the effect sizes of the respective PD and PD criteria. Publication bias was assessed visually by means of funnel plots and Egger's test. All analyses and plots were conducted using the "meta" and "metafor" package in R (version 4.0.2; R Core Team, 2020). A two-sided $p < 0.05$ was used to indicate statistical significance.

3. Results

3.1. Study characteristics

Appendix C provides an overview of the basic characteristics of the selected studies. Overall, the systematic literature search revealed 1473 potentially relevant articles (see Fig. 1) of which 40 were included in the final analyses, with a total sample size of 38,432 participants at baseline. Approximately 63.5% were female, and the mean age of the total sample size was 27.87 years ($SD = 3.92$ years).

Most of the included studies reported information on the diagnostic stability of PDs, with 14 focusing on any type of PD and 18 focusing on borderline PD. A total of 15 studies provided data on dimensional mean-level stability, ranging from 10 for antisocial PD (i.e., ASPD) to 15 for borderline PD. A total of 14 studies provided data on dimensional rank-order stability, ranging from seven for the paranoid PD to 14 for borderline PD. A complete overview is shown in Appendix D.

Table 1
Descriptive statistics for aggregated study characteristics ($k = 40$).

Study characteristic	N	Mean (SD)	k	%
Total sample size at baseline	38'432			
Mean age at baseline		27.87 (3.92)		
Time interval (in years)		4.84 (4.06)		
Proportion of females				63.52
Continent				
Europe			17	42.50
North America			20	50.00
Australia			3	7.50
Measurement instrument				
SCID-II			15	37.50
DIB			5	12.50
PDE			5	12.50
Clinical reports			3	7.50
Other			12	30.00
Setting				
Inpatients			10	25.00
Outpatients			10	25.00
Community-based			9	22.50
Psychiatric emergency			1	2.50
CW & JJS			1	2.50
Mixed			9	22.50
Comorbidities				
Mood disorders			5	12.50
Substance use disorders			1	2.50
Eating disorders			1	2.50
Conduct disorders			2	5.00
PTSD			2	5.00
Mixed			29	72.50
Quality of the primary studies				
Low			0	0.00
Fair			29	71.79
High			11	28.20

Note. CW & JJS = Child welfare and juvenile justice sample.

As shown in Table 1, the mean time interval between the first and last measurement occasion in the primary studies was 4.84 years ($SD = 4.06$ years), and most studies were conducted in North America (50.0%) and Europe (42.5%). With respect to measurement instruments, the Structured Clinical Interview for DSM-IV Personality Disorder (SCID-II; First, Gibbon, Spitzer, Williams, & Benjamin, 1997) was the most frequently used measurement instrument (37.5%). Five studies used the Diagnostic Interview for Borderlines (DIB; Gunderson, Kolb, & Austin, 1981) and five studies used the Personality Disorder Examination (PDE; Loranger, Susman, Oldham, & Russakoff, 1987) interview. 12 studies used other instruments than the SCID-II, the DIB, or the PDE and three studies reported information based on hospital records. The setting in which primary studies were conducted was equally represented: 10 studies reported information either based on inpatients or outpatients, and nine studies reported information on either community-based or mixed samples. One study included participants from a psychiatric emergency sample, and one study included participants from the child welfare (i.e., CW) and juvenile justice system (i.e., JJS).

3.2. Quality of included studies

The total quality scores of the included studies ranged from 5 ($k = 3$) to 10 ($k = 5$). Eleven studies were of high quality, 29 studies were of fair quality, and none of the studies was of low quality (Appendix E).

3.3. Stability of PDs

3.3.1. Diagnostic stability

The results on the diagnostic stability of PDs are shown in Figs. 2 and 3. A detailed overview, including the sensitivity analyses is given in Content 1 of Appendix F. The proportion of enduring cases from the first to the last available measurement occasion was 56.7% for any type of PD and 45.2% for borderline PD. This means that about half of the participants retained the diagnosis of any PD or borderline PD over time.

Significantly high between-study heterogeneity was found for both any PD and borderline PD. As such, the different estimates of diagnostic stability varied widely across studies, ranging from 30% (Schilders & Ogloff, 2017) to 80% (Lopez-Castroman et al., 2012) for any PD and from 10% (d'Huart et al., 2022) to 76% (Greenfield et al., 2015) for borderline PD.

The sensitivity analyses to reduce between-study heterogeneity revealed that excluding four outlier studies (Baca-Garcia et al., 2007; Bernstein et al., 1993; Lopez-Castroman et al., 2012; Schilders & Ogloff, 2017) for any PD did increase the proportion of enduring cases from 57% to 62% by slightly decreasing between-study heterogeneity (from

$I^2 = 89.7\%$ to $I^2 = 63.1\%$). Excluding four outlier studies for borderline PD (Bernstein et al., 1993; Greenfield et al., 2015; Kjaer, Biskin, Vestergaard, Gustafsson, & Munk-Jorgensen, 2016; Yen, Gagnon, & Spirito, 2013) did slightly decrease the diagnostic stability from 45.2% to 44.3% and the between-study heterogeneity decreased from $I^2 = 90.2\%$ to $I^2 = 76.9\%$.

The asymmetry in the funnel plot for any PD, displayed in Fig. G1.1 in the Appendix G, Content 1, as well as a significant Egger's test result ($t = 2.90, df = 12, p = 0.0133$) indicates a possible risk of overestimating diagnostic stability in this meta-analysis. The information depicted in the funnel plots indicates that studies with lower diagnostic stability estimates might be missing from the initial pool of included studies. Studies with smaller diagnostic stability estimates for any PD are more likely to remain unpublished compared to studies with larger estimates. Our results - which summarize only the publicly available evidence - might thus suggest a larger diagnostic stability for any PD than would be the case if unpublished findings would have been analyzed. However, this bias should be interpreted with caution due to the small number of studies in our analysis (Cuijpers, 2016).

3.3.2. Dimensional mean-level stability

The results on the dimensional mean-level stability analyses are displayed in Figs. 4 to 13. Content 2 in Appendix F indicates that PD criteria significantly decreased from the first to the last available measurement occasion for most PD criteria, except for antisocial PD ($SMD_{within} = 0.00, p = 0.9944$), obsessive-compulsive PD criteria ($SMD_{within} = -0.12, p = 0.2579$) and schizoid PD criteria ($SMD_{within} = -0.15, p = 0.1867$). Overall, the significant within-group standardized mean differences ranged from $SMD_{within} = -0.16$ for histrionic PD criteria to $SMD_{within} = -0.46$ for schizotypal PD criteria.

Significant high between-study heterogeneities were found for all types of PDs, while excluding outlier studies slightly decreased between-study heterogeneities, although between-study heterogeneities remained high, except for histrionic PD criteria ($I^2 = 26.4, \tau^2 < 0.0001, Q = 12.22, p = 0.2012$) after excluding three outlier studies (Hamlat et al., 2020; Johnson et al., 2000; Vergara-Moragues, Gonzalez-Saiz, Lozano, & Garcia, 2013) and for dependent PD criteria ($I^2 = 42.3, \tau^2 0.0087, Q = 13.86, p = 0.0855$) after excluding four outlier studies (Bovin, Wolf, & Resick, 2017; d'Huart et al., 2022; Hamlat et al., 2020; Johnson et al., 2000). In addition, within-group standardized mean differences slightly decreased when outlier studies were removed for most PD criteria, except for paranoid PD criteria ($SMD_{within} = -0.35, p\text{-value} < 0.0001$), histrionic PD criteria ($SMD_{within} = -0.19, p\text{-value} < 0.0001$) and obsessive-compulsive PD criteria ($SMD_{within} = -0.19, p\text{-value} = 0.0038$), for which the within-group standardized mean

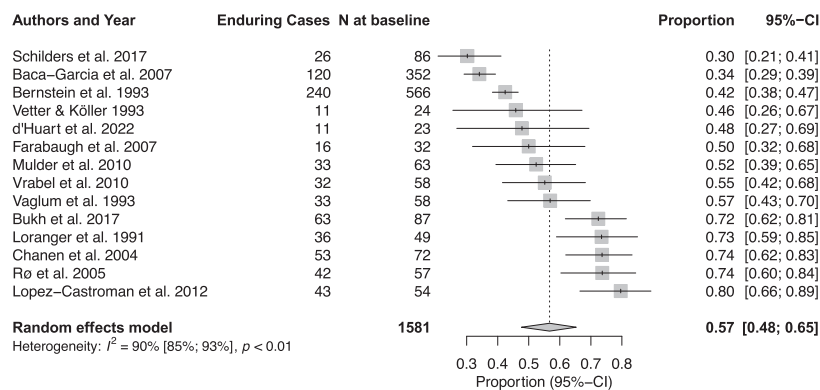


Fig. 2. Forest Plots of the diagnostic stability for any PD.

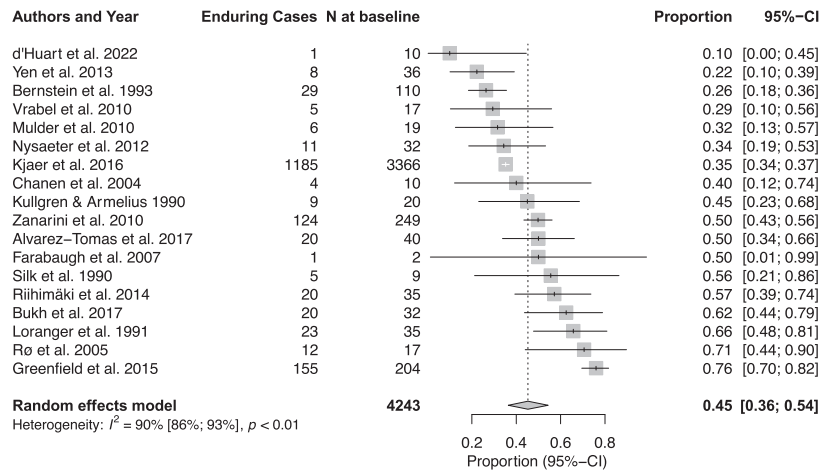


Fig. 3. Forest Plots of the diagnostic stability for borderline PD.

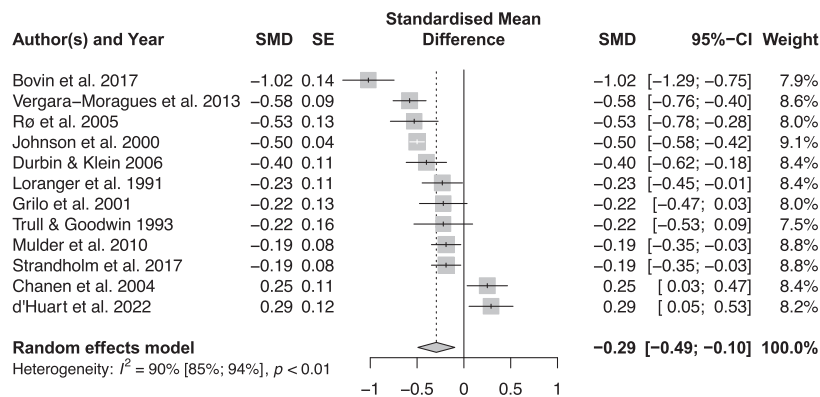


Fig. 4. Dimensional Mean-level Stability Paranoid PD.

differences significantly increased after two outlier studies were removed respectively (Bovin et al., 2017; Chanen et al., 2004).

The asymmetry in the funnel plot for dependent PD criteria (displayed in Fig. G2.9 in Appendix G, Content 2) and a significant Egger's test result ($t = 3.163$, $df = 11$, $p = 0.0090$), indicate a significant publication bias, suggesting higher decreases in dependent PD criteria over time if unpublished findings would have been included in the analysis.

3.3.3. Dimensional rank-order stability

The results on the dimensional rank-order stability of PDs are displayed in Figs. 14 to 23. A detailed overview, including the sensitivity analyses is given in Content 3 of Appendix F. Dimensional rank-order stability reached moderate to high effect sizes, with Pearson's r ranging from $r = 0.31$ for obsessive-compulsive PD criteria to $r = 0.56$ for antisocial PD criteria. Obsessive-compulsive PD criteria revealed the highest interindividual differences, followed by dependent PD criteria ($r = 0.39$) and avoidant and schizoid PD criteria ($r = 0.42$ each). The lowest interindividual differences, and thus the highest rank-order stability, was reached for antisocial PD criteria ($r = 0.56$) followed by

narcissistic and borderline PD criteria ($r = 0.46$ each).

Significant moderate to high between-study heterogeneities were found for all types of PD criteria, while excluding outlier studies slightly decreased between-study heterogeneities, although they remained moderate to high. Rank-order stability estimates decreased for most PD criteria, except for paranoid, borderline, and antisocial PD criteria which slightly increased after removing one (d'Huart et al., 2022), three (Hamlat et al., 2020; Johnson et al., 2000; Nestadt et al., 2010), and one (Nestadt et al., 2010) study respectively. The rank-order stability estimates for obsessive-compulsive PD criteria remained unchanged after excluding two outlier studies (de Groot, Franken, van der Meer, & Hendriks, 2003; d'Huart et al., 2022). No asymmetry in the funnel plots (displayed in the Figures in Appendix G, Content 3) and no significant Egger's test result were found.

3.4. Moderator analyses

As described above, we conducted separate subgroup analyses for four categorical moderators for each of the type of stability and each

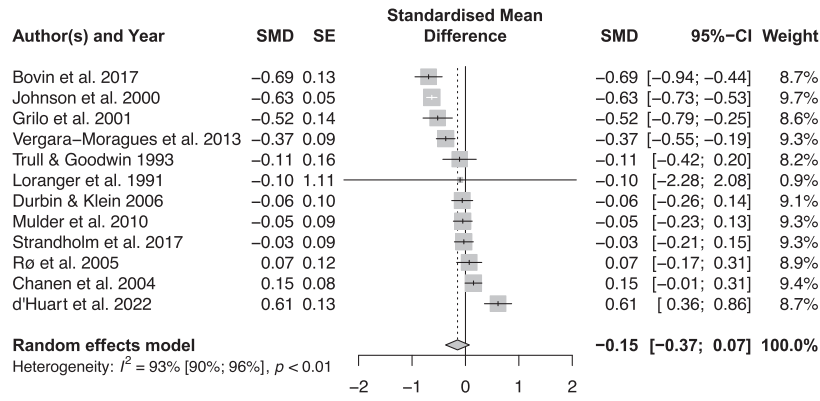


Fig. 5. Dimensional Mean-level Stability Schizoid PD.

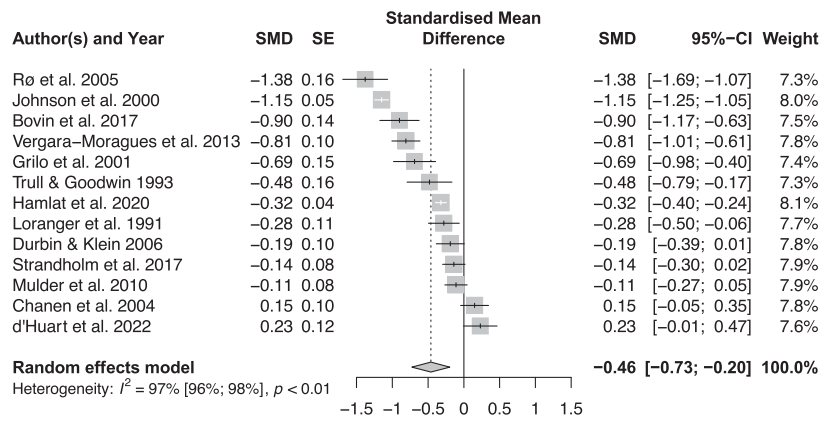


Fig. 6. Dimensional Mean-level Stability Schizotypal PD.

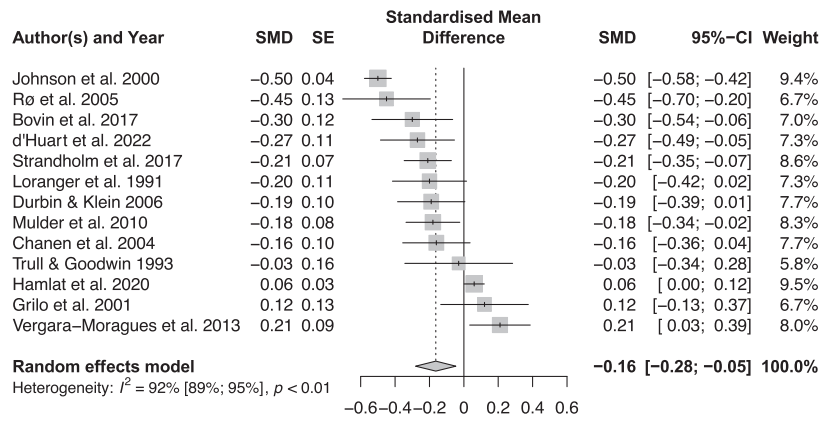


Fig. 7. Dimensional Mean-level Stability Histrionic PD.

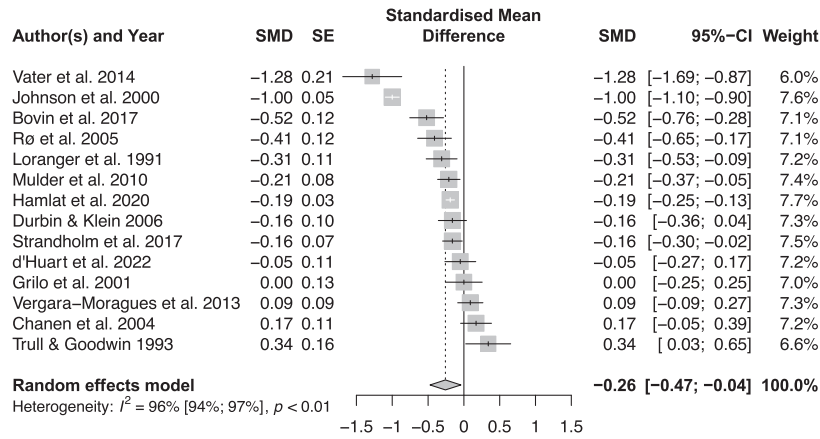


Fig. 8. Dimensional Mean-level Stability Narcissistic PD.

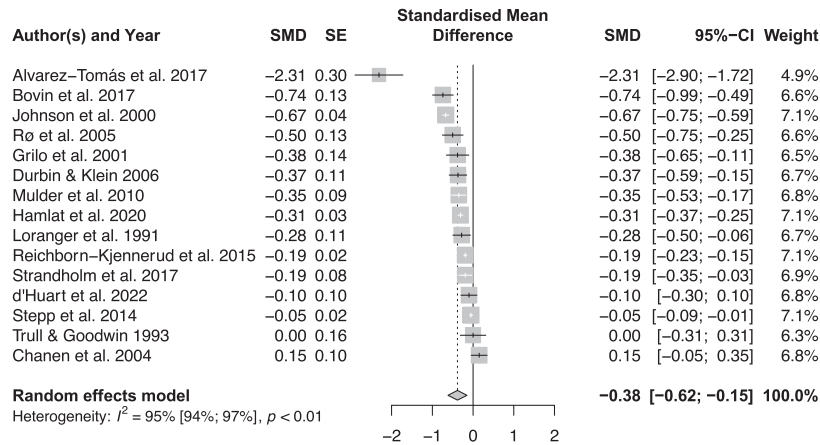


Fig. 9. Dimensional Mean-level Stability Borderline PD.

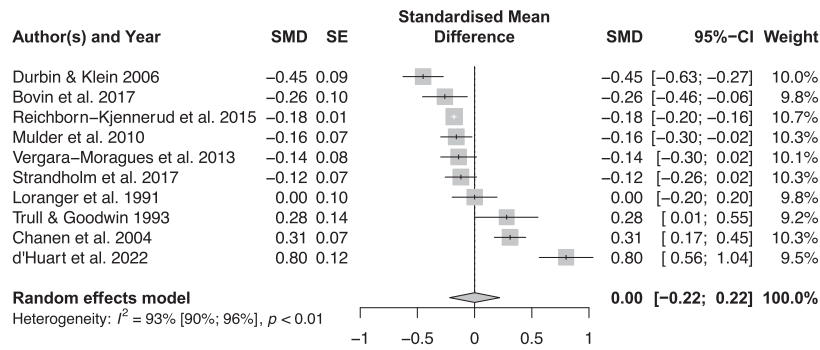


Fig. 10. Dimensional Mean-level Stability Antisocial PD.

