



A Lot of Warmth and a Bit of Control? How Parenting Mediates the Relationship Between Parental Personality and Their Children's Mental Health Problems

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Abstract

Research has identified parental personality and parenting behaviour as important contributors to healthy child development. However, indirect associations are largely unknown. The current study aimed to investigate the mediating role of parenting dimension relations between parental personality and adolescent mental health problems. The cross-sectional sample included 4258 German adolescents (48.7% male, 11–17 years) and one parent who participated in a national health survey (KiGGS Wave 2). The results underline and extend previous indications of direct associations between parental personality and their children's mental health problems by highlighting the adverse role of neuroticism. Furthermore, new insights are added regarding the mediating roles of parenting dimensions (i.e., warmth, behavioural control, and psychological control). Future efforts and parent-focused prevention programmes should be extended by parental personality to identify maladaptive parenting behaviour and thus contribute to the development of their children's mental health.

Keywords Externalizing problems · Internalizing problems · Adolescence · Parental personality · Parenting

Highlights

- Parental personality is indirectly related to adolescent mental health through parenting.
- Parental neuroticism and psychological control are associated with adolescent mental health problems.
- Parental conscientiousness and warmth are associated with adolescent mental health.
- Parental openness and agreeableness require more scientific attention.
- Further efforts are needed to provide preventive measures considering parental personality.

Childhood and adolescence are characterized by an increased vulnerability to mental health problems affecting approximately one-fourth of children and adolescents worldwide (Kieling et al., 2011, Klipker et al., 2018, Paus et al., 2008, Polanczyk et al., 2015). Mental health problems are commonly conceptualized as two broad dimensions of internalizing (directed mostly inwardly, e.g., depression and

anxiety) and externalizing problems (directed mostly outwardly, e.g., anger and aggression; Goodman et al., 2010). Already established problems remain relatively stable throughout childhood and adolescence and confer risk for a wide range of negative outcomes, including low achievement in school, delinquent behaviour, relationship difficulties, and poor well-being (Baumgarten et al., 2018, Patel et al., 2007, Picoito et al., 2021). Substantial research has shown that multiple factors elevate the risk for mental health problems in children and adolescents; more precisely, risk factors from the family domain, such as family dysfunction, parental psychopathology, parental personality and parenting style, are among the most important predictors of negative mental health outcomes (Bayer et al., 2019, Bayer et al., 2011, Evans et al., 2013, Göbel & Cohrdes, 2021, Wang et al., 2019). However, prior research results underscore the need for early prevention that

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effectively targets mental health risk factors for children and adolescents that can be addressed through parental education (e.g., Wang et al., 2019).

Parental Personality and Adolescent Mental Health Problems

Over the last decade, research has identified parental personality as an important contributor that may directly influence children's mental health development (Bertino et al., 2012, Nigg & Hinshaw, 1998, Ortiz Ruiz, 2018, Puff & Renk, 2016). For instance, Bertino et al. (2012) found a positive association between parental borderline and antisocial personality patterns and their children's externalizing behaviour problems, with stronger relationships for adolescents than for children. Most studies investigating parental personality and children's mental health have focused on parental neuroticism, which relates positively to psychosocial problems among their children (i.e., conduct disorders and hyperactivity) (Amrock & Weitzman, 2014, Nigg & Hinshaw, 1998, Prinzie et al., 2004, Sahithya & Raman, 2021).

Fewer studies concentrate on other personality dimensions of the well-known five-factor model of personality, which sufficiently described individual differences using five main factors: *neuroticism* (absence of emotional stability, e.g., frequent feelings of irritability and anger), *openness to new experiences* (e.g., curiosity, imagination), *conscientiousness* (e.g., self-discipline and duty), *extraversion* (e.g., outgoing, interpersonal contact), and *agreeableness* (e.g., altruism and empathy) (John et al., 2008). Whereas high neuroticism has been related to negative health practices and outcomes, opposite findings have been reported for high conscientiousness. Parents who rated themselves as more conscientious supported their children's behavioural adjustment (Oliver et al., 2009) and provided a beneficial parent–child interaction (Hong et al., 2015). Extraverted parents were more likely to have warm interactions with their children by displaying affection and love (Bornstein et al., 2011, Sahithya & Raman, 2021). One review by Belsky and Barends (2002) concludes that low parental neuroticism, high parental extraversion, and high parental conscientiousness are most likely beneficial for children's psychosocial development. More recent research has confirmed mothers' high extraversion and high conscientiousness, as significant predictors of children's mental health with lower internalizing problems (Ortiz Ruiz, 2018, Puff & Renk, 2016). However, inconclusive results have been documented for the association between parental agreeableness and openness to new experience and children's mental health (Nigg & Hinshaw, 1998, Oliver et al., 2009, Ortiz Ruiz, 2018, Prinzie et al., 2004).

Possible explanations for the relations between parental personality and children's mental health have been derived from stress reactivity (Bolger & Schilling, 1991) and attachment theory (Fraley & Shaver, 2008). Stress reactivity theory highlights the effect of personality on the way people approach and react to stressful situations and its influence on (mental) well-being (Bolger & Schilling, 1991, McCrae & Costa Jr, 2003, Wrosch & Scheier, 2003). Recent findings report evidence that parents with high neuroticism show higher psychological distress and react more negatively to their children's needs and problems (Mazza et al., 2020, Ortiz Ruiz, 2018). Parental feelings of anger, insecurity, and perceived powerlessness combined with poor emotion regulation (i.e., neuroticism) influences the relationship with their child, which in turn may predict behavioural problems (Mazza et al., 2020).

