

UNIVERSIDADE FEDERAL DE MINAS GERAIS
INSTITUTO DE CIÊNCIAS BIOLÓGICAS
PROGRAMA DE PÓS GRADUAÇÃO EM NEUROCIÊNCIAS

MYRIAN MACHADO DE PAULA SILVEIRA

WEBPARENTS: AN EXPERIENCE OF AN ONLINE PARENT ORIENTATION
PROGRAM FOCUSING ON PARENTAL INVOLVEMENT IN HOMEWORK DURING
THE COVID-19 PANDEMIC.

BELO HORIZONTE

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PANDEMIC.

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RESUMO

A pandemia de Covid-19 aumentou a carga dos pais em relação à supervisão dos deveres de casa dos filhos. O presente estudo teve como objetivo desenvolver uma escala para avaliar o envolvimento dos pais nos deveres de casa e avaliar os efeitos de uma intervenção parental de seis sessões, baseada na terapia cognitivo-comportamental e voltada para a supervisão das atividades escolares (WebPais). O primeiro estudo apresentou dados psicométricos preliminares de um questionário elaborado pela equipe de pesquisa para avaliar o envolvimento dos pais com os deveres de casa (SHIP). Os resultados de uma análise fatorial exploratória indicaram a retenção de dois fatores: Fator 1 (Comportamento da Criança), referente ao comportamento da criança durante o dever de casa e Fator 2 (Envolvimento dos Pais), descrevendo as atitudes dos pais durante o envolvimento com o dever de casa. Os fatores mostraram-se teoricamente interpretáveis e apresentaram bons valores de confiabilidade e replicabilidade. A escala apresentou boa consistência interna. As evidências de validade de critério mostraram que as pontuações do SHIP variaram de acordo com o sexo e a idade das crianças. O SHIP correlacionou com medidas externas amplamente utilizadas e validadas de práticas parentais e comportamento da criança e não se correlacionou à medida de saúde mental dos pais. Os dados de validade do SHIP indicaram o instrumento como uma ferramenta promissora. O segundo estudo avaliou os efeitos do WebPais em 64 participantes. Os resultados mostraram melhorias em todas as pontuações das escalas SHIP. Nas medidas secundárias, observou-se redução dos sintomas parentais de depressão, ansiedade e estresse, redução dos problemas dos filhos e das práticas de abuso físico. Os pais também relataram melhoras nos comportamentos Pró Sociais nas crianças e mostraram boa satisfação com o programa. Portanto, o programa de intervenção apresentou resultados positivos quanto à sua aplicabilidade. Para os estudos futuros recomenda-se o uso de um grupo de comparação.

Palavras-chave: Dever de casa, Envolvimento dos pais, Aconselhamento, Intervenção cognitivo-comportamental, Intervenção baseada na Internet, Questionário, Validade, Avaliação baseada na Internet

ABSTRACT

The COVID-19 pandemic increased the burden on parents about the children's homework supervision. The present study aimed to develop a scale to assess parental involvement in homework and to assess the effects of a six-session brief intervention, online parental guidance, based on cognitive behavioral therapy and focused on the supervision of school activities (WebParents). The first study showed preliminary psychometric data of a questionnaire created by the research team to assess parental involvement with homework (School homework involvement of parents questionnaire - SHIP). The results of exploratory factor analysis indicated the retention of two factors: Factor 1 (Child Behavior) and Factor 2 (Parental Involvement). The factors proved to be theoretically interpretable and showed good reliability and replicability values. The scale showed good internal consistency. Criterion validity results showed that SHIP scores varied according to children's sex and age. SHIP correlated with widely used and validated external measures of parenting practices and child behavior and did not correlate with the measure of parental mental health. SHIP validity data indicated the instrument as a promissory instrument. Finally, the second study evaluated the effects of WebParents intervention in 64 participants, Results showed improvements in all SHIP scales' scores. In secondary measures, we observed a reduction of parental symptoms of depression, anxiety, and stress, reduction of children's problems, and physical abuse practices. Parents also report higher ProSocial Behaviors in children and high levels of satisfaction with the program. Therefore, the WebParents intervention program showed positive results regarding its applicability. Future studies using a comparison group are required.

Keywords: School homework, Parental involvement, Counseling, Cognitive-behavioral intervention, Internet-based intervention, Questionnaire, Validity, Internet-based assessment.