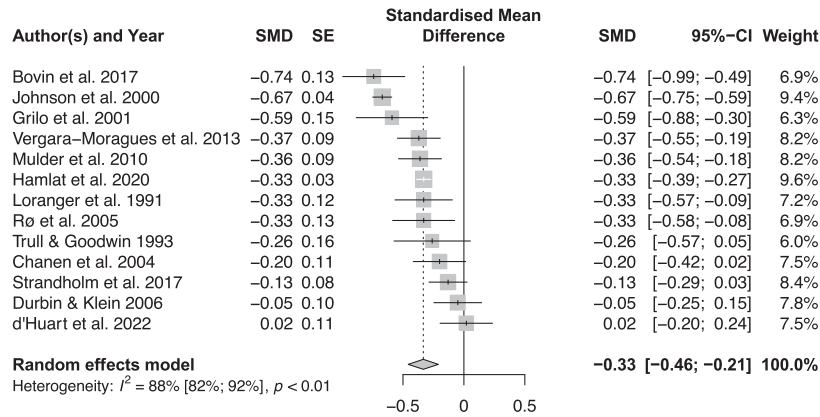


Fig. 11. Dimensional Mean-level Stability Avoidant PD.

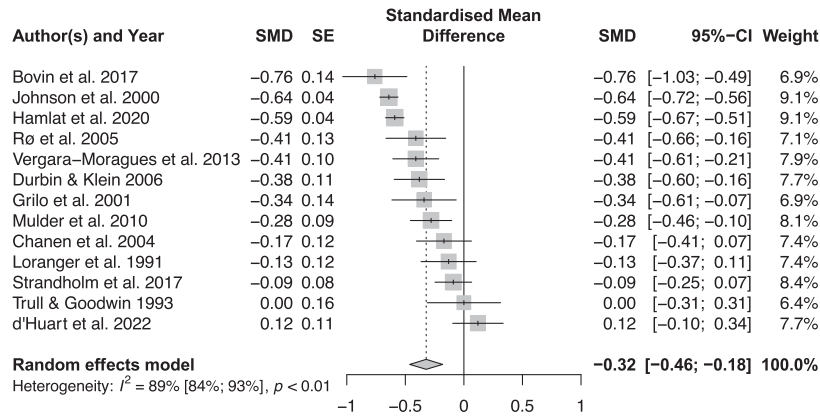


Fig. 12. Dimensional Mean-level Stability Dependent PD.

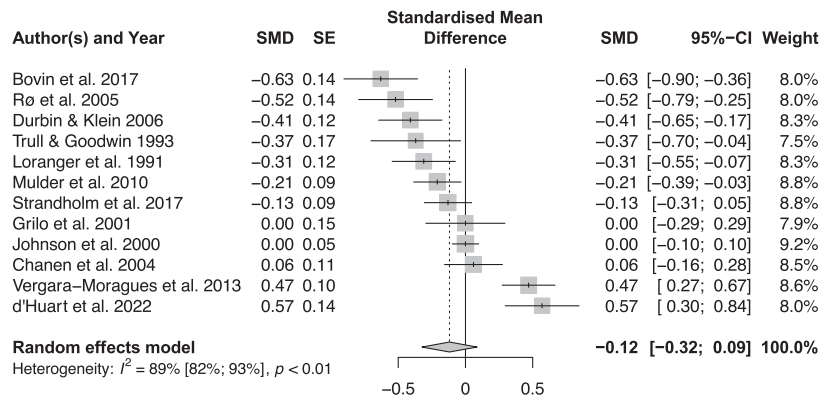


Fig. 13. Dimensional Mean-level Stability Obsessive-Compulsive PD.

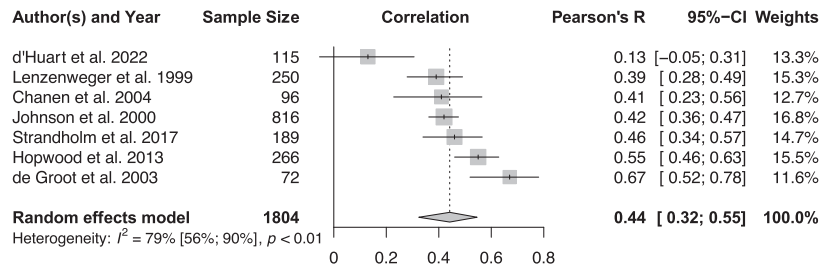


Fig. 14. Dimensional Rank-Order Stability Paranoid PD.

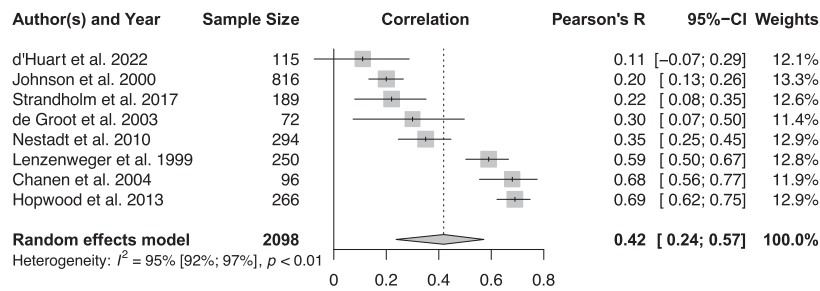


Fig. 15. Dimensional Rank-Order Stability Schizoid PD.

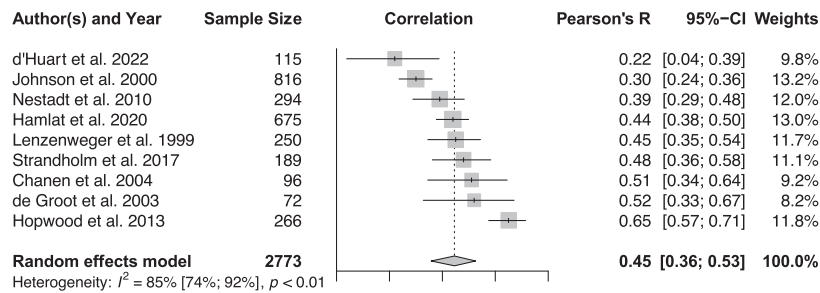


Fig. 16. Dimensional Rank-Order Stability Schizotypal PD.

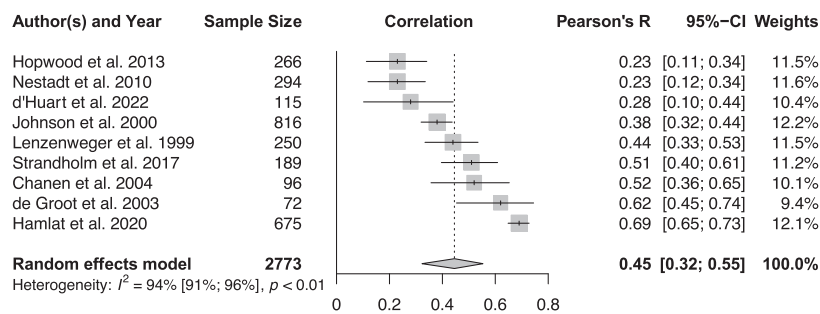


Fig. 17. Dimensional Rank-Order Stability Histrionic PD.

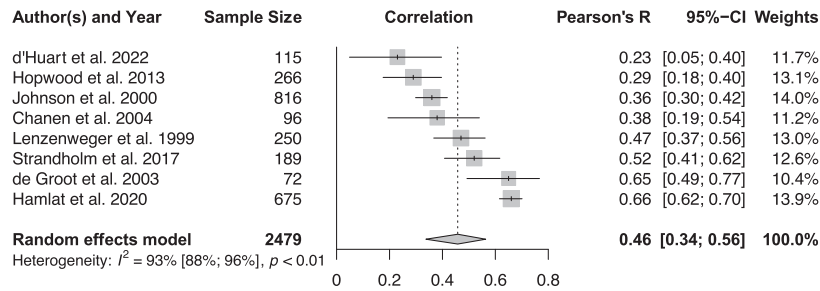


Fig. 18. Dimensional Rank-Order Stability Narcissistic PD.

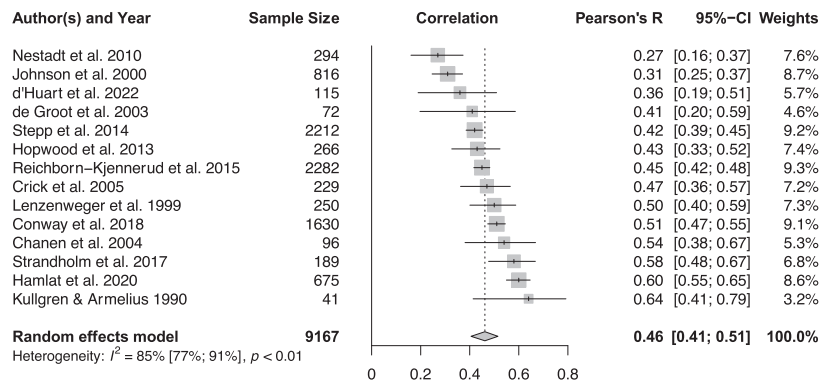


Fig. 19. Dimensional Rank-Order Stability Borderline PD.

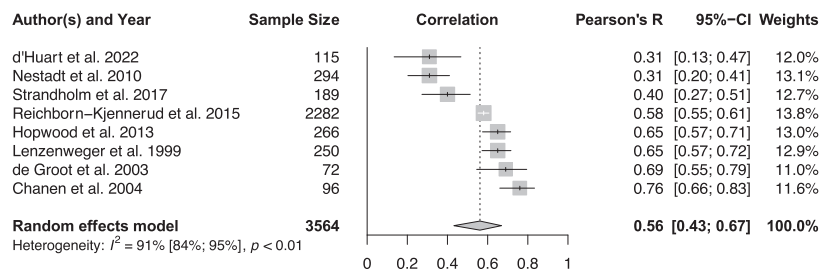


Fig. 20. Dimensional Rank-Order Stability Antisocial PD.

type of PD to explore the sources of study heterogeneity. Subgroup analyses for continuous moderators were omitted, as the included subgroups contained generally fewer than 10 studies.

3.4.1. Diagnostic stability

The results of the subgroup analyses for diagnostic stability are displayed in Content 1 of Appendix H. No differences were found in the diagnostic stability coefficients for any PD with respect to the continent in which the study was conducted, the setting of the primary studies, and the type of symptom disorder comorbidities at baseline. However, a significant difference between measurement instruments was found ($p = 0.0023$): Diagnostic stability was highest when the SCID-II was used ($r = 0.64$) and lowest when the DIB was used ($r = 0.30$). For borderline PD,

significant differences were found for the setting of the primary studies ($p = 0.0023$): Diagnostic stability was highest in the psychiatric emergency setting ($r = 0.76$) and lowest in the CW /JJS sample ($r = 0.09$).

3.4.2. Dimensional mean-level stability

As indicated in Content 2 of Appendix H, the results of the subgroup analyses for dimensional mean-level stability were quite heterogeneous regarding the specific type of PD criteria. For instance, whereas significant differences between dimensional mean-level stability estimates were found for avoidant PD criteria regarding the setting of the primary studies and the specific instrument used to assess PD criteria, no significant differences were found for narcissistic, borderline, and antisocial PD criteria. The setting of the primary studies as well as the specific

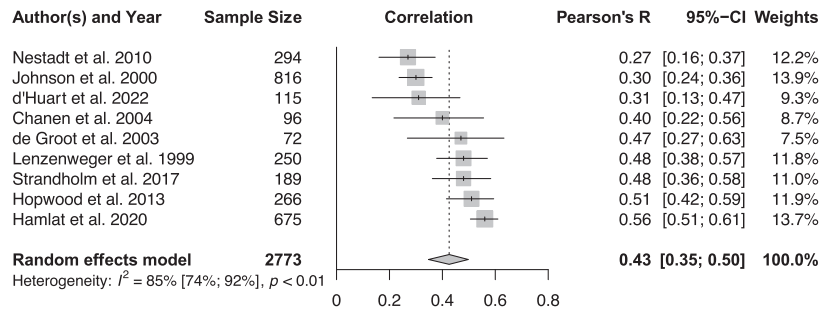


Fig. 21. Dimensional Rank-Order Stability Avoidant PD.

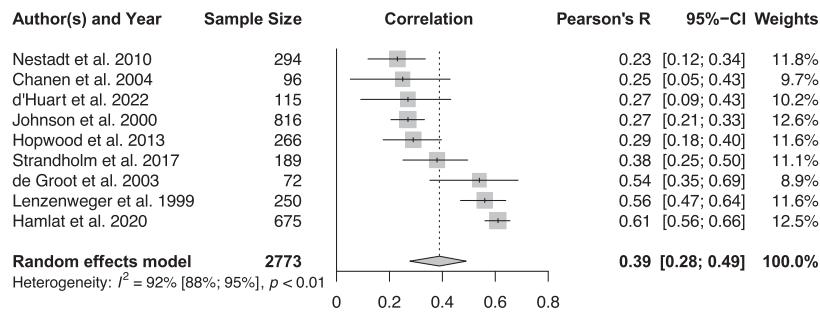


Fig. 22. Dimensional Rank-Order Stability Dependent PD.

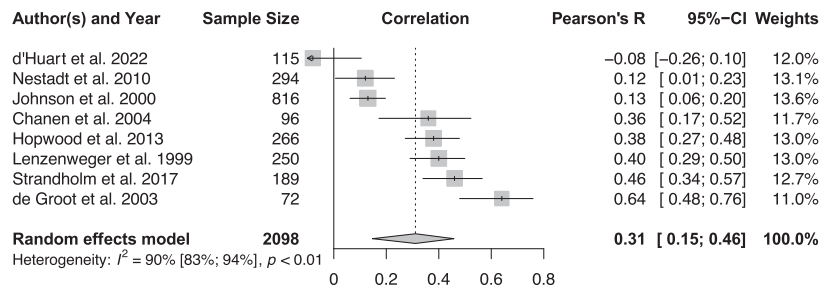


Fig. 23. Dimensional Rank-Order Stability Obsessive-Compulsive PD.

instrument used to assess PD criteria, were, however, among the most frequently significant factors influencing dimensional mean-level stability.

3.4.3. Dimensional rank-order stability

The results of the subgroup analyses for the dimensional rank-order stability are displayed in Content 3 of Appendix H. Like for dimensional mean-level stability, findings were quite heterogeneous depending on the specific type of PD criteria. While significant differences between dimensional rank-order stability estimates were found for paranoid PD criteria regarding the setting of the primary studies and the type of symptom disorder comorbidities at baseline, no significant differences were found at all for schizoid and antisocial PD criteria. The setting of the primary studies, the specific instrument used to assess PD criteria, and the type of symptom disorder comorbidities at baseline were found

to most frequently influence dimensional rank-order stability estimates, regardless of PD type.

4. Discussion

In the present systematic review and meta-analysis, we extended prior research on the stability of PDs and PD criteria by differentiating between a) the diagnostic stability, b) the dimensional mean-level stability, and c) the dimensional rank-order stability of PDs and PD criteria over time. In addition, this is the first meta-analysis that conducted moderator analyses to examine the effect of several methodological factors on the different types of stability regarding the specific types of PDs and PD criteria.

4.1. Diagnostic stability

Overall, results on diagnostic stability indicated only moderate stability, with only half the participants aggregated across the primary studies maintaining their diagnosis of any PD or borderline PD over time. This underlines previous findings that categorical PD diagnoses are not as stable as previously thought, suggesting that half of the individuals diagnosed with a PD are likely to not fulfill diagnostic criteria over time. This is particularly noteworthy and yet again highlights the shortcomings of the categorical PD system. In fact, one of the major concerns of the categorical system is that it is based on an arbitrary diagnostic threshold that can easily be met (diagnosis PD) or unmet (no diagnosis PD) by an addition or loss of a single criterion of a single criterion. This in turn, leads to diagnostic instability, although the subclinical expression of the individual's symptoms may remain high. Also, while the individual may no longer fulfill diagnostic criteria for one PD, he or she may meet the criteria for another type of PD due to an increase in a single criterion. This in turn, reflects the excessive comorbidity between distinct PD diagnoses. Moreover, a decline of PD diagnoses over time may also be (partly) due to the reduction of behavioral criteria, such as self-injurious behavior in borderline PD, as indicated in several studies from the Collaborative Longitudinal Study of Personality Disorders (CLPS; Skodol et al., 2005). Finally, reduced diagnostic stability may also be related to modest assessment interrater reliability, as interrater reliability of the SCID-II was found to be low ($\kappa = 0.63$; Weertman, Arntz, Dreesen, van Velzen, & Vertommen, 2003), while for dimensional scores, such as the AMPD, it seems to be high (Ohse et al., 2022). The diagnostic stability of PDs appears, thus, to be a rather inappropriate measure to assess the developmental course of PDs over time, as scaling PDs categorically leads to a significant loss of information.

4.2. Dimensional mean-level stability

Findings on dimensional mean-level stability indicate that PD criteria significantly decreased for most of the PDs, except for obsessive-compulsive and schizoid PD criteria. Antisocial PD criteria neither increased nor decreased over time. Overall, effect sizes were low to moderate. This indicates that the mean-level of PD criteria of most PDs, regardless of the type of disorder, underwent considerable change towards improvement. One explanation for overall improvement might lie in possible treatment effects (Newton-Howes, Clark, & Chanen, 2015). Surprisingly, however, community-based samples also showed substantial decreases in most PD criteria over time. Nonclinical studies of healthy personality traits found that mean trait levels tend to correspond with increasing maturity with age (i.e., decreasing neuroticism, increasing extraversion, agreeableness, and conscientiousness (Roberts et al., 2006)). Thus, normative developmental changes in PD criteria might exist in community-based samples next to changes attributable to potential treatment effects. Indeed, the findings of Wright, Pincus, and Lenzenweger (2012), indicated that decreases in avoidant PD criteria were associated with increases in dominance and warmth and decreases in neuroticism (Wright et al., 2012). While this may suggest a natural improvement over time, it should, however, be noted that primary studies did not report whether participants were in treatment between the first and last available measurement occasion. In addition, one should bear in mind the level of baseline severity when interpreting these findings, as it significantly influences the likelihood of improvement.

4.3. Dimensional rank-order stability

The findings on the dimensional rank-order stability, on the other hand, indicated moderate to high stability estimates depending on the specific type of PD. As such, whereas most types of PD criteria revealed only moderate rank-order stability, individuals presenting antisocial PD

criteria showed highly stable rank-orderings. In other words, this means that individuals who were relatively high in antisocial PD criteria at baseline were also relatively high in antisocial PD criteria at follow-up. This result underlines the regrettable continuity of antisocial behavior over time (Carroll, Clark, Hyde, Klump, & Burt, 2021) and the enormous difficulties to treat severe antisocial behavior (Gibbon, Khalifa, Cheung, Völlm, & McCarthy, 2020).

The findings on dimensional rank-order stability contradict in part the meta-analytical findings from Ferguson (2010), who claimed that both healthy personality and PD criteria were highly stable across the life span. This may be due to the fact that Ferguson (2010) only included a small number of studies based on less stringent inclusion criteria. In Ferguson (2010), for instance, PDs did not need to be measured using the same validated assessment method at baseline and follow-up, nor did diagnoses need to be based on ICD or DSM criteria. In addition, Ferguson (2010) did not differentiate between different types of PDs. Finally, research designs have evolved over time, including better statistical methods and longer follow-up periods. Interestingly however, dimensional rank-order stability tends to be somewhat more stable than dimensional mean-level stability. While PD criteria seem to significantly decrease from a mean-level perspective, they appear to remain rather stable when indexed by rank-order stability. This is in line with the narrative review from Morey and Hopwood (2013), suggesting that this pattern highlights the importance of specifying the type of stability being assessed (mean-level vs. rank-order stability) when assessing the stability of dimensional PD criteria.