In contrast, attachment theory proposes that securely attached individuals are more likely to feel protected and belonging, and interact with others in a confident and open manner, as they seem to develop "promoting" characteristics such as positive affectivity, healthy autonomy, and resilience (Fraley & Shaver, 2008). Research supports this assumption by providing evidence for a positive association between insecure attachment and neuroticism or negative correlations with agreeableness and extraversion (Nofle & Shaver, 2006). Additionally, parents with paranoid personality traits may not be able to provide a secure environment and may expose children to significant psychological stress, hindering a positive attachment relationship (Bertino et al., 2012). According to Deb and McGirr (2015), parents' personality dispositions and nurturing care are essential for healthy mental child development.

Parenting and Adolescent Mental Health Problems

Evidence suggests that positive parent–child interactions lay a foundation for the development of child and adolescent mental health (Achtergarde et al., 2015, Göbel & Cöhrdes, 2021). As primary contacts, parents provide adequate resources, care, affection, and control to foster child and adolescent healthy development and adjustment (Anaya & Perez-Edgar, 2019, Buschgens et al., 2010, Steinberg & Silk, 2002). Within their role, parents are faced with the challenge of adjusting levels of control to fit their children's needs for self-definition and autonomy (Buschgens et al., 2010, Mastrotheodoros et al., 2018, Steinberg & Silk, 2002). Although the needs for autonomy and social relations outside the home increase in middle adolescence, the role of parents remains important at this stage, as indicated by evidence that positive parent–child relationships are

associated with fewer adolescent mental health problems (Hair et al., 2008, Moilanen et al., 2015).

The effect of parenting behaviours on child and adolescent mental health outcomes has been a focus of investigations for the last 20 years (Aunola & Nurmi, 2005, Bayer et al., 2019, Calders et al., 2020, Huver et al., 2010, Milevsky et al., 2006, Petito & Cummins, 2012, Pettit et al., 2001, Raboteg-Saric & Sakic, 2013). Parenting can be either characterized as situational behaviours or combinations of specific parenting behaviours (i.e., parenting styles; Baumrind, 1971) or as general parenting strategies (i.e., parenting dimensions; Calders et al., 2020). With a focus on parenting dimensions, previous research has identified an affective dimension comprising warmth and support (e.g., responsiveness, acceptance) and a disciplinary dimension that entails parental control (Prinz et al., 2009, Scaramella et al., 1999). Parental control can be subdivided into behavioural control (e.g., monitoring, setting limits) and psychological control (e.g., love withdrawal, guilt induction; e.g., Aunola & Nurmi, 2005, Barber et al., 1994, Pettit et al., 2001). High levels of parental warmth were associated with a positive development of adolescent mental health (Calders et al., 2020, Yap & Jorm, 2015). Evidence on the effects of behavioural control is more mixed regarding its association with children's mental health problems, which may be due to different approaches towards its operationalization (Calders et al., 2020). Nevertheless, the majority of findings suggest beneficial effects of parental behavioural control and warmth for children's mental health, self-esteem, quality of life, and life satisfaction (Garcia et al., 2020, Pettit et al., 2001, Raboteg-Saric & Sakic, 2013, Steinberg, 2001). As opposed to parental warmth and behavioural control, levels of parental psychological control are associated with externalizing (Mabbe et al., 2019, Pettit et al., 2001, Pinquart, 2017) as well as internalizing problems (Barber et al., 1994, Mabbe et al., 2019, Scaramella et al., 1999). A major knowledge gap constitutes the lack of studies investigating parental personality dimensions (i.e., Big Five), their interplay with children's mental health problems, and the role of parenting.

The Mediating Role of Parenting

According to the Belsky (1984) classic process model, parental characteristics (e.g., parents' personality) determine among other factors parenting behaviour which in turn influences children's mental health development (Hutchings & Lane, 2005). Parental personality has been identified "as an inner resource that affects parenting" (Prinz et al., 2009, p. 351) and the most important predictor to influence parenting styles (Sahithya & Raman, 2021, Vafaenejad et al., 2018).

Relatively few studies have examined the mediating role of parenting between parental personality and their children's mental health (Brook et al., 2002, Oliver et al., 2009, Prinz et al., 2004, Puff & Renk, 2016). For instance, studies indicate that parental neuroticism is linked to disrupted discipline, which in turn predicts problem behaviours in adolescence (Brook et al., 2002, Prinz et al., 2004). In contrast, parents who are high on extraversion show more responsive and encouraging parenting behaviour (Puff & Renk, 2016). According to the longitudinal study by Oliver et al. (2009), parents high in conscientiousness are more likely to set limits (i.e., behavioural control); this, in turn, was related to fewer externalizing problems in adolescence. Agreeableness, openness to experience, and conscientiousness were associated with a parenting style related to high warmth and control (Vafaenejad et al., 2020). However, those studies mainly focused on parental behavioural control rather than psychological control. Although literature emphasizes the importance of parental personality and its influence on children's development, too little attention in empirical research was directed towards parenting quality (Bahrami et al., 2018, Puff & Renk, 2016, Sahithya & Raman, 2021). Foremost, we need to understand the factors influencing parenting in order to develop prevention and intervention programmes targeting child mental health outcomes (Gölcük & Berument, 2019). The current study extends the limited literature by examining the links between parental personality traits and parenting dimensions and adolescents' mental health. Based on the aforementioned research, we hypothesized that high parental neuroticism is related to a higher risk of adolescent mental health problems. Furthermore, we expected high parental conscientiousness and extraversion to be related to fewer adolescent mental health problems differentiated between internalizing and externalizing problems. In addition, the current study explored relations between parental openness and agreeableness and adolescent mental health problems.

Second, we hypothesized that parenting characterized by warmth and support as well as by behavioural control are associated with fewer adolescent mental health problems, whereas high psychological control is associated with a higher risk of adolescent externalizing and internalizing problems.

Finally, we hypothesized that parental personality is indirectly linked to adolescent mental health through parenting dimensions. More precisely, we expected parenting characterized by behavioural control to partially mediate the relationship of parental conscientiousness and neuroticism with their children's mental health problems. To address current research gaps, we also explored the mediating roles of two other parenting dimensions (i.e., warmth, psychological control) on the association between parents' personality and their children's mental health problems.

