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# Development of the School Homework Involvement of Parents (SHIP) scale: preliminary validity data

## *Desenvolvimento da escala SHIP (School Homework Involvement of Parents) de avaliação do envolvimento dos pais nos trabalhos escolares: dados preliminares de validade*

## Abstract

Parental involvement in school activities is a multifactorial construct, with mixed impacts on family relationships and children's learning and academic achievement. This paper aimed on the development of a self-report measure of parental involvement with school homework (School homework Involvement of parents (SHIP)) and presents preliminary data on its validity. A total of 176 parents of children aged 6 to 14 years were recruited through convenience sampling via social networks. In addition to SHIP, parents responded to questionnaires assessing anxiety, stress and depression symptoms, children's behavioral problems, and parenting style. Assessments were performed asynchronously through the internet. A bifactorial structure of SHIP, comprising "Child Behavior" and "Parental Involvement" was identified. Parents of boys reported more Child Behavior problems, while parents of younger children reported more Parental Involvement. Notably, the SHIP factors do not assess internalizing disorders in parents. Instead, the factors gauge correlated but independent dimensions of general behavior problems and positive monitoring. SHIP reliably measures parental involvement in school homework and holds potential utility in educational and clinical settings.

**Keywords:** Parents, Learning, Family Relations, Validation Study.

## Resumo

O envolvimento dos pais nas atividades escolares é um construto multifatorial, apresentando impactos mistos nas relações familiares, na aprendizagem e no desempenho acadêmico das crianças. Porém, há uma escassez de instrumentos disponíveis na literatura, principalmente no contexto brasileiro. Assim, o presente estudo objetivou o desenvolvimento e a avaliação dos dados preliminares de validade de uma medida de autorrelato (School Homework Involvement of Parents [SHIP]) para avaliar o envolvimento dos pais com as tarefas escolares. Um total de 176 pais de crianças com idades entre 6 e 14 anos foram recrutados por amostragem de conveniência por meio das redes sociais. Os participantes responderam a questionários que avaliavam os sintomas de ansiedade, depressão e estresse, problemas de comportamento infantil e estilo parental. Foi identificada uma estrutura bifatorial do SHIP, compreendendo os fatores "Comportamento da Criança" e "Envolvimento Parental". Pais de meninos relataram mais problemas de comportamento, enquanto os pais de crianças mais novas relataram maior envolvimento parental. Os fatores não se correlacionaram com as medidas de sintomas de humor nos pais e mediram dimensões correlacionadas, porém independentes de problemas de comportamento gerais e prática parental de monitorização positiva. O SHIP mostrou-se promissor para mensurar o envolvimento dos pais nas tarefas escolares.

**Palavras-chave:** Pais, Aprendizagem, Estudo de Validação, Relações Familiares.

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## INTRODUCTION

School homework refers to activities assigned by teachers to be completed outside of class time (Cooper et al., 2000). Over the years, evidence has emerged supporting the importance of homework as a pedagogic tool to enhance academic achievement, as well as an alternative way to encourage parental involvement in children's school lives (Bas et al., 2017; Cooper et al., 2000; Valdés-Cuervo et al., 2020).

In Brazil, homework is a widespread activity that gained popularity after the 1990s due to educational policies and investments to strengthen family-school relationships (Carvalho, 2006; Gomes & Cunha, 2019; Resende et al., 2018). It is estimated that 55.6% of 9th-grade Brazilian students have their homework checked by their parents, comprising 56.00% of students aged between 13 and 15 years old and 41.30% between 16 and 17 years old (Instituto Brasileiro de Geografia e Estatística [IBGE], 2016).

In recent decades, the effects of parental involvement with homework time (PIH) on children and family outcomes have been the focus of various studies. Evidence suggests that PIH can impact children's school achievement, behavior, motivation, and family relationships. However, findings regarding the effects of PIH still remain mixed and controversial (Barger et al., 2019; Fernández-Alonso et al., 2022; Kim, 2022). Studies indicate that PIH increases children's academic success and contributes to their development of socioemotional skills, fostering responsibility and self-efficacy (Xu et al., 2019). In contrast, some studies have shown that parental involvement in children's education can increase family stress, complicate children's behavioral problems, and reduce academic achievement (Fernández-Alonso et al., 2022; Moè et al., 2020). More recent studies have also shown that the context of the COVID-19 pandemic aggravated these difficulties, increasing problems related to PIH (Laguna et al., 2021; Touloupis, 2021).

Additionally, studies encountered factors that could mediate PIH's effects and its manifestation. It is already a consensus in literature that the quality of PIH is more related to positive outcomes than the frequency of involvement (Flunger et al., 2021). Furthermore, PIH is also impacted by a diversity of children's factors, for example, age, presence of diagnosis, learning problems, and sex and others. Parents of young children (elementary school) usually spend more time supervising homework compared with parents of children in middle and high school (Barger et al., 2019; Dettmers et al., 2019; Wei et al., 2019). The same way, studies showed that the quality of PIH varies also according to the presence of previous diagnosis or learning difficulties in children, because in these cases, parents tend to struggle more to establish rules and to deal with behavior problems and learning difficulties during homework supervision (Sipila-Thomas et al., 2020; Xiao et al., 2022). Finally, some studies demonstrated that parents showed different patterns of involvement depending on children sex (Silinskas & Kikas 2019). Parents usually report more behavior problems in boys during homework time (Lee et al., 2007; Russell et al., 2014), however, they tend to use more supportive practices for boys than for girls (Braza et al., 2015; Lee et al., 2007).

An explanation that could account for the mixed findings regarding PIH impacts, and manifestation may be the complexity of the construct, which involves a range of parental behaviors that might have contrasting impacts depending on the context (Fernández-Alonso et al., 2022). The controversial results on PIH can also be explained by how the construct is assessed and defined (Dumont et al., 2014; Trautwein, 2007, Xiao et al., 2022). There are different theoretical models in literature explaining parental involvement in school as a construct (Núñez et al., 2017; Pomerantz et al., 2007; Trautwein, 2007; Watkins, 1997). Next, three evidence-based models underlying home-based parental involvement assessment are presented. These models were chosen because they offer a valuable perception of parental involvement, and they present extensive evidence regarding PIH's impacts on children's and family outcomes.