4.4. Study-specific factors influencing the stability of PDs

Several study-specific factors were found to significantly influence the diagnostic stability of PDs and PD criteria over time, namely the continent in which the study was conducted, the setting of the study sample, the specific instrument used to assess PDs and PD criteria, as well as the specific type of symptom disorder comorbidities at baseline. This finding is in line with the narrative reviews from Morey and Hopwood (2013) and Hopwood and Bleidorn (2018). Remarkably, however, the factors differed depending on the specific type of stability as well as the specific type of PD and PD criteria assessed. While this may be due to methodological differences in the primary studies, such as different samples sizes, different time intervals, and different settings, it emphasizes the need to improve our understanding of how different factors tend to capture different aspects of PDs and PD criteria. Moreover, it is important to bear in mind that, in addition to the factors found to influence the stability of PDs and PD criteria in the current meta-analysis, there are several other factors that, according to Hopwood and Bleidorn (2018), may significantly influence stability estimates (i.e., genetic factors, environmental factors, and treatment factors). Due to the small number of primary studies, however, only categorical subgroup analyses could be conducted and continuous factors, such as sample size, time interval, mean age of included participants and the attrition rate could not be considered in the present meta-analysis. In addition to methodological factors, previous literature suggests that genetic and environmental factors also play a major role in the course of healthy personality and PD criteria over time (Briley & Tucker-Drob, 2014; Hopwood et al., 2011).

4.5. Study strengths

The current systematic review and meta-analysis fills an important gap in the existing literature by being the first of its kind, to differentiate between the diagnostic, the dimensional mean-level, and the dimensional rank-order stability of PDs and PD criteria over time. In light of the ongoing controversy about the stability of PDs, a comprehensive systematic review and meta-analysis was urgently needed, especially in view of the current shift from the categorical to the dimensional model of PDs. In addition, this systematic review and meta-analysis helps to

enhance our understanding of the factors influencing the stability of PDs and PD criteria, and thus, provides a comprehensive overview of the course of PDs over time. Finally, the present systematic review and meta-analysis contributes to dispelling the assumption that PDs are “enduring” and “inflexible” over time and highlights the importance of the radical change currently taking place in the conceptualization and diagnosis of PDs.

4.6. Study limitations

The findings of the current meta-analysis must be interpreted under the consideration of some limitations. First, the small number of primary studies for some specific PD criteria regarding the different types of stability limit the interpretation of the calculated effect sizes. In addition, the small number of primary studies, did not allow for an examination of the effect of continuous moderators (i.e., sample size, time interval, mean age, as well as the percentage of females and attrition rate), as conducting meta-regression analyses with $k < 10$ studies is not recommended (Cuijpers, 2016). Second, the current meta-analysis only allowed for investigating the stability of PDs and PD criteria based on two measurement points. The amount of change between two measurement points is, however, not fully informative about the shape of each person's individual trajectory. In addition, a two-wave design cannot distinguish true change from measurement error (Singer & Willet, 2003). In fact, reliability represents a conceptual upper bound for the validity and stability of PDs (Morey & Hopwood, 2013) as it is quite difficult to disentangle true change from an unreliable baseline assessment. In order to avoid issues related to the two-measurement design, we advocate to further conduct a three-level meta-analysis, that groups primary studies into several age categories, in order to detect age-related changes in PDs and PD criteria across the lifespan. Third, the funnel plots concerning the diagnostic stability for any PD, the dimensional mean-level stability for dependent PD criteria, and the dimensional rank-order stability for obsessive-compulsive PD criteria indicated possible publication biases, suggesting that studies with lower stability estimates are more likely to remain unpublished compared to studies with higher stability estimates. If this is true, the present findings might suggest higher stability estimates than would be the case if unpublished findings were included. Fourth, our meta-analyses showed high between-study heterogeneity for the individual PDs and PD criteria with respect to the different types of stability, suggesting, thus, high variation in study outcomes due to methodological differences between studies. Presumably, because of the thematic breadth of the included studies, this heterogeneity could not be explained. The thematic breadth of the included studies, however, was deliberately chosen to include as many studies as possible. As a result, the observed variance in effect sizes might be accounted for by other variables that were not considered in the present meta-analysis or that were not reported in the primary studies included. Finally, the dimensional approach on PDs used in the current meta-analysis substantially differs from the kind of dimensions adopted in the AMPD and the dimensional model of PDs in the ICD-11. In fact, the dimensions of severity go beyond a mere sum of PD symptoms. Nonetheless, too few studies investigating the dimensions advocated in the AMPD and ICD-11 are currently available, impeding the performance of a meta-analysis that addresses the stability of personality functioning and/or pathological PD traits over time. Finally, and as a general limitation, the literature itself on the temporal course of PDs and factors affecting the stability of PDs over time might be described as overall weak. As a result, the field is lacking systematic studies to address all the questions that ought to be answered.

4.7. Study implications

Overall, findings suggest that both PDs and PD criteria are only moderately stable over time, supporting recent claims that PDs are not as stable as previously thought. This highlights the need to overcome the

current assumption that PDs are “enduring”, “pervasive” and “inflexible” over time. Although the actual causes of changes in PDs and PD criteria over time remain unclear, it appears that the direction of change is a change towards improvement. This once again emphasizes that the diagnosis of a PD does not seem to be a lifelong impairment, that PDs are treatable, and thus, that PDs should be assessed and diagnosed as early as adolescence in order to ensure the best possible outcome. Indeed, when treated in adolescence, some patients no longer meet the criteria for borderline PD after less than a year of treatment (Schmeck et al., 2022). However, the stability of PDs and PD criteria remains a complex notion and findings must be interpreted in the light of aforementioned factors. If PDs and PD criteria are not as stable as previously assumed, and if stability itself depends on conceptual, methodological, genetic, and environmental factors, this raises the question of whether or not it is still appropriate to consider stability as a central characteristic of PDs. If neither the disorder nor the symptoms are stable per se, does it make sense to refer to PD or PD symptoms? Or is it rather the underlying level of personality functioning (LPF; i.e., self- and interpersonal functioning), conceptually independent of PD types and PD criteria, that defines what we assume to be a PD? As outlined in a review by Sharp and Wall (2021), the LPF reintroduces the idea of self and interpersonal functioning as the core feature of PDs and puts back into focus the original meaning of personality, namely, the subjective experience of what it means to be human. As studies on the stability of personality functioning and pathological personality traits are, nevertheless, sparse, future research should focus more intensively on personality functions and specific trait expressions to determine whether the new conceptualization adopted in the AMPD and ICD-11 clarifies the issue of stability over time. Future studies should, therefore, rely on dimensional assessments and longer follow-up intervals, using more sophisticated sampling and statistical procedures to overcome possible limitations.

5. Conclusion

Taken together, the findings suggest that both PDs and PD criteria are only moderately stable. In fact, only half of the participants aggregated across the primary studies maintained their diagnosis of any PD or borderline PD over time. Findings on dimensional mean-level stability indicated that PD criteria significantly decreased for most of the disorders, and findings on dimensional rank-order stability suggested moderate stability estimates, except for antisocial PD criteria for which rank-order stability estimates were found to be high. While there is considerable between study heterogeneity and it appears that stability itself depends on conceptual, methodological, genetic, and environmental factors, the results nevertheless indicate that there is a notable trend towards improvement. This challenges the current conceptualization of PDs in terms of disorders and traits, arguing instead in favor of the LPF by leaving these rather artificial categories behind and reintroducing the idea of self and interpersonal functioning as the core feature of PDs. This, in turn, supports the current shift to a dimensional model and highlights the use of the AMPD and the ICD-11, both acknowledging PDs to be only “relatively” stable. Nevertheless, literature itself on the temporal course of PDs can be described as overall weak, leaving unanswered questions in the field. This underscores the need for future research.

Contributors

DH and KS conceived the study. DH and SS conducted the systematic review. DH and SS extracted the data and carried out the quality assessment. DH conducted the statistical analyses. SS assisted with analyzing and interpreting the data. DD and KS drafted the first version of the manuscript. SS, DB, MB, CB, MS and KS revised and edited the manuscript for publication. All the authors have read and approved the final version.

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Declaration of Competing Interest

The authors declare no conflict of interest.

Data availability

Data will be made available on request.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.cpr.2023.102284>.

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¹ Note. References included in the meta-analyses may be found in Appendix I.

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Chapter 3 – Prevalence and 10-year stability of personality disorders from adolescence to young adulthood in a high-risk sample

Delfine d'Huart^{1*}, Martin Steppan², Süheyla Seker¹, David Bürgin^{1,3}, Cyril Boonmann^{1,4}, Marc Birkhölzer⁴, Nils Jenkel¹, Jörg M. Fegert³, Marc Schmid¹, & Klaus Schmeck¹

¹ Department of Child and Adolescent Psychiatric Research, Psychiatric University Hospitals Basel, Basel, Switzerland

² Division of Developmental and Personality Psychology, University of Basel, Basel, Switzerland

³ Department for Child and Adolescent Psychiatry/Psychotherapy, University of Ulm, Ulm, Germany

⁴ Department of Forensic Child and Adolescent Psychiatry, Psychiatric University Hospitals Basel, Basel, Switzerland

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Prevalence and 10-Year Stability of Personality Disorders From Adolescence to Young Adulthood in a High-Risk Sample

Delfine d'Huart^{1*}, Martin Steppan², Süheyla Seker¹, David Bürgin^{1,3}, Cyril Boonmann^{1,4}, Marc Birkhölzer⁴, Nils Jenkel¹, Jörg M. Fegert³, Marc Schmid¹ and Klaus Schmeck¹

¹ Department of Child and Adolescent Psychiatric Research, University Psychiatric Clinics Basel, Basel, Switzerland, ² Division of Developmental and Personality Psychology, University of Basel, Basel, Switzerland, ³ Department of Child and Adolescent Psychiatry and Psychotherapy, Ulm University, Ulm, Germany, ⁴ Department of Forensic Child and Adolescent Psychiatry, University Psychiatric Clinics Basel, Basel, Switzerland

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*Correspondence:

Delfine d'Huart
Delfine.d'Huart@upk.ch

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Background: With the implementation of the 11th edition of the International Classification of Diseases (ICD-11) in early 2022, there will be a radical change in the framework and process for diagnosing personality disorders (PDs), indicating a transition from the categorical to the dimensional model. Despite increasing evidence that PDs are not as stable as previously assumed, the long-term stability of PDs remains under major debate. The aim of the current paper was to investigate the categorical and dimensional mean-level and rank-order stability of PDs from adolescence into young adulthood in a high-risk sample.

Methods: In total, 115 young adults with a history of residential child welfare and juvenile-justice placements in Switzerland were included in the current study. PDs were assessed at baseline and at a 10-year follow-up. On a categorical level, mean-level stability was assessed through the proportion of enduring cases from baseline to follow-up. Rank-order stability was assessed through Cohen's κ and tetrachoric correlation coefficients. On a dimensional level, the magnitude of change between the PD trait scores at baseline and at follow-up was measured by Cohen's d . Rank-order stability was assessed through Spearman's ρ .

Results: The prevalence rate for any PD was 20.0% at baseline and 30.4% at follow-up. The most frequently diagnosed disorders were antisocial, borderline, and obsessive-compulsive PDs, both at baseline and at follow-up. On a categorical level, the mean-level stability of any PD was only moderate, and the mean-level stability of specific PDs was low, except of schizoid PD. Likewise, the rank-order stability of any PD category was moderate, while ranging from low to high for individual PD diagnoses. On a dimensional level, scores increased significantly for most PDs, except for histrionic traits, which decreased significantly from baseline to follow-up. Effect sizes were generally low. The rank-order stability for dimensional scores ranged from low to moderate.

Conclusion: The findings indicate low to moderate stability of Pds and Pd traits from adolescence to adulthood, which supports the growing evidence that categorical diagnoses of Pds are quite unstable. This in turn, emphasizes the use of the upcoming ICD-11 that Acknowledgments Pds to be only “relatively” stable.

Keywords: personality disorders (PDs), prevalence, stability, high-risk sample, youth

INTRODUCTION

The introduction of personality disorders (PDs) in the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III) (1) led to a substantial increase in empirical research and clinical interest (2). Yet, the advent of specific diagnostic criteria and a multiaxial approach that differentiated PDs (i.e., Axis II) from clinical syndromes (i.e., Axis I) set the stage for an ongoing controversy about the conceptualization and diagnosis of PDs. While PDs were defined as discrete, distinct categories, the shortcomings of such a categorical classification model became quickly apparent (3–5), and a shift to a more dimensional model, in which PDs are perceived as extreme variants of normal personality dimensions, became inevitable (6, 7). With the upcoming 11th edition of the International Classification of Diseases (ICD-11) (8), the conceptualization of PDs is finally in transition, acknowledging PDs to be only “relatively” stable (9–11). For over decades, however, temporal stability consisted in one of the major distinguishing features between Axis I and Axis II disorders with the stability of PDs being substantially higher than for other mental disorders. Yet cumulative findings slowly appeared to question the stability of PDs, by suggesting considerable improvement over time (12, 13). Thus, against the common assumption that PDs are “enduring,” “inflexible,” and “stable” the categorical stability of PDs has found to be not much higher than the stability of other mental disorders (14). Indeed, the Collaborative Longitudinal Study of PDs (CLPS) (15), which investigated the stability of schizotypal, borderline, avoidant, and obsessive-compulsive PDs over time, found that fewer than half of PD patients still met the criteria for a diagnosis after 2 years (16). With regard to borderline PD (BPD), 85% of the original sample had remitted after 10 years (17).

Nevertheless, as outlined in Morey and Hopwood’s narrative review (18), temporal stability is a complex notion and has to be examined with respect to several factors. First, estimates tend to vary as a function of the type of stability being assessed. In the present study, the focus relies on the two types of stability that have been studied most frequently, namely mean-level and rank-order stability. Mean-level stability refers to the degree to which the average level of a PD or a PD trait in a given sample changes over time. Rank-order stability, on the other hand, refers to the consistency of an individual’s relative ordering compared to others in a given sample, capturing, thus, the extent to which interindividual differences persist over time (18). Rank-order stability is high if the participants in a given sample maintain their ordering with regard to a specific PD or PD trait relative to each other over time, even if the sample as a whole increases or decreases with regard to that PD or PD trait. As such, rank-order changes are independent of mean-level changes (19). Second,

estimates depend in part on the type of PD construct being assessed (i.e., categories or traits), suggesting higher stability for dimensional traits rather than for distinct categories (20–22). In their narrative review, Grilo and McGlashan (21) reported that the rank-order stability for meeting any PD diagnosis is fair to moderate, while individual PD diagnoses often exhibit lower stability. In contrast, dimensional scores tend to show slightly higher stability estimates. Durbin and Klein (20) confirmed these findings by showing that rank-order stability was low to fair for categorical PD diagnoses over a 10-year follow-up in depressed outpatients, while rank-order stability for dimensional PD traits was fair to moderate. According to Grilo et al. (23), mean-level stability, when assessed dimensionally, is generally lower than rank-order stability, which indicates that symptoms tend to decrease on average, but the rank-ordering of individuals within a defined sample remains roughly the same. Third, estimates may be affected by the assessment method being used to measure PDs. Self-report questionnaires tend to show a relatively higher stability than clinical interviews (20, 24). For instance, the findings from Samuel et al. (22) for dimensional ratings showed significantly greater rank-order and mean-level stability for self-report questionnaires compared to clinical interviews. Findings regarding categorical PD diagnoses, in contrast, indicated comparable rank-order and mean-level stability. Finally, Morey and Hopwood (18) outlined how the clinical status and age range of a given sample are critical factors affecting PD stability estimates over time. Studies investigating the course of PDs, however, seem to focus mainly on adult samples, and studies on children and adolescents are scarce. This paucity of research has been in part due to the widespread reluctance to diagnose PDs in youth (25, 26) and to the belief that personality in adolescence is inconstant and characterized by emotional outbursts and impulsive behavior (27, 28). Existing literature, however, clearly states that PDs can be validly and reliably diagnosed among juveniles (27, 28) and that the stability of PDs in adolescence is found to be comparable to the stability in adulthood (29, 30).

Given the apparent number of developmental tasks [e.g., achieving emotional independence from parents, developing close relationships with peers, preparing for a professional occupation (31)], the transition from adolescence to adulthood seems to be a salient period for investigating the stability of PDs (18, 32). To the best of our knowledge, however, only two studies have explicitly investigated the stability of PDs from adolescence to early adulthood. The Children in the Community (CIC) study investigated the stability of PD traits in a community sample ranging in age from 9 to 28 (33). Findings show that mean PD traits were highest in adolescence and declined linearly to adulthood, although effect sizes were small. Rank-order stability

was found to be low to moderate, and cluster C traits seemed to be less stable than cluster A and B traits (34). Similarly, Bornoalova et al. (35), who investigated the stability and heritability of BPD in a community sample, showed a significant mean-level decline from age 14 to 24, although rank-order stability was high. A third study, namely the study from Chanen et al. (36), investigated the 2-year stability of PDs in older adolescent outpatients, aged 15–18 years, and found that 74% of those diagnosed with a PD at baseline still met the criteria for a PD at follow-up. Regarding dimensional ratings, both rank-order and mean-level stability ranged from low (PD NOS) to moderate (borderline, histrionic, and schizotypal) to high (antisocial and schizoid) (36).

Given the apparent role of developmental influences on the etiology of PDs, studies about the stability of PDs in high-risk samples are surprisingly lacking. The aim of the present study was therefore to examine the prevalence of PDs and their stability over a 10-year period from adolescence to adulthood in adolescents placed in residential care and juvenile-justice institutions. Due to multiple risk factors – such as childhood adversities (37), unfavorable parenting practices, low socioeconomic status, parental mental disorders (38), early mental-health problems (e.g., ADHD, oppositional defiant disorders, and attachment disorders), symptoms of depression and anxiety (39), substance use (40), self-harming behavior (41), psychopathic traits, and youth delinquency (42) – adolescents in residential care and juvenile-justice institutions are particularly at risk of developing a PD, and PD prevalence rates among them are high, ranging from 18 to 40% across studies (43–45). To account for conceptual and methodological factors, both categorical and dimensional mean-level and rank-order stability were investigated.

MATERIALS AND METHODS

Study Design

Baseline

Data was obtained from the longitudinal “Swiss Study for Clarification and Goal-Attainment in Child Welfare and Juvenile-Justice Institutions” [German: Modellversuch zur Abklärung und Zielerreichung in stationären Massnahmen (MAZ)] (46). The study was conducted between 2007 and 2011 with the primary aims of describing the mental health of children and adolescents in residential care and of investigating the effects of residential youth care over an approximately 1-year period in Switzerland. Child welfare and juvenile-justice institutions accredited by the Swiss Federal Ministry of Justice were invited to participate, of which 64 institutions agreed to take part. Juveniles who had been living for at least 1 month in 1 of these 64 included child welfare and juvenile justice institutions and possessed sufficient language skills in German, French, or Italian as well as sufficient intelligence scores ($IQ > 70$) were eligible for participation. The juveniles had been placed in the child welfare and juvenile-justice institutions by penal law, by civil law, or voluntarily. Both voluntary placement and placement by civil law were due to severe mental distress or precarious living conditions. Prior to participation, juveniles, parents or legal

guardians, and social workers were asked to provide informed consent. Participants then completed computer-administered questionnaires as well as semistructured clinical interviews regarding mental health, psychosocial problems, and offending behavior. Assessment was conducted by trained psychologists and research assistants. Overall, 592 children and adolescents aged 6–26 years (mean age = 16.3 years) participated at baseline. Of those participants, 511 agreed to be contacted for a possible follow-up study. The study procedure was approved by the Ethics Committees on Research Involving Humans at the University of Basel and the University of Lausanne (Switzerland) and by the Institutional Review Board at the Ulm University (Germany).

Follow-Up

After a follow-up period of approximately 10 years, participants were reassessed in the study “Youth Welfare Trajectories: Learning from Experiences” [German: Jugendhilfverläufe: Aus Erfahrung Lernen (JAEL)], which is currently being conducted to examine participants’ psychosocial development over time and their transition out of care. Participants were contacted by postal mail, phone, email, and social media. Of the 511 participants, 231 (45.2%) agreed to participate in the follow-up. Despite considerable efforts, 8 (1.6%) participants could not be located, 121 (23.7%) could not be reached, 99 (19.4%) refused to participate, 44 (8.6%) did not provide informed consent, and 8 (1.6%) were deceased. A study flow-chart is provided in **Supplementary Figure 1**. An analysis of the sample attrition showed no significant differences in sociodemographic features (i.e., age, gender, number of former placements, and average duration in residential care) between the participants who took part in the follow-up and those who did not. The follow-up assessment consisted primarily of a set of online questionnaires that participants could complete from home. Participants were then invited to a face-to-face meeting, where they were reassessed using semistructured clinical interviews and semistructured qualitative in-depth interviews regarding mental health, psychosocial problems, and offending behavior. Assessment was conducted by trained psychologists, doctoral students, and research assistants. The study procedure was approved by the Ethics Committee Northwestern and Central Switzerland (EKNZ, Ref.: 2017-00718).