Methods

Sample and Procedure

These study data are part of the German Health Interview and Examination Survey for Children and Adolescents (KiGGS), a health-monitoring system established at the Robert Koch Institute. The KiGGS cross-sectional survey was conducted between 2014 and 2017 at 167 sample points across Germany (KiGGS Wave 2). KiGGS Wave 2 used a nationally representative probability sample of 15,023 children and adolescents (49.8% male) aged 0–17 years. A detailed description of the survey methodology can be found in Mauz et al. (2017) and Lange et al. (2018). In brief, one parent (82.5% mothers) of the recruited children and adolescents provided information on a wide spectrum of health-relevant topics. KiGGS Wave 2 was conducted in accordance with the data protection provisions set out in the Federal Data Protection Act, and the Hannover Medical School's Ethics Committee approved the study (No 2275-2014). The present analyses are based on a subsample of 4258 adolescents (48.7% male) ranging in age from 11 to 17 years ($M = 14.0$ years, $SD = 2.0$) and one parent. Written informed consent was obtained from the parents.

Measures

Adolescent mental health problems

A parent completed the validated German version of the 25-item Strength and Difficulties Questionnaire (Goodman, 1997, Klasen et al., 2000) for their adolescent child. Items are rated from 0 (not true) to 2 (certainly true), and responses indicate mental health problems in various contexts. Scores on the subscales “emotional problems” (e.g., often unhappy) and “peer problems” (e.g., bullied by others) were combined to indicate internalizing problems (SDQint), and scores on the subscales “conduct problems” (e.g., lies or cheats frequently) and “hyperactivity” (e.g., restless, overactive) were combined to indicate externalizing problems (SDQext), as suggested by previous theoretical and empirical evidence (see Goodman et al., 2010). Cutoff scores of >7 (SDQint) and >9 (SDQext) were used to generate two categorical variables, indicating 0 = no mental health problems and 1 = mental health problems, as indicated by German norm values (Woerner et al., 2004). Cronbach's alpha, as an indicator for the internal consistency of scales, was 0.78 for SDQext and 0.73 for SDQint.

Parental personality

Personality traits were measured using items on the “Big Five” dimensions of openness to new experience (O),

conscientiousness (C), extraversion (E), agreeableness (A), and neuroticism (N) (German version of the BFI-10; Rammstedt & John 2007); each scale is represented by two items. Responses were rated on a 5-point scale from 1 (not at all) to 5 (totally) and summarized to a total score for each subscale. Rammstedt and John (2007) showed good validity of the 10-item BFI personality inventory, as suggested by replication of the factorial structure and average correlations of 0.69 with the NEO-PI-R personality scales. Interitem correlations in the present study were $r = 0.31$ ($p < 0.001$) for openness, $r = 0.29$ ($p < 0.001$) for conscientiousness, $r = 0.51$ ($p < 0.001$) for extraversion, $r = 0.27$ ($p < 0.001$) for agreeableness, and $r = 0.26$ ($p < 0.001$) for neuroticism.

Parenting dimensions

One parent completed a 27-item inventory to measure parenting dimensions (ZKE; Reitzle et al., 2001) rated from 0 (not at all) to 3 (completely true). The inventory is composed of three subscales: “warmth and support” (hereafter referred to as warmth; 12 items; e.g., “I respect my child's opinion even if I have another opinion”), “rules and behavioural control” (hereafter referred to as behavioural control; six items; e.g., “I always want to be asked before my child goes out”), and “psychological control” (nine items; e.g., “I often want to change something about my child”). A mean score for each subscale was created for the analysis. Cronbach's alpha for warmth was 0.88, for behavioural control 0.72, and for psychological control 0.74.

Parental socioeconomic status (SES)

The SES represents an index score developed by Lampert et al. (2014). The index is built on the basis of three components that were assessed from the parents: the education qualification index (International Comparative Analysis of Social Mobility in Industrial Nations classification CAS-MIN; Brauns et al., 2003), the occupational status index (International Socio-Economic-Index of Occupational Status ISEI; Ganzeboom & Treiman, 2003), and net equalized income (according to the federal government's poverty and wealth reporting guidelines and the recommendations for reporting on social cohesion in Europe). In the present analyses, SES was used as a distribution-based variable containing three categories that reflect the ranking of children by the social status of the households in which they live: low (lower quintile), medium (second to fourth quintile), and high (upper quintile; see in more detail in Lampert et al., 2014). In the present sample, 11.6% of children and adolescents had a low SES (95% CI, 10.7 to 12.6), 66.3% (95% CI, 64.9 to 67.7) a moderate SES, and 22.1% (95% CI, 20.9 to 23.3) a high SES.

Parental well-being

One parent answered the 8-item adult Personal Well-Being Index (PWI-A; Cummins et al., 2003), which comprises questions on satisfaction with the following quality of life domains: standard of living, health, life achievement, personal relationships, personal safety, community connectedness, future security, and spirituality/religion. Responses were rated using a scale from 0 to 10 and were summarized to a total score. Cronbach's alpha was 0.88.

Statistical Analyses

Analyses were conducted in two steps. First, means or proportions, confidence intervals, and bivariate correlation analyses were obtained for all variables: sociodemographic characteristics, mental health problems (SDQint, SDQext), parental personality (OCEAN), and parenting dimensions (warmth, behavioural control, and psychological control). Second, we calculated a path model testing the associations between parental personality and parenting dimensions and adolescent mental health problems. Additionally, we examined the mediating roles of parenting dimensions on the associations between parents' personalities and their children's mental health problems. Adolescents' age, sex, parental SES, and well-being were treated as control variables.