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Abbreviations and Acronyms

ABEP	Associação Brasileira de Empresas de Pesquisa
ADHD	attention deficit hyperactivity disorder
CBT	Cognitive Behavior Therapy
CFI	Comparative Fit Index
CR	Composite Reliability
DASS-21	Depression, Anxiety and Stress Scale
ECV	Explained common variance
EFA	Exploratory factor analysis
ES	Effect Size
HSP	Homework Success Program
IBGE	Instituto Brasileiro de Geografia e Estatística
IEP	Inventário de Estilos Parentais
KMO	Kaiser-Meyer-Olkin
MIREAL	average of the item's residual absolute loads
ODD	Oppositional Defiant Disorder
PA	Parallel Analysis
PIH	Parental involvement in school homework
PSI	Parenting Style Inventory
RDWLS	Robust Diagonally Weighted Least Squares
RMSEA	Root mean Square Error of Approximation
SDQ	Strengths and Difficulties Questionnaire
SES	socioeconomic status
SHIP	School homework involvement of parents
SPSS	Statistical Package for the Social Sciences
TLI	Tucker-Lewis Index
UniCo	One-dimensional Congruence

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General Introduction

Homework activities are an important aspect of school learning, being present in most school curricula over the world (Cooper, 2000, 2006). Evidence showed that homework execution is associated with better academic achievements (Cooper, 2006; Kitsantas & Zimmerman, 2009; Xu, 2011). Moreover, these activities already demonstrate being important to the development of socio-emotional skills in children and adolescents (Zimmerman & Kitsantas, 2005). There is recognition, including on the part of public bodies, of the importance of this type of activity for academic life (Gaviria, 2015; da Silva, 2012). Homework is also considered a link between families and school, promoting parental involvement with children's school life (Barger et al., 2019; Hoover-Dempsey, 2001).

Parents play an important role in their children's education by supporting and supervising their homework activities (Castro et al., 2015; Hoover-Dempsey, 2001). Quality of parental involvement seems to impact more than the time spent in homework supervision (Dumont et al., 2014). Parental involvement is a multidimensional construct, and several models were proposed to categorize types of parental involvement in school life (Pomerantz et al., 2005; Watkins, 1997; Dumont et al., 2014, Eccles et al., 1991).

Among the models reported in the literature, we emphasize in this thesis parental involvement specifically with homework activities. Due to a lack of models about parental involvement in homework (PIH) (Cooper, 2000), we understand that some models of general parental involvement could also be relevant to comprehend parental involvement in homework case (Pomerantz & Litwack, 2007; Watkins, 1997; Dumont et al., 2014; Eccles et al., 1991).

General parental involvement in school is usually divided between home-based and school-based types of involvement (Dumont et al., 2012, 2014). School-based involvement includes parental participation in the school community, such as attending meetings and doing

voluntary work (Park et al., 2017). Nevertheless, in this thesis, we focus on home-based involvement which refers to parental involvement in school activities at home, where also PIH is included (Strickland, 2015). In addition, parental home-based involvement can be classified and assessed considering parental behaviors, parenting practices, attitudes, and beliefs (Watkins, 1997). Some studies suggest the division between types of parental support to characterize general parental involvement (Watkins, 1997; Dumont et al., 2014; Eccles et al., 1991). We understand that this division could also fit PIH (Cooper, 2000).

One example classifies parental involvement in autonomy-support and control. The first one is parental use of positive and non-coercive practices to help children during school activity in a way to promote motivation and autonomy (Dumont et al., 2014). The second one is the unwanted interference of parental involvement, including the use of coercive practices aiming at behavior control. In another model's example, parental involvement is classified according to parents' expectations and beliefs regarding their children's academic process. The autonomy support was related to better children's outcomes than the control type (Pomerantz, 2005; Vasquez et al., 2016). In this form, parents are categorized mastery-oriented vs. performance-oriented (Watkins, 1997; Glidden, 2015) or having focus on process vs. person focus (Pomerantz & Litwack, 2007). In this classification the idea is that parents focus more on children's achievement, that is, assess children's performance in school according to children's grades. Parental mastery-oriented pay attention to children's learning process. This way, better outcomes in children are expected when parents have a better look at children's learning, being able to recognize children's success and not only focus on learning difficulties and bad performance in tests (Pomerantz & Litwack, 2007; Gagné, 2003; Gonida & Cortina, 2014).