Participants

As the primary aim of this study was to investigate the stability of PDs from adolescence to adulthood, only participants with complete data from the Structured Clinical Interview for DSM-IV-TR Axis II Personality Disorders (SCID-II) (47) at baseline and at follow-up were included, which left a study sample of 138 participants. In addition, participants younger than 12 years of age or older than 18 years at baseline were excluded. The final sample included 115 participants (39.13% female) with a mean age of 15.82 ($SD = 1.93$; range 12–18) at baseline and a mean age of 25.89 ($SD = 2.18$; range = 21–30) at follow-up (**Table 1**). Excluded participants revealed no statistically significant differences from participants at baseline in age [$t(169) = -1.54$; $p = 0.126$], gender [$\chi^2(1) = 0.002$; $p = 0.964$], number of placements in residential care [$t(551) = 0.40$;

TABLE 1 | Sample characteristics at baseline and follow-up ($N = 115$).

	Baseline	Follow-up
	<i>M (SD)</i>	<i>M (SD)</i>
Age (years)	15.8 (1.9)	25.9 (2.2)
Number of placements in residential care	0.7 (1.0)	3.4 (2.8)
Average duration in residential care (years)	1.4 (1.7)	6.3 (4.8)
	<i>n (%)</i>	<i>n (%)</i>
Gender (female)	45 (39.1)	45 (39.1)
Current mental-health disorders^a		
Any current mental-health disorder	74 (64.9)	64 (55.6)
ADHD ^b	13 (11.4)	24 (20.9)
Anxiety disorder ^b	29 (25.4)	19 (16.5)
Conduct disorder ^{b,c}	34 (29.8)	
Mood disorder ^b	16 (14.0)	22 (19.1)
Personality disorder	23 (20.0)	35 (30.4)
Psychotic disorder ^b	2 (1.7)	2 (1.7)
PTSD ^b	5 (4.4)	6 (5.2)
Substance-use disorder ^b	17 (14.9)	41 (35.6)
Current mental-health treatment ^d	55 (61.1)	27 (23.5)

^aParticipants with multiple mental-health disorders are displayed more than once.

^bDue to missing data, the sample size at baseline was $N = 114$. ^cOnly available at baseline. ^dDue to missing data, the sample size at baseline was $N = 90$.

$p = 0.689$], average duration in residential care [$t(228) = -0.19$; $p = 0.849$], PDs [$\chi^2(1) = 2.41$; $p = 0.120$], and mental-health problems other than PDs [$\chi^2(1) = 0.56$; $p = 0.451$].

Measurements

Sociodemographic Characteristics

Sociodemographic information – age, gender, number of former placements, average duration in residential care (i.e., total time spent in residential care and juvenile-justice institutions), and current mental-health treatment – was collected using a computer-based questionnaire at baseline and at follow-up. Participants' data on social welfare, disability, and unemployment insurance were only assessed at follow-up.

Mental Disorders

Mental disorders at baseline were assessed with the Schedule for Affective Disorders and Schizophrenia for School-Age Children – Present and Lifetime Version (K-SADS-PL) (48). The K-SADS-PL is a semistructured clinical interview that provides a reliable and valid measurement of DSM-IV diagnoses in children and adolescents. At follow-up, mental disorders were examined with the Structured Clinical Interview for DSM-5 Disorders – Clinician Version (SCID-5-CV) (49). The SCID-5-CV is a semistructured clinical interview based on DSM-5 diagnoses covering the most common diagnoses seen in clinical settings: depressive and bipolar disorders, schizophrenia spectrum and other psychotic disorders, substance-use disorders, anxiety disorders, obsessive-compulsive disorder, post-traumatic stress disorder (PTSD), attention-deficit hyperactivity disorder (ADHD), and adjustment disorder. In addition, the SCID-5-CV screens for 17 additional DSM-5 diagnoses. Items and diagnoses are scored based on dichotomous “present” and

“absent” response options. The SCID-5-CV presents excellent reliability, with Cohen's κ ranging from 0.70 to 0.75 (50).

Personality Disorders

Personality disorders were assessed at baseline and at follow-up using the SCID-II (47). The SCID-II is a semistructured interview designed to yield PD diagnoses based on the DSM-IV and DSM-IV-TR (i.e., paranoid, schizoid, schizotypal, histrionic, borderline, antisocial, narcissistic, avoidant, dependent, obsessive-compulsive, depressive, and passive-aggressive PDs) and consists of 134 items, which are rated on a 3-point Likert scale (1 = absent, 2 = subthreshold, and 3 = threshold). Since depressive and passive-aggressive PDs were removed in the DSM-5, both disorders were included in the PD NOS section in the following analyses. Categorical diagnoses are provided according to the specific diagnostic thresholds of PDs the DSM-IV. Dimensional scores are provided by summing the scores from each individual item for each separate PD. Interrater reliability for categorical diagnoses varies from 0.48 to 0.98 (Cohen's κ), and internal consistency ranges from 0.71 to 0.94 (51). At baseline, the diagnosis of antisocial PD was assigned only if study participants were over 18 years old. Due to participants' young age, most of them could not be given the diagnosis. To anticipate later analyses of the stability of antisocial PD, the criteria for antisocial PD were nevertheless collected for participants both under and over 18 years old. The present analyses therefore include antisocial PD diagnoses in participants who were both younger and older than 18 years old at baseline.

Statistical Analysis

First, to determine the prevalence rates of PDs at baseline and at follow-up, we performed descriptive statistical analyses. Group comparisons regarding social benefits between participants with and without a PD were assessed at follow-up using χ^2 tests. Second, categorical mean-level stability was measured by the proportion of enduring cases from baseline ($t1$) to follow-up ($t2$), that is, the number of participants meeting the criteria for a PD at both measurement times divided by the total number of participants with a PD at baseline. Categorical rank-order stability was calculated by Cohen's κ and tetrachoric correlations (r_{tet}). Cohen's κ is one of the most commonly used statistics to test diagnostic agreement between diagnoses assigned at baseline and at follow-up. A negative value indicates an agreement worse than expected or even a disagreement. A value between 0 and 0.20 represents a low agreement, and a value ranging from 0.21 to 0.40 a fair agreement. A κ between 0.41 and 0.60 indicates a moderate agreement, a κ between 0.61 and 0.80 a substantial agreement, and 0.81–1.0 a perfect agreement between two assessments (52). While Cohen's κ takes into account the possibility of an agreement occurring by chance, tetrachoric correlation coefficient (r_{tet}) measures the mere relationship between binary baseline and follow-up scores with the assumption of bivariate normality (53). Similar to Pearson's r , a value between 0.1 and 0.3 is considered to be low, a value between 0.3 and 0.5 moderate, and a value between 0.5 and 0.8 high. Finally, for dimensional PD ratings, mean-level stability was measured by calculating mean trait scores and

standard deviation at baseline and at follow-up, resulting in a mean-difference score. Cohen's d was used to estimate the effect size of the magnitude of change between baseline and follow-up scores. According to Cohen (54), an effect size of 0.20 is considered a small effect, an effect size of 0.50 a moderate effect, and an effect size of 0.80 a large effect. Dimensional rank-order stability was measured using Spearman's ρ (r_s), given a substantial positive skew. The interpretation of Spearman's ρ (r_s) is similar to that of Pearson's r . Additional explorative sensitivity analyses regarding the prevalence as well as categorical and dimensional mean-level and rank-order stability of PD according to specific age ranges at baseline (12–14 and 15–18 years) are presented in the **Supplementary Material**. All statistical analyses were conducted using RStudio [Version 1.4.1106; (55)]. Statistical significance was set to $p < 0.05$ for all analyses. Complete case analyses were performed.

RESULTS

Prevalence Rates of Current Mental Disorders at Baseline and at Follow-Up

Findings regarding the prevalence rates of mental disorders at baseline and at follow-up are presented in **Table 1**. At baseline, 74 (64.9%) participants reported a current mental-health disorder; conduct disorders (29.8%), anxiety disorders (25.4%), and PDs (20.0%) were the most frequent diagnoses. Fifty-five (61.1%) participants were receiving mental-health treatment at the time of the assessment. At follow-up, the prevalence rate for any mental disorder was about 55.6%; substance-use disorders (35.6%), PDs (30.4%), and ADHD (20.9%) were the most common. A total of 27 (23.5%) participants reported receiving mental-health treatment at follow-up (**Table 1**). Participants with a PD at follow-up were significantly more likely to report disability insurance than participants without a PD at follow-up [$\chi^2(1) = 6.10$; $p = 0.010$] (**Table 2**) [see (56)].

Prevalence Rates of PDs at Baseline and at Follow-Up

Findings regarding the prevalence rates of PDs at baseline and at follow-up are presented in **Table 3**. At baseline, 23 (20.0%) participants met the criteria for any PD. While 10 (8.7%) participants met the criteria for one PD diagnosis, 5 (4.3%) met the criteria for two, and 8 (7.0%) met the criteria for three or

TABLE 3 | Prevalence rates of personality disorder diagnoses at baseline (t1) and follow-up (t2) ($N = 115$).

Personality disorders (PDs)	Baseline (t1)	Follow-up (t2)
	<i>n</i> (%)	<i>n</i> (%)
Any PD	23 (20.0)	35 (30.4)
One PD	10 (8.7)	18 (15.6)
Two PDs	5 (4.3)	8 (7.0)
≥ Three PDs	8 (7.0)	9 (7.8)
Cluster A	5 (4.3)	8 (7.0)
Paranoid	3 (2.6)	3 (2.6)
Schizotypal	0 (0.0)	2 (1.8)
Schizoid	3 (2.6)	5 (4.3)
Cluster B	16 (13.9)	23 (20.0)
Histrionic	2 (1.7)	0 (0.0)
Narcissistic	4 (3.5)	2 (1.7)
Borderline	10 (8.7)	9 (7.8)
Antisocial ^a	7 (6.1)	19 (16.5)
Cluster C	8 (7.0)	13 (11.3)
Avoidant	3 (2.6)	5 (4.3)
Dependent	1 (0.9)	1 (0.9)
Obsessive compulsive	4 (3.5)	8 (7.0)
PD NOS ^b	3 (2.6)	5 (4.3)
Passive aggressive	5 (4.3)	5 (4.3)
Depressive	4 (3.5)	7 (6.1)

Participants with multiple PDs are displayed more than once. ^aIncluding participants younger than 18 years at baseline. ^bPD not otherwise specified (NOS).

more PD diagnoses. With a prevalence rate of 8.7%, borderline PD was the most common diagnosis, followed by antisocial PD (6.1%). Every participant with a PD at baseline also met criteria for another type of mental disorder at baseline. At follow-up, the prevalence rate for any PD was 30.4%. Overall, 18 (15.6%) participants met the criteria for only one PD, while 8 (7.0%) had two PD diagnoses, and 9 (7.8%) met the criteria for three or more PD diagnoses. The most frequently diagnosed disorders were antisocial (16.5%), borderline (7.8%), and obsessive-compulsive PDs (7.0%). At the cluster level, cluster B PD disorders were the most prevalent diagnoses, both at baseline (13.9%) and at follow-up (20.0%). All participants with a PD at follow-up, except one, met the criteria for another type of mental disorder.

Categorical Stability

Findings regarding the categorical stability of PDs from baseline to follow-up are presented in **Table 4**.

Mean-Level Stability

The number of enduring cases from baseline to follow-up could only be calculated for PDs diagnosed at baseline. Since no participants met the criteria for a schizotypal PD at baseline, mean-level stability could not be calculated for this disorder. Of the 23 participants who met the criteria for one or more PDs at baseline, 11 still met the criteria for a PD diagnosis at follow-up, resulting in a categorical mean-level stability of 47.8%. Overall, 12 of these 23 participants improved from baseline to follow-up by no longer meeting the criteria for a PD, while 24 of 92 participants with no PD at baseline met the criteria for a PD at follow-up. With only one participant out of 10 meeting the criteria

TABLE 2 | Social benefits at follow-up (t2) ($N = 115$).

	Follow-up (t2)			χ^2	<i>p</i> -value
	Total sample	No PDs	PDs		
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)		
Social welfare ^a	29 (25.2)	18 (22.5)	11 (31.4)	0.610	0.354
Unemployment insurance ^a	8 (7.0)	5 (6.2)	3 (8.6)	0.003	0.698
Disability insurance ^a	17 (14.8)	7 (8.8)	10 (28.6)	6.102	0.010*

^aOnly available at follow-up. * $p < 0.05$.

TABLE 4 | Categorical stability of personality disorders from baseline (t1) to follow-up (t2) ($N = 115$).

Personality disorders (PDs)	Absent t1 and t2	Present t1/absent t2	Absent t1/present t2 (new cases)	Present t1 and t2 (enduring cases)	Mean-level stability		Rank-order stability	
					Proportion enduring ^a	Cohen's κ	Tetrachoric correlation coefficient	
					n (%)	n (%)	n (%)	n (%)
Any full-syndrome PD	68 (59.1)	12 (10.4)	24 (20.9)	11 (9.6)	47.8	0.18	0.33***	
Cluster A	104 (90.4)	3 (2.6)	6 (5.2)	2 (1.7)	40.0	0.27	0.60***	
Paranoid	109 (94.9)	3 (2.6)	3 (2.6)	0 (0.0)	0.0	-0.03	0.38***	
Schizotypal	113 (98.3)	0 (0.0)	2 (1.7)	0 (0.0)	–	–	–	
Schizoid	109 (94.8)	1 (0.9)	3 (2.6)	2 (1.7)	66.7	0.48	0.85***	
Cluster B	81 (70.4)	11 (9.6)	18 (15.6)	5 (4.3)	31.2	0.11	0.23*	
Histrionic	113 (98.3)	2 (1.7)	0 (0.0)	0 (0.0)	0.0	–	–	
Narcissistic	109 (94.8)	4 (3.5)	2 (1.7)	0 (0.0)	0.0	-0.02	0.40***	
Borderline	97 (84.4)	9 (7.8)	8 (7.0)	1 (0.9)	10.0	0.02	0.08	
Antisocial ^b	92 (80.0)	4 (3.5)	16 (13.9)	3 (2.6)	42.9	0.16	0.41***	
Cluster C	95 (82.6)	7 (6.0)	12 (10.4)	1 (0.9)	12.5	0.01	0.03	
Avoidant	107 (93.0)	3 (2.6)	5 (4.3)	0 (0.0)	0.0	-0.03	0.28**	
Dependent	113 (98.3)	1 (0.9)	1 (0.9)	0 (0.0)	0.0	-0.01	0.72***	
Obsessive compulsive	104 (90.4)	3 (2.6)	7 (6.0)	1 (0.9)	25.0	0.13	0.38***	
PD NOS ^c	107 (93.0)	3 (2.6)	5 (4.3)	0 (0.0)	0.0	-0.03	0.28**	
Passive aggressive	105 (91.3)	5 (4.3)	5 (4.3)	0 (0.0)	0.0	-0.04	0.17	
Depressive	105 (91.3)	3 (2.6)	6 (5.2)	1 (0.9)	25.0	0.14	0.42***	

^aCalculated by the number of enduring cases divided by the total number of participants meeting a PD at baseline. ^bIncluding participants younger than 18 years at baseline. ^cPD not otherwise specified (NOS). – measures not available, as either baseline or follow-up PD criteria were not met. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. The sample size is sufficient to achieve a power ≥ 0.8 if $r_{tet} \geq 0.42$.

for borderline PD at both assessments, the categorical mean-level stability of borderline PD was low (10.0%). For schizotypal, histrionic, narcissistic, antisocial, avoidant, dependent, PD NOS, and passive-aggressive PDs, none of the participants met the criteria at baseline or at follow-up.

Rank-Order Stability

Cohen's κ and tetrachoric correlations (r_{tet}) could only be calculated for PDs for which there were participants who met the criteria at baseline or at follow-up or at both measurement points. Since no participants met the criteria for a schizotypal PD at baseline, and no participants met the criteria for a histrionic PD at follow-up, Cohen's κ and tetrachoric correlations (r_{tet}) could not be calculated for either of these disorders. With a Cohen's κ of 0.18 for any PD, the concordance between baseline and follow-up assessments was low. For individual diagnoses, κ was likewise low, except for schizoid PD ($\kappa = 0.48$). The tetrachoric correlation coefficient (r_{tet}) from baseline to follow-up for any PD was 0.33, which indicates a moderate rank-order stability. For individual PDs, rank-order stability ranged from low (borderline, avoidant, PD NOS, and passive-aggressive PDs) to moderate (paranoid, narcissistic, antisocial, obsessive-compulsive, and depressive PDs) to high (schizoid, dependent PDs). With a tetrachoric correlation coefficient (r_{tet}) of 0.60, rank-order stability was by far the highest for cluster A disorders.

Dimensional Stability

Findings regarding the dimensional stability of PDs from baseline to follow-up are presented in **Table 5**.

Mean-Level Stability

Overall, the mean-level scores of dimensional ratings increased for most disorders. The total score significantly increased from baseline to follow-up, although the effect size was small ($d = 0.23$; $p = 0.016$). Significant increases were found for paranoid ($d = 0.22$; $p = 0.017$), schizoid ($d = 0.36$; $p < 0.001$), antisocial ($d = 0.57$; $p < 0.001$), obsessive-compulsive ($d = 0.42$; $p < 0.001$), and depressive PDs ($d = 0.26$; $p = 0.005$). Findings regarding the mean-level scores for schizotypal, narcissistic, borderline, dependent, and depressive traits revealed no significant change. A significant decrease was found only for histrionic traits, although the effect size was small ($d = 0.24$; $p = 0.010$).

Rank-Order Stability

The pattern of rank-order stability of the dimensional scores from baseline to follow-up ranged from low (paranoid, schizoid, schizotypal, histrionic, narcissistic, avoidant, dependent, obsessive-compulsive, passive-aggressive, and depressive) to moderate (borderline, antisocial). Correlations were significant, except for paranoid ($r_s = 0.13$, $p = 0.153$), schizotypal ($r_s = 0.11$, $p = 0.264$), obsessive-compulsive ($r_s = -0.08$, $p = 0.412$), and passive-aggressive traits ($r_s = 0.08$, $p = 0.423$).

DISCUSSION

The aim of the current study was to examine the prevalence rates as well as the mean-level and rank-order stability of PDs over a 10-year follow-up in adolescents placed in residential care and

TABLE 5 | Dimensional stability of personality disorders from baseline to follow-up ($N = 115$).

Personality disorder traits	Mean-level stability				Rank-order stability	
	Baseline	Follow-up	Mean difference	Cohen's d	p -value	Spearman's ρ
	M (SD)	M (SD)				
Total score	99.27 (19.63)	104.1 (18.52)	4.89	0.23	0.016*	0.24**
Cluster A	29.1 (6.94)	31.23 (6.96)	2.13	0.26	0.006**	0.18
Paranoid	9.08 (2.83)	9.90 (2.90)	0.82	0.22	0.017*	0.13
Schizotypal	10.20 (1.93)	10.65 (2.16)	0.44	0.14	0.123	0.11
Schizoid	8.19 (1.92)	9.36 (2.95)	1.17	0.36	<0.001***	0.22*
Cluster B	42.70 (10.11)	43.44 (8.93)	0.74	0.07	0.462	0.28**
Histrionic	9.79 (2.56)	9.20 (1.51)	-0.69	0.24	0.010*	0.28**
Narcissistic	10.82 (2.78)	10.66 (2.41)	-0.15	0.04	0.649	0.23*
Borderline	13.36 (5.05)	12.83 (3.92)	-0.53	0.11	0.236	0.36***
Antisocial	8.73 (2.56)	10.81 (3.70)	2.06	0.57	<0.001***	0.31***
Cluster C	27.47 (5.80)	29.73 (6.34)	2.26	0.30	0.001**	0.20*
Avoidant	9.13 (2.89)	9.18 (2.69)	0.05	0.01	0.864	0.31***
Dependent	9.82 (2.64)	10.14 (2.72)	0.33	0.10	0.289	0.27**
Obsessive compulsive	10.17 (3.05)	11.91 (3.31)	1.75	0.42	<0.001***	-0.08
Passive aggressive	9.17 (3.01)	9.43 (2.64)	0.25	0.06	0.470	0.08
Depressive	9.35 (3.14)	10.41 (3.73)	1.06	0.26	0.005**	0.25**

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. The sample size is sufficient to achieve a power of ≥ 0.8 if $d \geq 0.24$ and $\rho \geq 0.23$.

juvenile-justice institutions. Both the stability of PD categories and the stability of dimensional PD traits were analyzed from adolescence to adulthood. The present findings indicated high PD prevalence rates in young adults with a history of child welfare and juvenile-justice placements, while PD diagnoses and PD traits exhibited only low to moderate stability over the 10-year follow-up.