The Grolnick and Ryan (1994) model proposes three parenting styles that could predict children's socioemotional competencies and academic performance: (1) Autonomy support: parental practices that encourage children's autonomy in problem-solving, help with collaborative decision-making, and reinforce success and personal choices, (2) direct parental involvement which includes parental interest and knowledge about children's school life and (3) providing structure which encompasses parental provision of clear and consistent guidelines and physical study space to help children establish an academic routine.

Watkins (1997) proposed an example of a bifactorial structure for PIH. In his model there were two styles of involvement: mastery and performance orientation. Mastery orientation is the style when parents drive their attention to the children's learning process, valuing small academic achievements. In contrast, performance oriented parents tend to value only when children achieve great grades.

Pomerantz et al. (2007) also proposed four dimensions of PIH: (1) Parental autonomy/control: autonomy support allows children to independently explore their environment, initiate actions, and engage in proactive problem-solving, while controlling involves parental pressure to steer children towards specific outcomes (e.g., excelling in school), often through commands, directives, or love withdrawal; (2) Parental *person-focus* and *process-focus:* parents with a person-focused orientation typically place greater emphasis on their children's accomplishments, whereas process-focused parents tend to prioritize their children's learning and mastery process. (3) Emotions cultivated and (4) Parental beliefs: the authors also acknowledge the potential for parents to develop positive or negative beliefs and emotions regarding their involvement.

Evidently, the diversity of theories and the PIH concept has led to numerous ways of assessing this construct. Parental

involvement has primarily been measured and qualitatively analyzed through interviews, often consisting of open-ended questions (e.g., as used in Cooper et al., 2000). Instruments featuring yes/no questions or Likert scales have also been used, although less frequently. Scales designed explicitly to assess PIH are relatively scarce in the literature. More commonly, PIH is assessed indirectly through instruments that address the broader construct of involvement in school. For instance, parental perceptions of the level of parent-child conflict (see Power et al., 2015), children's perceptions of the quality of involvement they receive from parents (e.g., Núñez et al., 2019; Silinskas & Kikas, 2019), and parental involvement in school life in general, combining home-based and school-based involvement (Puccioni, 2018), and children behavior problems during homework (Power et al., 2015). Other scales have been proposed to assess PIH, however, their psychometric properties have not been thoroughly evaluated. Additionally, these scales are often tailored for use within specific research contexts, such as scales designed to assess children's perceived parental help with math homework (Dumont et al., 2014; Silinskas & Kikas, 2019), and to evaluate children's perceptions of parental control and parental support of homework (Núñez et al., 2017; Touloupis, 2021; Valdés-Cuervo et al., 2020).

An example of a scale that attempted to assess the quality of parental involvement in homework was developed by Watkins (1997). Based on his theory of parental types of involvement orientation, he created a 27-item scale that measures two involvement styles: mastery and performance-oriented. The Parental Involvement Inventory also included questions about general parental involvement, often framed as inquiries beginning with "how often" and questions assessing parents' perceptions of teachers' behavior towards homework.

Cunha et al. (2018) introduced the Parental Homework Management Scale (PHMS) based on Xu (2008). The items in the scale were modified to indicate parental involvement in homework assistance, resulting in eight items using a 5-point response scale. These items represented the three homework management strategies: (1. Arranging the environment, 2. Time management, 3. Monitoring children's motivation and emotions). The PHMS has been employed in various studies to examine parental involvement in homework and its impact on student outcomes (Suárez Fernández et al., 2022; Xu et al., 2017; Xu & Wu, 2013).

In Brazil, parental involvement is often assessed qualitatively, predominantly using interviews and focus groups (Carvalho, 2006; Resende et al., 2018). When scales are serviced, the construct is commonly evaluated through indirect measures such as parent-child relationships, social skills, and parenting styles (e.g., Glidden & Weber, 2020; Gomes & Cunha, 2019; Silveira et al., 2021). Nevertheless, there are no validated scales in Brazilian Portuguese designed to assess parental involvement in homework. Therefore, in this study, we aimed to develop and evaluate preliminary validation evidence of a 15-item scale named the School Homework Involvement of Parents (SHIP) that assesses parental involvement during children's homework. It is expected to find a multifactorial structure and positive correlations with variables that measure similar constructs and no correlations with variables that measure different constructs. Moreover, it is expected to find differences between children's age, sex and diagnosis groups, according to what was previously demonstrated in literature.

## METHODS

### Participants

The total sample comprised 176 participants. The sample consisted of 155 biological mothers, 10 biological fathers, 2 grandparents, 5 aunts, 3 adoptive mothers, and 1 godmother. We are going to use the term "parents" to refer to all types of caregivers. Participants were from 18 Brazilian states, with the majority (78%) from the southeastern region and 54% from Minas Gerais. Among the parents, 72% were married, aged between 20 and 50 (M=40.98, *SD*=6.73). The parents had an average formal schooling of 14.22 (*SD* = 1.68) years. Each family had one enrolled child participating in the study, of which (39.8%) were girls, aged 6 to 14 (*M*=9.59 years, *SD*=2.51). Most of the children (62%) attended private schools, with a larger part in the 4th and 5th grades (9 and 10 years old). In 71.00% of the cases, parents reported previous diagnoses for their children, such as anxiety, attention deficit hyperactivity disorder (ADHD), dyslexia/dyscalculia, and Oppositional Defiant Disorder (ODD). The high frequency of reported diagnoses in children is justified because the data collection occurred together with a second study of a parental intervention. Moreover, twenty-six participants had missing responses in external measures (DASS-21, IEP and SDQ) because of non-completion of the inscription forms. The sociodemographic characteristics of the participants are presented in Table 1.