We performed structural equation modelling (SEM) to fit the proposed structural model to the data using the software package Mplus 7 (Muthén & Muthén, 2011). The two categorical outcomes (SDQint, SDQext) were estimated using weighted least squares estimation with a mean- and variance-adjusted (WLSMV) estimator. The indirect effects were modelled with the MODEL INDIRECT option. The significance of the indirect effects was determined using bias-corrected bootstrap 90% *Cis* (MacKinnon et al., 2004). Confidence intervals that did not include zero indicated mediating effects. To further analyse the indirect effects, we calculated the standardized indirect effect for each association (Preacher & Kelley, 2011) and the proportion of the total effect explained by the indirect effect (PEID). The PEID is indicated by the product of standardized beta coefficients of the direct paths from parental personality on parenting and parenting on adolescent mental health problems divided by the total effect from parental personality on adolescent mental health problems.

Due to its sensitivity to sample size, the significance of the chi-square test does not provide useful information on model fit, and other measures need to be considered (Kenny, 2020, Kline, 2015). As recommended by Hu and Bentler (1999), several well-established indices with values indicating a good model fit were estimated; a comparative fit index (*CFI*) and Tucker-Lewis index (*TLI*) above 0.90,

and a root mean square error of approximation (*RMSEA*) less than or equal to 0.06, indicate acceptable fit. Mplus incorporates all cases, including those missing at random, using the full information maximum likelihood (*FIML*) approach. Missing data for the predictor variables were at maximum 5.2% (extraversion).

Results

Table 1 shows the means or proportions, confidence intervals, and bivariate correlation analyses obtained for mental health problems (SDQint, SDQext), parental personality (OCEAN), parenting dimensions (warmth, behavioural control, and psychological control), and control variables.

The results from SEM analyses indicated excellent fit of the proposed model to the present data, $\chi^2 = 3151.75$ ($p < 0.001$), $CFI = 1.00$, $TLI = 1.00$, $RMSEA < 0.01$, $R^2 = 0.39$. We calculated a second model that also included age and sex interactions with parenting dimensions on adolescent mental health. However, the inclusion of interaction terms did not contribute to a better fit of the model. In contrast, the interaction model displayed poor fit, $\chi^2 = 40913.96$ ($p < 0.001$), $CFI = 0.27$, $TLI = -1.38$, $RMSEA = 0.74$, $R^2 = 0.28$.

As shown in Fig. 1, adolescent internalizing problems were directly associated with high parental neuroticism and low conscientiousness as well as extraversion. Unexpectedly, adolescent externalizing problems were directly associated only with low parental conscientiousness. No direct link was found for agreeableness or openness to new experience.

Parenting characterized by warmth was related to fewer adolescent externalizing problems, while parental behavioural control was related to fewer internalizing problems but not vice versa. However, parents who exhibited more psychological control showed a higher risk of adolescent externalizing and internalizing problems. Overall, relations between parent personality and parenting dimensions with adolescent mental health problems were relatively small (e.g., conscientiousness and SDQint, $\beta = 0.06$) to moderate (e.g., psychological control and SDQext, $\beta = 0.31$).

All five personality dimensions were linked to parental warmth, whereby four characteristics except openness to new experience were associated with behavioural control. Psychological control was related to neuroticism, openness to new experience, agreeableness and conscientiousness.

Furthermore, each of the five parental personality traits showed indirect relations with adolescent mental health, mediated by each of the three parenting dimensions. Whereas parental personality was directly and indirectly linked (i.e., partial mediation) to adolescent internalizing problems there were only indirect associations between parental personality and adolescent externalizing problems

Table 1 Correlations and descriptive statistics for child and adolescent sociodemographic factors, mental health problems, parental personality, and parenting

	Sociodemographic				SDQ ^a				Parental personality ^b				Parenting dimensions ^c			
	1	2	3	4 ^d	5	6	7	8	9	10	11	12	13	14		
<i>Sociodemographic</i>																
1 Age	1															
2 Sex	0.04**	1														
3 Parental SES	-0.02	0.01	1													
4 Parental WB	<-0.01	<-0.01	0.20**	1												
<i>SDQ</i>																
5 SDQint	-0.02	0.04**	-0.09**	-0.19**	1											
6 SDQext	-0.09	-0.12**	-0.06**	-0.12**	0.16**	1										
<i>Parental personality</i>																
7 O	0.02	-0.02	-0.14**	-0.07**	0.01	0.03	1									
8 C	0.01	0.01	-0.04**	0.16**	-0.07**	-0.08**	-0.09**	1								
9 E	<0.01	0.01	0.06**	0.24**	-0.11**	-0.04**	-0.19**	0.19**	1							
<i>Sociodemographic</i>																
10 A	<-0.01	<-0.01	0.05**	-0.08**	0.02	0.03*	0.05**	-0.07**	-0.06**	1						
11 N	-0.02	0.01	-0.2	-0.31**	0.14**	0.07**	0.08**	-0.09**	0.05**	-0.19**	1					
<i>Parenting dimensions</i>																
12 Warmth	-0.08**	0.04**	0.06**	0.21**	-0.10**	-0.17**	-0.19**	0.15**	-0.06**	-0.12**	-0.04	1				
13 Behavioural control	-0.26**	0.03*	-0.07**	0.04**	-0.01	0.06**	-0.04**	0.17**	0.08**	0.05**	0.02	0.21**	1			
14 Psychological control	-0.13**	-0.02	-0.10**	-0.21**	0.19**	0.29**	0.08**	-0.19**	-0.08**	0.13**	0.21*	-0.31**	0.25**	1		
<i>Descriptive statistics</i>																
<i>M</i>	14.0	-	-	54.8	21.2	14.2	5.2	8.5	7.0	5.3	5.8	28.9	13.2	5.7		
<i>95% CI</i>	13.9–14.1			54.5–55.1	20.0–22.4	13.3–15.2	5.2–5.3	8.4–8.5	6.9–7.0	5.2–5.3	5.8–5.9	28.8–29.0	13.1–13.3	5.6–5.8		