At least three findings have to be discussed in more detail. First, PD prevalence rates substantially increased from adolescence to adulthood in this high-risk sample. While the normative course of BPD during adolescence is described as an increase of BPD pathology from puberty to young adulthood (57), most previous findings indicate a general decline in PDs and PD traits beginning in young adulthood (17). On the other hand, the prevalence rates of any PD as well as of specific PDs are consistent with the existing literature; the prevalence rates of PDs in institutionalized youth and young adults with a history of out-of-home care have been found to range between 18 and 40% across studies (43–45). A recent meta-analysis on mental disorders in incarcerated youth, which included 30 studies of 8,000 participants, indicated that antisocial and borderline PDs were relatively common in both males and females, while the prevalence of narcissistic and schizotypal PDs was comparably low (58). The current study seems to confirm this pattern, as antisocial and borderline PDs were among the most frequently diagnosed disorders, both at baseline and at follow-up. An increase in PD diagnoses from adolescence to adulthood in this sample, may, thus, be explained by the fact that many adolescents in residential care and juvenile-justice institutions have experienced severe childhood adversities (e.g., child abuse and neglect), which are shown to significantly contribute to the development of PDs (59, 60).

For instance, the meta-analysis by Porter et al. (37) found that patients with borderline PD were over 13 times more likely to report childhood adversity than non-clinical controls. In addition, participants in this high-risk sample were likely to have experienced a range of other critical risk factors, such as unfavorable parenting practices, low socioeconomic status, childhood psychopathology, including high substance use, self-harming behavior, and youth delinquency, which have also been shown to be significantly associated with the development of PDs over time (38–42). Given the multifaceted nature of problems faced by juveniles in child welfare care and juvenile-justice institutions, the institutions often lack the professional and financial means to detect personality problems at an early stage, leading to delays in diagnoses and appropriate treatment. Delaying appropriate diagnoses, in turn, carries clinical risk, as evidence is accumulating that many of the harms associated with PDs occur early in the course of the disorder (61), and delay tends to lead toward greater impairments and poorer outcomes (62).

Second, on the categorical level, the mean-level stability of any PD was only moderate, and the mean-level stabilities of specific PDs were low to moderate, except for schizoid PD (high). The concordance between baseline and follow-up assessments (i.e., Cohen's κ) was low, both for any PD and for individual PDs, except for schizoid PD (moderate). The rank-order stability (i.e., tetrachoric correlation (r_{tet})) of any PD category was moderate. For individual diagnoses, the rank-order stability ranged from low (i.e., borderline, avoidant, PD NOS, passive-aggressive PDs) to moderate (i.e., paranoid, narcissistic, antisocial, obsessive-compulsive, depressive PDs) to high (schizoid, dependent PDs). Regarding categorical mean-level stability, Chanen et al. (36) found a higher proportion of enduring cases (74%) compared to our findings (47%), which may be due to the shorter

follow-up interval (2 years), the clinical status of participants (outpatients), and the narrower age range (15–18 years old) in their study. Indeed, the explorative age-sensitive analyses in the **Supplementary Material** revealed a higher categorical mean-level stability for the participants who were 15–18 years old than for the participants who were 12–14 years old, although the stability still seems to be lower than that found by Chanen et al. (36). Categorical mean-level stabilities for individual PDs, however, were similar to those found by Chanen et al. (36). As such, participants may have changed specific PDs (from one PD category to another category) but did not discard the general diagnosis of a PD over time. Noteworthy, however, is that 24 (20.9%) participants first developed a PD in young adulthood. As the explorative age-sensitive analyses revealed, older adolescents (15–18 years) were more likely to meet a PD diagnosis first at follow-up than younger adolescents (12–14 years). This suggests that the onset of a PD indeed lies in later adolescence and that some of the present sample had not yet passed the critical age. Another explanation might be that PDs in (young) adolescence are more difficult to detect (63). In addition, older adolescents with a PD diagnosis between 15 and 18 years may have already had longer and more stable patterns of personality pathology, which, therefore, may be more predictive of unfavorable long-term outcomes. Nevertheless, a total of 12 (10.4%) participants improved from baseline to follow-up and no longer met the criteria for a PD in adulthood. While this could have been due to several factors (e.g., treatment or spontaneous remission), it is also possible that these participants no longer met the diagnosis of a PD but still exhibited PD symptoms. This, in turn, is a major concern of the categorical classification system, as it is based on an arbitrary diagnostic threshold that can be easily met (PD diagnosis) or not met (no PD diagnosis) by an increase or decrease in a single criterion.

Regarding categorical rank-order stability, the poor concordances between the baseline and follow-up assessments (i.e., Cohen's κ) for any PD and for individual PD diagnoses are consistent with those found by Chanen et al. (36). Findings regarding rank-order stability measured with tetrachoric correlations (r_{tet}) are difficult to compare across studies, since Cohen's κ remains the most common statistical measure for assessing the rank-order stability of categorical data. Overall, rank-order stability nevertheless seemed to be higher for specific PD diagnoses (i.e., paranoid, narcissistic, avoidant, dependent, PD NOS, and passive-aggressive PDs) than mean-level stability for these PD diagnoses, which suggests that even if the specific diagnoses did not remain the same over time, the rank ordering of participants with such a disorder appeared to be more or less the same. Both the rank-order stability and the mean-level stability of borderline PD were particularly weak, which indicates that on average, neither the category nor the rank ordering of participants with a borderline PD remained the same over time. While this may seem somewhat surprising, it is consistent with the narrative review from Bondurant et al. (64), which suggests that there is only little diagnostic borderline PD stability in adolescence. Interestingly, both Cohen's κ and tetrachoric correlation coefficients (r_{tet}) were considerably higher for older adolescents at baseline (15–18 years) compared to younger

adolescents (12–14 years old) at baseline (see **Supplementary Table 2**), which suggests that diagnoses in early adolescence should be treated with caution.

Third, on the dimensional level, PD scores significantly increased for most of the disorders, except for schizotypal, avoidant, narcissistic, borderline, dependent, and passive-aggressive traits. Histrionic traits significantly decreased from baseline to follow-up. Effect sizes were generally low, except for antisocial and obsessive-compulsive traits. In contrast to our findings, Johnson et al. (34) found a significant mean-level decline in dimensional ratings from adolescence to adulthood, and Chanen et al. (36) found neither a significant increase nor a decrease in PD traits, except for paranoid (increase), antisocial (increase), and depressive PDs (decrease). One explanation is that the study by Johnson et al. (34) was conducted in a community-based sample, while the study by Chanen et al. (36) was conducted with older adolescent outpatients. The overall low to moderate dimensional rank-order stability in the present study was, however, consistent with the rank-order stability found in the studies by Johnson et al. (34) and Chanen et al. (36). This indicates that although mean-level PD traits tended to increase among adolescents in residential care and juvenile-justice institutions through adulthood, their individual rank ordering seemed to be less stable, emphasizing interindividual differences among participants. The additional explorative age-sensitive analyses revealed higher dimensional mean-level and rank-order stability estimates regarding older participants (15–18 years old) than younger participants (12–14 years old). On the one hand, this highlights the presence of PD traits in early adolescence but on the other hand, suggests that PD diagnoses before the age of 15 should be interpreted with caution.

Strengths

The current study fills an important gap in the existing literature on the stability of PDs by explicitly presenting findings from adolescence to adulthood in a high-risk sample. Indeed, only a few studies have investigated the stability of PDs from adolescence to adulthood, and to the best of our knowledge, none have yet investigated the stability of PDs from adolescence to adulthood in adolescents in residential care and juvenile-justice institutions. Yet these adolescents have a particularly high risk of developing a PD due to a cumulation of risk factors. Considering the apparent role of developmental tasks in the transition from adolescence to adulthood in the development of PDs, this study is particularly valuable. Another strength of the current study is the long follow-up interval of 10 years. This is noteworthy given that young-adult care leavers (i.e., juveniles who left residential care or juvenile-justice institutions) are often difficult to locate, since many live in rather unstable and changing circumstances (65) or suffer from severe mental-health disorders (66).

Limitations

Nonetheless, the findings of this study must be interpreted under the consideration of some limitations. First, the relatively small sample size of 115 participants must be emphasized. As a result, the number of cases for categorical PDs were small, which made it difficult to adequately assess categorical stability and, therefore,

the results must be interpreted with caution and replications including larger sample sizes are highly needed. Second, although no significant differences were found in the sociodemographic baseline data between included and excluded participants, a selection bias cannot be completely ruled out. Indeed, positive self-selection may occur in longitudinally followed-up high-risk samples, as participants with severe PDs may have declined to participate at follow-up or could not be located due to difficult life circumstances. On the other hand, it may be that participants who remained connected to mental health care were more likely to participate in the current follow-up study, which could explain the high prevalence rates of PDs. Third, the current study only allowed PDs to be assessed using a two-measurement-point design. The amount of change between two measurement points is, however, not fully informative about the shape of each person's individual growth trajectory. In addition, a two-wave design cannot distinguish true change from measurement error (67) and is unable to evaluate the impact of regression-to-the-mean effects; that is, a statistical artifact making naturally occurring variations look like true changes when particularly large or small scores are followed by scores closer to the mean (68). Fourth, the dimensional approach taken within this study does not precisely correspond to the dimensions within the ICD-11, as the latter go beyond a mere sum of features within a categorical diagnosis. However, the dimensional approach adopted in the current study can be considered as a proxy, as no empirical evidence was yet available for the dimensional approach proposed by the ICD-11 at the time of the baseline study. Finally, while the present study explicitly focused on the stability of PDs from adolescence to adulthood, the cutoff age of 18 years at baseline is somewhat arbitrary, although adulthood is traditionally described as beginning at the age of 18 years. Indeed, based on psychosocial characteristics, recent studies have suggested that emerging adulthood is a period between adolescence (18 years) and full-fledged adulthood (25 years) (69). Specifically, with regard to etiological influences on the development of personality traits, Hopwood et al. (70) defined late adolescence at age 17, emerging adulthood at age 24, and young adulthood at age 29. Future studies should consider the prolongation of adolescence or emerging adulthood, which is currently taking place, especially in Western societies (69), in order to adequately assess the stability of PDs from adolescence to adulthood.

CONCLUSION

Three main findings can be drawn from the current study. First, the prevalence rates of PDs in young adults with a history of child welfare and juvenile-justice placements are high. Second, most categorical PD diagnoses and dimensional PD traits increased from adolescence to adulthood in our sample. Third, overall, the findings indicate low to moderate stability of PDs and PD traits from adolescence to adulthood, although the extent of stability differed according to the PD construct (i.e., categorical diagnoses or dimensional traits), the type of stability (i.e., mean-level or rank-order stability) and the specific PD and PD trait being

assessed. As a result, the current findings are in accordance with the growing evidence, that PDs are not that stable. This in turn, emphasizes the current shift to a more dimensional model and highlights the use of the upcoming ICD-11 that acknowledges PDs as only "relatively" stable.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving humans participants were reviewed and approved by the Ethics Committees on Research Involving Humans at the University of Basel and the University of Lausanne (Switzerland) as well as the Institutional Review Board at the University of Ulm (Germany). The follow-up study procedure was approved by the Ethics Committee Northwestern and Central Switzerland. Written informed consent to participate in this study was provided by the participants and the participants' legal guardian/next of kin, if participants were under 18 years old.

AUTHOR CONTRIBUTIONS

Dd'H, MSt, CB, and KS contributed to conceiving and designing the present manuscript. Dd'H wrote the first draft of the manuscript and analyzed the data. Dd'H, DB, SS, and CB collected the data. MSt supervised the data analyses. CB, MB, NJ, MSc, JF, and KS commented on an earlier draft of the article and supervised the entire process. All authors read and approved the final manuscript.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fpsy.2022.840678/full#supplementary-material>

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Chapter 4 – Personality functioning and the pathogenic effect of childhood maltreatment in a high-risk sample

Delfine d’Huart^{1*}, Joost Hutsebaut^{2,5}, Süheyla Seker¹, Marc Schmid¹, Klaus Schmeck¹, David Bürgin^{1,3†} & Cyril Boonmann^{1,4†}

¹Department of Child and Adolescent Psychiatric Research, Psychiatric University Hospitals Basel, Basel, Switzerland

²Department of Medical and Clinical Psychology, Tilburg University, Tilburg, The Netherlands

³Department for Child and Adolescent Psychiatry/Psychotherapy, University of Ulm, Ulm, Germany

⁴LUMC Curium – Department of Child and Adolescent Psychiatry, Leiden University Medical Center, Leiden, The Netherlands

⁵Viersprong Institute for Studies on Personality Disorders, De Viersprong, Halsteren, The Netherlands

†shared last authorship

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Personality functioning and the pathogenic effect of childhood maltreatment in a high-risk sample



Delfine d'Huart^{1*}, Joost Hutsebaut^{2,5}, Süheyla Seker¹, Marc Schmid¹, Klaus Schreck¹, David Bürgin^{1,3†} and Cyril Boonmann^{1,4†}

Abstract

Background: While the psychopathological sequelae of childhood maltreatment are widely acknowledged, less is known about the underlying pathways by which childhood maltreatment might lead to an increased risk for mental health problems. Recent studies indicated that impaired personality functioning might mediate this relationship. The aim of the present paper was to extend the current literature by investigating the mediating effect of impaired personality functioning between different types of childhood maltreatment and self-reported mental health problems in a high-risk sample.

Methods: Overall, 173 young adults (mean age = of 26.61 years; $SD = 3.27$) with a history of residential child welfare and juvenile justice placements in Switzerland were included in the current study. The Childhood Trauma Questionnaire (CTQ-SF), Semi-structured Interview for Personality Functioning DSM-5 (STiP-5.1) and the self-report questionnaires of the Achenbach System of Empirically Based Assessment scales (ASEBA) were used. Mediation analyses were conducted through structural equation modeling.

Results: Overall, 76.3% ($N = 132$) participants indicated at least one type of childhood maltreatment, with emotional neglect being most commonly reported (60.7%). A total of 30.6% ($N = 53$) participants self-reported mental health problems. Emotional abuse ($r = 0.34$; $p < .001$) and neglect ($r = 0.28$; $p < .001$) were found to be most strongly associated with mental health problems. In addition, impaired personality functioning was found to be a significant mediator for overall childhood maltreatment ($\beta = 0.089$; $p = 0.008$) and emotional neglect ($\beta = 0.077$; $p = 0.016$). Finally, impaired self-functioning was found to be a significant mediator when both self-functioning and interpersonal functioning were included as potential mediators in the relationship between overall childhood maltreatment ($\beta_j = 0.177$, $p_j = 0.007$) and emotional neglect ($\beta_j = 0.173$, $p_j = 0.003$).

Conclusion: Emotional neglect may be particularly important in the context of childhood maltreatment, personality functioning, and mental health problems and, therefore, should not be overlooked next to the more "obvious" forms of childhood maltreatment. Combining interventions designed for personality functioning with trauma-informed practices in standard mental health services might counteract the psychopathological outcomes of maltreated children and adolescents.

[†]David Bürgin and Cyril Boonmann have shared last authorship

*Correspondence: delfine.dhuart@hotmail.com

¹ Department of Child and Adolescent Psychiatric Research, Psychiatric University Hospitals Basel, Basel, Switzerland
Full list of author information is available at the end of the article



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Keywords: Personality functioning, Self-functioning, Childhood maltreatment, Emotional neglect, Mental health problems, Mediation analysis

Introduction

Childhood maltreatment (i.e., emotional neglect, physical neglect, emotional abuse, physical abuse, and sexual abuse) is a major concern that substantially affects millions of people and has been shown to be significantly associated with poor mental health [1, 2]. In a recent review of several meta-analyses of the sequelae of childhood maltreatment, an increased risk for psychopathology was identified as one of the five hallmarks (i.e., increased risk of obesity; increased risk of high-risk sexual behaviors, increased risk of smoking, and increased risk of child maltreatment in children with disabilities) of childhood maltreatment [3]. Although the association between childhood maltreatment and psychopathology is well researched, less is known about the causal relationships and the underlying pathways by which childhood maltreatment might lead to an increased risk for mental health problems. Interestingly, Lang et al. [3] identified resilience as a potential sixth hallmark, given the frequent observation that in all studies some affected individuals seemed to survive without notable consequences. The issue of resilience may point to the potential role of personality and personality functioning as mediators that may partially explain why some individuals experience a much higher burden following childhood maltreatment compared to others.

Childhood maltreatment has often been observed as a precursor related to the onset of personality disorders (PDs), most specifically borderline personality disorder (BPD). Patients with BPD have been found to be almost 14 times more likely to report a history of childhood maltreatment than non-clinical controls, with emotional abuse and neglect being the most prevalent types of childhood maltreatment [4]. Indeed, numerous studies have indicated that exposure to childhood maltreatment is related to various BPD symptoms, such as affective instability, interpersonal problems, identity problems, impulsivity, and suicidal behavior [5–8]. In a community-based study, Brown et al. [9] for instance, reported significantly more childhood maltreatment in participants engaging in Non-Suicidal Self-Injury (NSSI) compared to healthy controls, with emotional abuse and neglect being etiologically more directly associated with self-harm than physical and sexual abuse. The meta-analysis from Liu et al. [10], in addition, found general support for a positive association between childhood maltreatment and impulsivity, with pooled effect sizes ranging from small (i.e., sexual abuse) to large (i.e., emotional abuse). Taken

together, studies show an increased risk for PDs and associated symptomatology.

Recently, new perspectives on PDs have been formulated in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; [11]) as well as in the 11th edition of the International Classification of Diseases (ICD-11; [12]), which may enable us to approach the role of PDs somewhat differently. Whereas in classic studies, features of PDs are typically seen as a potential symptomatic outcome of childhood maltreatment, newer models rather approach PDs in terms of structural impairments in personality functioning [13]. This reflects an important paradigm shift in which PDs are being seen as dispositions of vulnerability, while traditional PD symptoms, like self-harm or frantic efforts to avoid real or imagined abandonment, as the potential behavioral outcomes of these dispositions. In other words, whereas in the traditional approach such symptoms constitute the PD itself, in the new model they could be seen as potential outcomes of the underlying PD. The Alternative Model of Personality Disorders (AMPD) in Section III of the DSM-5 frames the core of PDs as a range of impairments in self- and interpersonal functioning, that may underlie typical symptoms or disabilities. Taking this perspective, impaired personality functioning may be considered as a mediator between childhood maltreatment and potential symptomatic sequelae. This matches a developmental perspective assuming that personality functioning refers to the development of certain abilities, like the ability to self-reflect, to regulate emotions, to attune to the mind of others, to experience safety within intimate relationships and to design a sense of uniqueness and self-direction [14]. PDs then reflect the impaired development of these abilities, serving as a risk disposition for developing mental health problems. In fact, individuals with impaired personality functioning have found to be at increased risk for depression and anxiety disorders [15–17]. In addition, a study among 228 psychiatric outpatients and incarcerated addicts showed that impaired personality functioning was significantly associated with lower healthy functioning, fulfillment, and well-being in adulthood [18]. Personality functioning could, thus indeed, be conceptualized as one of the many aspect of resilience mediating the pathogenic impact of childhood maltreatment.

Previous work has, actually, shown that several facets of personality functioning may serve as a mediator for the long-term consequences of childhood maltreatment.