Considering the fact that, despite its importance, the PIH construct is still not very well defined (Dumont et al., 2014; Cooper et al., 2000). In the first study of this thesis, we

aim to present the development of a questionnaire to assess PIH and its preliminary evidence of validity. We expect that the scales assess parental perspective regarding their own involvement in school homework and also assessment of children behavior and attitudes observed in relation to homework. We hypothesized that the scale indicates more than one factor, showing the multidimensionality of the construct and presenting sensibility to differences considering parents and children characteristics.

Furthermore, this thesis aimed to present the results of this scale to show preliminary evidence of efficacy of a short term, cognitive-behavior and internet-based parenting intervention named WebParents. Studies suggest that parents face many problems in supporting and supervising their children's home activities. The context of the covid 19 pandemic aggravated these difficulties (Novianti & Garzia, 2020; Grossi et al., 2020; Salari et. al., 2020). During the COVID-19 pandemic, schools were closed, and parents had to increase participation in school life, mainly, in school homework (Novianti & Garzia, 2020; Grossi e cols., 2020; Salari et. al., 2020). Nevertheless, most parents reported being confused about how to be involved and also present lack of pedagogical repertoire to deal with school homework (Cia et al., 2006; Cooper, 2000; Santini & Williams, 2016).

Due to these difficulties, the demand for internet-based parenting interventions has increased in relevance during the pandemic (Roos et al., 2021; Wade et al., 2020, Floger et al., 2020). Online parenting intervention already showed efficacy (Spencer et al., 2020; Nieuwboer et al., 2013; Breitenstein et al., 2014). In a previous study, we published the results of WebParents intervention (Silveira et al., 2021). We found that internet-based parental intervention showed reduction of parental symptoms of depression, anxiety and stress and behavior problems in children. Moreover, parents observed more ProSocial behavior in children and showed satisfaction regarding the program intervention and good acceptance of online modality. Therefore, in the Study 2 of this thesis we aimed to complement the results o

this previous study, showing WebParents results assessing the effects of the intervention in PIH outcomes. We used pre-post comparison to investigate differences in PIH and also in secondary measures outcomes. We expect that after the intervention parents reported improvements regarding children behavior and PIH outcomes. In addition, reductions of parental mental health problems, general behavior problems and improvements of parenting practices are also expected.

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STUDY 1

Development of the Parental Involvement with School Homework Questionnaire (SHIP): preliminary evidence

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Abstract

The COVID-19 pandemic increased the need for parental involvement with school homework. The development of SHIP, a self-report measure of Parental Involvement with School Homework, and preliminary data on its validity are reported. 176 parents of typically developing children from 6 to 14 years were recruited by convenience through social networks. In addition to SHIP, parents responded to questionnaires assessing their own internalizing symptoms, behavioral problems in their children and their parenting style. Assessments were performed asynchronously through the internet. A bifactorial structure of SHIP, comprising Child Behavior and Parental Involvement, was found. Parents of boys reported more Child Behavior problems and parents of younger children reported more Parental Involvement. SHIP factors do not assess internalizing disorders in parents. SHIP factors assess correlated but independent dimensions of behavior problems and positive monitoring. SHIP assesses parental involvement with school homework reliably and may be useful in the educational and clinical settings. Sensitivity of SHIP to cognitive-behavioral interventions to promote parental involvement with school homework need to be assessed.

Keywords: School homework, Parental involvement, Questionnaire, Validity, Internet-based assessment

Introduction

Homework are activities given by the teachers to be done out of school time (Cooper et al., 2000). In Brazil, homework is a very common activity and its importance increased after the 1990s due to educational policies and investments to strengthen family-school relationships (Gaviria, 2015; da Silva, 2012). It is estimated that 55.6% of 9th grade students have their homework verified by their parents. This percentage is 56.00% for children aged between 13 and 15 years old and 41.30% for children aged between 16 and 17 years (IBGE, 2015). Homework activities are an important aspect of school learning, over the years, evidence accumulated showing homework as an important pedagogical tool to improve academic performance. Meta-analysis showed a positive relation of homework realization with school performance, being these effects observed mainly in more advanced school grades (Cooper, 2006. Bas et al., 2017).

