education sciences

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Homework-Related Parental Emotions Scale (PES-Home): Development, Validation, and Links to Personality Traits

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Abstract

Educational success is shaped by students' social background, making parental support with homework particularly important for younger learners. Beyond instructional help, the emotional quality of this support may influence parent–child interactions and, in turn, students' outcomes. However, little is known about the emotions that parents experience during homework support or how these emotions relate to parents' personality traits. Therefore, the present study surveyed N = 903 parents (M_{Age} = 42.40, SD = 5.60; 87.4% female, predominantly mothers) of sixth-grade students using the newly developed Homework-Related Parental Emotions Scale (PES-Home) to assess parents' emotions during homework support. In addition, parents reported personality traits of openness and extraversion as well as further individual characteristics (gender, age, marital status, number of children at home, educational attainment, and weekly working hours). The results of the exploratory and confirmatory factor analyses indicate that the PES-Home scales exhibit sound psychometric properties and reliably capture the three emotions of enjoyment, anxiety, and anger. Bivariate correlations and findings of a path model reveal significant links between parents' emotions and their openness, extraversion, and additional individual characteristics. Specifically, higher educational attainment, more children in the household, and longer working hours are each associated with less favorable emotional experiences during homework support. Our findings highlight that research on parental homework support is still at an early stage and requires further investigation.

Keywords: parents' emotions; homework support; personality traits; PES-home; factor analysis

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Academic Editor: Izhar Oplatka

Received: 26 March 2026
Revised: 16 June 2026
Accepted: 24 June 2026
Published: 27 June 2026

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1. Introduction

In Germany, children's educational success depends strongly on their social background and status (OECD, 2023; Quenzel & Hurrelmann, 2019). One pathway linking social background to educational outcomes is parental engagement in children's schooling, which is particularly consequential for students' educational trajectories (Jeynes, 2017; Moroni et al., 2015). Parental support with homework is correspondingly important, especially for younger students (Moroni et al., 2015, 2016). This relevance became particularly evident during the COVID-19 restrictions, when learning shifted into the home environment (Holtgrewe et al., 2020; Huber & Helm, 2020). While household conditions and

available resources shaped distance learning (Huber & Helm, 2020), socially disadvantaged families tend to have fewer resources and provide less support (Holtgrewe et al., 2020). Although parental involvement—defined as parents' school- and education-related activities (Jeynes, 2007)—has been widely examined (e.g., Kim, 2022; Tan et al., 2020), parental homework support as a core component of involvement has received comparatively less direct attention, with mixed findings that vary by study design and indicators used (Moroni et al., 2015).

Beyond organizational aspects of support, parents' emotions during homework interactions shape the quality of parent–child exchanges and, in turn, children's emotions (Moè & Katz, 2018). Such emotional reactions may partly stem from stable personality traits, as personality psychology posits that individuals are predisposed to characteristic emotional response patterns (McCrae & Costa, 2008). Yet, evidence on which emotions parents experience while helping with homework—and how these emotions relate to personality—is scarce, partly due to the lack of dedicated measurement instruments. Therefore, the present study validates the newly developed Homework-Related Parental Emotions Scale (PES-Home), an adaptation of the Teachers' Emotions Scale (TES; Frenzel et al., 2013, 2016) for use with parents, assessing three basic emotions: joy, anger, and anxiety. In addition, we examine how the validated instrument relates to parents' personality traits—specifically openness and extraversion—and further individual characteristics of the surveyed parents.

2. Parents' Emotions and Homework Support

Homework is often associated with increased negative emotions and decreased positive emotions among students of all ages (Moè & Katz, 2018). Its benefits for academic performance remain debated, as effectiveness appears to depend strongly on how homework is designed and implemented (Cooper et al., 2006; Trautwein, 2007). In the school context, the emphasis is on integrating homework into instruction through preparation and review, as well as on task selection and cognitive activation (Dettmers et al., 2010). In the home context, the focus shifts to the quality of support, particularly the extent to which parents respect students' needs—analogous to classroom teaching, where autonomy and competence support, rather than excessive control, are emphasized (Dumont et al., 2012; Moroni et al., 2016). It follows that the impact of homework, as a crucial link between school and family, depends on factors both inside and outside the school. Accordingly, parental homework support has received increasing attention due to its relevance for a range of student outcomes (Xu et al., 2017) such as improved emotion regulation skills (Xu, 2024a), higher well-being (Hoferichter et al., 2021; Ma et al., 2026), higher motivation, and lower anxiety (Rubach & Bonanati, 2021). Besides this growing body of research on parental homework support and its impact on student outcomes, little is known about the emotions that parents experience when helping their children with school-related tasks. Nevertheless, it must be assumed that the parents' emotions and the associated transmission processes between parents and children—as will be discussed in more detail later—are relevant to the interactions and, consequently, to the aforementioned outcomes. Importantly, parents' emotions are both outcomes of situational appraisals and proximal predictors of their support behaviors. Drawing on Control-Value Theory (CVT; Pekrun, 2006), parents are expected to experience enjoyment when they appraise their involvement as controllable and valuable, and anger or anxiety when control or value appraisals are undermined. Self-Determination Theory (SDT; Ryan & Deci, 2000, 2017) likewise suggests that contexts supporting autonomy, competence, and relatedness foster positive emotions, whereas controlling exchanges increase negative emotions.

Extending evidence from classrooms (Frenzel et al., 2021), teachers' emotions influence students via three pathways: direct emotional contagion (a psychological phenomenon where one person's emotions and related behaviors directly trigger similar emotions and behaviors in others; Hatfield et al., 1994), effects mediated through instructional and relational behaviors (emotions influence instructional choices and in turn students' emotions; broaden-and-build theory; Fredrickson, 2013), and recursive feedback loops (students' characteristics affect teacher behavior and emotions; Nurmi & Kiuru, 2015). Analogous processes likely apply in the home: parents' emotions may transmit to children, shape support quality, and co-evolve with children's reactions during homework. Although the evidence is still limited, some studies support this assumption. For example, Moè and Katz (2018) showed that parents' emotions during homework support are highly relevant to children's emotional experiences. Other studies have likewise reported associations between parents' and students' emotions during homework (Else-Quest et al., 2008; Katz et al., 2012). Else-Quest et al. (2008) found correlations between mothers' and children's positive emotions, as well as between their negative emotions, when doing homework together. Interestingly, Katz et al. (2012) reported a significant association only for positive affect between parents and children, whereas the association for negative affect was not significant. Moè and Katz (2018) further suggested that parents' positive emotions may buffer children's negative emotional experiences during homework by directly increasing positive emotions and, indirectly, by enhancing children's self-efficacy for doing homework.

Taken together, research converges on the conclusion that parental positive emotions (likewise teachers' positive emotions) facilitate children's learning, motivation, and emotion regulation, whereas negative emotions tend to impede these processes. However, systematic evidence on parents' emotions remains limited due to measurement gaps and a predominant focus on the quantity/quality of support (Moè et al., 2020; Xu, 2024b) rather than the affective experiences underpinning it.

To our knowledge, no research has yet examined how various parental characteristics (e.g., personality traits, age, gender) and aspects of family life (e.g., number of children, weekly working hours) relate to the emotions that parents experience while supporting homework. Findings from studies on teachers (e.g., regarding gender and Big Five traits) may, however, be tentatively extrapolated to the parental context.

3. Personality Traits and Emotions

Research on the Big Five, or Five-Factor Model (FFM), is among the most robust frameworks in personality psychology (Costa & McCrae, 1992; John et al., 2008; McCrae & Costa, 2008). It comprises openness, conscientiousness, extraversion, agreeableness, and neuroticism. Openness reflects curiosity, creativity, and receptiveness to new ideas; conscientiousness denotes self-discipline and goal-directed organization; extraversion involves sociability, assertiveness, and positive emotionality; agreeableness reflects empathy and cooperation; neuroticism captures emotional instability and a tendency toward anxiety and sadness (Costa & McCrae, 1992). These traits show moderate rank-order stability across the lifespan (Roberts & DelVecchio, 2000). Neuropsychological approaches further integrate emotions and personality: the Affective Neuroscience Personality Scales (ANPS) link positive (play, seek, care) and negative (fear, anger, sadness) affective systems to Big Five traits, assuming shared subcortical origins that guide adaptive behavior (Marengo et al., 2021). The joint influence of person and situation on emotions (Lewin, 1951; CVT, Pekrun, 2006) and the view of emotions as both transient states and stable dispositions (Lazarus, 1994) underscore their close relation to personality, reflected in habitual emotion measures like the Teachers' Emotions Scale (TES; Frenzel et al., 2016), which we adapt for parents here.