### Instruments

*School Homework Involvement of Parents (SHIP)*: The SHIP scale was developed in Brazilian Portuguese to evaluate parental participation during children's homework. It comprises 15 items describing children's behavior during homework, as well as parents' thoughts and perceptions regarding their involvement in homework activities. Participants rate these items on a 5-point Likert scale. Scale's construction procedures and validity evidence are described in next sections.

*Depression, Anxiety, and Stress Scale - The DASS-21-short version* (Lovibond & Lovibond, 1995; Brazilian version by Vignola & Tucci, 2014): This widely used scale measures symptoms of depression, anxiety, and stress in adults. It includes 21 self-reported items, each rated on a 4-point Likert scale. There are seven items for each subscale. In the Brazilian population, Cronbach's alpha coefficients were $\alpha$=0.90 for the

**Table 1.** Sociodemographic characteristics of participants.

| | Age Group (years) | | Total sample (6-14 years) | 6-8 Years | 9-11 years | 12 -14 years |
|---|---|---|---|---|---|---|
| **Children** | N | | 176 | 71 | 60 | 45 |
| | Age (mean, SD) | | 9.59(2.51) | 7.06(0.84) | 10.03(0.80) | 12.98(0.78) |
| | Sex (% female) | | 39.80 | 45.10 | 33.30 | 40.00 |
| | Formal schooling (mean, SD) | | 4.47(2.53) | 2.10(1.44) | 4.87(0.82) | 7.67(1.28) |
| | School type (% private school) | | 62.50 | 64.80 | 63.30 | 57.80 |
| **Parents** | Age (mean, SD) | | 40.98(6.73) | 39.20(6.76) | 42.02(6.55) | 42.40(6.46) |
| | Sex (% female) | | 94.30 | 93.00 | 95.00 | 95.60 |
| | Marital status (% married) | | 72.30 | 71.80 | 80.00 | 61.20 |
| | Number of children per family (mean, SD) | | 1.88(0.99) | 1.94(1.26) | 1.75(0.68) | 1.93(0.86) |
| | Formal schooling (mean, SD) | | 14.22(1.68) | 14.11(1.83) | 14.08(1.82) | 14.58(1.10) |
| | Residence State (%) | Minas Gerais | 54.50 | 60.6 | 50.00 | 51.10 |
| | | Southeastern | 17.60 (RJ, SP, ES) | 15.50 (RJ, SP, ES) | 26.70 (RJ, SP) | 15.50 (RJ, SP, ES) |
| | | South | 7.90 (PR, SC, RS) | 1.40(PR) | 5.00 (PR, SC) | 15.50 (PR, SC, RS) |
| | | North | 1.20(AC, PA) | 2.90(AC, PA) | 0 | 0 |
| | | Northeast | 12.40 (BA, PB, AL, CE, MA, RN, PE) | 12.60 (BA, PB, MA, RN) | 11.70 (BA, RN) | 13.20 (BA, PB, AL, CE, MA, RN) |
| | | Center West | 4.60 (DF, GO, MS) | 1.80(DF) | 6.70(DF, GO) | 4.40(DF,MS) |

Note: SD=Standard deviation; MG (Minas Gerais), RS (Rio Grande do Sul), SP (São Paulo), RN (Rio Grande do Norte), BA (Bahia), DF (Distrito Federal), PR (Paraná), PB (Pernambuco), ES (Espírito Santo), GO (Goiás), and MS (Mato Grosso do Sul).

stress scale, α=0.92 for depression, and α=0.86 for anxiety (Vignola & Tucci, 2014). In the present study sample (150 participants), Cronbach's alpha was 0.95.

*Strengths and Difficulties Questionnaire (SDQ)* (Goodman, 1997; Brazilian version by Fleitlich et al., 2000): This scale measures parents' perceptions of children's behavior and consists of 25 items, which are rated on a 3-point scale. The scale has five (5) subscales: Pro-social Behavior, Emotional Problems, Conduct Problems, Hyperactivity, Peer Problems. The SDQ-Total Score is calculated by summing all items. In the Brazilian population, Crobach's alpha was α=0.80 (Saur & Loureiro, 2012). For the present study sample (150 participants), Cronbach's alpha was α = 0.70.

*Inventário de Estilos Parentais* (IEP) (Gomide, 2006): This instrument assesses parental styles and comprises 42 items. It evaluates two positive practices, Positive Monitoring, Moral Behavior, in addition to five negative practices, Physical Abuse, Negative Monitoring, Inconsistent Punishment, Negligence, Relaxed Discipline. IEP - Total Score is calculated by subtracting the negative practices from the positive ones; thus, a more negative score indicates a greater presence of negative practices. In the Brazilian population, Cronbach's alpha was 0.80 (Gomide, 2006), and for the present study sample, Cronbach's alpha was α = 0.71 (150 participants).

## Procedures

### *Instrument construction and content analysis*

The instrument was constructed in the following four steps: (1) Literature review: a comprehensive literature review to identify common aspects evaluated in studies related to PIH. During this step, a semi-structured questionnaire developed by Cooper et al. (2000) was discovered, which covered most of the identified aspects. Subsequently, this questionnaire served as the foundation for developing the scale items. (2) Scale Item Creation: in the second stage, 24 sentences in Portuguese were generated by the first author. These sentences considered five aspects derived from evidence-based models of PIH described in the literature and in Cooper's questionnaire (Cooper et al., 2000). These aspects included: (1) the level of parental support during homework time, (2) children's attitudes and behaviors observed by parents, (3) stress experienced by parents during homework supervision, (4) conflict situations between parents and children while doing homework, and (5) homework organization and physical structure. (Cooper et al., 2000; Grolnick & Ryan;

1989; Pomerantz et al., 2007). (3) Expert Committee Review: in the third step, the preliminary version of the scale, consisting of 24 items with a 5-point Likert scale and scale instruction, was analyzed by an expert committee. The committee comprised three judges with PhDs in psychology and extensive experience in parental interventions and children's learning. These judges conducted a qualitative analysis of the items, considering their content and semantic adequacy, coupled with an online meeting with the first author to discuss these evaluations. (4) Preliminary Factor Analysis: in the fourth and final step, the scale was administered to 176 parents, and a preliminary exploratory factor analysis was conducted. Additionally, a second online meeting with the experts committee was held to further refine the scale.