Homework boosts students' learning, once it creates opportunities to review and manipulate school content (Bruce & Singh, 1996; Brookhart, 1997; Cooper, 2006). In addition, homework requires skills beyond content knowledge, helping to promote the development of discipline and a sense of responsibility (Cooper, 2006; Xu, 2005). In homework, students also have to deal with difficulties and challenges, optimizing strategies to control negative emotions and develop impulsive management strategies (Zimmerman & Kitsantas, 2005; Grolnick & Ryan, 1989) and learn to recognize competences and skills (Kitsantas & Zimmerman, 2009; Xu, 2011). Homework also promotes the participation of parents in school life and strengthens parents and teachers relation (Alleman & Brophy, 1991; Epstein & Van Voorhis, 2001).

Despite the positive impacts of homework, other studies showed that these activities can be a source of stress to students and their families, negatively impacting the quality of life and reducing interest in school (Warton, 2001; Coutts, 2004; Hernandez, 2020). The negative impact of homework is related more with external variables such as whether there is parental support and the type and quality of parental involvement with school life (Barger, 2019; Dumont et al., 2014). Parents play an important role in their children's education by supporting and supervising homework activities (Castro et al., 2015; Hoover-Dempsey, 2001).

The results about how parent involvement in homework influences students' outcomes remains ambiguous. On the one hand, there are studies showing that direct involvement with homework increases children's success in school and contributes to the development of socioemotional skills, fostering responsibility and auto-efficacy (Hong & Milgram, 2000; Hong et al., 2009; Zimmerman & Kitsantas, 2005). On the other hand, researchers defend that parental involvement can increase family stress, complicate children's behavior problems, and reduce academic performance (Moé et al., 2018, 2020).

Homework can be defined as an opportunity to support and encourage the development of skills, such as time and progress management, responsibility, respect of limits, auto-efficacy, and autonomy (Cooper et al, 2006; Bembenutty & Zimmerman, 2003). The interaction environment during homework time is also an opportunity to correct errors and cultivate parent-children communication (Cia, et al, 2008). Watkins (1997) affirmed the importance of observing the type of involvement dispensed and the type of results generated to the students' learning process.

Divergent results demonstrated the impacts of parent involvement in children's school and personal outcomes. Hoover-Dempsey & Sandler (1995) listed three reasons that parents become involved in school-related activities. One of the reasons described by the authors was

if parents perceive or not, they are being required and invited to be involved by teachers or children. Furthermore, the second reason refers to the parental beliefs about the role and the importance of their participation (mostly impacted by previous models' experiences with parents during infancy). The third reason is the parental sense of self efficacy to become involved in school tasks. This type of involvement is frequently required by most teachers and children. However, if parents believe that they do not have enough acknowledgement to help their children, this can negatively impact the quality of parental involvement (Hoover-Dempsey & Sandler, 1995).

Negative results of parental involvement can be also explained in how the construct is evaluated (Dumont et al., 2014). Studies have shown that the quantity of time that parents spend helping their children with school activities is not always positively correlated with good outcomes (Dumont 2012, 2014). Parents face many problems in supporting and supervising their children's home activities. These difficulties arise from characteristics of the parents, the children, and the school context (Cia et al., 2006; Santini & Williams, 2016; Gonina & Cortina, 2014; Pomerantz et al., 2006). When homework time is performed in a very stressful way, using excessive control practices can be detrimental to student learning, also reducing student motivation and family coordination (Pomerantz et al., 2005; Pomerantz et al., 2006; Vasquez et al., 2016).

Despite its importance, parent involvement constructs still have mixed definitions (Dumont et al., 2014; Cooper et al., 2000). Next, we will develop the definition used in the study of parental involvement, based on evidence-based models already described in literature.

Based on self-determination theory of Deci and Ryan's (1987), a vast research and theory emerged differentiating parental involvement in autonomy support and controlling. According to Pomerantz and colleagues, (2005): "*autonomy support is defined as allowing*

children to explore their own environment, initiate their own behavior, and take an active role in solving their own problems” (p. 381) and *“Controlling behavior, in contrast, involves the exertion of pressure by parents to channel children toward particular outcomes (e.g., doing well in school) by regulating children through such methods as commands, directives, or love withdrawal.”* (p. 381) (Pomerantz et al., 2005)