Empirically, personality–emotion links are well documented, particularly for neuroticism, agreeableness, and conscientiousness (Lievaart et al., 2016). Openness and extraversion appear to be particularly relevant for emotions in teaching and learning contexts. Openness is associated with intellectual exploration and pedagogical flexibility, whereas extraversion is linked to positive affect and social engagement in instructional interactions (McCrae & Costa, 2008). Although the empirical evidence is less abundant and somewhat mixed, theoretical considerations suggest meaningful associations with anger, anxiety, and joy. Therefore, we focus on openness and extraversion in relation to these emotions. Meta-analytic work indicates that negative affective systems are inversely related to extraversion, whereas positive systems relate positively to extraversion and openness (Marengo et al., 2021), consistent with neurobiological findings on trait–emotion circuitry (DeYoung et al., 2010). Extraversion is robustly associated with global positive affect and enjoyment (Donovan et al., 2026; Komulainen et al., 2014; Mitte & Kämpfe, 2008; Wilt & Revelle, 2019) and often shows negative relations with anxiety, including during COVID-19 (linguistic analyses of New York tweets; Gruda & Ojo, 2022) and in Chinese young adults (Wu et al., 2024), though findings are not uniform across cohorts and countries (Komulainen et al., 2014). Openness relates to global positive affect in some accounts (Watson & Clark, 1992; Watson & Naragon-Gainey, 2014), but in Donovan et al. (2026), it was unrelated to enjoyment and positively related to sadness. Lyon et al.'s (2021) meta-analysis reports both positive and negative correlations between openness facets and anxiety. Wu et al. (2024) found a negative association with generalized anxiety in Chinese young adults. Komulainen et al. (2014) observed no significant links with positive or negative affect but noted heightened reactivity to daily stressors among more open individuals, consistent with variable openness–anxiety relations. Beyond these mixed results and broader accounts of links between extraversion, openness, and affect (Watson & Clark, 1992; Watson & Naragon-Gainey, 2014; Wilt & Revelle, 2019), specific evidence on anger and fear in relation to these two traits remains scarce.

Emotions and personality also depend on social context. Personality traits shape emotional responses in interpersonal situations (Villata et al., 2017), and habitual emotions can influence personality development (Querengässer & Schindler, 2014). Forecasted positive affect before social activities correlates with extraversion (Spark & O'Connor, 2020). In the political domain, extraverts and more open individuals reported higher anxiety when policies contradicted their preferences; extraversion related positively to anger under personally challenging changes, whereas openness related negatively to anger (Wolak & Marcus, 2007). Social situations are key triggers of emotion (Raufelder & Schlesier, 2026; Schlesier & Raufelder, 2024), including challenging contexts such as homework support, which may be particularly relevant for the development and expression of parental emotions.

4. Aims and Hypotheses

As argued before, there is a need for an instrument that assesses parents' homework-related emotions in German-speaking contexts. Therefore, we adapted the Teachers' Emotions Scale (TES; Frenzel et al., 2013, 2016) to the parental homework context and developed the Homework-Related Parental Emotions Scale (PES-Home). The adaptation involved modifying the item content, target context, and referent of the original TES items. Specifically, all items referring to teachers and classroom-related situations were reworded to reflect parents' emotional experiences in the context of supporting their children with homework. This included replacing references to teaching activities with homework-related interactions, adjusting situational descriptions to the home-learning environment, and reformulating item wording to ensure relevance and comprehensibility for parents. The

emotional content and theoretical meaning of the original items were retained, while contextual phrasing was adapted to reflect parental roles. No new emotions were introduced; the scale continued to assess the same core emotions as the TES. Conceptually, we treat personality as a distal factor that shapes parents' control-value appraisals and need-supportive tendencies, which in turn give rise to proximal homework-related emotions (enjoyment, anger, anxiety). A valid and reliable measure of these emotions is essential for advancing research on parental homework support, identifying factors associated with parents' emotional experiences (e.g., personality traits, gender, etc.), and ultimately informing interventions aimed at fostering more positive parent–child interactions during homework. In the present study, we aimed to answer two main research questions:

- RQ1: Does the PES-Home demonstrate adequate psychometric properties?
- RQ2: Are homework-related parental enjoyment, anger, and anxiety as measured by the PES-Home systematically associated with theoretically relevant individual characteristics, providing evidence for construct validity?

Based on prior research using the TES (Frenzel et al., 2016), we formulated the following hypotheses regarding the psychometric properties of the PES-Home:

H1a. *The PES-Home will demonstrate a clear three-factor structure, with enjoyment, anger, and anxiety emerging as distinct first-order factors.*

H1b. *The PES-Home subscales will exhibit adequate internal consistency, as indicated by Cronbach's α and McDonald's ω.*

Validity evidence based on relations to other variables (construct validity) was examined by analyzing associations between the PES-Home subscales and individual characteristics, including the personality traits of openness and extraversion as well as gender, age, marital status, number of children at home, educational attainment, and weekly working hours. We assumed the following hypotheses:

H2a. *Personality traits will be systematically associated with homework-related enjoyment, anger, and anxiety, such that traits reflecting both extraversion and openness will be positively related to enjoyment and negatively to anger and anxiety (Burić & Macuka, 2018; Clark & Watson, 1999; Watson & Clark, 1992).*

H2b. *Drawing on research on gender differences in teachers (Hagenauer et al., 2015), we hypothesize that mothers exhibit higher intensity of both positive and negative emotions.*

As findings on teachers' emotions related to age are generally linked to professional experience, and no evidence exists regarding family characteristics (e.g., number of children) or employment workload, we do not formulate hypotheses in these areas but instead adopt an exploratory approach.

5. Methodology

5.1. Participants and Procedures

A total of N = 903 parents (M_{Age} = 42.40, SD = 5.60; 87.4% female and thus predominantly mothers) participated in the study. Data were collected at the beginning of the 2018/19 school year (October), using a paper-and-pencil questionnaire assessing parents' self-reported homework-related emotions. The present data collection was part of the project '*Educational Community at Catholic Schools*', funded by the Bavarian Catholic Foundation and conducted at the Research and Teaching Unit for School Education and

Instructional Research at Friedrich-Alexander University Erlangen-Nuremberg, which aimed to investigate students' socio-emotional experiences shortly after the transition from primary to secondary school.

On average, parents (predominantly mothers) reported a weekly working time of 22.64 h (SD = 12.40; range = 0–60 h). The mean number of children living in the household was 2.15 (range = 1–6). The majority of participants reported German citizenship as their first nationality (91.7%), and 94.5% indicated German as the language spoken at home. Regarding educational attainment, 51.3% of parents (predominantly mothers) reported a lower or intermediate secondary school certificate (German: Hauptschule or Realschule), 47.2% reported a higher education entrance qualification (German: Abitur or Fachabitur), and 0.2% reported no school-leaving certificate. All the parents (predominantly mothers) who participated in the present study had at least one child who was in Grade 6.

No institutional ethics committee approval was obtained because, under institutional and state regulations in place at the time of data collection (October 2018), anonymous, non-interventional survey research in school settings did not require review by an ethics committee. Instead, the study was conducted under a written cooperation agreement with the responsible school authority, participating schools and the Friedrich-Alexander University Erlangen-Nuremberg, which conducted the study. This cooperation agreement specified procedures, data protection measures, and participants' rights. The schools were asked by the school authority to participate, and parents were informed accordingly at parent–teacher conferences held by the schools. Prior to the survey, participants were informed of their rights under the General Data Protection Regulation and it was expressly emphasized that participation was voluntary. Participants could withdraw at any time and request that their data be deleted. Both parents provided informed consent prior to participation. The questionnaires were given to the students to take home and were collected at the schools. There, they were picked up by anonymized for review staff for further evaluation.