***Data collection and ethical consideration***

Data collection occurred during the COVID-19 pandemic between September 2020 and November 2021. The study was promoted through social media platforms such as Instagram, Facebook, and WhatsApp. Participants completed a Google Forms, where they provided socio-demographic information and completed study instruments. A snowball sampling technique was employed to obtain a convenience sample. All participants in the study signed a consent form stating their agreement and willingness to participate in the study, as well as allowing their data to be published. The project was approved by the Ethics Board of Universidade Federal de Minas Gerais (CAAE number: 34687220.9.0000.5149).

***Statistical analyses***

Firstly, sample-baseline differences in external variables among children age groups (G1: 6-8 years old, G2: 9-11 years old, and G3: 12-14 years old), were measured by repeatedly One-Way ANOVAs. Furthermore, Student t-tests were utilized to evaluate differences considering children's sex and reported diagnosis. The data was non-normal according to the Kolmogorov-Smirnov test; however, Bootstrap, and resampling methods were applied to correct data normality for the parametric analysis.

Internal structural validity was assessed by an exploratory factor analysis (EFA). The Parallel Analysis (PA) technique, with data randomly permuted, was applied to measure the number of dimensions to retain. The Robust Promin rotation method was also used in this process (Ferrando & Lorenzo-Seva, 2018). Cronbach's alpha and McDonald's ordinal Omega index measured the internal consistency of SHIP. The Composite Reliability Index measured the scale's reliability (Valentini & Damásio, 2016). The H-index was used to measure factors' stability and the quality of factor representation (scores above 0.70 suggest a well-established latent variable and good replicability (Ferrando & Lorenzo-Seva, 2018)).

Relations with other variables were evaluated using two methods: One-Way ANOVA was conducted to examine differences in SHIP components across age groups (G1: 6-8 years old; G2: 9-11 years old; G3: 12-14 years old) and Student's t-tests for independent variables was employed to assess differences regarding children's sex and previously reported diagnosis. It was used eta-squared to assess size effect for One-Way ANOVAS and Cohen's d index for test-t. Lastly, Pearson's correlations of SHIP the scales DASS-21, SDQ, and IEP were conducted.

## RESULTS

***Instrument Construction and Content Analysis***

The first expert committee that most of the items were suitable in terms of their content and semantics and a few alterations were decided. Four items related to homework organization and physical structure were removed from the scale because they did not align with the logic of the other items, which referred directly to parental supervision. Additionally, a minor adjustment was made to one item for improved clarity. For example, the sentence "*Considero que a responsabilidade da tarefa de casa é do meu filho(a)*" changed to "*Considero que a responsabilidade da tarefa de casa é apenas do meu filho(a)"*.

Furthermore, in preliminary factor analysis with a 20-item scale results, it was observed that five items presented low factor loadings (<0.30). These items were collectively reviewed in a second session with the experts committee and subsequently removed. Of the last five items excluded, two referred to parents' thoughts and beliefs about their involvement in children's homework (e.g.: *"Não tenho dificuldades em ajudar meu filho(a) na tarefa de casa"*), and three described parental practices (e.g.: *"Ajudo meu filho(a) na tarefa de casa para que ele(a) termine mais rápido"*). As a result, the final version of the scale comprised 15 items.

***Baseline Data - Parental perceptions in the external variables (DASS-21, SDQ, IEP)***

The results showed significantly higher scores in the boy's parents' answers in DASS-Stress symptoms (d=0.44), SDQ-Hyperactivity (d=0.49), SDQ-Emotional Problems (d=0.40), SDQ-Conduct Problems (d=0.53), SDQ-Peer Problems (d=0.59) and SDQ-Total Difficulties (d=0.73), compared with girls' parents. Parents of children with prior diagnoses (WD) indicated higher scores SDQ-Hyperactivity (d=1.00), SDQ-Emotional Problems (d=0.68), SDQ-Conduct Problems (d=0.81), Peer Problems (d=0.41), and SDQ-Total Difficulties (d=1.09) compared with parents of children without diagnosis (WOD). WOD-reported diagnoses reported lower scores in SDQ-ProSocial Behavior (d=-0.41), IEP-Positive Monitoring (d=-0.43), and IEP-Total Score (d=-0.39) compared with WD.

Parents of children in the G1 age group showed higher indices in SDQ-Emotional Problems compared to parents of children in G3 [Welch's F (2, 91.734)=3.30, p<0.05, ETA-Square=0.044]. G1 and G2 parents displayed lower scores in IEP-Negligence practices compared with G3 [Welch's F (2, 85.812) =3.71, p<0.05, ETA-Square=0.064]. Lower scores in IEP-Moral Behavior were observed in G1, compared with G3 [Welch's F (2, 96.485)=3.30, p<0.05, ETA-Square=0.04].

***Internal Structure and Consistency***

For the Internal Structure of the scale is expected to find a multifactorial structure with a maximum of five factors. The exploratory factor analysis showed that the sample's adequation was evidenced by the Kaiser-Meyer-Olkin (KMO), yielding a score of 0.77 and a significant Bartlett's sphericity test (1250, df=105, p<0.001). Because of the non-normal distribution of the data, a Polychoric matrix was serviced, and the factor extraction was performed using the Robust Diagonally Weighted Least Squares (RDWLS).

Two factors were retained based on PA, and their interpretation was guided by the content of the items. Factor 1, labeled *Child Behavior,* included six items that described children's behavior in school activities. The second factor, labeled *Parental Involvement,* encompassed nine items that pertained to parental beliefs and behaviors concerning homework involvement. Parallel analysis results are shown in Table 2.