Notes. *M* mean, *CI* confidence interval, *WB* well-being, *SDQint* internalizing problems, *SDQext* externalizing problems, *O* openness, *C* conscientiousness, *E* extraversion, *A* agreeableness, *N* neuroticism

**p* < 0.05

***p* < 0.01

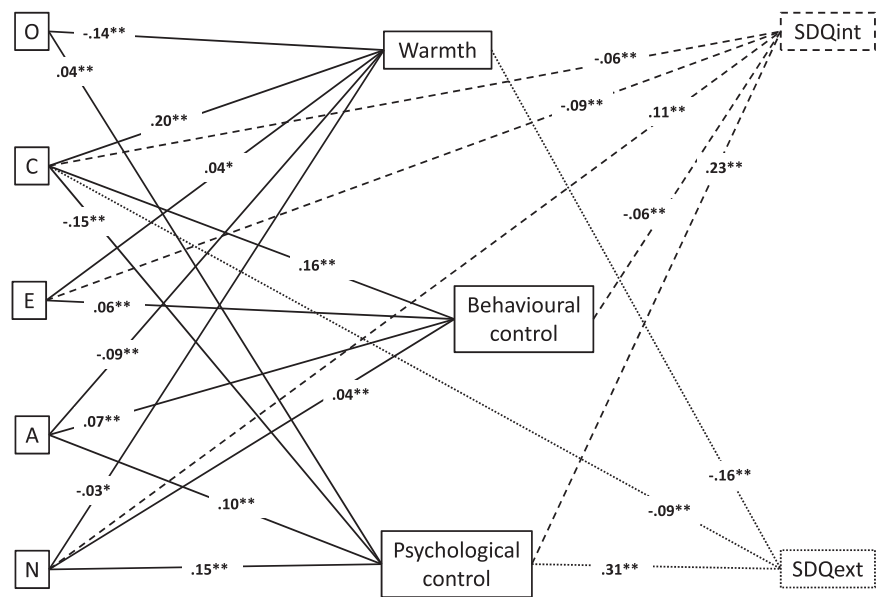
^aproportions

^bscore (2 = min, 10 = max)

^cscore (0 = min, 36 = max for warmth, 18 = max for behavioural control, 27 = max for psychological control)

^dscore (1 = min, 70 = max)

Fig. 1 Standardized coefficients from SEM showing *total effects* of parental personality (OCEAN) and parenting dimensions (warmth, behavioural control, and psychological control) on adolescent internalizing (SDQint; long-dashed lines) and externalizing problems (SDQext; short-dashed lines). Only significant paths are shown and marked by ** $p < 0.01$ and * $p < 0.05$. Age, sex, parental SES, and parental well-being are not shown in the figure but were included as covariates in the analyses. Model fit indices: $\chi^2 = 3151.75$, $p < 0.001$, $CFI = 1.00$, $TLI = 1.00$, $RMSEA < 0.01$, $R^2 = 0.39$



indicating full mediation by parenting, except for conscientiousness (Table 2). Figure 2 displays the proportions of total effects explained by the indirect effects (PEID). As a result of additional analyses of each indirect association, when mediated by parental behavioural control, conscientiousness ($\beta = -0.01$, $SE = 0.003$, $p < 0.001$), extraversion ($\beta = -0.03$, $SE = 0.001$, $p = 0.009$), and neuroticism ($\beta = -0.02$, $SE = 0.001$, $p = 0.018$) showed negative associations with adolescent internalizing problems, whereas agreeableness showed a positive association ($\beta = 0.03$, $SE = 0.001$, $p = 0.004$). Openness to new experience was not associated with adolescent mental health problems via behavioural control. The proportions of the total effect explained by the indirect effect (PEID) were 9.6%, 4.0%, 3.0%, and 4.2%, respectively.

In contrast, parental warmth partly mediated the association between parents' personality and their children's externalizing problems but not their internalizing problems. While high levels of parental conscientiousness ($\beta = -0.03$, $SE = 0.003$, $p < 0.001$, PEID = 32.0%), and extraversion ($\beta = -0.01$, $SE = 0.002$, $p = 0.008$, PEID = 6.4%) were indirectly related to a lower risk of adolescent externalizing problems via parental warmth, the opposite pattern was found for high levels of openness ($\beta = 0.03$, $SE = 0.001$, $p = 0.004$, PEID = 7.5%), agreeableness ($\beta = 0.01$, $SE = 0.003$, $p < 0.001$, PEID = 14.4%), and neuroticism ($\beta = 0.01$, $SE = 0.002$, $p = 0.029$, PEID = 4.8%).

Parental psychological control mediated the association between parents' personality (except extraversion) and their children's internalizing and externalizing problems (Fig. 2). While high parental conscientiousness was related to fewer adolescent internalizing ($\beta = -0.03$, $SE = 0.004$, $p < 0.001$, PEID = 34.5%) and externalizing problems ($\beta = -0.05$,

$SE = 0.004$, $p < 0.001$, PEID = 71.3%) via parental psychological control, the opposite pattern was found for high levels of openness ($\beta = 0.01$, $SE = 0.004$, $p = 0.006$, PEID = 4.1% for externalizing and $\beta = 0.01$, $SE = 0.003$, $p = 0.007$, PEID = 18.4% for internalizing problems), agreeableness ($\beta = 0.03$, $SE = 0.005$, $p < 0.001$, PEID = 71.3% for externalizing and $\beta = 0.02$, $SE = 0.004$, $p < 0.001$, PEID = 23.0% for internalizing problems), and neuroticism ($\beta = 0.04$, $SE = 0.005$, $p < 0.001$, PEID = 46.5% for externalizing and $\beta = 0.03$, $SE = 0.004$, $p < 0.004$, PEID = 4.3% for internalizing problems).

Discussion

This study's objective was to provide a comprehensive overview of associations between various dimensions of parental personality and the mental health problems of adolescents. Additionally, new insights were anticipated for the explanatory role of parenting dimensions. The main aim was to derive recommendations for preventive public health measures.