5.2. Instruments

5.2.1. Homework-Related Parental Emotions

Homework-related parental emotions were assessed using the newly developed Homework-Related Parental Emotions Scale (PES-Home). The PES-Home was adapted by a team of researchers and teachers at Friedrich-Alexander University Erlangen-Nuremberg from the Teachers' Emotions Scale (TES; Frenzel et al., 2013, 2016), which was originally developed to assess teachers' emotions in both a global instructional context and a class-specific (group-specific) context. For the present study, the group-specific TES items were adapted to the parental context, meaning that all items were systematically reworded to capture parents' emotional experiences during general homework support and school-related activities with their own child. References to classroom instruction, teaching activities, and student groups were replaced with formulations referring to parental involvement in homework assistance and learning-related interactions at home. While the contextual framing of the items was modified, the emotional content and theoretical meaning of the original items were retained, and no additional emotion categories were introduced. In this process, one additional item each was developed for joy and anger (Joy2 and Ang1; see Table A1[1] and Table A2). The finalized item list was then piloted with five parents as part of a comprehensive pilot study of the questionnaire, with particular attention to completion time and potential ambiguities in wording. Items Joy3 and Anx3 were discussed because not all parents could relate to the preparation for providing homework support. However, it was agreed that activities often occurred prior to the actual support; moreover, anticipating and preparing for homework support can be considered part of the overall

emotional experience of enjoyment related to helping with homework. Therefore, the items were included.

The final PES-Home consists of 14 items measuring three homework-related parental emotions: enjoyment (5 items), anger (5 items), and anxiety (4 items). Enjoyment items capture enjoyment and positive affect during homework support (e.g., enjoyment in assisting the child). Anger items assess irritation, frustration, and anger experienced during homework-related interactions. Anxiety items reflect feelings of tension, nervousness, and worry related to supporting the child with school-related tasks. See Table A2 for all items.

All items were answered on a 5-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree. Higher scores indicate higher levels of the respective emotion. Scale scores for enjoyment, anger, and anxiety were computed by averaging the corresponding items.

5.2.2. Parents' Individual Characteristics

We initially screened short-form scales for all Big Five traits. Only openness and extraversion met predefined psychometric quality criteria (McDonald's $\omega \geq 0.60$; Döring & Bortz, 2016) for use as covariates, whereas the remaining traits did not achieve acceptable score quality for this sample. To minimize attenuation and protect interpretability, we analyzed openness and extraversion only. The personality traits extraversion (e.g., "I am outgoing and enjoy social interaction") and openness (e.g., "I have an active imagination and am imaginative") were assessed using two items for each scale of the 10-Item Big Five Inventory (BFI; Rammstedt et al., 2012; McDonalds $\omega = 0.74$ and 0.62). Gender was coded as male (1) and female (2). Age was measured in years. Educational attainment was assessed on a six-level ordinal scale: (1) no school-leaving certificate, (2) lower secondary school certificate (German: Hauptschule/Wirtschaftsschule), (3) intermediate secondary school certificate (German: Realschule), (4) subject-specific higher education entrance qualification (German: Fachabitur), (5) general higher education entrance qualification (German: Abitur), and (6) other qualifications. Due to low proportions in some of the categories, we subsumed (1) parents with a lower and an intermediate secondary school certificate and (2) parents with a subject-specific and general higher education entrance qualification; parents with no school-leaving certificate were excluded from the analyses as these comprised only 0.2% of the sample. Weekly working hours were assessed as the self-reported average number of hours worked per week.

5.3. Analytic Strategy

All statistical analyses were conducted using JASP (Version 0.95.3) and RStudio (Version 2024.04.2; packages: psych (Revelle, 2020), and lavaan (Rosseel, 2012).

5.3.1. Psychometric Properties of the PES-Home

The total sample was randomly split into two equally sized subsamples to allow for cross-validation. The first subsample was used for exploratory factor analyses (EFA), while the second subsample was reserved for confirmatory factor analyses (CFA).

For the EFA, preliminary assumption checks were conducted, including descriptive statistics, a Pearson correlation matrix, and the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy. EFA was estimated using maximum likelihood extraction with oblique oblimin rotation, because the latent factors were assumed to be correlated. Factor loadings ≤ 0.40 were excluded from the final solution. The number of factors was determined based on factor loadings, scree plot inspection and theoretical interpretability. In addition, path diagrams were generated to visualize the factor structure. Model fit was evaluated using the chi-square test, the Comparative Fit Index (CFI), the Tucker–Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square

Residual (SRMR). Acceptable model fit was indicated by CFI and TLI $\geq$ 0.90 and RMSEA and SRMR $\leq$ 0.08 (Kline, 2016; Saris et al., 2009). Descriptive statistics for the extracted factors as well as the proportion of explained variance were reported.

The second subsample was used to conduct a CFA to cross-validate the factor structure identified in the EFA: namely, a model with three factors (enjoyment, anger, anxiety). The same fit indices and cutoff criteria were applied as in the EFA. Missing data were handled using full information maximum likelihood (FIML) estimation. Internal consistency of the resulting scales was assessed using both McDonald's ω and Cronbach's α.

5.3.2. Construct Validity

Construct validity of the Homework-Related Parental Emotions Scale (PES-Home) was examined by analyzing its relations to theoretically relevant individual characteristics. Specifically, associations between the PES-Home dimensions enjoyment, anger, and anxiety and personality traits (extraversion and openness), gender, age, number of children at home, educational attainment, and weekly working hours were investigated, providing validity evidence based on relations to other variables. As substantially more women than men participated in the survey, we additionally examined whether measurement invariance was established across both gender groups. Construct validity was evaluated using bivariate correlations and multivariate regression analyses. Correlations (Pearson's r or Kendall's τ, depending on the variable scale) were computed between the PES-Home subscales and individual characteristics, mean scores of the emotion and personality trait variables. The three emotions served as dependent variables and were allowed to covary with one another. Openness, extraversion, educational attainment, age, gender, number of children, and weekly working hours were included as independent variables. The model was estimated using maximum likelihood (ML) estimation, and missing values were handled via FIML. Model fit was not evaluated as the model was saturated.

6. Results

6.1. Psychometric Properties of the PES-Home: A Three-Factor Solution Containing the Emotions Enjoyment, Anger, and Anxiety

6.1.1. Preliminary Analyses

The preliminary analyses indicated that the assumptions for the subsequent analyses were met. Descriptive statistics for the full sample (see Table 1), Split-Half Sample 1 (see Table A3), and Split-Half Sample 2 (see Table A4) showed that items assessing enjoyment generally yielded higher mean scores than items assessing anger and anxiety. Furthermore, the response range was utilized for almost all items, and item distributions did not exhibit substantial skewness or kurtosis, with the exception of items pJOY3, pANG5, pANX3, and pANX4.

Bivariate correlation analyses conducted on the full sample (see Table 2) revealed that items within each discrete emotion dimension (enjoyment items, anger items, and anxiety items) were highly and significantly positively correlated, with coefficients ranging from 0.32 to 0.75. In addition, positive and significant correlations were observed between the negative emotion items (anger and anxiety), whereas negative correlations emerged between enjoyment items and both anger and anxiety items. Only a small number of item pairs (four in total) showed non-significant correlations; in all cases, these involved item pJOY3 ("In general, I enjoy helping with homework so much that I like to prepare for it and carry it out").

Table 1. Descriptive statistics for the full sample.

Item	Valid	*M*	*SD*	Skewness	Kurtosis	Range	Min	Max
pJOY1	896	3.58	0.86	−0.216	−0.162	4.000	1.000	5.000
pJOY2	894	3.62	0.89	−0.296	−0.448	4.000	1.000	5.000
pJOY3	891	2.55	1.09	0.286	−0.665	4.000	1.000	5.000
pJOY4	895	3.65	0.86	−0.388	0.267	5.000	1.000	5.000
pJOY5	890	3.27	0.88	−0.095	−0.009	4.000	1.000	5.000
pANG1	896	2.28	0.86	0.216	−0.390	4.000	1.000	5.000
pANG2	895	2.21	0.93	0.481	−0.312	4.000	1.000	5.000
pANG3	895	2.33	0.91	0.397	−0.216	4.000	1.000	5.000
pANG4	895	1.98	0.98	0.828	0.062	4.000	1.000	5.000
pANG5	896	1.72	0.84	1.142	1.084	4.000	1.000	5.000
pANX1	894	1.79	0.82	0.846	0.162	3.000	1.000	4.000
pANX2	895	2.16	1.07	0.661	−0.360	4.000	1.000	5.000
pANX3	892	1.83	0.92	1.161	1.022	4.000	1.000	5.000
pANX4	894	1.69	0.91	1.385	1.510	4.000	1.000	5.000

Note. Valid = valid cases; M = mean; SD = standard deviation; Min = minimum; Max = maximum. p = parental, JOY = enjoyment, ANG = anger, ANX = anxiety.