There is no model theorization specifically to parental involvement (home-based) in homework (Cooper, 2000). Cooper and coworkers (2000) considered two general models that *“integrated student, parent, and family factors as influences on student achievement via parent involvement in homework”* (pg. 465). It is understood that *“parents’ styles of motivating and supporting”* (pg. 466) can be directly linked with *“self-regulation and competence-related outcomes (in children)”* (pg. 466) in children (Grolnick and Ryan, 1989). Grolnick and Ryan (1989) proposed three parent styles that could predict children socioemotional competences and academic performance. The authors assessed 48 American families regarding the following styles: *autonomy support* (parent style that encourage children autonomy in problem solving, helping with collaborate decision make, reinforce success and personal choices), *direct parent involvement* (it refers to how much parents show an active attitude to demonstrate interest and knowledge about children's school life), and provision of structure (it is *“the degree to which parents provide clear and consistent guidelines and follow-through on contingencies for the child’s behavior, independent of the content of these expectations. Greater structure makes it easier for children to discern who and what controls outcomes.”* (p. 466) (Cooper et al., 2000). The authors found that autonomy support was the most consistent dimension of their model. Furthermore, they reported that greater levels of all the three styles proposed were associated with higher results of self-regulation and academic performance in students.

The second model indicated by Cooper and coworkers (2000) was described by Eccles

and colleagues (1991). The authors evaluated more than two thousand adolescents and concluded that the control perception and its effects are not always the same along the development. The adolescents interviewed reported more necessity of control and emotional support from their parents than younger students. The authors explained that even if control perception is most of the time clearly negatively associated with academic performance and motivation in students, it is important to consider the level of children's necessity of both controlling and autonomy involvement.

In the same line, a meta-analysis of 50 studies showed significant changes in the types of parents' involvement in school during the transition to elementary and middle school. The results also found that homework supervision was the least type of involvement related to achievement. On the other hand, they proposed a new type of involvement named academic socialization, which were indicated to have more efficacy to middle school students. Academic socialization is the type of involvement that combines adolescents' necessity of a clear communication with parents about expectations and education values. This type of involvement also includes parental support regarding the organization of future about occupational desires, fostering decision-make strategies and supporting education trajectory (Hill & Tyson, 2009).

In addition to the control and autonomy idea of involvement, Pomerantz and Litwack, (2007) also proposed in their model dimensions referring to the parental orientation focus, emotions cultivated and parents beliefs about children's potential. Regarding parental focus the authors described two types of involvement, the *person focus* and the *process focus*. Parents who are person-focused usually pay more attention to what children can not do or learn, while process-focused parents give more attention to the learning and mastery process. From cultivated emotions, two types of involvement also rise, positive and negative effects. In the same way, parents' beliefs about their children's potential also unfold into positive belief

and negative beliefs.

In another study, Pomerantz and colleagues (2005) interviewed 109 mothers and children about affection during daily homework time. The results showed that the interviewed parents showed high levels of negative effects especially on days when parents were more intensely involved in school activities, and they also did not find positive affection levels on days of high parental assistance. A large amount of involvement can lead to negative effects and stress. Another interesting result was that high levels of negative affect not only affected parents' provision of care, but also, influenced the children's helplessness perception (Pomerantz et al., 2005).

These results alerted to the importance of considering the children's necessities before encouraging parents to be more involved. Some factors have already demonstrated impacts on the type of parental involvement used. Cooper and coworkers (2000) showed that homework involvement becomes more relevant when children present learning difficulties once parents would tend to show more motivation and have more patience during supervision. However, studies demonstrated that parents of children with school difficulties can also feel more lost and tend to apply more punitive practices (Bryan et al., 2001; Cooper & Nye, 1994; Cooper, 2000).

The same way, children sex also demonstrated to be a factor that impacts the way parents involve with school life and how the involvement impacts students' performance. Evidence of sex impacts on parental involvement is mixed, however, studies showed that parents tend to involve more with academical life with girls, showing more control, intrusive and unwanted strategies with boys. (Bhanot & Jovanovic, 2005; Cooper et al., 2000; Dumont et al., 2012, 2014; Carter & Wojtkiewicz, 2000). Considering effects of sex in PIH, it seems that PIH positive impacts in learning improvements tend to be lower in girls, because parents of girls seem present more demanding expectations and offer more negative feedback,

impacting negatively the sense of autonomy and motivation (Kast & Connor, 1988; Koestner et al., 1989).

Watkins (1997) was another author who defended that parental expectation and beliefs are important mediators to parental involvement. In his theory, Watkins (1997), based on Achievement Goal Theory, proposed two types of involvement orientation: *mastery oriented* and *performance-orientated* involvement. In the first dimension, parents tend to focus more on the learning process, attributing the reason in children for good performance more than external variables. On the other hand, *performance-oriented* parents have the focus mainly on grades and academic performance, and usually prefer harder tasks to achieve a better performance (Ames and Archer, 1987).