For instance, the pathogenic effects of childhood maltreatment have been demonstrated to be mediated by low self-esteem [19], negative self-associations [20], self-compassion and shame [21], emotion dysregulation [22–24], mentalizing incapacity [25], attachment [26], self-blame, and interpersonal difficulties [27]. In a study among 235 pregnant women and 66 expecting fathers, Berthelot et al. [28] found that the association between childhood maltreatment and psychological symptoms during pregnancy was partially mediated by the level of reflective functioning. Moreover, the capacity to self-reflect also predicted parents' feelings of competence related to parenthood and their psychological investment in the unborn child. The authors conclude that reflective functioning may, therefore, serve as an important aspect of resilience mitigating the aversive impact of parental trauma. Similarly, London et al. [29] demonstrated the mediating role of attachment insecurity in the association between exposure to violence and experiencing symptoms of Post-Traumatic Stress Disorder (PTSD) in adolescents. Huang et al. [30] studied the mediating role of mentalizing and attachment in a sample of 184 PD patients and 111 community controls. They found that lower mentalizing ability and attachment insecurity mediated the link between childhood maltreatment and PTSD symptoms. While this is just a brief snapshot of relevant findings, they all seem to converge in that certain processes of emotion regulation, self-direction, social cognition, threat recognition, and interpersonal support may mediate the pathogenic impact of childhood maltreatment and explain the development of transdiagnostic psychopathological expressions [31]. The previously mentioned AMPD may provide a conceptual framework for the abilities that may be relevant to understand the mediating role of general personality functioning, with the Level of Personality Functioning Scale (LPFS) providing a generalized dimension of severity that encompasses aspects like self-functioning (i.e., self-reflection, emotion regulation, and self-direction) and interpersonal functioning (i.e., social cognition, empathy, and interpersonal security).

To the best of our knowledge, only three studies investigated the mediating effect of personality functioning as such in the association between childhood maltreatment and psychopathology so far. While the study of Dagnino et al. [16] found significant mediating effects of personality functioning between physical and sexual abuse and depressive symptomatology, the study of Freier et al. [32], revealed that up to two-thirds of the associations between different types of childhood maltreatment and symptoms of depression and anxiety were mediated by impaired personality functioning. The study of Krakau et al. [33], moreover, revealed that identity perception

and self-reflective capacities had the strongest mediating impact between overall childhood maltreatment and mental distress. Thus, there is, indeed, some evidence that the association between childhood maltreatment and psychopathology may be mediated by personality functioning and that self-functioning may have the strongest mediating effect. However, current findings either result from community-based or clinical settings and are either based on childhood maltreatment screening instruments or are limited to general personality functioning. In addition, current findings are entirely based on self-reported personality functioning, according to the operationalized psychodynamic diagnosis structure questionnaire (i.e., OPD Structure Questionnaire [OPD-SQ]; [34, 35]). The sole use of self-report to assess personality impairments has, however, been questioned [36]. A study in a high-risk sample with detailed measures of childhood maltreatment and self-reported mental health problems, investigating different domains of impaired personality functioning with a clinical interview according to the AMPD, could, thus, extend current evidence.

The aim of the present study was to examine impaired personality functioning as a potential mediator between different types of childhood maltreatment and self-reported mental health problems in young adults with a history of residential child welfare and/or juvenile justice placements. In addition, this study sought to identify the domains of impaired personality functioning that have the strongest mediating effects between different types of childhood maltreatment and mental health problems. Based on the aforementioned findings, we postulated that young adults with a history of residential child welfare and juvenile justice placements may show higher levels of impaired personality functioning when facing childhood maltreatment, resulting in a greater severity of self-reported mental health problems. Specifically, we hypothesized: 1) that different types of childhood maltreatment (i.e., emotional neglect, physical neglect, emotional abuse, physical abuse, and sexual abuse) would be positively associated with mental health problems, 2) that these effects would be partially mediated by impaired personality functioning and 3) that abilities related to self-functioning would mediate these effects more strongly than abilities related to interpersonal functioning.

Methods

Study design

Data was obtained from the longitudinal Swiss study "Youth Welfare Trajectories: Learning from Experiences" (German: Jugendhilfverläufe: Aus Erfahrung lernen [JAEL] [37]), a 10-year follow-up study of the "Swiss Study for Clarification and Goal-Attainment in

Child Welfare and Juvenile Justice Institutions" (German: Modellversuch Abklärung und Zielerreichung in stationären Massnahmen [MAZ.] [38]). The baseline study was conducted between 2007 and 2011 with the primary aims of (1) describing the mental health of children and adolescents in residential care and (2) investigating the outcomes of residential youth care over an approximately 1-year period. Child welfare and juvenile justice institutions accredited by the Swiss Federal Ministry of Justice were invited to participate, of which 64 institutions agreed to take part. Juveniles who had been living for at least 1 month in one of these 64 included institutions and had sufficient language skills in German, French, or Italian as well as sufficient intelligence scores ($IQ > 70$) were eligible for participation. Overall, 592 children and adolescents aged 6–26 years (mean age = 16.3 years) participated at baseline. After a follow-up period of approximately 10 years, participants were reassessed between 2018 and 2020 with the aim of investigating their psychosocial development and their transition out of care. Of the 511 participants who initially agreed to be contacted for a possible follow-up at baseline, 231 (45.2%) participated in the follow-up study. Despite considerable efforts, 8 (1.6%) participants could not be found, 121 (23.7%) did not respond to our contact request, 99 (19.4%) refused to participate, 44 (8.6%) agreed to participate, but eventually did not fill out the informed consent form or any questionnaire, and 8 (1.6%) were deceased. A study flow-chart is provided in Additional file 1: Figure S1. An analysis of the sample attrition showed no significant differences in sociodemographic features at baseline (i.e., age, gender, number of former placements, average duration in residential care) between the participants who took part in the follow-up and those who did not. The follow-up assessment consisted primarily of a set of online questionnaires that participants could complete from home. Participants were then invited to a face-to-face meeting, where they were reassessed using semi-structured clinical interviews and semi-structured qualitative in-depth interviews regarding mental health, psychosocial problems, and offending behavior. Assessment was conducted by trained psychologists, doctoral students, and research assistants. The study procedure was approved by the Ethics Committee Northwestern and Central Switzerland (EKNZ, Ref.: 2017-00718).

Participants

As the primary aim of this study was to investigate the mediating role of personality functioning between childhood maltreatment and mental health problems, only participants with complete data from the Childhood Trauma Questionnaire—Short Form (CTQ-SF; [39]), the Semi-structured Interview for Personality Functioning

DSM-5 (STiP-5.1; [40]), as well as the self-report questionnaires of the Achenbach System of Empirically Based Assessment (ASEBA; [41]) were included in the analyses. The final sample included 173 participants (32.76% female) with a mean age of 26.61 ($SD = 3.27$; range 18–38 years) (Table 1). Participants that were excluded from the current analyses were slightly younger than included participants (mean age = 24.81; $SD = 3.79$; $t(79) = 2.12$; $p = 0.037$). No statistically significant differences were found in gender ($\chi^2(1) = 0.000$; $p = 1.000$), number of placements ($t(98) = 0.90$; $p = 0.367$), average duration in residential care ($t(49) = 0.85$; $p = 0.401$), personality functioning ($t(5) = -0.55$; $p = 0.606$), and mental health problems ($t(48) = -1.17$; $p = 0.247$).

Measurements

Sociodemographic characteristics

Sociodemographic information—age, gender, number of placements, average duration in residential care (i.e., total time spent in residential care and/or juvenile justice institutions) and current mental health treatment—was assessed using a computer-based questionnaire.

Childhood maltreatment

Childhood maltreatment was measured retrospectively at follow-up, with the Childhood Trauma Questionnaire—Short Form (CTQ-SF; [39]). The CTQ-SF is a self-report questionnaire, consisting of 25 retrospective items assessing childhood maltreatment histories, each scored

Table 1 Sample characteristics (N = 173)

	M (SD)
Age (years)	26.60 (3.28)
Number of placements in residential care	3.70 (3.26)
Average duration in residential care (years)	6.99 (5.34)
	n (%)
Gender (female)	57 (32.95)
Childhood maltreatment	132 (76.30)
One type of childhood maltreatment	30 (17.34)
Two types of childhood maltreatment	45 (26.01)
> Three types of childhood maltreatment	57 (32.95)
Emotional abuse	44 (25.43)
Physical abuse	58 (33.53)
Sexual abuse	35 (20.23)
Emotional neglect	105 (60.69)
Physical neglect	87 (50.29)
Current mental-health problems	
Overall mental health problems	53 (30.6)
Internalizing problems	51 (29.5)
Externalizing problems	42 (24.3)
Current mental-health treatment	41 (23.7)

on a 5-point Likert scale (i.e., “never true” to “very often true”). Three additional minimalization/denial items are used to identify individuals who may be underreporting traumatic events. The CTQ-SF includes five subscales: emotional abuse, physical abuse, sexual abuse, physical neglect, and emotional neglect. The individual items are summed to give subscale scores from 5 to 25, as well as a weighted total score, which is calculated based on the score of each subscale adjusted for the number of items included in that subscale. The CTQ-SF was found to show high reliability and validity, with intraclass correlation coefficients ranging from $r = 0.76$ – 0.86 [39].

Personality functioning

Personality functioning was assessed with the Semi-structured Interview for Personality Functioning DSM-5 (STiP-5.1; [40]). The STiP-5.1 is a clinician-rated interview, assessing the overall level of personality functioning according to the Alternative Model of Personality Disorders (AMPD), introduced in Section III of the DSM-5. The interview consists of 28 open questions and several optional clarifying questions, divided into two main domains of personality functioning: self-functioning and interpersonal functioning. Self-functioning, on the one hand, refers to a range of adaptive abilities related to the following two subdomains: identity (i.e., experience of oneself as unique, the stability of self-esteem, and the capacity for emotion regulation) and self-direction (i.e., the pursuit of meaningful goals, the utilization of prosocial internal standards of behavior, and the ability to productively self-reflect). Interpersonal functioning on the other hand, refers to abilities of the two subdomains: empathy (i.e., ability to understand others' experiences and motivations, to tolerate differing perspectives, and to understand the impact of one's behavior on others) and intimacy (i.e., the ability to establish durable and meaningful relationships, to experience and tolerate closeness, and mutual regard). Each subdomain relates to three abilities derived from the LPFS, resulting in a total of 12 facets, rated each on a 5-point scale: Level 0 (little or no impairment), Level 1 (some impairment), Level 2 (moderate impairment), Level 3 (severe impairment), and Level 4 (extreme impairment). The final STiP-5.1 score can either consist of a total score related to the global level of personality functioning or four domain scores related to the four subdomains (i.e., identity, self-direction, empathy, intimacy). For the present analyses, we combined the 12 facets scores to obtain an overall dimensional score with the widest possible range of scores. The STiP-5.1 presents high internal consistency, with a Cronbach's α of 0.97 for the total scale. The interrater reliability is shown to be good, with ICCs ranging from 0.81 to

0.92 in an overall sample and from 0.58 to 0.80 in a clinical sample [40].

Mental health problems

Mental health problems were assessed using the self-report questionnaires of the Achenbach System of Empirically Based Assessment scales (ASEBA; Youth Self-Report [YSR; [42]]; Young Adult Self-Report [YASR; [43]]; Adult Self-Report [ASR; [44]]). The YSR (i.e., 118 items), YASR (i.e., 124 items) and ASR (i.e., 120 items) are designed to assess emotional and behavioral problems in adolescents (11–18 years), young adults (i.e., 18–30 years) and adults (i.e., 18–59 years). Each item is rated on a three-point Likert scale (0 = not true, 1 = sometimes true, 2 = very true). Summing the scores of the eight subscales results in a total score, as well as two superordinate scores for internalizing and externalizing symptoms. In the current study, raw scores were transformed into t-scores, with a t-score ≥ 60 considered to be clinically relevant.

Statistical analysis

First, descriptive statistical analyses were calculated for sociodemographic variables, childhood maltreatment, personality functioning and mental health problems. Second, Pearson's correlation coefficients were calculated to investigate the associations between childhood maltreatment and mental health problems (i.e., hypothesis 1). Third, mediation analyses were conducted, using structural equation modeling adjusted for age and gender, in order to explore the mediating role of impaired personality functioning between childhood maltreatment and mental health problems (i.e., hypotheses 2 and 3). Mediation analyses seek to determine the extent to which the effect of an exposure (i.e., childhood maltreatment) on an outcome variable (i.e., mental health problems) is mediated by an intermediate variable (i.e., personality functioning). The mediation effect is referred to as the indirect effect, while the portion of the exposure that does not go through the mediating variable is referred to as the direct effect. Summing up the direct and indirect effect results in the total effect of an exposure (i.e., childhood maltreatment) on the outcome (i.e., mental health problems). We, first, calculated the indirect effect of impaired personality functioning (i.e., STiP-5.1 total score) between different types of childhood maltreatment (i.e., CTQ-SF total score, emotional abuse, physical abuse, sexual abuse, physical neglect, and emotional neglect) and mental health problems to test hypothesis 2 (i.e., impaired personality functioning significantly mediates the association between different types of childhood maltreatment and mental health problems). We, then dropped the STiP-5.1 total score as potential mediator

and simultaneously incorporated the STiP-5.1 domains self-functioning and interpersonal functioning to test hypothesis 3 (i.e., self-functioning mediates the effect of childhood maltreatment on mental health problems more strongly than interpersonal functioning). The proportion of the mediating effect indicates the proportion of the total effect that occurs through the mediating effect (i.e., indirect effect). Based on recommendations by Hayes [45], a bootstrapping sampling procedure with 5'000 bootstrapped samples was applied in the structural equation models. Bootstrapping is a nonparametric approach that accounts for non-normal distribution and provides nonbiased confidence intervals [46] that allow more accurate inferences when the sample size is small. According to Preacher et al. [47] mediation emerges, when the mediating effect is found to be significant and if zero is not included in the 95% confidence interval. All effects were adjusted for age and gender. Multicollinearity of independent variables was not considered to be an issue (see Additional file 1: Table S1). All statistical analyses were conducted using RStudio (Version 1.4.1106; [48]). Statistical significance was set to $p < 0.05$. Complete case analyses were performed.

Results

Descriptive characteristics

Findings on the descriptive analyses are presented in Table 1. Participants spent an average of 6.99 years ($SD = 5.34$) in the child welfare and/or juvenile justice system, with a mean number of 3.70 ($SD = 3.26$) placements. Overall, 76.3% ($N = 132$) participants indicated at least one type of childhood maltreatment, with 32.95% ($N = 57$) reporting even three or more. Emotional neglect was most commonly reported (60.69%), followed by physical neglect (50.29%) and physical abuse (33.53%). A total of 30.6% ($N = 53$) participants self-reported mental health problems, with internalizing problems (29.5%) being slightly more often reported than externalizing

problems (24.3%). 23.7% ($N = 41$) participants reported current mental health treatment.

Personality functioning

Findings regarding the level of personality functioning are presented in Table 2. Overall, 33.52% ($N = 58$) participants showed significant impairments in personality functioning, with 20.93% ($N = 36$) exhibiting moderate, 11.05% ($N = 19$) severe and 1.74% ($N = 3$) extreme impairments. A total of 27.74% ($N = 48$) participants exhibited impairments in Self-functioning. Of these, 26.01% ($N = 45$) showed impairments in Identity and 23.12% ($N = 40$) showed impairments in Self-direction. A total of 25.43% ($N = 44$) participants exhibited impairments in Interpersonal functioning, with 21.96% ($N = 38$) showing impairments in Empathy and 18.50% ($N = 32$) showing impairments in Intimacy.

Associations between childhood maltreatment, personality functioning and mental health problems

Findings regarding the associations between childhood maltreatment, personality functioning, and mental health problems are presented in Table 3. The strongest association was found between personality functioning

Table 3 Associations between childhood maltreatment, personality functioning and mental health problems ($N = 173$)

	Personality functioning	Mental health problems
Overall childhood maltreatment	0.23**	0.34***
Emotional neglect	0.17*	0.28***
Physical neglect	0.12	0.18*
Emotional abuse	0.19*	0.34***
Physical abuse	0.13	0.19*
Sexual abuse	0.18*	0.16*
Personality functioning	–	0.36***

Note. Pearson's r are reported. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 2 Personality Functioning ($N = 173$)

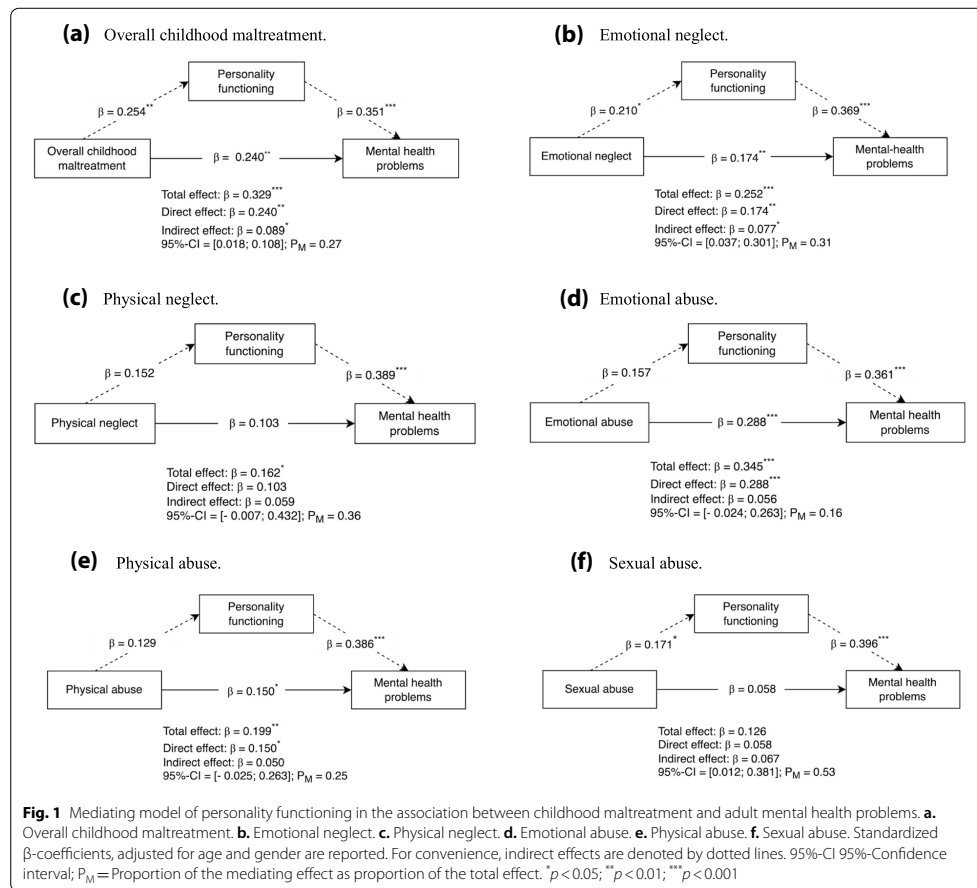
	No to low impairment n (%)	Moderate impairment n (%)	Severe impairment n (%)	Extreme impairment n (%)
Overall personality functioning	115 (66.47)	36 (20.93)	19 (11.05)	3 (1.74)
Self-functioning	125 (72.25)	27 (15.70)	19 (11.05)	2 (1.16)
Identity	128 (73.99)	25 (14.37)	19 (11.05)	1 (0.57)
Self-direction	133 (76.88)	20 (11.49)	15 (8.62)	5 (2.87)
Interpersonal functioning	129 (74.57)	29 (16.76)	13 (7.51)	2 (1.16)
Empathy	135 (78.03)	27 (15.52)	11 (6.32)	0 (0.00)
Intimacy	141 (81.50)	19 (10.98)	9 (5.20)	4 (2.31)

and mental health problems ($r=0.36, p<0.001$), indicating that the greater the impairments in personality functioning, the greater the mental health problems. All types of childhood maltreatment were positively associated with mental health problems, ranging from $r=0.16$ (i.e., sexual abuse) to $r=0.34$ (i.e., emotional abuse), suggesting that more severe childhood maltreatment led to more severe mental health problems. Finally, overall childhood maltreatment ($r=0.23, p=0.002$), emotional neglect ($r=0.17, p=0.027$), emotional abuse ($r=0.19, p=0.013$), and sexual abuse ($r=0.18, p=0.019$) were positively associated with personality functioning, indicating that more severe forms of these types of childhood maltreatment significantly

led to more severe impairments in personality functioning.