Table 2. Bivariate correlation matrix of all items (full sample).

Item		Item	Pearson's *r*	
pJOY1	-	pJOY2	0.735	***
pJOY1	-	pJOY3	0.384	***
pJOY1	-	pJOY4	0.559	***
pJOY1	-	pJOY5	0.515	***
pJOY1	-	pANG1	−0.325	***
pJOY1	-	pANG2	−0.346	***
pJOY1	-	pANG3	−0.429	***
pJOY1	-	pANG4	−0.317	***
pJOY1	-	pANG5	−0.378	***
pJOY1	-	pANX1	−0.344	***
pJOY1	-	pANX2	−0.231	***
pJOY1	-	pANX3	−0.256	***
pJOY1	-	pANX4	−0.256	***
pJOY2	-	pJOY3	0.405	***
pJOY2	-	pJOY4	0.577	***
pJOY2	-	pJOY5	0.542	***
pJOY2	-	pANG1	−0.357	***
pJOY2	-	pANG2	−0.410	***
pJOY2	-	pANG3	−0.466	***
pJOY2	-	pANG4	−0.329	***
pJOY2	-	pANG5	−0.458	***
pJOY2	-	pANX1	−0.364	***
pJOY2	-	pANX2	−0.276	***
pJOY2	-	pANX3	−0.308	***
pJOY2	-	pANX4	−0.318	***
pJOY3	-	pJOY4	0.400	***
pJOY3	-	pJOY5	0.349	***
pJOY3	-	pANG1	−0.063	
pJOY3	-	pANG2	−0.078	*
pJOY3	-	pANG3	−0.138	***
pJOY3	-	pANG4	−0.099	**
pJOY3	-	pANG5	−0.123	***

Table 2. *Cont.*

Item		Item	Pearson's *r*	
pJOY3	-	pANX1	−0.083	*
pJOY3	-	pANX2	−0.047	
pJOY3	-	pANX3	−0.045	
pJOY3	-	pANX4	−0.026	
pJOY4	-	pJOY5	0.465	***
pJOY4	-	pANG1	−0.315	***
pJOY4	-	pANG2	−0.307	***
pJOY4	-	pANG3	−0.309	***
pJOY4	-	pANG4	−0.271	***
pJOY4	-	pANG5	−0.336	***
pJOY4	-	pANX1	−0.285	***
pJOY4	-	pANX2	−0.165	***
pJOY4	-	pANX3	−0.198	***
pJOY4	-	pANX4	−0.204	***
pJOY5	-	pANG1	−0.388	***
pJOY5	-	pANG2	−0.472	***
pJOY5	-	pANG3	−0.420	***
pJOY5	-	pANG4	−0.342	***
pJOY5	-	pANG5	−0.378	***
pJOY5	-	pANX1	−0.281	***
pJOY5	-	pANX2	−0.279	***
pJOY5	-	pANX3	−0.248	***
pJOY5	-	pANX4	−0.276	***
pANG1	-	pANG2	0.706	***
pANG1	-	pANG3	0.573	***
pANG1	-	pANG4	0.570	***
pANG1	-	pANG5	0.523	***
pANG1	-	pANX1	0.398	***
pANG1	-	pANX2	0.325	***
pANG1	-	pANX3	0.315	***
pANG1	-	pANX4	0.321	***
pANG2	-	pANG3	0.648	***
pANG2	-	pANG4	0.567	***
pANG2	-	pANG5	0.560	***
pANG2	-	pANX1	0.464	***
pANG2	-	pANX2	0.425	***
pANG2	-	pANX3	0.381	***
pANG2	-	pANX4	0.426	***
pANG3	-	pANG4	0.626	***
pANG3	-	pANG5	0.572	***
pANG3	-	pANX1	0.483	***
pANG3	-	pANX2	0.380	***
pANG3	-	pANX3	0.372	***
pANG3	-	pANX4	0.407	***
pANG4	-	pANG5	0.605	***
pANG4	-	pANX1	0.426	***
pANG4	-	pANX2	0.286	***
pANG4	-	pANX3	0.299	***
pANG4	-	pANX4	0.330	***
pANG5	-	pANX1	0.516	***
pANG5	-	pANX2	0.415	***
pANG5	-	pANX3	0.446	***
pANG5	-	pANX4	0.492	***

Table 2. *Cont.*

Item		Item	Pearson's *r*	
pANX1	-	pANX2	0.508	***
pANX1	-	pANX3	0.553	***
pANX1	-	pANX4	0.548	***
pANX2	-	pANX3	0.753	***
pANX2	-	pANX4	0.616	***
pANX3	-	pANX4	0.698	***

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; p in item titles indicates parental, JOY = enjoyment, ANG = anger, ANX = anxiety.

The Kaiser–Meyer–Olkin (KMO) criterion (see Table A5) indicated excellent sampling adequacy, with values exceeding 0.80 for all items in the full sample as well as in both randomly split subsamples.

The inspection of the scree plot (see Figure 1), together with the results of the exploratory factor analysis (see Table 3 for model fit indices and Table 4 for factor loadings), indicated that a three-factor solution provided the optimal representation of the data. The eigenvalues for the factors—enjoyment, anger, and anxiety—all exceeded 1 (see Figure 1). The cumulative variance explained by the three-factor solution amounted to 59.1%.

The results of the confirmatory factor analyses (CFAs) conducted on Split-Half Sample 2 (see Table 5 and Figure 2) were substantively consistent with the findings of the EFA performed with Split-Half Sample 1 and indicated good model fit (see Table 3). All internal consistency estimates were in the very good range, with values exceeding 0.80 (see Table 6).

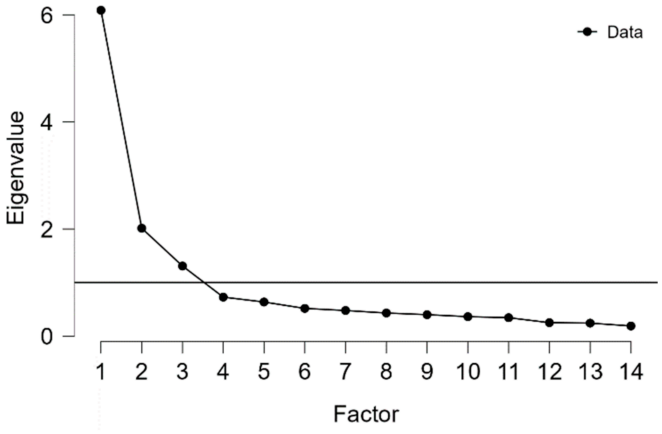


Figure 1. Scree plot of the PES-Home.

Table 3. EFA, CFA model fits, chi-squared test and fit indices of the factor model (Split-Half Samples 1 and 2).

	X^2	df	*p*	RMSEA	SRMR	TLI	CFI
EFA Model (Split-Half Sample 1)	393.36	52	<0.001	0.08	0.03	0.92	0.96
CFA Model (Split-Half Sample 2): 3-Factor Model	290.19	74	<0.001	0.08	0.07	0.92	0.93

Note. EFA = Exploratory Factor Analysis, CFA = Confirmatory Factor Analysis, df = Degrees of Freedom, CFI = Comparative Fit Index, TLI = Tucker–Lewis Index, RMSEA = Root Mean Square Error of Approximation, SRMR = Standardized Root Mean Square Residual.

Table 4. Factor loadings of the exploratory factor analysis of the PES-Home (Split-Half Sample 1).

	Factor 1: Anger	Factor 2: Anxiety	Factor 3: Enjoyment	Uniqueness
pANG1	0.868			0.295
pANG2	0.764			0.261
pANG4	0.748			0.413
pANG3	0.620			0.416
pANG5	0.473			0.443
pJOY2		0.836		0.268
pJOY1		0.791		0.350
pJOY4		0.722		0.472
pJOY3		0.595		0.699
pJOY5		0.542		0.452
pANX3			0.949	0.166
pANX2			0.796	0.323
pANX4			0.743	0.354
pANX1			0.488	0.459

Note. Applied rotation method is promax. p = parental, JOY = enjoyment, ANG = anger, ANX = anxiety.