As seen above, the variety of theories and perspectives about the concept of parental involvement in school life and more specifically in homework, generated many ways to assess this construct. Parental involvement has been mostly measured through interviews with parents and analyzed in a qualitative way. The interviews consisted mainly of open-ended questions that had no answer option, (e.g., as used in the study by Cooper et al, 2000). Instruments with yes or no questions or Likert scale were also used with lower frequency. There are few scales in the literature that assess more specifically parental involvement in homework. In most cases, it is evaluated using questionnaires that touch the involvement construct. For example, assessing parents' perception of levels of conflict between parents and children (see Power, 2001), levels of parental stress (see Moé et al., 2020;), the perception of children in relation to the quality of involvement they receive from parents (e.g., Gonzalez-DeHass et al., 2005; Kohl et al., 2000) and parental involvement in school life in general, combining home-based and school-based involvement (Puccioni, 2018).

An example of a scale that tried to assess the quality of parental involvement in homework was developed by Watkins (1997) who, based on his theory of types of parentals

engagement orientation, constructed a 27-item scale measuring the two involvement styles (mastery and performance-oriented). In his questionnaire, named Parental Involvement Inventory, there were also questions about general parental involvement (questions that started with, “what is the frequency”) and also questions that assessed parents' perception of teachers' conduct about homework.

Another example of scale was developed by Cunha et al (2018). The authors drew on research by Xu et al. (1998) about homework management strategies for elementary and high school students. The items on the scale proposed by Xu (2008a) were translated and the questions were adapted to indicate the parents' behavior during homework help. Eight items were constructed and a 5-point scale to answer it. The items reflected the three homework management strategies proposed by Xu (2008a): arrangement of the environment, time management, monitoring of children's motivation and emotions.

In Brazil, parental involvement is often assessed qualitatively, using interviews and focus groups (de Carvalho, 2006). When scales are used, the construct is generally assessed through questionnaires that measure indices of communication between parents and children, social skills and parenting styles (e.g., Glidden, 2015; Fernandez et al., 2014; Cia et al., 2016). However, there are no validated scales in Brazilian Portuguese to assess parental involvement in homework.

The context of the Covid-19 pandemic aggravated these difficulties (Stewart, 2021). Therefore, based on PIH, we developed a 15-item scale to assess parental involvement in homework. We will present the preliminary validation results of the scale. An exploratory factor analysis showed the presence of two factors that were interpreted as, *Factor 1 - Children behavior*, indicating parental perception about children's behavior in homework and *Factor 2 - Parental involvement*, related to attitudes observed by parenting during homework supervision. Furthermore, acceptable

results of internal consistency and convergent and divergent validity were found. Hypothesis tests were also carried out to investigate the effects of gender and age variables on the two factors. Finally, predictive validity showed that the factors can be predicted from other indicators.