Parental Personality and Adolescent Mental Health Problems

In accord with previous findings and our predictions, high parental neuroticism was associated with a higher risk of adolescent mental health problems (Nigg & Hinshaw, 1998, Oliver et al., 2009, Prinzie et al., 2004, Sahithya & Raman, 2021), although solely applying to internalizing problems. Following theoretical assumptions, associations between high neuroticism and mental health problems can be

Table 2 Direct, indirect and total effects (standardized beta coefficients, standard error) from parental personality and parenting dimensions on child and adolescent mental health problems resulting from SEM

	Direct effect β (SE)	Indirect effect β (SE)	Total effect β (SE)
<i>Internalizing problems</i> ($R^2 = 0.14$)			
Openness	−0.05* (0.024)	0.01* (0.005)	−0.04 (0.023)
Conscientiousness	−0.01 (0.023)	−0.04** (0.007)	−0.06** (0.022)
Extraversion	−0.09** (0.023)	<0.01 (0.004)	−0.09** (0.024)
Agreeableness	−0.01 (0.022)	0.02** (0.005)	0.01 (0.022)
Neuroticism	0.08** (0.024)	0.03** (0.005)	0.11** (0.023)
Warmth	–	–	−0.01 (0.024)
Behavioural control	–	–	−0.06** (0.025)
Psychological control	–	–	0.23** (0.023)
Age	–	–	−0.02 (0.022)
Sex	–	–	0.07** (0.021)
Parental SES	–	–	−0.07** (0.022)
Parental well-being	–	–	−0.15** (0.021)
<i>Externalizing problems</i> ($R^2 = 0.24$)			
Openness	−0.03 (0.025)	0.04** (0.007)	0.01 (0.026)
Conscientiousness	−0.01 (0.024)	−0.08** (0.009)	−0.09** (0.024)
Extraversion	0.01 (0.026)	0.01 (0.006)	0.03 (0.027)
Agreeableness	−0.01 (0.026)	0.05** (0.006)	0.03 (0.027)
Neuroticism	0.01 (0.026)	0.05** (0.007)	0.06 (0.026)
Warmth	–	–	−0.16** (0.025)
Behavioural control	–	–	−0.01 (0.026)
Psychological control	–	–	0.31** (0.024)
Age	–	–	−0.12** (0.022)
Sex	–	–	−0.18** (0.022)
Parental SES	–	–	−0.04 (0.024)
Parental well-being	–	–	−0.11** (0.022)
<i>Warmth</i> ($R^2 = 0.13$)			
Openness	–	–	−0.14** (0.015)
Conscientiousness	–	–	0.20** (0.016)
Extraversion	–	–	0.04* (0.016)
Agreeableness	–	–	−0.09** (0.015)
Neuroticism	–	–	−0.03* (0.016)
Age	–	–	−0.08** (0.014)
Sex	–	–	0.04** (0.014)
Parental SES	–	–	0.04* (0.015)
Parental well-being	–	–	0.13** (0.019)
<i>Behavioural control</i> ($R^2 = 0.11$)			
Openness	–	–	−0.03 (0.016)
Conscientiousness	–	–	0.16** (0.016)
Extraversion	–	–	0.06** (0.015)
Agreeableness	–	–	0.07** (0.015)
Neuroticism	–	–	0.04** (0.016)
Age	–	–	−0.26** (0.015)
Sex	–	–	0.03 (0.014)
Parental SES	–	–	−0.09** (0.015)
Parental well-being	–	–	0.04* (0.017)

Table 2 (continued)

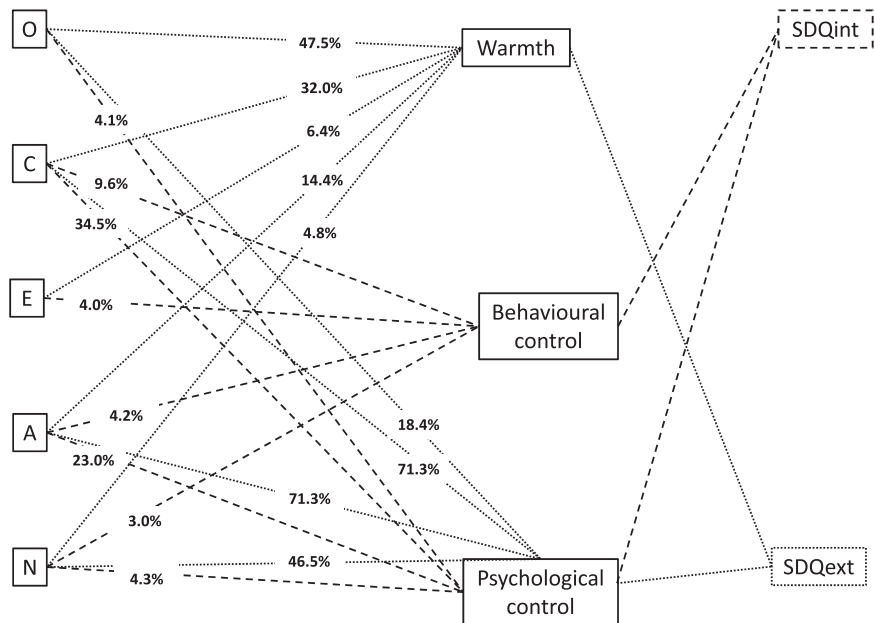
	Direct effect β (SE)	Indirect effect β (SE)	Total effect β (SE)
<i>Psychological control</i> ($R^2 = 0.13$)			
Openness	–	–	0.04* (0.016)
Conscientiousness	–	–	–0.15** (0.016)
Extraversion	–	–	0.03 (0.016)
Agreeableness	–	–	0.10** (0.015)
Neuroticism	–	–	0.15** (0.015)
Age	–	–	–0.12** (0.014)
Sex	–	–	–0.03* (0.014)
Parental SES	–	–	–0.07** (0.016)
Parental well-being	–	–	–0.13** (0.017)
<i>Covariance</i>			
SDQint & SDQext	–	–	0.37** (0.032)
Warmth & behavioural control	–	–	0.17** (0.016)
Warmth & psychological control	–	–	–0.25** (0.017)
Behavioural & psychological control	–	–	0.26** (0.014)