Table 5. Results of the confirmatory factor analysis of the PES-Home (Split-Half Sample 2).

						95% Confidence Interval	
Factor	**Indicator**	**β**	***SE***	**z-Value**	***p***	**Lower**	**Upper**
Joy	pJOY1	0.836	0.019	43.65	<0.001	0.798	0.873
	pJOY2	0.883	0.017	52.58	<0.001	0.850	0.916
	pJOY3	0.479	0.040	11.83	<0.001	0.399	0.558
	pJOY4	0.644	0.032	20.33	<0.001	0.582	0.706
	pJOY5	0.668	0.030	21.97	<0.001	0.608	0.727
Anger	pANG1	0.729	0.026	28.22	<0.001	0.678	0.779
	pANG2	0.820	0.020	41.83	<0.001	0.781	0.858
	pANG3	0.840	0.018	46.67	<0.001	0.805	0.875
	pANG4	0.756	0.024	31.50	<0.001	0.709	0.803
	pANG5	0.765	0.024	32.53	<0.001	0.719	0.812
Anxiety	pANX1	0.650	0.032	20.61	<0.001	0.589	0.712
	pANX2	0.828	0.020	42.17	<0.001	0.789	0.866
	pANX3	0.876	0.017	50.95	<0.001	0.842	0.909
	pANX4	0.765	0.024	31.81	<0.001	0.718	0.812

Note: β = standardized coefficient; *SE* = standard error; z = test statistic; *p* = *p*-value.

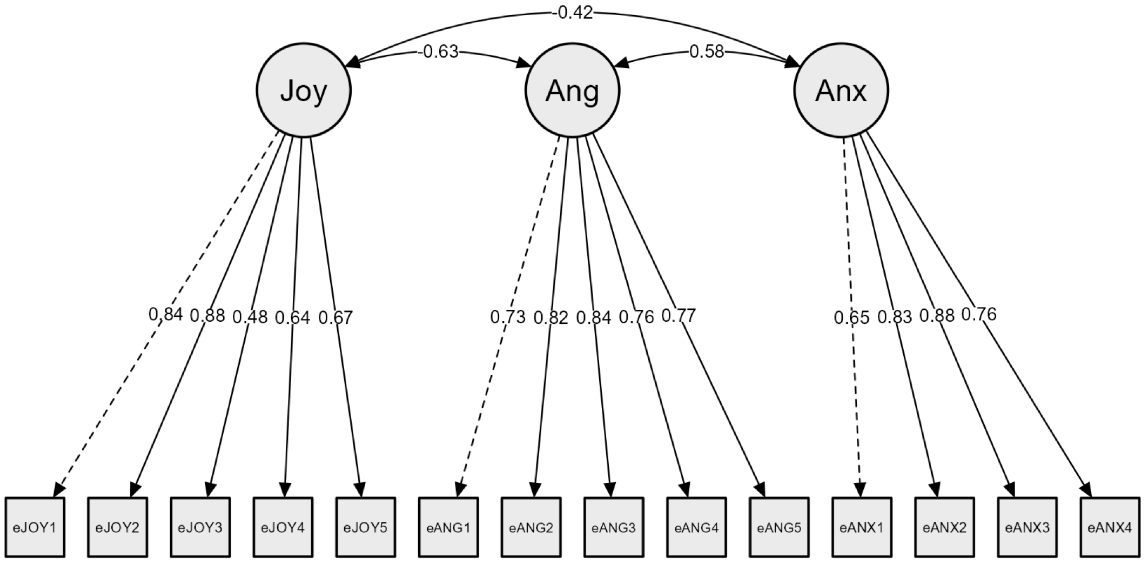


Figure 2. Results of the CFA Model (Split-Half Sample 2).

Table 6. Internal consistencies (Split-Half Samples 1 & 2 and Full Sample).

	Coefficient ω	Coefficient α
Split-Half Sample 1		
Enjoyment	0.82	0.82
Anxiety	0.88	0.87
Anger	0.87	0.87
Split-Half Sample 2		
Enjoyment	0.82	0.82
Anxiety	0.87	0.86
Anger	0.89	0.89
Full Sample		
Enjoyment	0.82	0.82
Anxiety	0.87	0.86
Anger	0.88	0.88

Measurement of the PES-Home scales did not differ across gender (see Table A6).

6.1.2. Construct Validity: Associations Between Homework-Related Parental Enjoyment, Anger, and Anxiety-Associated and Relevant Individual Characteristics

Several correlations (see Table 7) between the homework-related parental emotions and parents' individual characteristics reached statistical significance despite small magnitudes. Openness was positively related to enjoyment ($r = 0.17$, $p \leq 0.01$) and negatively related to anger ($r = -0.08$, $p \leq 0.05$), while extraversion was negatively correlated with anxiety ($r = -0.12$, $p \leq 0.01$). Parents' educational attainment was positively associated with anger and gender was negatively related to enjoyment. The number of children at home was also negatively related to enjoyment, while the weekly working hours were positively correlated with anger.

Table 7. Bivariate correlations.

	1	2	3	4	5	6	7	8	9
PES-Home									
1 Enjoyment	-								
2 Anger	−0.48 **								
3 Anxiety	−0.33 **	0.56 **							
Personality Traits									
4 Openness	0.17 **	−0.08 *	−0.05						
5 Extraversion	0.03	−0.05	−0.12 **	0.20 **					
Individual Characteristics									
6 Graduation	0.03	0.08 *	−0.06	0.14 **	0.15 **				
7 Age	0.02	0.04	−0.02	0.05	−0.02	0.15 **			
8 Gender	−0.07 *	0.00	−0.01	0.13 **	0.10 **	0.03	−0.15 **		
9 Number of Children at Home	−0.09 *	0.05	0.06	−0.04	0.07	0.07	−0.19 **	0.02	
10 Average Work Hours per Week	−0.04	0.09 *	0.06	0.01	0.04	0.09 *	0.12 **	−0.20 **	−0.15 **

Note. Pearson's r was used for associations between continuous variables, whereas Kendall's τ was used for ordinal variables and dichotomous variables (gender and graduation level). PES-Home: Homework-Related Parental Emotions Scale * $p < 0.05$, ** $p < 0.01$.

The path model showed several significant associations between the three PES-Home emotions, personality traits, and individual characteristics. Detailed results are presented in Table 8.

Table 8. Path Model.