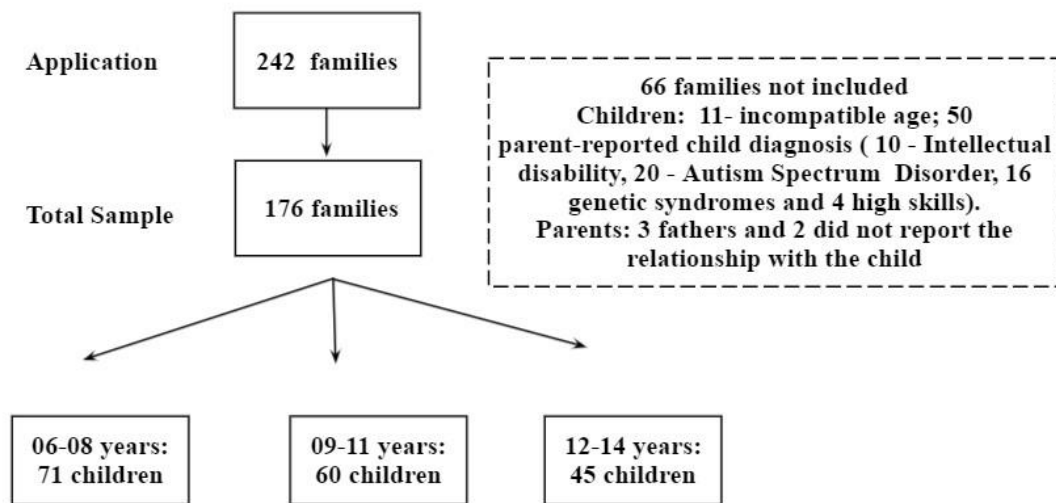
Methods

Participants

Participants were recruited through social media. Two-hundred and forty-two parents or proxies of children aged from 6 to 14 years responded to the instruments in Google Forms. Data from 66 subscribers who did not meet the inclusion criteria were excluded (50 because of a previous child's diagnosis, one because of the mother's diagnosis, and two did not report a relation of kinship or care with the child). Data are reported from 176 families from eighteen Brazilian states. The caregivers were 155 biological mothers, 10 biological fathers, 2 grandparents, 5 aunts, 3 adoptive mothers and 1 godmother. The participant's recruitment flow is presented in Figure 2.1.

Most of the families belonged to higher socio-economic and education strata, as discussed in the Results section. One child per family was enrolled (39.80% were girls). Children were between 06 and 14 years old and 62.00% attended private schools. Caregivers reported previous children's diagnoses such as anxiety, attention deficit hyperactivity disorder (ADHD), dyslexia/dyscalculia, and Oppositional Defiant Disorder (ODD) in 71.00% of the cases. No previous diagnoses were reported in 29.00%.

Figure 2.1 - Flowchart of recruitment of participants, study 1.



Instruments

School homework involvement of parents (SHIP): A self-report questionnaire was developed to assess parental involvement with children's homework activities. SHIP School homework involvement of parents (SHIP) consists of 15 items describing attitudes and behaviors of parents and students during homework supervision. Parents needed to report their level of agreement to items' statements, using five options: (1) "I don't agree at all"; (2) "I slightly agree"; (3) "I agree more or less"; (4) "I strongly agree"; (5) "I completely agree". The instrument construction proceeded in three steps. First, after a literature review (Grolnick & Slowiaczek, 1994; Eccles & Harold, 1996; Cooper et al., 2000; Ames et al., 1964; Pomeratz et al., 2005, Hoover-Dempsey & Sandler, 1995), five important aspects to be assessed regarding children's homework attitudes and parental supervision were delimited: (1) parental support during homework time ("I just check if the task has been done and I rarely help with the execution"); (2) children's attitudes and behaviors observed by parents ("My child asks me for help with homework when he or she encounters difficulties."); (3) situations of parental stress during homework supervision ("It is very difficult for me to help my child with homework."); (4) conflict situations between

parents and children in homework time ("There are frequent discussions between me and my child during homework time"), (5) homework organization and physical structure ("Usually my child does his/her homework in a quiet place, with the TV turned off."; "My child has a time delimited to do the homework.").

The decision to include items representative of these five domains of parental involvement was based on the fact that they gather the main aspects presented in evidence-based models of parental involvement reported in the literature (Grolnick & Slowiaczek, 1994; Eccles & Harold, 1996; Cooper et al., 2000; Hoover-Dempsey et al., 2001; Pomerantz et al., 2005). The main models that were the inspiration for our questionnaire are summarized in more detail in the Introduction. More briefly, the parental involvement models were based on psychological theories such as Achievement Goal Theory and Self-determination Theory (Deci and Ryan's, 1987; Ames et al., 1994) that provided bases to understand the parental involvement in school homework (PIH) as a manifestation of behaviors, attitudes, practices and beliefs of parents and children that reflects on parent-children dyad relationship and children's learning and motivation. Because of that, it makes sense to assess parental involvement with items describing parental perception of children behavior, self-assessment of parents own behaviors and practices that it is used to support homework, and also considering stress situations associated with homework.

Considering the previous five aspects listed and based on a semi-structured interview used by Cooper and coworkers (2000), in the second step, 24 items were elaborated by the first author. The content of the items was evaluated by three expert judges who were knowledgeable on school homework and parental research. The judges suggested grammatical changes and the exclusion of four items referring to homework organization and physical structure. These items did not follow the same logic as the rest of the scale (in which items addressed parental supervision more directly). Finally, the questionnaire was applied to a

sample of 176 parents, and an exploratory factor analysis was performed. In this analysis, considering the 24 items, five items showed low factor loadings (<0.30) and they were additionally removed. The final version of SHIP comprises 15 items.