All items exhibited strong factor loadings, with *Factor 1-Child Behavior* items ranging from 0.40 to 0.98, and *Factor 2-Parental Involvement* items ranging from 0.34 to 0.82. Notably, five items (1, 9, 10, 11, and 16) within *Factor 2-Parental Involvement* displayed cross-loadings. The replicability indices for both factors were robust (*Factor 1-Child Behavior*, H-observed=0.93 and *Factor 2-Parental Involvement*, H-observed=0.77. Table 3 provides detailed information on factor loadings, composite reliability, and H-index scores. The internal consistency of the *SHIP-Total Score* was assessed using McDonald's ordinal (α=0.81), and Cronbach's alpha (α=0.81). Moreover, the factors demonstrated high reliability assessed by the Composite Reliability (CR) index, with *Factor 1 - Child Behavior*, C=0.91, and *Factor 2 - Parental Involvement*, CR=0.76.

***Relation with other variables***

The relation with other variables was evaluated in terms of the instrument's ability to differentiate groups by children's age, sex, and diagnosis, as detailed in Table 4. It is expected to find higher levels in *Factor 1- Children Behavior's* scores for boys than for girls; for younger children (G1 and G2 compared with G3) and for children with previous diagnosis. Similarly, it is expected to find higher levels in *Factor 1 - Children Behavior* for younger children and children with diagnosis, but it is not expected to find differences between children's sex.

Significantly higher scores in *Factor 1 - Child Behavior* were reported by parents of girls versus parents of boys (d=0.33). Conversely, parents of children previously diagnosed had lower scores for *Factor 1- Child Behavior* (d=0.57) and for the Total Score (d=0.42). To further explore differences in SHIP dimensions among various age groups, a One-Way ANOVA was conducted. Post-hoc Bonferroni tests revealed that parents of children in the G1 group (ages 6-8) displayed higher scores in *Factor 2-Parental Involvement* [Welch's F (2, 101.106) =5.08, p<0.05, ETA-Square=0.05] and *SHIP-Total Score* [Welch's F (2, 104.46) =2.74, p>0.05, ETA-Square=0.04] compared to the other two groups.

Regarding Pearson's correlations between the SHIP scales and three external measures (DASS-21, SDQ, and IEP), as presented in Table 5. It is expected that Factor *1-Children Behavior* correlated more with SDQ and *Factor 2-Parental Involvement* correlated more with IEP. For SHIP-Total Score it was expected to have significant correlations with both SDQ and IEP. *Factor 1-Children Behavior* did not correlate with DASS-21 (p>0.05). In contrast, *Factor 1-Child Behavior exhibited significant c*orrelations with all SDQ scales (p<0.001) and four IEP subscales: Positive Monitoring (r=0.19), Inconsistent

**Table 2.** Results of Parallel Analysis.

| Factor | Real-data % of variance | Mean of random % of variance | 95 percentiles of random % of variance |
|---|---|---|---|
| 1 | 35.4390 | 13.9047 | 15.7249 |
| 2 | 14.2799 | 12.3382 | 13.6617 |
| 3 | 8.4554 | 11.2204 | 12.1994 |
| 4 | 7.8800 | 10.2159 | 11.0796 |
| 5 | 6.6122 | 9.2755 | 10.0626 |
| 6 | 5.4739 | 8.3313 | 9.0423 |
| 7 | 4.9584 | 7.4108 | 8.1494 |
| 8 | 3.9373 | 6.5741 | 7.3038 |
| 9 | 3.2034 | 5.7139 | 6.4469 |
| 10 | 2.5411 | 4.8240 | 5.5964 |
| 11 | 2.1910 | 3.9167 | 4.7753 |
| 12 | 1.5649 | 2.9981 | 3.9329 |
| 13 | 1.1597 | 2.1244 | 3.1674 |
| 14 | 0.3036 | 1.1519 | 2.1387 |

**Table 3.** Internal consistency of SHIP and factorial loading with two factors.

| Item | Mean | SD | Factor Loadings | | Communality |
|---|---|---|---|---|---|
| | | | Factor 1 | Factor 2 | |
| 1. I help my child with homework whenever he or she needs it. | 4.39 | 0.92 | -0.38 | **0.83** | 0.51 |
| 2. I think my child could be more independent in doing homework | 2.22 | 1.24 | **0.40** | -0.15 | 0.12 |
| 3. I consider that the homework's responsibility belongs only to my child. | 3.91 | 1.33 | 0.17 | **0.35** | 0.21 |
| 4. I have no patience to teach my child during homework and I give all the correct answers. | 4.46 | 0.96 | 0.07 | **0.48** | 0.27 |
| 5. I try to help my child with homework so that he or she participates in the resolving process. | 1.86 | 1.10 | 0.21 | **-0.74** | 0.43 |
| 6. I just check if the task has been done and I rarely help with the execution. | 4.11 | 1.15 | -0.24 | **0.45** | 0.15 |
| 7. It is very difficult for me to help my child with homework. | 3.59 | 1.40 | 0.37 | **0.44** | 0.51 |
| 8. I think that other people are better able to help my child with homework than I am. | 3.69 | 1.45 | 0.30 | **0.35** | 0.32 |
| 9. I think my help with homework can negatively impact my child's learning. | 4.05 | 1.24 | 0.34 | **0.36** | 0.37 |
| 10. My child needs a lot of time to do homework. | 2.72 | 1.40 | **0.46** | -0.10 | 0.18 |
| 11. My child asks me for help with homework when he or she encounters difficulties. | 4.19 | 1.09 | -0.40 | **0.54** | 0.23 |
| 12. I think my child doesn't like to do homework. | 2.60 | 1.44 | **0.90** | -0.07 | 0.75 |
| 13. My child does not know the importance of homework and only does it as an obligation. | 2.68 | 1.49 | **0.90** | -0.04 | 0.77 |
| 14. There are frequent discussions between me and my child during homework time. | 2.80 | 1.48 | **0.90** | -0.15 | 0.84 |
| 15. My child is disobedient during homework time. | 3.17 | 1.52 | **0.97** | -0.09 | 0.86 |

| | Factor 1 | Factor 2 |
|---|---|---|
| Composite Reliability | 0.91 | 0.76 |
| H-Latent | 0.95 | 0.81 |
| H-Observed | 0.93 | 0.77 |

Note: SD=standard deviation.