Dependent Variable	Independent Variable	β	SE	z-Value	*p*	95% Confidence Interval	
						Lower	Upper
Regression Coefficients							
Joy	Openness	**0.184**	**0.045**	**4.069**	**<0.001**	**0.095**	**0.273**
	Extraversion	0.004	0.046	0.080	0.936	−0.087	0.094
	Graduation	0.038	0.047	0.816	0.415	−0.053	0.129
	Age	−0.027	0.047	−0.579	0.562	−0.119	0.065
	Gender	**−0.127**	**0.046**	**−2.726**	**0.006**	**−0.218**	**−0.036**
	Number of Children	**−0.102**	**0.046**	**−2.223**	**0.026**	**−0.192**	**−0.012**
	Weekly Working Hours	−0.069	0.046	−1.502	0.133	−0.159	0.021
Anger	Openness	−0.083	0.045	−1.863	0.062	−0.170	0.004
	Extraversion	−0.055	0.045	−1.234	0.217	−0.143	0.033
	Graduation	**0.099**	**0.045**	**2.187**	**0.029**	**0.010**	**0.187**
	Age	0.036	0.046	0.797	0.425	−0.053	0.126
	Gender	0.041	0.046	0.906	0.365	−0.048	0.130
	Number of Children	0.061	0.045	1.366	0.172	−0.027	0.149
	Weekly Working Hours	**0.093**	**0.045**	**2.070**	**0.038**	**0.005**	**0.180**
Anxiety	Openness	0.000	0.047	0.009	0.993	−0.093	0.093
	Extraversion	**−0.117**	**0.048**	**−2.457**	**0.014**	**−0.210**	**−0.024**
	Graduation	−0.070	0.048	−1.451	0.147	−0.165	0.025
	Age	−0.013	0.049	−0.262	0.794	−0.108	0.083
	Gender	0.017	0.049	0.346	0.729	−0.079	0.112
	Number of Children	0.083	0.048	1.735	0.083	−0.011	0.176
	Weekly Working Hours	0.082	0.048	1.709	0.087	−0.012	0.175
Covariances							
Joy	Anger	**−0.478**	**0.027**	**−17.918**	**<0.001**	**−0.530**	**−0.425**
Joy	Anxiety	**−0.328**	**0.031**	**−10.579**	**<0.001**	**−0.389**	**−0.267**
Anger	Anxiety	**0.573**	**0.023**	**24.594**	**<0.001**	**0.528**	**0.619**
Openness	Extraversion	**0.197**	**0.044**	**4.426**	**<0.001**	**0.110**	**0.284**
Openness	Graduation	**0.150**	**0.046**	**3.270**	**0.001**	**0.060**	**0.240**
Openness	Age	0.050	0.046	1.095	0.273	−0.040	0.141
Openness	Gender	**0.146**	**0.045**	**3.205**	**0.001**	**0.057**	**0.235**
Openness	Number of Children	−0.042	0.046	−0.909	0.363	−0.133	0.049
Openness	Weekly Working Hours	0.013	0.047	0.275	0.783	−0.079	0.105
Extraversion	Graduation	**0.158**	**0.046**	**3.410**	**<0.001**	**0.067**	**0.249**
Extraversion	Age	−0.018	0.047	−0.378	0.706	−0.109	0.074
Extraversion	Gender	**0.112**	**0.046**	**2.437**	**0.015**	**0.022**	**0.202**
Extraversion	Number of Children	0.071	0.046	1.530	0.126	−0.020	0.161
Extraversion	Weekly Working Hours	0.040	0.047	0.849	0.396	−0.052	0.132
Graduation	Age	**0.152**	**0.046**	**3.320**	**<0.001**	**0.062**	**0.242**
Graduation	Gender	0.036	0.047	0.762	0.446	−0.057	0.128
Graduation	Number of Children	0.064	0.046	1.385	0.166	−0.027	0.155
Graduation	Weekly Working Hours	**0.091**	**0.047**	**1.963**	**0.050**	**0.000**	**0.183**
Age	Gender	**−0.191**	**0.044**	**−4.284**	**<0.001**	**−0.278**	**−0.103**
Age	Number of Children	**−0.186**	**0.045**	**−4.151**	**<0.001**	**−0.273**	**−0.098**
Age	Weekly Working Hours	**0.114**	**0.046**	**2.513**	**0.012**	**0.025**	**0.204**
Gender	Number of Children	0.022	0.046	0.469	0.639	−0.069	0.113
Gender	Weekly Working Hours	**−0.198**	**0.044**	**−4.461**	**<0.001**	**−0.285**	**−0.111**
Number of Children	Weekly Working Hours	**−0.151**	**0.045**	**−3.357**	**<0.001**	**−0.240**	**−0.063**

Note. β = standardized regression coefficient; SE = standard error; z = z statistic; *p* = *p*-value. Significant estimates ($p \leq 0.05$) are highlighted in bold. Because the model was saturated, global fit indices were not informative and were therefore not interpreted (CFI = 1.00, RMSEA ≤ 0.001, SRMR ≤ 0.001), R^2 Joy = 0.06, R^2 Anger = 0.03, R^2 Anxiety = 0.03.

7. Discussion

Theoretical Significance of the Findings

The study aimed to validate the Homework-Related Parental Emotions Scale (PES-Home) and to explore the construct validity of the scale by investigating its correlations with theoretically relevant parental characteristics.

Consistent with the original instrument by Frenzel et al. (2016), we hypothesized a three-factor structure with highly reliable factors. This hypothesis (H1a) was supported: across both split-half samples and the full sample, fit indices, factor loadings, and the scree plot consistently favored a three-factor solution. The measure demonstrated strong psychometric properties and convincing construct validity. Item-level and inter-construct correlations aligned with expectations, with one exception involving four items tapping negative emotions and one enjoyment item (pJOY3). The divergence likely reflects the wording of pJOY3, which also showed a substantially lower mean than the other enjoyment items. Nonetheless, confirmatory factor analyses (CFA) indicated good model fit for the three-factor model, and results were highly consistent across split-half samples, underscoring the stability of the factor structure. Reliability was excellent: both Cronbach's α and McDonald's ω indicated very good internal consistency for each scale, indicating reliable measurement of the three emotions and thereby supporting H1b.

The analysis of construct validity involved examining the correlations between the three PES-Home factors and the theoretically relevant characteristics of the parents. First, the correlations between the two Big Five personality traits, openness and extraversion, and emotions were examined. It was hypothesized that both traits would correlate positively with enjoyment and negatively with negative emotions (anxiety and anger). As expected, the correlation matrix showed a slight positive correlation between openness and enjoyment, and a slight negative correlation between openness and anger. Extraversion was also found to be negatively correlated with anxiety, but the effect size was also rather small (Gruda & Ojo, 2022; Wu et al., 2024). These results were also found in the path model, with one difference: the effect between anger and openness disappeared when considering all variables together in one path model. These findings support H2a, at least in part, reflecting the assumption of positive correlations between both personality traits and positive affect and negative correlations between the personality traits and negative affect (Watson & Clark, 1992; Watson & Naragon-Gainey, 2014). The findings on openness expand the current state of research with insights into its connection with anxiety and enjoyment; however, they contradict findings regarding negative relations between openness and anxiety (Lyon et al., 2021; Wu et al., 2024).

Building on evidence of gender-specific emotional experiences among teachers (Hagenauer et al., 2015), we hypothesized that mothers would experience stronger emotions when helping with homework than fathers (H2b). In our sample, the negative correlation between gender and enjoyment suggests that mothers derive less enjoyment from providing homework support than fathers; this is also evident in the path model. One possible explanation is that mothers continue to be more involved in homework help—even as fathers' involvement increases (Else-Quest et al., 2008; Moroni & Dumont, 2023)—and often assume greater responsibility for their children's schooling, which may heighten time pressure and everyday stress. Consequently, homework support may be experienced more as an obligation than as a voluntary or enjoyable activity, reducing associated enjoyment. However, this pattern could also be due to the strong overrepresentation of mothers in our sample or to their greater involvement in care work and its associated stress. Although the PES-Home showed strict measurement invariance across gender, possible gender differences require more detailed examination in the future.

Regarding other parental characteristics, we found a small positive correlation between educational attainment and anger in both the bivariate correlations and the path model, indicating that higher parental education is associated with higher levels of anger during homework support. One potential explanation is that more highly educated parents hold higher academic expectations for their children, leading to more intensive involvement that may exceed children's needs or capabilities. Alternatively, higher expectations may translate into greater pressure on children, manifesting as a greater tendency toward anger. However, the relationship between parental expectations and socioeconomic or educational background remains unclear: some studies report a positive association between higher expectations and educational level (Englund et al., 2004), while others do not (Kirk et al., 2011). The mechanisms underlying parents' emotional experiences during homework support should be investigated in greater detail using alternative study designs, since the relations found in our study are of a rather small magnitude and should thus not be overinterpreted.

We also found a negative correlation between the number of children in the household and enjoyment during homework support, as well as a positive correlation between working hours and anger in both bivariate correlation analyses and the path model. The first finding suggests that parents with more children at home tend to experience less enjoyment when helping with homework—likely because supporting multiple children increases time demands, coordination challenges, and overall stress, making the experience less relaxed and rewarding. The positive association between working hours and anger indicates that parents who work longer hours may face greater fatigue or time pressure, which can reduce patience and heighten frustration during homework support, increasing the likelihood of anger. Both patterns align with stress models (e.g., the Job Demands–Resources model; Bakker & Demerouti, 2007), which posit that higher demands and fewer personal resources lead to more negative and fewer positive emotional experiences in everyday interaction contexts.

Although the mentioned associations were statistically significant, their magnitudes were rather small. We caution against inferring substantial practical impact from these estimates, particularly on the individual level. Theoretically, these results are consistent with the proposed nomological links but should be interpreted as incremental rather than decisive evidence. Especially for educational attainment, openness, and extraversion, the observed effects are modest.

8. Limitations

Several limitations of the present study should be considered when interpreting the findings.