Notes. Sex is coded with male as the reference category (female = 50.9% CI = 49.4–52.3) and parental socioeconomic status (SES) with low as the reference category. β = Standardized beta coefficient; SE Standard error. $\chi^2 = 3151.75, p < 0.001, CFI = 1.00, TLI = 1.00, RMSEA < 0.01, R^2 = 0.39$

* $p < 0.05$

** $p < 0.01$

Fig. 2 Standardized coefficients from SEM showing *indirect effects* of parental personality (OCEAN) and parenting dimensions (warmth, behavioural control, and psychological control) on adolescent internalizing (SDQint; long-dashed lines) and externalizing problems (SDQext; short-dashed lines). Only significant paths are shown and marked by ** $p < 0.01$ and * $p < 0.05$. Age, sex, parental SES, and parental well-being are not shown in the figure but were included as covariates in the analyses. Model fit indices: $\chi^2 = 3151.75, p < 0.001, CFI = 1.00, TLI = 1.00, RMSEA < 0.01, R^2 = 0.39$



explained by a frequent and disproportionately high negative reactivity towards stressful events (i.e., stress reactivity theory, Bolger & Schilling, 1991, Mazza et al., 2020, Ortiz Ruiz, 2018). More frequent negative life events, maladaptive emotional coping strategies, and overreactivity in

response to stress have been identified as mechanisms by which neurotic parents supposedly create a stressful and insecure environment lacking support and stress regulation competency and therefore linked to children’s mental health problems (Ellenbogen & Hodgins, 2004). In this light, the

present finding that adolescent internalizing problems are more affected by parental neuroticism than externalizing problems seems plausible. In conclusion, future studies should include stress reactivity and regulation competency to yield further explanatory evidence.

Moreover, as expected, the results indicated that adolescents with parents high in conscientiousness had fewer externalizing problems, while a parental personality high in extraversion showed adolescents with fewer internalizing problems but not vice versa. Low conscientiousness has been discussed as indicative of poor mental health, owing to a vulnerability towards negative self-perceptions, low self-efficacy, and poor coping abilities (Kotov et al., 2010). Hence, strengthening competencies that enable parents to deal with challenging life events and to develop a positive self-image are not only key factors for their own mental health and health behaviour in daily life but may also help to promote the mental health of their children (Bolger & Schilling, 1991, Wrosch & Scheier, 2003).

High parental extraversion may be particularly beneficial for adolescent emotional well-being and social relations with peers, as suggested by lower internalizing problems (e.g., Ortiz Ruiz, 2018). This mechanism is still not fully explored, but it has been hypothesized that extraverts may react more positively to social situations that contribute to greater mental health, even after controlling for the amount of social contact (Diener et al., 1992, Lucas et al., 2008). More research is needed to clarify how strong parental extraversion correlates with the extraversion levels of their children and whether this correlation explains the findings on adolescent social and emotional well-being that may be mediated via behavioural factors.

Parental openness to new experience and agreeableness were directly associated with rather adverse parenting (low parental warmth and high psychological control) but not with child mental health problems. However, results showed several indirect associations with adolescent internalizing and externalizing problems. Interpreting these findings is difficult due to the few and mixed findings, so far. Whereas some studies found positive associations between parental openness or agreeableness and their children's externalizing problems others found the opposite pattern (Nigg & Hinshaw, 1998, Oliver et al., 2009, Prinzie et al., 2004). Possible explanatory approaches are close relationships between openness and sensation seeking (Nigg & Hinshaw, 1998) or agreeableness and inconsistent parenting (i.e., laxness followed by overreaction; Prinzie et al., 2004) but require further scientific attention.

Parenting and Adolescent Mental Health Problems

As predicted, parenting characterized by warmth was related to fewer adolescent externalizing problems. Additionally,

high levels of parental behavioural control were related to fewer adolescent internalizing problems but not externalizing problems. In contrast, parental psychological control was related to a higher risk of externalizing and internalizing problems in adolescents.

Thus, the present findings substantiate previous indications of a positive association between parental warmth and adolescent psychological adjustment and coping, as well as parents' behavioural control and their children's self-regulation and compliance, which lead to better mental health (Aunola & Nurmi, 2005, Barber et al., 1994, Buschgens et al., 2010, Solomon, 2000, Yap & Jorm, 2015). The combination of both parenting dimensions (i.e., warmth and behavioural control) has been proposed as particularly supportive of adolescent mental health by different studies (this combination has been termed "authoritative parenting"; Calders et al., 2020, Steinberg, 2001). Moreover, the results highlight the magnitude of parental psychological control on different aspects of adolescent mental health (Buschgens et al., 2010). Parental psychological control is characterized by non-responsiveness to a child's psychological needs and discouragement of autonomous thinking or acting. It has adverse effects on adolescents' mental health, as it disrupts the development of autonomy and behaviour becomes shaped by external demands rather than being self-determined (Barber et al., 1994, Steinberg & Silk, 2002).

Although the direction of causality is not yet clear, the present findings support prior theoretical assumptions (Belsky, 1997) and empirical evidence (e.g., Bayer et al., 2019, Gölcük & Berument, 2019, Hutchings & Lane, 2005) regarding the relationship between parenting and child mental health. This is particularly important with respect to the fact that parenting behaviours, in contrast to other risk factors, can be addressed by public health measures (Achtergarde et al., 2015).