Punishment (r= -0.21), Relaxed Discipline (r=-0.18), and Total Score (r=0.26). *Factor 2-Parental Involvement* did not demonstrate a correlation with DASS-21 subscales ($p > 0.05$). However, it did exhibit correlations with other measures, including SDQ-Emotional Problems (r=-0.285), SDQ-Conduct problems (r=-0.20), and SDQ-Total Difficulties (r=-0.22), IEP-Positive Monitoring (r=0.17) and IEP-Relaxed Discipline (r=0.16).

*SHIP-Total Score* did not correlate with DASS-21 ($p>0.05$) but showed significant correlations with five of the six SDQ subscales (excluding the Peer problems scale). Additionally, it displayed correlations with IEP-Positive Monitoring (r=0.22), IEP - Relaxed Discipline (r=-0.21), and IEP - Total Score (r=0.25). The correlation between *Factor 1-Child Behavior,* and *Factor 2-Parental Involvement*, was statistically significant ($\alpha$=0.40). The *SHIP - Total Score* also correlated with both factors, showing a stronger correlation with *Factor 1-Child Behavior* (r=0.89), as compared to *Factor 2-Parental Involvement* (r=0.79).

## DISCUSSION

The current study aimed to assess the psychometric properties of the SHIP scale, developed by the authors to evaluate PIH. The scale originated from a semi-structured survey produced by Cooper et al. (2000) and incorporates five frequent aspects founded on evidence-based theoretical models of home-based parental involvement. PIH is a multifaceted construct that encompasses various parental behaviors and attitudes influenced by cognitive, emotional, and motivational processes (Flunger et al., 2021; Trautwein, 2007; Valdés-Cuervo et al., 2020). While several scales for measuring PIH exist in the foreign literature (Cunha et al., 2018; Suárez Fernández et

**Table 4.** SHIP differences in age-groups, children sex and children's diagnosis.

| | | ANOVA - Age Group difference | | | | Student's t test - Sex differences | | | | | Student's t test - Children diagnosis differences | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Age Group | Mean (sd) | F | p value | η 2 | Sex | Mean (sd) | T | Mean dif. | p value | Cohen's d | Rep. Diag. | Mean(sd) | t | Mean dif. | p value | Cohen's d |
| SHIP | Factor 1 - Child Behavior | G1 | 17.18 (5.99) | 2.740 | 0.069 | - | Girls | 17.41 (6.08) | -2.12 | -2.05 | 0.035 | 0.33 | WD | 15.07 (6.36) | -3.51 | -3.48** | <0.001 | 0.57 |
| | | G2 | 14.68 (6.33) | | | | Boys | 15.37 (6.37) | | | | | WOD | 18.55 (5.60) | | | | |
| | | G3 | 16.60 (5.56) | | | | | | | | | | | | | | | |
| | Factor 2 - Parental Involvement | G1 | 35.55 (4.18) | 5.08* | 0.008 | 0.05 | Girls | 34.39 (4.36) | -0.31 | -0.23 | 0.754 | - | WD | 34.14 (4.69) | -0.45 | -0.34 | 0.653 | - |
| | | G2 | 33.60 (4.37) | | | | Boys | 34.16 (4.86) | | | | | WOD | 34.48 (4.61) | | | | |
| | | G3 | 33.07 (5.30) | | | | | | | | | | | | | | | |
| | Total Score | G1 | 52.73 (8.67) | 4.19* | 0.018 | 0.04 | Girls | 51.80 (8.62) | -1.61 | -2.27 | 0.110 | - | WD | 49.22 (9.27) | -2.60 | -3.820* | 0.010 | 0.42 |
| | | G2 | 48.28 (9.36) | | | | Boys | 49.53 (9.54) | | | | | WOD | 53.04 (8.66) | | | | |
| | | G3 | 49.67 (9.28) | | | | | | | | | | | | | | | |

Note: η2=eta-squared; sd=standard deviation, G1=06-08 years; G2=09-11 years; G3=12-14 years; WD=with diagnosis; WOD=without diagnosis; Rep.Diag.=reported diagnosis.* p< 0.05 and **p<0.001

al., 2022; Xu et al., 2017; Xu & Wu, 2013; Watkins, 1997), only a few of them have accompanying validity evidence. All things considered, to the best of our knowledge, there is no validated scale available in Brazilian Portuguese to assess this aspect (Glidden & Weber, 2020).

The structural validity assessment of the SHIP scale revealed two dimensions: *Factor 1-Child Behavior* and *Factor 2-Parental Involvement*. This result was not aligned with the multidimensionality observed in other studies (Cooper et al., 2000; Flunger et al., 2021; Pomeratz et al., 2005). Initially, it was expected to have a structure with at least 4 factors, based on the aspects listed by Cooper et al. (2000). However, bifactorial structures demonstrated to be robust for this scale. Besides, there are models in literature that also found a bifactorial structure (Watkins, 1997).

Regarding SHIP internal structure, *Factor 1-Child Behavior* includes items describing children's behaviors and attitudes toward homework activities, while *Factor 2-Parental Involvement* comprises items that report parental behaviors and attitudes regarding homework supervision. It is worth noting that the internal consistency for *Factor 2-Parental Involvement* was lower than that for *Factor 1-Child Behavior*. One potential explanation for this discrepancy is that parents may find it easier to report on the child's behavior than on their own behavior, which could contribute to the stronger factor power of *Factor 1-Child Behavior*. The omega-alpha coefficient for the SHIP total score was 0.81, indicating that the items are correlated and can be interpreted as a dimension. The use of Total Scores in assessing PIH is in line with previous research (Silinskas & Kikas, 2019; Valdés-Cuervo et al., 2020), highlighting the utility of a comprehensive measure.