First, sample characteristics restrict generalizability. The study included only parents of students in intermediate and higher secondary tracks and was conducted in privately run Catholic schools. The sample was further characterized by relatively high socioeconomic status, a low proportion of families with migration backgrounds, and a strong predominance of mothers. As a result, the findings may not represent families from more diverse educational, socioeconomic, cultural, or school contexts, nor do they permit firm conclusions about fathers' emotional experiences during homework support. We therefore avoid broad generalizations of "parents" and specify that effects likely characterize mothers in this context. Furthermore, our data pertain to parents of sixth-grade students in Germany; generalizations to other educational stages or cultural settings should be made cautiously.

Second, all measures relied on parental self-reports, which are vulnerable to response biases such as social desirability and inaccuracies in retrospective reporting. Multi-informant designs (e.g., collecting reports from both parents and children) and obser-

vational methods could yield more nuanced insights into emotional processes during homework interactions. A further key limitation is that we did not analyze neuroticism, agreeableness, and conscientiousness. In our study, the available short-form scales for these traits did not reach acceptable score quality, which could have led to underestimation of theoretically expected associations. Future studies should employ alternative instruments with stronger psychometric performance to provide a fuller nomological network including all Big Five Traits.

Third, research on parental emotions during homework support is still sparse, providing relatively few benchmarks for interpreting the present results within a broader empirical context. Replications and extensions are therefore needed to establish the robustness and generalizability of our findings. A comparison of the parent sample with teacher data would be informative, too (e.g., to test measurement invariance and contextualize mean differences). Because our primary aim here was the context-specific validation of the parent version, we deferred this step. We plan to conduct a systematic cross-role comparison in subsequent work. Future research should also test invariance across roles, using matched items and joint samples to determine the extent of score comparability.

Fourth, the cross-sectional design precludes causal inferences about the relationships between personality traits (openness and extraversion), individual characteristics (of both parents and children), and parents' emotional experiences. Longitudinal or experimental designs are required to clarify directionality and developmental dynamics. Future studies must establish predictive validity by linking PES-Home scores to child outcomes such as academic achievement, motivation, and parent–child interaction quality.

Fifth, our analyses primarily relied on bivariate correlations, which may obscure more complex associations or mask indirect and interactive effects. Future studies should employ multivariate and longitudinal modeling to better capture the interplay among parental characteristics, contextual factors, and emotional experiences. Several significant effects were rather small in magnitude. While such effects can accumulate at scale, their immediate practical relevance is limited. Future studies should examine whether these associations translate into meaningful differences in behavior or outcomes across settings and over time.

Finally, several potentially relevant parental and contextual factors were not assessed. Parents' prior experiences with homework support, parenting styles, general emotional dispositions, and current stress or burden levels may substantially shape emotional experiences in homework situations. Including these variables in future research could provide a more comprehensive account of the determinants of parental emotions during homework support.

9. Conclusions

This study introduces and validates the Homework-Related Parental Emotions Scale (PES-Home), an adaptation of the Teachers' Emotions Scale (TES, Frenzel et al., 2016) for the parental homework context. Across exploratory and confirmatory factor analyses, the PES-Home demonstrated a clear three-factor structure—enjoyment, anger, and anxiety—with good model fit and strong internal consistency. These findings indicate that the PES-Home reliably captures parents' discrete emotions during homework support and can serve as a robust instrument for future research in home-learning contexts. The PES-Home offers a brief, context-specific instrument to identify and monitor parents' enjoyment, anger, and anxiety during homework, enabling schools and family–school teams to target support where strain is highest.

Construct validity analyses further underscore the theoretical relevance of the PES-Home. Consistent with literature linking personality traits to emotions (Donovan et al., 2026; Lyon et al., 2021; Marengo et al., 2021), openness was positively associated with enjoyment

and negatively with anger, while extraversion showed a negative association with anxiety (Gruda & Ojo, 2022; Wu et al., 2024). Beyond personality, several individual characteristics were meaningfully related to parents' homework-related emotions: higher educational attainment and longer weekly working hours were linked to more anger; a greater number of children at home were associated with lower enjoyment; and mothers reported lower enjoyment than fathers. Taken together, these patterns suggest that both dispositional and contextual factors shape emotional experiences during homework support, with demands (e.g., workload, multiple children) and expectations (e.g., linked to education level) potentially constraining positive emotions and amplifying negative emotions.

The findings have practical and theoretical implications. Practically, they point to the value of supporting parents—especially those facing high demands or time pressure—in adopting strategies that foster autonomy support, emotion regulation, and constructive homework routines. Hence, this can guide the tailoring of coaching (e.g., emotion regulation for anger, reappraisal and planning for anxiety, engagement strategies for low enjoyment) and serve as both a baseline and outcome measure to evaluate intervention impact. For parental guidance, individualized feedback can be paired with practical SDT-aligned strategies (clarifying tasks with teachers, structuring routines, autonomy-supportive prompts) and referrals when needed. Based on the information provided by the PES-Home, it would be possible to further connect parents to support beyond the immediate guidance from the school: e.g., school-based services (e.g., counselor, social worker), evidence-based parenting courses or workshops, community resources (e.g., tutoring, after-school programs, family support centers), mental health services (e.g., stress/anxiety counseling), language/translation support, or social assistance (e.g., time management or caregiving resources). This would provide targeted support that matches the specific needs of the families with an appropriate specialized service. In research, the PES-Home fills a critical measurement gap by enabling systematic study of how parents' emotions during homework relate to support quality, children's emotions and motivation, and ultimately academic outcomes—mirroring well-established mechanisms in teacher–student research, including emotional contagion, mediation via autonomy and competence support, and reciprocal dynamics over time. As a research tool, it allows tests of whether parental emotions mediate the effects of homework practices on student outcomes, identifies contextual moderators such as task difficulty and time constraints, and enables cross-grade and cross-cultural validation. In doing so, the PES-Home provides a coherent framework to connect parental affect, interaction processes, and student learning within a unified, testable model.

Future work should expand to more diverse samples, include multi-informant or observational methods, and employ longitudinal studies to clarify directionality and mechanisms. Integrating additional variables (e.g., parenting styles, emotion regulation skills, socioeconomic indicators) will help disentangle the interplay of personality traits, context, and emotions. Overall, the PES-Home lays a foundation for a more nuanced understanding of parental emotions during homework support and for interventions aimed at enhancing the home learning environment to better support children's emotions and educational success.

Author Contributions: Conceptualization: R.O. and J.S.; Data curation: R.O. and M.G.-Z.; Formal analysis: J.S.; Funding acquisition: M.G.-Z.; Investigation: R.O. and J.S.; Methodology: J.S.; Project administration: R.O. and M.G.-Z.; Resources: M.G.-Z.; Software: J.S.; Supervision: M.G.-Z.; Validation: J.S.; Visualisation: J.S.; Roles/Writing—original draft: R.O. and J.S.; Writing—review and editing: R.O., J.S. and M.G.-Z. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by *Bavarian Catholic Foundation* (grant number 7192023).

Institutional Review Board Statement: The study was conducted as part of the research project "Evaluation des Schulentwicklungsprojektes Erziehungsgemeinschaft an Katholischen Schulen " (engl.: Evaluation of the school development project 'Educational Community at Catholic Schools') funded by the Bavarian Catholic Foundation, grant number 7192023, obtained by Prof. Dr. Michaela Gläser-Zikuda. At the start of the project, a contract was signed between the funding body and the university, stipulating that "Both parties undertake [. . .] to comply with the relevant data protection regulations." The Ethics Committee of the Friedrich-Alexander-Universität Erlangen-Nürnberg stated 2017 that it was not necessary to approve the study.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data is available upon request from the corresponding author.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. German version of the PES-Home and TES Scales (Frenzel et al., 2016).