Mediation analyses

Findings regarding the mediating effect of impaired personality functioning between different types of childhood maltreatment and mental health problems are presented in Fig. 1. First, overall childhood maltreatment, emotional neglect and sexual abuse significantly predicted impaired personality functioning ($\beta=0.254, p=0.004$; $\beta=0.210, p=0.010$; and $\beta=0.171, p=0.043$ respectively). Second, personality functioning significantly predicted mental health problems for all types of childhood maltreatment. Third, significant total effects were found for all types of



childhood maltreatment, except for sexual abuse. Fourth, personality functioning revealed significant indirect effects (i.e., mediating effects) for overall childhood maltreatment ($\beta = 0.089$; $p = 0.008$) and emotional neglect ($\beta = 0.077$; $p = 0.016$). The proportion of indirect effects of the total effect was 27% for overall childhood maltreatment and 31% for emotional neglect. This indicates that about one-third of the association between overall childhood maltreatment and mental health problems, as well as emotional neglect and mental health problems was mediated through impaired personality functioning. Fifth, significant direct effects remained for overall childhood maltreatment ($\beta = 0.240$; $p = 0.001$), emotional neglect ($\beta = 0.174$; $p = 0.009$), emotional abuse ($\beta = 0.288$; $p < 0.001$) and physical abuse ($\beta = 0.150$; $p = 0.018$).

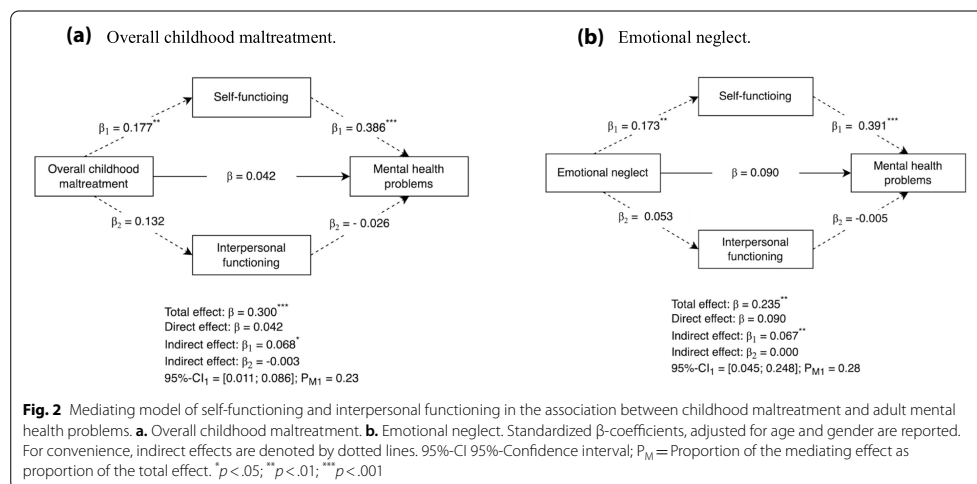
As impaired personality functioning was not found to significantly mediate the association between emotional abuse, physical abuse and neglect, and sexual abuse and mental health problems, hypothesis 3 was only tested for overall childhood maltreatment and emotional neglect. The findings are presented in Fig. 2. First, overall childhood maltreatment as well as emotional neglect significantly predicted self-functioning ($\beta_1 = 0.177$, $p = 0.007$; and $\beta_1 = 0.173$, $p = 0.003$ respectively) but not interpersonal functioning. Second, only self-functioning significantly predicted mental health problems for both types of childhood maltreatment (i.e., $p < 0.001$). Third, significant total effects were found for both types of childhood maltreatment (i.e., $p < 0.001$). Fourth, only self-functioning revealed a significant indirect effect (i.e., mediating effect) for overall childhood maltreatment ($\beta = 0.068$;

$p = 0.015$) and emotional neglect ($\beta = 0.067$; $p = 0.008$). The proportion of the indirect effect of the total effect for emotional neglect was 23% for overall childhood maltreatment and 28% for emotional neglect. This indicates that almost one-quarter of the association between overall childhood maltreatment and mental health problems, and almost one-third of the association between emotional neglect and mental health problems was mediated through self-functioning. Fifth, no significant direct effects remained when including both, self-functioning, and interpersonal functioning as mediators in the association between overall childhood maltreatment, emotional neglect, and mental health problems.

Discussion

The aim of the current study was to examine impaired personality functioning as a potential mediator between different types of childhood maltreatment and mental health problems in young adults with a history of residential child welfare and/or juvenile justice placements. In addition, this study sought to identify domains of impaired personality functioning that have the strongest mediating effect between different types of childhood maltreatment and mental health problems. The current results revealed at least three major findings to be discussed below.

First, as expected, a significant positive association was found between different types of childhood maltreatment and mental health problems, indicating childhood maltreatment to increase the risk for higher levels of overall psychopathology. This is in line with our first hypothesis,



suggesting that more severe childhood maltreatment leads to substantially higher levels of internalizing and externalizing symptoms [16, 32, 33]. Notably, emotional abuse and neglect showed the largest associations with mental health problems. Although there is considerable support for the other types of childhood maltreatment [49, 50], our findings add to the growing literature highlighting the strong pathogenic effects of emotional abuse and neglect [51–54]. Thus, not only the more obvious types of childhood maltreatment (i.e., physical abuse and neglect, and sexual abuse) tend to have a significant impact on mental health, rather, the more subtle and often hidden forms of childhood maltreatment, such as emotional abuse and neglect, might lead to even higher levels of mental health problems [55].

Second, and partially in line with hypothesis 2, our findings revealed impaired personality functioning to be a significant mediator between overall childhood maltreatment and mental health problems. This is consistent with previous findings [16, 32, 33], suggesting a continuous process, in which childhood maltreatment deteriorates personality functioning, which, in turn, leads to higher levels of mental health problems. When considering different types of childhood maltreatment, impaired personality functioning, however, was found to be a significant mediator only for emotional neglect. This finding is inconsistent with hypothesis 2, and somewhat surprising, given that the study from Freier et al. [32] found a significant mediating effect for all types of childhood maltreatment. The findings from Freier et al. [32], however, resulted from a large community-based sample and prevalence rates of childhood maltreatment were substantially lower compared to our sample. In addition, participants in our sample, were exposed to a range of other significant risk-factors—such as unfavorable parenting practices, low socioeconomic status, parental mental disorders, early mental health problems, self-harming behavior, psychopathic traits, and youth delinquency—all of which may have shaped personality functioning, besides traumatic experiences. Moreover, emotional neglect predicted impaired personality functioning more strongly than other types of childhood maltreatment in our sample. This is in line with findings from a clinical sample from Gander et al. [56], who found that emotional abuse and neglect were twice as strongly related to impaired personality functioning than physical abuse, physical neglect, and sexual abuse. Our findings, thus, support the growing evidence that emotional neglect may be more relevant in the context of personality functioning than physical neglect, physical abuse, and sexual abuse [57]. Nevertheless, the total mediating effect of impaired personality functioning only accounted for about 30% of the total effect between overall childhood

maltreatment, emotional neglect, and mental health problems, meaning that 70% still proceeded through the direct effect from childhood maltreatment to mental health problems. Yet it may be that an additional proportion was referred by other potential mediators, such as the parent–child relationship [58], physical exercise [59], maladaptive coping strategies [60], brain alterations [61], and verbal abilities [62], which all have been found to significantly mediated the association between childhood maltreatment and mental health problems. This highlights the crucial need to conduct further studies with concurrently different mediators.

Third, and partially consistent with hypothesis 3, our findings revealed a significant mediating effect of impaired self-functioning when both self-functioning and interpersonal functioning were included as potential mediators in the relationship between overall childhood maltreatment and emotional neglect. This is in line with the findings from Krakau et al. [33], indicating a pronounced impact of identity perception and self-direction in mediating between childhood maltreatment and mental health problems. This supports, in addition, previous findings that found negative self-associations [20, 59], impaired self-compassion and shame [21], negative self-efficacy [63] and impaired reflective functioning [64] to be significant mediators between childhood maltreatment and mental health problems. Indeed, childhood maltreatment, particularly emotional neglect [65], has been repeatedly shown to profoundly affect self-identity across the lifespan [66]. Unlike emotional abuse, which involves the presence of unexpected negative inputs, emotional neglect, involves an absence of expected positive inputs [67–69], or simply the absence of any input. This lack of responsiveness to a child's needs may compromise their ability to identify and value their own feelings and needs, which in turn, may lead to a lack of clarity about their own identity and self-direction [65]. This might explain, at least in part, why only impaired self-functioning significantly mediated the association between emotional neglect and mental health problems, when both self-functioning and interpersonal functioning were included as potential mediators. Yet again, the mediating effect of self-functioning only accounted for about 25% of the total effect between overall childhood maltreatment, emotional neglect, and mental health problems, meaning that 75% still proceeded through the direct effect from childhood maltreatment to mental health problems as well as potentially other mediators.

Strengths

The present study contributes to current research on the association between childhood maltreatment and mental health problems by explicitly presenting findings from a

high-risk sample. Only a few studies have investigated the mediating role of impaired personality functioning as a potential mediator between childhood maltreatment and mental health problems, and to the best of our knowledge, none have yet investigated this effect in a high-risk sample. Yet, children and adolescents placed in the residential child welfare and/or juvenile justice system have a particularly high risk of developing impaired personality functioning as well as mental health problems due to a cumulation of risk factors (i.e., childhood maltreatment, unfavorable parenting practices, low socioeconomic status, childhood psychopathology, self-harming behavior, and youth delinquency), which is why such samples provide particularly valuable insights into the association between childhood maltreatment and mental health problems. The inclusion of different types of childhood maltreatment further allowed to examine which types of childhood maltreatment are mostly mediated by impaired personality functioning. Finally, by simultaneously including self-functioning and interpersonal functioning as potential mediators, we were able to differentiate the mediating role of two distinct domains of personality functioning.

Limitations

Nonetheless, current findings must be interpreted under the consideration of some limitations. First, the use of mediation analysis on cross-sectional data has widely been questioned as cross-sectional estimates can either seriously under- or overestimate indirect effects [70]. The present mediation analyses were, however, conducted according to Hayes et al. [45] as an attempt to test a specific model. Therefore, findings must be interpreted with caution and further investigations, using longitudinal studies, are highly needed. Second, findings on childhood maltreatment relied entirely on retrospective self-reports, which might result in recall bias [71]. In addition, retrospective reports could be affected by personality functioning and/or actual functioning. However, the CTQ has found to be valid [72], and no significant difference between prospective and retrospective self-reports of childhood maltreatment have been found in a comparative study [73]. Third, mental health problems were assessed using self-report questionnaires, making responses susceptible to various forms of biases, such as social desirability and limited self-awareness [74]. Fourth, the current study did not consider possible moderators of childhood maltreatment, such as age at the time of maltreatment, frequency, and duration of maltreatment as well as the perpetrator relationship, all of which have been found to considerably affect the risk for psychopathology. As such, exposure to abuse at an earlier age

is more likely to result in higher levels of psychopathology, earlier onset, higher number of comorbidities and poorer treatment outcomes [75]. Including such moderators could, thus, provide valuable insight into the relationship between childhood maltreatment and mental health problems. Finally, as maltreatment often extends throughout childhood and adolescence, a developmental cascade model and potential sensitive periods for influences of maltreatment and personality functioning should be explored within future studies.

Implications

For clinical practice, the current findings indicate that children and adolescents involved in the child welfare and/or juvenile justice system, should be systematically assessed for childhood maltreatment, personality functioning and mental health problems, as prevalence rates are distressingly high. In addition, the findings emphasize the need to sensitize standard mental health treatments to childhood maltreatment and impaired personality functioning. In terms of trauma-informed practices, mental health services should provide a broad-based understanding for childhood maltreatment and the pathways in which childhood maltreatment may affect the development of mental abilities like emotion regulation, self-reflection, and social cognition and, therefore, may lead to maladaptive coping strategies and problematic behavior. In addition, mental health services should provide safe, trusting, and continuous nurturing relationships, in order to promote resilience in maltreated children and adolescents [76, 77]. Moreover, mental health services should assist vulnerable children and adolescents in developing these mental abilities. While this goes beyond providing adequate care, it requires a sensitive relationship which is attuned to the personal needs and emotions of these children. In terms of personality functioning, emerging evidence suggests the use of severity- and trait-informed treatment methods. In addition, the different facets described by the AMPD or ICD-11, may help clinicians to identify individual problems across domains (e.g., identity, self-reflection, emotion regulation, and interpersonal security), resulting in more tailor-made treatments [78]. Combined with trauma-informed practices, such interventions could help maltreated children and adolescents to develop more adaptive self-concepts, self-direction, and emotion regulation capacities, which, in turn, could potentially mitigate psychopathological outcomes. As childhood maltreatment is, however, neither a necessary nor a sufficient condition for developing mental health problems and, likewise, does not necessarily compromise personality functioning,

future research should focus on resilience to promote healthy development in maltreated children and adolescents. In addition, it is important to bear in mind that personality functioning only accounts for a small part of the pathogenic impact of maltreatment, thus, further investigations are highly needed to focus on other potential mediators, as for instance, parent–child relationship, physical exercise, and brain alterations, which all have been found to significantly mediated the association between childhood maltreatment and mental health problems [58, 59, 61]. Furthermore, age, gender, socioeconomic status, and current mental health treatment were identified as important factors affecting the results of this study. Future research should, therefore, investigate the impact of these factors on personality functioning to further explore how each factor affects the long-term consequences of childhood maltreatment. Finally, childhood neglect has been the most overlooked and least researched form of childhood maltreatment [79, 80], which may be referred to as the “neglect of neglect” [81–83]. This lack of research is partly due to insufficient measurement instruments to assess childhood neglect. Thus, future research should investigate neglect on its own right and develop appropriate measurements.

Conclusion

The present findings add to the current understanding of impaired personality functioning, in particular impaired self-functioning, as an important mediator of the association between overall childhood maltreatment, emotional neglect and mental health problems. The findings, thus, indicate that emotional neglect may be particularly important in the context of childhood maltreatment, personality functioning, and mental health problems and, therefore, should not be overlooked next to the more “obvious” forms of childhood maltreatment. Future research should address the sequelae of childhood maltreatment in high-risk samples, particular prone to the adverse consequence of childhood maltreatment, including concurrently different mediators, in order to unpack the complex association between childhood maltreatment and mental health problems. Combining interventions designed for personality functioning with trauma-informed practices in standard mental health services might foster resilience and counteract the psychopathological outcomes of maltreated children and adolescents.

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s13034-022-00527-1>.

Additional file 1: Figure S1. Flow-chart of the study sample. **Table S1.** Multicollinearity of independent variables (Pearson's r).

Author contributions

DH, JH, DB, and CB contributed to conceiving and designing the present manuscript. DH wrote the first draft of the manuscript. DH, DB, SS, and CB collected the data. DH analyzed the data, and DB supervised the data analyses. JH, DB, CB, SS, MS, and KS commented on an earlier draft of this article and supervised the entire process. All the authors read and approved the final manuscript.

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Availability of data and materials

The raw data supporting the conclusions of this article can be requested from the first author.

Declarations

Ethics approval and consent to participate

The baseline study procedure was reviewed and approved by the Ethics Committees on Research Involving Humans at the University of Basel and the University of Lausanne (Switzerland) as well as the Institutional Review Board at the University of Ulm (Germany). The follow-up study procedure was approved by the Ethics Committee Northwestern and Central Switzerland. Written informed consent to participate in this study was provided by the participants and the participants' legal guardian/next of kin, if participants were under 18 years old.

Competing interests

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential competing interests.

Author details

¹Department of Child and Adolescent Psychiatric Research, Psychiatric University Hospitals Basel, Basel, Switzerland. ²Department of Medical and Clinical Psychology, Tilburg University, Tilburg, The Netherlands. ³Department for Child and Adolescent Psychiatry/Psychotherapy, University of Ulm, Ulm, Germany. ⁴LUMC Curium – Department of Child and Adolescent Psychiatry, Leiden University Medical Center, Leiden, The Netherlands. ⁵Viersprong Institute for Studies on Personality Disorders, De Viersprong, Halsteren, The Netherlands.

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Chapter 5 – General Discussion

This thesis sought to contribute to the heterogeneous body of literature by examining long-standing controversies regarding the conceptualization, onset, and course of PDs over time, incorporating both the categorical and dimensional models of PDs. Consistent with the current shift in paradigm, this thesis incorporated both the categorical and dimensional models of PDs. More specifically, this thesis investigated a) the prevalence, onset, and stability of PDs over time and b) the extent to which impaired personality functioning mediates the pathogenic effect of childhood maltreatment. First, we conducted a systematic review and meta-analysis on the categorical and dimensional mean-level and rank-order stability of PDs. Second, we examined PD prevalence rates as well as the categorical and dimensional mean-level and rank-order stability of PDs in a high-risk sample, focusing specifically on the transition from adolescence into young adulthood. Third, we investigated the mediating effect of impaired personality functioning between different types of childhood maltreatment and self-reported mental health problems, using the same high-risk sample.

This chapter provides a general discussion of what we found and how our findings add to the current state of research, highlighting the need for future work and clinical implications.

5.1 Redefining stability within the context of personality disorders

As the findings of our systematic review and meta-analysis reveal, PDs are only moderately stable, with most PD symptoms significantly decreasing over time. This raises the question of whether it is still appropriate to consider stability as a defining feature of PDs. As outlined in the introduction, the response to this question depends on the nature of what is considered to be stable, thus, the PD construct being studied. Yet, stability itself depends on multiple factors which significantly challenges our methodological understanding for capturing stability over time. Indeed, some researchers still use the term ‘stability’ without explicitly stating the type of stability they are referring to (Morey & Hopwood, 2013). While the AMPD and ICD-11 acknowledge PDs to be only “relatively stable” (Criterion D), it is unclear whether this refers to mean-level or rank-order stability. This is particularly problematic as both types of stability vary substantially, as pointed out in our systematic review and meta-analysis. Criterion D, moreover, lacks a temporal framework by which stability is conceptualized, although it seems apparent that stability estimates change considerably depending on the time frame being considered (Morey & Hopwood, 2013). Future work should, thus, focus on how to redefine ‘stability’ in the context of PDs, accounting for conceptual, methodological, environmental, and genetic factors. This is particularly important to prevent unnuanced statements, both in

research and clinical practice. In addition, future studies should increasingly focus on the AMPD and ICD-11 to determine whether the new conceptualization will clarify some of the issues related to the stability of PDs.

5.2 Symptomatic remission and full recovery

Although our systematic review and meta-analysis suggest that most PD categories and PD criteria decrease over time, it is of the utmost importance to acknowledge that a symptomatic remission is not necessarily accompanied by a full recovery. While symptomatic remission is defined as no longer meeting diagnostic criteria for at least two years, full recovery is defined as achieving symptomatic remission in addition to good social and occupational functioning. In the McLean Study of Adult Development (MSAD; Zanarini et al., 2005), 34.6% of borderline PD patients had experienced symptomatic remission at two years' follow-up, about half (49.5%) at four years' follow-up, 69% at six years' follow-up, and 93% at ten years' follow-up (Zanarini et al., 2003; Zanarini et al., 2007). By the time of a 16-year follow-up, almost all patients (99%) had experienced symptomatic remission and symptom reduction remained relatively stable, with only a few experiencing symptomatic recurrence (Zanarini et al., 2012). Yet only half had achieved significant functional improvement over time, with some even experiencing poorer functioning outcomes. As a result, good social and occupational functioning is more difficult to achieve than symptomatic remission, and sustained recovery is much less common than sustained symptomatic remission – at least for borderline PD. As such, a decrease in PD criteria is not necessarily accompanied by an increase in social and occupational functioning (d'Huart et al., 2023). Indeed, functional outcomes of PDs are severe (Skodol, 2008; Winsper et al., 2015), and a growing body of literature indicates that early-onset borderline PD patients tend to experience difficult personality (i.e., low openness, low agreeableness, high neuroticism, and low conscientiousness), poor mental health (i.e., meeting diagnostic criteria for mental disorders, engaging in suicidal behavior, or using clinical support services), poor educational and economic outcomes (i.e., unemployment), more health-risk behaviors (i.e., smoking habits, risky sexual behavior), lower wellbeing (i.e., social isolation and dissatisfaction with life) and an increased likelihood to engage in delinquent behavior (i.e., family violence, bullying and being victims of crime) in adulthood (Chen et al., 2006; Hastrup et al., 2019; Javaras et al., 2017; Wertz et al., 2019).