The Mediating Role of Parenting

The present results suggest that parenting dimensions explain a significant proportion of the variance in associations between parents' personality and their children's mental health problems. In line with previous findings, the analyses showed indirect effects via parental behavioural control on adolescent mental health problems, but they were limited to internalizing problems (Bayer et al., 2019, Oliver et al., 2009, Prinzie et al., 2004). One possible explanation includes the different operationalization of parental behavioural control; one can differentiate between "proactive control" (e.g., parents establish rules and limitations to facilitate desired child behaviour) and "reactive control" (e.g., punishment in reaction to undesired child behaviour; Calders et al., 2020). The latter is supposed to negatively

affect adolescent externalizing problems (Calders et al., 2020). In the present study, the operationalization of parental behavioural control represents proactive control rather than reactive control, and its absence may have influenced children's internalizing problems but not externalizing problems. More research is needed to disentangle different facets of parental control and their associations with different mental health outcomes.

Furthermore, the present findings support and extend previous research on the positive effect of parental conscientiousness and extraversion on adolescents' mental health, which can be explained by parental warmth as well as behavioural control (Lucas et al., 2008, Oliver et al., 2009). The results replicated negative associations between parental neuroticism as well as psychological control and adolescent mental health and highlighted their mutually reinforcing negative effect (Prinz et al., 2004, Yap & Jorm, 2015). Overall, combinations of parental conscientiousness and neuroticism with parental warmth and psychological control explained noticeable variance (> 30%) in adolescent mental health compared to the other mediation effects. For instance, we found an indirect effect between parental agreeableness and adolescent mental health problems mediated via high parental psychological control as well as low parental warmth (explained variance was less than 15%).

In conclusion, based on the present findings, high parental agreeableness may manifest in adverse parenting behaviour and therefore seems to be a reasonable factor for developing intervention measures with a focus on parenting. However, findings regarding the role of agreeableness are still inconclusive, although results from a longitudinal study highlight parental agreeableness and extraversion for child mental health as relevant parental characteristics (de Haan et al., 2012). Hence, specific combinations of parental personality and parenting dimensions need further investigation.

Limitations

Some study limitations should be considered when interpreting these findings. First, cross-sectional data were used, which eliminated the possibility of drawing conclusions about developmental changes during adolescence, for instance, changes in levels of perceived autonomy or parental adjustment of behavioural control. Consequently, the findings cannot be used to explain causal pathways. Second, mother and father reports were not equally balanced in the present data (82.5% were mothers) due to the KiGGS sampling procedure aimed at only one parent of the recruited adolescent. Future studies should differentiate between mothers' and fathers' parenting behaviour to investigate the separate effects of psychological control (e.g., Deb & McGirr, 2015). Additionally, different personality constellations between parents

and mother–father interactions may also play a role in adolescent mental health and should be considered in future work. Another limitation refers to the use of the short 10-item BFI personality inventory, which reflects only a broad indication of the five distinct personality dimensions. Finally, the study results are based on a large sample of the German population but cannot be generalized to other cultural contexts (external validity) and show a lack of real-time reports or behavioural approaches (ecological validity).

Practical Implications

The present results support the association between parental personality and parenting behaviour related to adolescent mental health and thereby offer entry points for public mental health interventions. More precisely, the results can add value to existing prevention and early intervention programmes targeting parents by considering the role of parental personality in parenting behaviour and its effect on their children's mental health. The current research found indications for high parental conscientiousness and extraversion as potentially supportive factors for adolescent mental health in combination with high parental warmth and behavioural control as well as low psychological control. In contrast, high parental neuroticism and psychological control increase the risk of adolescent mental health problems. In addition, parenting characterized by behavioural control seems more relevant for the prevention of adolescent internalizing problems, whereas parental warmth may support the prevention of externalizing problems.

Interventions focusing on parenting skills outside the clinical setting (e.g., how to use clear and calm instructions, logical consequences for misbehaviour) have gained more attention and often target parents or parents with their children (Medlow et al., 2016, Tarver et al., 2014). For instance, the Positive Parenting Programme (Triple P; Sanders et al., 2014, Sanders et al., 2000) aims to prevent and offer treatment for children's behavioural and emotional problems. Moreover, the Strengthening Families Programme (SFP; Kumpfer & Magalhães, 2018, Kumpfer et al., 1996) focuses on prevention and intervention with children at risk of substance abuse and delinquency. On the other hand, community-based parent interventions working with parents' personality are not yet well investigated and far from implemented, although the first suggestions on how to integrate parental personality into parental education programmes have already been published (Achtergarde et al., 2015). Hereby, Achtergarde et al. (2015) formulated basic questions focusing on child temperament (“What do children need from their parents according to their temperament?”), parental personality (“What do parents need to improve their parenting according to their personality?”), interfering fit (“What to do when parent and child do not fit

together in terms of temperament and personality?”), and possible answers (e.g., in cases of high extraversion, parents may profit from “social feedback” and “group training”) to help guide individually tailored parental interventions. Universal or indicated prevention programmes targeting parenting skills in consideration of personality traits may be effective in reducing adolescent mental health problems to some extent. For instance, raising awareness and knowledge about maladaptive mechanisms may be a good entry point.

Current directions within personality psychology research suggest that personality traits show both continuity and change related to life transitions and important events over the life course (Wrzus & Roberts, 2017). In addition, several clinical studies show how personality changes in response to interventions, especially neuroticism, are subject to variation, followed by extraversion (see meta-analysis by Roberts et al., 2017). Additionally, personality interventions can have surprisingly rapid effects; both short- and long-term personality changes have been reported after only eight weeks of intervention (Roberts et al., 2017).

In conclusion, the present findings suggest that prevention measures addressing the general population may not be as efficient as indicated prevention (see recent meta-analysis by Leijten et al., 2019). Thus, further efforts are needed to include parental personality in existing programmes and to identify other unconsidered factors for universal prevention approaches that help parents recognize problematic personality mechanisms at an early stage, change maladaptive parenting behaviour, and thereby contribute to the healthy development of their children.

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