Label	PES-Home	TES (Frenzel et al., 2016)
JOY1	Mein Kind bei den Schularbeiten zu unterstützen macht mir Spaß.	Im Allgemeinen macht mir Unterrichten Freude.
JOY2	Im Allgemeinen macht mir die Hausaufgabenbetreuung und das gemeinsame Lernen mit meinem Kind Freude.	-
JOY3	Im Allgemeinen macht mir die Hausaufgabenhilfe so viel Spaß, dass ich diese gerne vorbereite und durchführe.	Im Allgemeinen macht mir Unterrichten so viel Spaß, dass ich den Unterricht gerne vorbereite und durchführe.
JOY4	Im Allgemeinen unterstütze ich mein Kind in schulbezogenen Dingen mit Begeisterung.	Im Allgemeinen unterrichte ich mit Begeisterung.
JOY5	Während der Hausaufgabenhilfe habe ich oft Grund, mich zu freuen.	Während des Unterrichts habe ich oft Grund, mich zu freuen.
ANG1	Während der schulbezogenen Aktivitäten mit meinem Kind ärgere ich mich.	-
ANG2	Während der Hausaufgabenbetreuung habe ich oft Grund, mich zu ärgern.	Während des Unterrichtens habe ich oft Grund, mich zu ärgern.
ANG3	Während der Hausaufgabenhilfe und dem gemeinsamen Lernen mit meinem Kind bin ich oft genervt.	Während des Unterrichtens bin ich oft genervt.
ANG4	Bei schulbezogenen Aktivitäten mit meinem Kind werde ich gelegentlich richtig sauer.	Ich werde gelegentlich richtig sauer.
ANG5	Im Allgemeinen frustriert mich die Durchführung schulbezogener Aktivitäten mit meinem Kind.	Im Allgemeinen frustriert mich das Unterrichten.
ANX1	Bei der Unterstützung meines Kindes bei schulbezogenen Aufgaben bin ich angespannt und nervös.	Beim Unterrichten bin ich angespannt und nervös.
ANX2	Ich mache mir oft Sorgen, dass die Unterstützung bei den Hausaufgaben nicht so richtig klappt.	Ich mache mir oft Sorgen, dass das Unterrichten nicht so richtig klappt.
ANX3	Die Vorbereitung der Hilfe bei schulbezogenen Aufgaben bereitet mir oft Sorgen.	Die Vorbereitung des Unterrichts bereitet mir oft Sorgen.
ANX4	Wenn ich an die Hausaufgabenbetreuung denke, bin ich beunruhigt.	Wenn ich an das Unterrichten denke, bin ich beunruhigt.

Note: enjoyment = Enjoyment, ANG = Anger, ANX = Anxiety.

Table A2. English version of the PES-Home and TES Scales (Frenzel et al., 2016).

Label	PES-Home	TES (Frenzel et al., 2016)
JOY1	I enjoy supporting my child with their schoolwork.	In general, I enjoy teaching.
JOY2	In general, I enjoy helping my child with homework and learning together.	-
JOY3	In general, I enjoy homework help so much that I like to prepare for it and carry it out.	In general, I enjoy teaching so much that I like to prepare and carry out the lessons.
JOY4	In general, I support my child in school-related matters with enthusiasm.	In general, I teach with enthusiasm.
JOY5	While helping with homework, I often have reason to be happy.	During the lessons, I often have reason to be happy.
ANG1	During school-related activities with my child, I feel annoyed.	-
ANG2	While helping with homework, I often have reason to feel annoyed.	While teaching, I often have reason to feel angry.
ANG3	During homework help and learning together with my child, I often feel irritated.	While teaching, I feel often annoyed.
ANG4	During school-related activities with my child, I sometimes get really angry.	I occasionally feel really angry.
ANG5	In general, carrying out school-related activities with my child frustrates me.	In general, teaching frustrates me.
ANX1	When supporting my child with school-related tasks, I feel tense and nervous.	When teaching, I feel tense and nervous.
ANX2	I often worry that helping with homework doesn't really work out well.	I often worry that teaching won't really work out.
ANX3	Preparing help with school-related tasks often causes me worry.	The preparation of the lessons often worries me.
ANX4	When I think of homework supervision, I feel worried.	When I think about teaching, I feel worried.

Note: enjoyment = enjoyment, ANG = anger, ANX = anxiety.

Table A3. Descriptive statistics for the Split-Half Sample 1.

	Valid	*M*	*SD*	Skewness	Kurtosis	Range	Min	Max
pJOY1	463	3.568	0.857	−0.285	0.028	4.000	1.000	5.000
pJOY2	462	3.602	0.892	−0.272	−0.401	4.000	1.000	5.000
pJOY3	461	2.475	1.054	0.279	−0.621	4.000	1.000	5.000
pJOY4	462	3.591	0.868	−0.262	−0.028	4.000	1.000	5.000
pJOY5	460	3.230	0.880	−0.101	−0.039	4.000	1.000	5.000
pANG1	463	2.307	0.858	0.293	−0.213	4.000	1.000	5.000
pANG2	462	2.225	0.901	0.469	−0.234	4.000	1.000	5.000
pANG3	462	2.355	0.900	0.457	0.017	4.000	1.000	5.000
pANG4	461	1.987	0.976	0.774	−0.136	4.000	1.000	5.000
pANG5	462	1.740	0.877	1.189	1.162	4.000	1.000	5.000
pANX1	459	1.743	0.798	0.909	0.324	3.000	1.000	4.000
pANX2	460	2.176	1.081	0.704	−0.275	4.000	1.000	5.000
pANX3	458	1.817	0.934	1.231	1.199	4.000	1.000	5.000
pANX4	459	1.667	0.906	1.362	1.335	4.000	1.000	5.000

Note. Valid = valid cases; M = mean; SD = standard deviation; SE = standard error; Min = minimum; Max = maximum. p = parental; JOY = enjoyment; ANG = anger; ANX = anxiety.

Table A4. Descriptive statistics for the Split-Half Sample 2.

	Valid	*M*	*SD*	Skewness	Kurtosis	Range	Min	Max
pJOY1	433	3.596	0.872	−0.149	−0.350	4.000	1.000	5.000
pJOY2	432	3.641	0.885	−0.323	−0.488	4.000	1.000	5.000
pJOY3	430	2.630	1.124	0.271	−0.738	4.000	1.000	5.000
pJOY4	433	3.720	0.836	−0.530	0.701	5.000	1.000	5.000
pJOY5	430	3.302	0.878	−0.089	0.035	4.000	1.000	5.000
pANG1	433	2.245	0.855	0.132	−0.600	4.000	1.000	5.000
pANG2	433	2.199	0.959	0.497	−0.380	4.000	1.000	5.000
pANG3	433	2.303	0.922	0.343	−0.445	4.000	1.000	5.000
pANG4	434	1.979	0.991	0.887	0.275	4.000	1.000	5.000
pANG5	434	1.694	0.793	1.051	0.821	4.000	1.000	5.000
pANX1	435	1.841	0.834	0.783	0.026	3.000	1.000	4.000
pANX2	435	2.140	1.057	0.612	−0.462	4.000	1.000	5.000
pANX3	434	1.843	0.911	1.088	0.852	4.000	1.000	5.000
pANX4	435	1.708	0.921	1.412	1.705	4.000	1.000	5.000

Note. Valid = valid cases; M = mean; SD = standard deviation; SE = standard error; Min = minimum; Max = maximum. p = parental; JOY = enjoyment; ANG = anger; ANX = anxiety.

Table A5. Results of the Kaiser–Meyer–Olkin (KMO) test.

	KMO (Full Sample)	Split-Half Sample 1	Split-Half Sample 2
Overall KMO	0.902	0.891	0.901
pANG1	0.900	0.869	0.915
pANG2	0.895	0.883	0.892
pANG3	0.937	0.934	0.931
pANG4	0.907	0.895	0.903
pANG5	0.942	0.942	0.931
pANX1	0.959	0.949	0.957
pANX2	0.862	0.863	0.848
pANX3	0.832	0.823	0.834
pANX4	0.911	0.898	0.912
pJOY1	0.873	0.869	0.867
pJOY2	0.874	0.855	0.887
pJOY3	0.863	0.849	0.847
pJOY4	0.920	0.909	0.923
pJOY5	0.938	0.924	0.939

Note: p = parental, JOY = enjoyment, ANG = anger, ANX = anxiety.

Table A6. Multigroup measurement invariance analysis of the PES-Home by gender.

Invariance Level	Model–Fit						Difference		
	χ^2	df	*p*	CFI	SRMR	RMSEA	ΔRMSEA	Δdf	ΔCFI
Configural	392.88	148	<0.001	0.94	0.07	0.08	-	-	-
Metric	397.16	159	<0.001	0.94	0.07	0.07	−0.004	9	0.002
Scalar	406.41	170	<0.001	0.94	0.07	0.08	−0.003	11	0.000
Strict	455.25	184	<0.001	0.93	0.07	0.031	0.002	14	0.009

Note

[1] Because the study was conducted in Germany, the questionnaire was administered in German. Therefore, the TES items only needed to be adapted for the target group and did not require translation. Table A1 presents the original German items for teachers and parents. Table A2 provides the English translations of these items.

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