Using a dimensional approach, Aidan G. C. Wright et al. (2015) were among the first to show that AMPD traits prospectively predicted psychosocial outcomes. As such, AMPD traits most strongly predicted interpersonal problems and the aggregated measure of

functioning. The multisite Norwegian Study of the AMPD (Nor-AMP; Hummelen et al., 2022) also revealed that the level of personality functioning (LPFS) was a more powerful predictor of psychosocial impairment than the sum of PD criteria alone. Specifically, self-functioning was a better predictor than interpersonal functioning, with Identity and Empathy being the strongest predictors (Buer Christensen et al., 2020). As a consequence, most PD patients never manage to fully participate in society, even if their PD symptoms significantly decrease over time (Videler et al., 2019). Taken together, while our systematic review and meta-analysis suggest that most PD symptoms improve over time, symptom remission is not inherently synonymous with recovery, and more comprehensive approaches and specifically targeted intervention methods are needed to enable participants to fully engage in society.

5.3 Individual patterns of change

In investigating the stability of PDs from adolescence to adulthood, our study only allowed PDs to be assessed using a two-wave measurement design. The amount of change between two measurement points is, however, not fully indicative of the shape of each person's individual growth trajectory, requiring a minimum of three measurement timepoints to be modelled. A more sophisticated statistical method to examine the unique PD trajectories of individuals and groups are individual growth curve models (Lenzenweger et al., 2004). In general, by collecting data at multiple time points, individual growth curve models allow researchers to analyze trends and variations in changes in PDs over time at both the aggregate (i.e., mean level) and the individual level (i.e., for each study participant). As such, growth curve models focus both on similarities among individuals and on differences among individuals. Individual growth curve models are, however, insensitive to potential latent subgroups within the study sample whose symptoms change at different rates or who have differing symptom levels at baseline (Muthén, 2004). This hampers the ability to find out whether there are subgroups of individuals whose PD symptoms do not remit over time, or alternatively, whose PD symptoms remit particularly fast. Elucidating the heterogeneity in the course of PDs may, however, contribute to the understanding of the development and pathogenesis of personality, which remains largely unknown to this day (Hallquist & Lenzenweger, 2013). Growth mixture modeling (GMM; Muthén & Shedden, 1999) is a combination of latent growth curve modeling and finite mixture modeling that addresses the question of whether the trajectories of change within a given sample are homogeneous or whether latent subgroups within this sample have different trajectories. The study by Hallquist and Lenzenweger (2013) revealed three latent trajectories among 258 first-year undergraduate students: 1) individuals experiencing a rapid PD symptom

remission, 2) individuals experiencing a slow PD symptom decline and 3) a small subset of individuals experiencing few PD symptoms upon clinical interview at each assessment. Rapid symptom remission was associated with fewer comorbid disorders, lower negative emotionality, and greater positive emotionality. Slow symptom remission, on the other hand, was associated with comorbid PD symptoms and lower positive emotionality. Changes in most symptoms for one PD were associated with concurrent changes in other PDs, depressive symptoms, and anxiety. These findings indicate that the longitudinal course of PD symptoms is heterogeneous, and that PD symptoms may be transient in some individuals (e.g., Wright & Simms, 2016). A possible explanation postulated by Wright and Simms (2016) is that an adaptive configuration of personality traits (e.g., low negative emotionality and high restriction) may help prevent the long-term persistence of PD symptoms (Hallquist & Lenzenweger, 2013). Another more person-centered approach to assess changes in PD symptoms, particularly borderline PD symptoms, is the ecological momentary assessment (EMA; Shiffman & Stone, 2008) method. EMA involves repeated, frequently occurring assessments of participants' current affective, behavioral, and contextual experiences while engaging in naturalistic daily life activities using handheld devices capable of registering responses to short self-report questionnaires (Davanzo et al., 2023). Such intensive measurements capture both within-day and within-person behavior, as well as changes in experience over time, allowing for real-time investigation of the immediate causes and effects of symptoms (Myin-Germeys et al., 2018). Statistical methods and assessments like these reflect the range of opportunities that research into the stability or change of PDs has to offer.

5.4 Mechanisms of change

While there is convincing evidence that the average level of most PD diagnoses and symptoms tends to decrease over time (Study I), surprisingly little is known about the mechanisms of change that illustrate why and how PDs change over time. Studies on healthy personality traits in non-clinical settings have revealed that mean trait levels tend to shift towards greater maturity as individuals age, indicating a decrease in neuroticism and an increase in extraversion, agreeableness, and conscientiousness (Roberts et al., 2006). Recent literature suggests that changes in PDs, primarily borderline PD symptoms, may occur in concert with changes in healthy personality traits. The findings of Wright and colleagues (2012), for instance, indicated that a reduction in avoidant PD symptoms was linked to an increase in dominance and warmth, and a decrease in neuroticism. Similarly, Wright et al. (2015) found that improvements in

borderline PD symptoms were associated with increases in conscientiousness and decreases in neuroticism.

As outlined in the review by Hopwood and Bleidorn (2018), behavioral genetic research suggests that both genetic and environmental factors play a role in the course of PDs over time. As such, individuals may be genetically predisposed to exhibit more or less stable PD symptoms. Yet, individuals evolve within specific environments, which differentially affects how their symptoms develop over time. The study by Reichborn-Kjennerud et al. (2015), for instance, indicated that the rank-order stability of antisocial and borderline PD symptoms was largely due to genetic factors, whereas symptomatic remission was mainly due to environmental risk factors. Bornovalova et al. (2009), on the other hand, found that both stability and symptomatic remission in borderline PD symptoms were mainly affected by genetic factors, while environmental factors only played a modest role. However, the authors point out that the strong influence of genetic factors does not relate to insignificant environmental factors, but rather emphasizes that the environment is likely to influence gene expression, which in turn influences symptomatic development. Both studies, however, were unable to reveal environmental factors likely to affect the course of PDs. Nevertheless, Bornevalova and colleagues (2009) assumed that factors such as exposure to childhood maltreatment, maladaptive parenting (or the perception of such), as well as nonsystematic events (e.g., accidents), played an important role. According to a systematic review by Skabeikyte and Barkauskiene (2021), factors associated with the course of borderline PD symptoms in adolescence include childhood temperament (e.g., high levels of emotionality and low levels of sociability), comorbid psychopathology (e.g., alcohol abuse disorder, drug abuse disorder, major depressive disorder, as well as anxiety and attention deficit hyperactivity disorder (ADHD) symptoms) and interpersonal experiences (e.g., peer-related violence and poor relationship quality). Another important factor associated with change in PD diagnoses and symptoms are treatment effects (Cristea et al., 2017; Newton-Howes et al., 2015). A recent review by Kramer et al. (2020) investigated the process of change in PD psychotherapy and suggested that besides the therapeutic relationship (e.g., alliance and empathy), change in emotions (e.g., emotion regulation, awareness, and transformation), social cognitions (e.g., mentalizing, meta-cognition, and interpersonal patterns) and defense mechanisms contribute to a healthy change, especially in borderline PD.

Understanding the process of change is, therefore, a complex task, as change is likely to be the result of the interaction of many different factors. Future research may focus on protective factors, including environmental and genetic factors, to predict changes in PDs over

time – a research avenue that is in line with the need to further explore the construct of resilience.

5.5 Personality disorders from a developmental lens

Our study on the stability of PDs from adolescence to adulthood (Study II) revealed that about 21% first developed a PD in young adulthood. Based on explorative age-sensitive analyses, older adolescents (15–18 years) were more likely to be diagnosed with a PD for the first time at follow-up than younger adolescents (12–14 years). This suggests that the onset of a PD lies, indeed, in later adolescence, with some individuals still below the critical age. However, as outlined in section 1.4, from a dimensional trait perspective, maladaptive personality traits may already manifest in early childhood (Sharp & Wall, 2018). Research on pathological personality traits in children has shown that early personality dysfunction is closely related to the traits described in the Big Five model (i.e., Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness; De Clercq & De Fruyt, 2003; De Clercq et al., 2006; Shiner, 2005). Nevertheless, the more severe forms of PDs only become clinically apparent in (late) adolescence, when adolescents become emotionally, cognitively, and socially able to integrate knowledge about themselves and others into a coherent whole (Chanen & Thompson, 2019). In fact, as Erikson (1950) suggested 70 years ago, one of the central developmental tasks in adolescence is the emergence and consolidation of a coherent sense of self in order to adopt autonomous adult role functioning. Interestingly, the Criterion A concept of identity, self-esteem, self-reflection, goal setting, empathy and intimacy seem to converge in the ability to form an integrated sense of self and others (Rosen, 2016). While this process may proceed smoothly for most adolescents, it may be that for others this process will be characterized by significant distress, preventing certain abilities (e.g., the ability to self-reflect, to regulate emotions, to attune to the mind of others) from developing, which may result in impaired personality functioning (Sharp & De Clercq, 2020). As pointed out by Sharp and Wall (2021) and reminiscent of Kernberg's (1984) concept of personality organization, PDs, thus, emerge when an integrated and coherent sense of self fails to develop during the transition to becoming an agentic, self-determining adult (Sharp & Wall, 2021). According to McAdams' (2015) developmental theory of personality, personality itself is built upon three layers, evolving through development, with the ultimate goal of combining personality into a coherent self. The first layer is that of the person as a social actor, characterized by dispositional traits, which result from genetic endowment and early life experiences. The first layer emerges in early childhood (i.e., by the age of 2 to 3 years) when the child becomes able to self-regulate and has

the aim of sketching a behavioral outline and shaping the child's style of action. The second layer is that of the person as a motivated agent, which begins to mature around 7 to 9 years, when the child begins to understand that behaviors are motivated by intentions that are closely linked to values and beliefs. The second layer, thus, describes personal adaptations to developmental challenges, motivations, and goals shaped by early social demands. Finally, the third layer is that of a person as an autobiographical author, which typically emerges during adolescence and emerging adulthood (i.e., 15 to 25 years). For the first time, the adolescent is cognitively able to derive a coherent, meaningful, and purposeful story of his past experiences, current self, and imagined future, which is consolidated into his narrative identity.

While our dispositional traits (first layer) are assumed to be stable, our values, beliefs, and goals (second layer) and, thus, our narrative identity (third layer) may change considerably over the life course. Forging a coherent sense of self is, thus, a developmental process, starting as early as infancy, and evolving until old age. As outlined in the review by Sharp and Wall (2021), the level of personality functioning (i.e., LPF), as described in the AMPD, reintroduces the idea of self- and interpersonal functioning as the core and common feature of PDs. PDs should, therefore, be conceptualized within the context of a developmental lens, putting back into focus the original meaning of personality, namely “the subjective experience of what it means to be human” (Sharp & Wall, 2021, p. 1).

5.5 Clinical implications

Our systematic review and meta-analysis suggest that PDs, either assessed categorically or in terms of more dimensional symptom counts, are not as stable as previously assumed. This highlights the need to overcome the clinical assumption that PDs are “enduring”, “pervasive” and “inflexible” over time (APA, 2013). There is cumulative evidence that PDs are treatable (Cristea et al., 2017), and thus should be assessed and diagnosed prior to the age of 18 in order to provide the best possible outcome later in life (Storebø et al., 2020). However, despite evidence that PDs can and should be diagnosed in adolescence (Chanen & Thompson, 2019; Hutsebaut et al., 2013), the majority (63%) of British psychiatrists considered the diagnosis invalid in 2009 (Griffiths, 2011). In 2013, only about 8% of psychologists in the Netherlands and Belgium reported diagnosing PDs in adolescence and only about 6% offered corresponding treatment (Laurensen et al., 2013). Eleven years later, a straw poll of the Royal College at the Faculty of Child and Adolescent Psychiatry Winter Institute revealed that still a third would not diagnose borderline PD in young people (Kingsley, 2022). Therefore, it is estimated that it takes at least ten years for a person with a PD to receive an accurate diagnosis. For years, patients

may, thus, experience potentially iatrogenic harm from inappropriate treatment (Grenyer, 2019; Sulzer et al., 2016). There is no doubt that the reluctance to diagnose PDs in young people results from good intentions. However, as outlined in section 1.4, a reluctance to diagnose PDs at an early stage leaves young people deprived of effective treatments, increasing their risk of an impaired life course and fatal outcomes (Schmeck, 2022).

In line with the developmental perspective outlined in section 5.4, the Adolescent Identity Treatment (AIT; Foelsch et al., 2014) offers a therapeutic approach to treating PDs in adolescence from a psychodynamic and integrative perspective. As the name suggests, AIT focuses specifically on identity and combines modified elements of transference focused psychotherapy (TFP; Clarkin et al., 1999) with psychoeducation, behavior-oriented home plans and parental work to support the therapeutic process of adolescents. A recent study, comparing AIT with dialectical behavior therapy for adolescents (DBT-A; Rathus & Miller, 2002), found that both treatments significantly improved psychosocial functioning and personality functioning over a one-year follow-up in adolescents with borderline PD, with AIT being even more efficient in symptom reduction. The authors concluded that AIT is a promising approach, and that both treatments are highly effective in improving psychosocial functioning and personality functioning in adolescents with a borderline PD (Schmeck et al., 2022). Patients as well as clinicians may, thus, be cautiously optimistic about the prognosis of a PD (Biskin, 2015; Fonagy et al., 2015).

The dimensional trait perspective adopted in the AMPD and ICD-11 may help clinicians not only to see whether a patient suffers but also how the patient suffers. This might enable clinicians to perceive the patient holistically by trying to understand the patient behind the disorder. As Livesley (2013) stated, “[w]e have all been preoccupied with diagnostic categories and ignored the individual” for way too long. The classification of trait specifiers may help to identify individual problems, leading to more personalized and tailor-made treatments, while the classification of severity may help to inform clinical prognosis and intensity of treatment (Bach & First, 2018; Bach et al., 2015). It is crucial to understand that a treatment does not intervene at the level of the disorder, as the disorder itself is not a discrete pathology but rather individual maladaptive feelings, thoughts, and behaviors. With the facets and traits described in the AMPD and ICD-11, clinicians become able to target unique difficulties by drawing a complete and individualized picture of the patient (Bach et al., 2015).

As the findings of Studies 2 and 3 revealed, children and adolescents involved in the child welfare and/or juvenile-justice system are at particular risk of developing a PD. In fact, Study 2 indicated that the prevalence rates of PD diagnoses and symptoms considerably

increased from adolescence to adulthood, while in community-based and clinical samples, PDs and symptoms generally tend to decrease as juveniles mature into adulthood (Bornovalova et al., 2009; Chanen et al., 2004; Grilo et al., 2001; Hamlat et al., 2020; Johnson et al., 2000; Strandholm et al., 2017). This might be explained by the fact that children and adolescents involved in the child welfare and/or juvenile justice system are likely to have experienced several critical risk factors, including childhood maltreatment (i.e., emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect). As shown in Study 3, the majority of participants reported at least one type of childhood maltreatment, with one-third even reporting three or more types of childhood maltreatment. By far the most common type of childhood maltreatment was emotional neglect. Indeed, as outlined in section 1.3, there is cumulative evidence that childhood maltreatment is a potential risk factor for the onset of PDs, most specifically borderline PD (Porter et al., 2020; Steele et al., 2019). As a result, the novel ICD-11 diagnosis of complex post-traumatic stress disorder (C-PTSD) – intended to describe a more severe response to life adversities characterized by difficulties in self- and interpersonal functioning over and above the traditional PTSD criteria – has frequently been compared to PDs, specifically borderline PD, in terms of conceptual and empirical overlap (Ford & Courtois, 2021; Jowett et al., 2020; White & Hudson, 2022). While some have suggested that the borderline PD diagnosis may be outdated through C-PTSD (Kulkarni, 2017), others have emphasized considerable differences across both disorders (Cloitre et al., 2014). Felding et al. (2021) have outlined both similarities and differences between the two and call for future research, as the clinical utility of this new diagnosis has yet to be established (Schmeck, 2022).

Far off this controversial debate, our findings in Study 3 suggested emotional neglect to be particularly relevant in the context of personality functioning, particularly self-functioning. Indeed, this finding has been supported by a recent review by Back and colleagues (2021) and is in line with previous findings indicating a significant link between childhood maltreatment, specifically emotional neglect, and self-identity. Emotional neglect differs from emotional abuse in that it does not involve unexpected negative inputs but rather the absence of expected positive inputs (Humphreys & Zeanah, 2015; McLaughlin, 2018; McLaughlin & Sheridan, 2016) – or even the absence of any input. This lack of responsiveness to a child's needs can severely affect their ability to recognize and value their own feelings and needs, which in turn can lead to a confusion about their own identity and self-direction (Kapeleris & Paivio, 2011). This might explain our finding, indicating that only impaired self-functioning significantly mediated the pathogenic impact of emotional neglect when both self-functioning and interpersonal functioning were included as potential mediators.

From a clinical perspective, our findings from Studies 2 and 3 highlight that children and adolescents involved in the child welfare and/or juvenile-justice system should be systematically assessed for childhood maltreatment, personality functioning, and mental health problems. In addition, the findings emphasize the importance of raising awareness among both residential care staff and traditional mental health practitioners about childhood maltreatment and its impact on personality functioning. Regarding trauma-informed practices (Musckett, 2014), mental health services should offer a comprehensive understanding of childhood maltreatment and the pathways through which childhood maltreatment may affect the development of mental abilities (e.g., emotion regulation, self-reflection, and social cognition) and therefore may evoke maladaptive coping strategies and problematic behavior. Mental health services should assist vulnerable children and adolescents in developing these mental abilities, while providing safe, trusting, and continuous nurturing relationships. Interventions of this kind could help maltreated children and adolescents to cultivate more adaptive self-concepts, self-direction, and emotion regulation capacities. This, in turn, could potentially mitigate psychopathological outcomes. This approach may encourage researchers and clinicians to perceive personality functioning within the context of resilience (e.g., Kerber et al., 2023; Rossi et al., 2021).

5.6 Conclusion

The findings of our systematic review and meta-analysis revealed that PDs, either assessed categorically or in terms of more dimensional symptom counts, are not as stable as previously assumed. In fact, most PDs and PD criteria significantly decreased over time, thus, suggesting a notable trend towards improvement. This raises the question of whether it is still appropriate to consider stability as a defining feature of PDs. Redefining stability within the context of PDs will, thus, be particularly important to prevent unnuanced statements both in research and clinical practice. Future work on the AMPD and ICD-11 may eventually determine whether the new conceptualization will clarify some of the issues related to the stability of PDs. Nevertheless, it should be acknowledged that a symptomatic remission is not necessarily accompanied by a full recovery, with most PD patients never managing to fully participate in society despite considerable remission. Understanding the process of change is, thus, particularly important in order to identify protective factors that might potentially mitigate long-term impairments. More sophisticated statistical models may, in addition, help to identify individual patterns of change, which in turn, may contribute to developing more individualized treatments. Moreover, the findings of our study on the stability of PDs from adolescence into

adulthood clearly demonstrated that the onset of PDs does indeed lie in late adolescence, with the stability in adolescence being comparable to that in adulthood. From a dimensional trait perspective, however, maladaptive personality traits may already manifest in early childhood. Therefore, PDs should be conceptualized within the context of a developmental lens. As a result, PDs, thus, should be diagnosed prior to the age of 18 in order to provide the best possible outcomes. Indeed, several promising treatments for adolescent PD patients exist, encouraging clinicians to be cautiously optimistic about the prognosis of PD. This again highlights the need to overcome the clinical assumption that PDs are ‘enduring’, ‘pervasive’ and ‘inflexible’ over time. Due to multiple risk factors, children and adolescents involved in the child welfare and/or juvenile-justice system are, nevertheless, particular at risk for developing a PD. Standard mental health services should, thus, ideally be combined with trauma-informed practices to assist these children and adolescents in developing more adaptive self-concepts, self-direction, and emotion regulation capacities, while providing safe, trusting, and continuous nurturing relationships. This, in turn, may buffer psychopathological outcomes.

Taken together, the present thesis argues in favor of the AMPD and ICD-11 by leaving the rather artificial PD categories behind and reintroducing the idea of self- and interpersonal functioning as the core feature of PDs. This might enable clinicians to perceive the patient more holistically, with specific traits helping to identify individual problems. This may eventually contribute to more personalized and tailor-made treatments.

As a matter of fact, we have ignored the individual for far too long. It is time to look at the patient behind the disorder by bringing back into focus the original meaning of personality, namely “the subjective experience of what it means to be human” (Sharp & Wall, 2021, p. 1).

Chapter 6 – References

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