The relations with other variables demonstrated that the SHIP scale could identify differences among groups (children's sex, age, and presence of previous diagnoses). Specifically, parents of girls reported higher scores on *Factor 1-Child Behavior* compared to parents of boys. This finding aligns with previous research indicating that parents tend to perceive more positive homework-related behaviors in girls than in boys (Lee et al., 2007). Evidence suggests that girls exhibit greater conscientiousness and willingness to engage in school homework compared to boys (Braza et al., 2015). However, boys display higher frequencies of hyperactive/impulsive and oppositional behaviors (Russell et al., 2014). Similarly, the baseline results of the SDQ indicated that parents of boys reported higher levels of conduct problems compared to parents of girls. This finding is also consistent with literature that shows more externalizing problems in boys compared with girls (Lee et al., 2007; Russell et al., 2014).

Parents of children with prior reported diagnosis showed lower scores on both *Factor 1-Child Behavior* and *SHIP-Total Score*. These findings align with the baseline SDQ results, where parents of children with previous diagnoses reported higher scores for general behavioral problems. This finding is consistent with previous research on behavior problems in children with psychiatric diagnoses and learning disabilities (Sipila-Thomas et al., 2020; Xiao et al., 2022). No significant differences were found between the presence of diagnosis and sex groups in *Factor 2-Parental Involvement* and IEP parenting practices subscales. This finding is consistent with studies suggesting that parents engage with both boys and girls in similar manners

**Table 5.** SHIP correlations with DASS-21, SDQ and IEP.w

| | | SHIP | | DASS-21 | | | | SDQ | | | | | | PSI | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Factor 1 | Factor 2 | Total Score | Depression | Anxiety | Stress | Prosocial scale | Hyperactivity scale | Emotional problems scale | Conduct problems Scale | Peer problems scale | Total difficulties score | Positive Monitory | Moral Behavior | Inconsistent Punishment | Negligence | Relaxed Discipline | Negative Monitoring | Physical Abuse | Total |
| SHIP | Factor 1 | 1 | | | | | | | | | | | | | | | | | | | |
| | Factor 2 | 0.366** | 1 | | | | | | | | | | | | | | | | | | |
| DASS-21 | Total Score | 0.882** | 762** | 1 | | | | | | | | | | | | | | | | | |
| | Depression | -0.121 | 0.042 | -0.063 | 1 | | | | | | | | | | | | | | | | |
| | Anxiety | -0.057 | 0.000 | -0.040 | 0.683** | 1 | | | | | | | | | | | | | | | |
| | Stress | -0.118 | -0.001 | -0.082 | 0.661** | 0.724** | 1 | | | | | | | | | | | | | | |
| SDQ | Prosocial scale | 0.279** | 0.128 | 0.259** | -0.011 | -0.033 | -0.084 | 1 | | | | | | | | | | | | | |
| | Hyperactivity scale | -0.455** | -0.90 | -0.363** | 0.005 | 0.045 | 0.229** | -0.242** | 1 | -. | | | | | | | | | | | |
| | Emotional problems scale | -0.314** | -0.285** | -0.363** | 0.221** | 0.257** | 0.273** | -0.137 | 0.205* | 1 | | | | | | | | | | | |
| | Conduct problems Scale | -0.470** | -0.197* | -0.427** | 0.036 | 0.116 | 0.125 | -0.482** | 0.511** | 0.298** | 1 | | | | | | | | | | |
| | Peer problems scale | -0.242** | -0.054 | -0.017 | 0.138 | 0.181 | 0.077 | -0.416** | 0.269** | 0.319** | 0.407** | 1 | | | | | | | | | |
| | Total difficulties score | -0.526** | -0.218** | -0.476** | 0.139 | 0.208* | 0.256** | -0.438** | 0.731** | 0.643** | 0.763** | 0.691** | 1 | | | | | | | | |
| IEP | Positive Monitory | -0.195* | 0.173* | 0.224* | -0.074 | -0.095 | -0.064 | 0.083 | -0.163* | -0.207* | -0.172* | -0.224** | 0.270** | 1 | | | | | | | |
| | Moral Behavior | 0.037 | -0.048 | 0.002 | -0.108 | -0.013 | 0.001 | -0.016 | 0.045 | 0.130 | 0.043 | 0.037 | 0.090 | -0.231** | 1 | | | | | | |
| | Inconsistent Punishment | -0.207* | -0.122 | -0.210 | 0.183* | 0.252** | 0.418** | -0.224** | 0.185* | 0.276** | 0.319** | 0.080 | 0.300** | -0.112 | 0.085 | 1 | | | | | |
| | Negligence | -0.114 | -0.104 | -0.132 | 0.113 | 0.169* | 0.228** | -0.025 | 0.078 | 0.322** | 0.166* | 0.231** | 0.277** | -0.387** | 0.014 | -0.419** | 1 | | | | |
| | Relaxed Discipline | -0.182* | -0.163* | -0.210* | 0.213** | 0.304** | 0.283** | -0.199* | 0.153 | 0.248** | 0.316** | 0.172* | 0.307** | -0.286** | -0.064 | 0.388** | 0.355** | 1 | | | |
| | Negative Monitoring | -0.156 | -0.046 | -0.132 | 0.091 | 0.159 | 0.216** | 0.010 | 0.141 | 0.125 | 0.220** | 0.021 | 0.178* | 0.007 | 0.244** | 0.217** | 0.228** | 0.313** | 1 | | |
| | Physical Abuse | -0.111 | 0.032 | -0.093 | 0.047 | 0.171* | 0.226** | -0.124 | 0.170 | 0.123 | 0.260** | 0.217** | 0.268** | -0.172* | -0.071 | 0.423** | 0.416** | 0.239** | 0.156 | 1 | |
| | Total | 0.256** | 0.147 | 0.253** | -0.211** | -0.306** | -0.380** | 0.155 | -0.221** | -0.303** | -0.372** | 0.224** | -0.389** | -0.488** | -0.184** | -0.638** | 0.710** | -0.691** | -0.528** | 0.633** | 1 |

Note: *p<0.05; **p<0.001.

(Bhanot & Jovanovic, 2005; Silinskas & Kikas 2019). However, there is still some variability in the literature, with other studies suggesting that parents of boys tend to use strategies based on behavioral control, while parents of girls cultivate higher expectations for their daughters, which in some cases may be unrealistic (Bhanot & Jovanovic, 2005; Braza et al., 2015).

As expected, parents of younger children reported higher scores in *Factor 2- Parental Involvement* and *SHIP-Total Score*. Studies have consistently reported greater parental involvement with school homework among younger children of age comparable to those examined in this report (Barger et al., 2019; Wei et al., 2019). Older children, however, tend to rely less on their parents to complete school homework (Epstein et al., 2021; Wei et al., 2019). From puberty onward, the extent of parental involvement changes. Parents of adolescents tend to be more involved in assisting with occupational decisions rather than daily school assignments (Goshin et al., 2021; Wei et al., 2019).

No significant correlations were found between the SHIP scales and the DASS-21, indicating that SHIP scores were not significantly influenced by parents' subjective assessments of their internalizing symptoms, evidencing that SHIP measured a different construct of DASS-21. Previous research has suggested that increased scores on measures of parental stress predict inconsistent disciplinary practices and coercive behavior during homework supervision (Katz et al., 2022; Moè et al., 2020). The lack of correlation found in this study can be attributed to the low levels of stress, anxiety, and depression symptoms in the baseline data.

The correlations between *Factor 1 - Child Behavior* and the various subscales of the SDQ revealed significant but generally weak-to-moderate relationships. Specifically, a weak correlation was observed for SDQ Prosocial Behaviors, while weak and inverse correlations were identified for SDQ Peer Problems. In contrast, moderate and inverse correlations were discovered for the SDQ Hyperactivity, SDQ Emotional Problems, and SDQ Conduct Problems. These results suggest that the SDQ measures broader behavioral issues, especially external behavior, that may impact the homework-specific items assessed by *Factor 1 - Child Behavior*. This way, *Factor 1-Child Behavior* appears to focus more on evaluating behaviors related to conduct and hyperactivity in children, as opposed to social behavior. Studies indicate that children experiencing behavior problems often encounter difficulties with homework and are less motivated to complete homework tasks (Power et al., 2015; Xiao et al., 2022; Xu et al., 2019).

Weak correlations were also observed between *Factor 2-Parental Involvement* and IEP-Positive Monitoring. This weak correlation suggests that *Factor 2-Parental Involvement* and IEP-Positive Monitoring capture different aspects of parental involvement. *Factor 2-Parental Involvement* evaluates practical dimensions of parental involvement (e.g., "Ajudo meu filho(a) na tarefa de casa sempre que ele(a) precisa", whereas Positive Monitoring in the IEP evaluates more general and emotional aspects of parental involvement (e.g., "Eu pergunto como foi seu dia na escola e ouço atentamente." Despite assessing different dimensions of involvement, IEP is a commonly used instrument in Brazilian research to assess parental involvement in home-based activities (Domingues, 2020; Glidden & Weber, 2020). Regarding the correlations between *Factor 1-Child Behavior* and IEP-Positive Monitoring, a correlation coefficient of r=0.19 was observed, indicating that only 4% of shared variance exists between them. This result suggests that *Factor 1-Child Behavior* evaluates a distinct dimension of PIH that Positive Monitoring does not.

IEP-Relaxed discipline exhibited significant correlations with SHIP scores (*Factor 1- Child Behavior*, r=-0.22; *Factor 2-Parental Involvement*, r=-0.21 and *Total Score*, r=0.25). This can be explained by the fact that relaxed discipline pertains to parent incongruence in rules establishment (e.g., "Quando castigo meu filho e ele me pede para sair do castigo, após um pouco de insistência, permito que ele saia do castigo." In contrast, SHIP describes parents' level of involvement during homework (e.g. "Apenas verifico se a tarefa foi realizada e raramente eu ajudo na execução" (Gomide, 2006; Glidden & Weber, 2020; Silveira et al., 2021). Studies show that parental relaxed practices can impact the quality of parental interaction during homework, increasing coercive and incongruence practices impacting children behavior and motivation towards homework (Braza et al., 2015; Cooper et al., 2000). In summary, SHIP focuses on children 's behavioral problems and instrumental aspects of PIH.

## CONCLUSIONS

In summary, the results demonstrate that the School Homework Involvement of Parents (SHIP) scale serves as a valuable tool for assessing parental involvement in homework within the Brazilian context. This instrument effectively addresses a crucial gap in the available array of tools designed to measure this pivotal aspect of the family-school relationship. The multifaceted nature of parental involvement, as underscored by theoretical models, was not found in SHIP; however, PIH dimensions were well-reflected in the bifactorial structure identified in results. *Factor 1*, named '*Children's Behavior*,' centers on parental perceptions of children's homework-related behaviors. In contrast, *Factor 2*, labeled '*Parental Involvement*,' delves into the attitudes and practices observed by parents during homework supervision. The data underscores the SHIP scale's robust psychometric properties, characterized by strong internal consistency. The scale also showed relations with external measures associated with children's age, diagnosis, behavior, and parenting practices. Additionally, the scale did not measure the same construct of an instrument that assesses parents stress, depression, and anxiety.

This study has limitations that should be considered. Firstly, the sample used was obtained from a non-generated sample, primarily consisting of mothers, a high number of

children with previous diagnosis, and individuals from higher economic conditions. The sample characteristics limit the generalizability of the findings to more diverse populations. Secondly, data collection occurred during the COVID-19 pandemic, which could have influenced the parents' responses. The pandemic brought about significant changes in educational settings, homework routines, and stress levels for parents and children. To address these limitations and enhance the robustness of the findings, future studies should be done aiming to include more diverse samples.

Therefore, the results of the present study highlight the potential of the SHIP scale as a valuable tool for assessing parental involvement in school activities, particularly regarding school homework. Another strength of this study lies in its timeliness and relevance, particularly considering the increased importance of parental involvement in school homework during and after the COVID-19 pandemic. Moreover, the study's results suggest PIH may be reliability assessed through the internet. Practical contributions involve utilizing SHIP to construct or evaluate program interventions aimed at enhancing and assessing the effectiveness of PIH.

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