External variables

Cr terio Brasil (Associa o Brasileira de Empresas de Pesquisa [ABEP], 2019) was used to evaluate the socioeconomic status (SES) of the participants. This instrument is widely used to assess SES in Brazil. SES is estimated considering the educational level of the families' head and if the families residence is located on a paved street and if it is contemplated with a sewerage system. Further, it is also based on the number of vehicles and appliances at home, such as computers, refrigerators and on the quantity of bathrooms at home and housemaids.

Depression, Anxiety and Stress Scale - DASS-21- short version (Lovibond & Lovibond, 1995, Vignola & Tucci, 2014) is a widely used instrument to evaluate adult symptoms of depression, anxiety, and stress. It consists of 21 self-reported items, answered through a Likert scale of 4 points (ranging from "0 = totally disagree" to "3 = completely agree"), considering a time window of the last week. Each subscale is represented by seven items. The sentences describe feelings related to each of three conditions (e.g., "Couldn't feel any good feelings" for depression, "I felt afraid for no reason" for anxiety, and "I found difficulty to relax" for stress). Internal consistency was estimated in 150 participants, corresponding to Cronbach's $\alpha=0.95$.

Strengths and Difficulties Questionnaire (SDQ) (Fleitlich et al., 2000, Goodman, 1997): was used to assess parental perceptions of children's behavior. The instrument is composed of 25 items, responded by the parents with "0 = not true", "1 = somewhat true", and "3 = certainly true", considering a time window of the last six months. The scores are obtained from 5 subscales evaluating *ProSocial Behavior*, *Emotional Problems*, *Conduct Problems*,

Hyperactivity, Peer Problems, and *SDQ-Total Score* is calculated with the sum of all items. Internal consistency was estimated in 150 participants, corresponding to Cronbach's alpha 0.70.

Inventário de Estilos Parentais (PSI, Parenting Style Inventory) (Gomide, 2006, Pinheiro & Gomide, 2020): This instrument assesses parental practices and resources used in children's education. Parents are asked to respond to 42 items, considering 10 episodes ("Never" for 0 to 2 times, "Occasionally" for 3 to 7 times, and "Always" for 8 to 10 times). The items describe two positive (*Positive Monitoring; Moral Behavior*) and five negative practices (*Physical Abuse, Negative Monitoring; Inconsistent Punishment; Negligence; Relaxed Discipline*). A total score is calculated subtracting the negative practices from positive ones. A more negative score means more presence of negative practices. Internal consistency was estimated in 150 participants, corresponding to Cronbach's alpha = 0.71.

Procedures

Data was asynchronously collected over the internet. Data collection happened during COVID-19 pandemic (between September 2020 and November 2021). This study was conducted according to procedures recommended by the Helsinki Declaration of ethics in research with humans. The project was approved by the Ethics Board of Universidade Federal de Minas Gerais (Project 's title: "Desenvolvimento e estudo da viabilidade de pandemia "Web Pais": Orientação parental das atividades escolares em casa em tempos". "CAAE" number: 34687220.9.0000.5149).

Statistical analyses

Statistical analyses were conducted in four phases: preliminary analyses; structural validity, reliability, and internal consistency; criterion validity and convergent and discriminant validity. Except for the structural validity, reliability, and internal consistency for

which we used Factor Analysis software (version 10.5.03), all the other analyzes were conducted using Statistical Package for the Social Sciences (SPSS - version 26.0).

Data distribution was non-normal, as assessed by Kolmogorov-Smirnov and Shapiro-Wilk tests ($p > 0.001$), and data variance was non-homogeneous, as assessed by the Levene test ($p > 0.001$). Correction for data normality deviations and differences in group sizes was done using Bootstrapping procedures (1000 re-samplings: 95% CI BCa) in all One-Way ANOVAs and Student's t tests (Haukoos & Lewis, 2005). The effect sizes were calculated using Cohen's d for independent Student's t test and ETA-Square for ANOVA.

Factors analyses were conducted using data from the *TotalGroup* ($n = 176$). SES data for *TotalGroup* was available for 163 participants. External variables were present in 150 of the cases. This second sample, called *SubGroup* was used to assess criterion and convergent and discriminant validity. In preliminary analysis we assessed eventual differences between the *TotalGroup* and *Subgroup* were statistically compared using t-tests and Chi-square. Moreover, for the *SubGroup* it was calculated also if there were differences among the groups (age, sex, and diagnosis) considering the external measures. For this purpose, successive one-way analysis of variance (One-Way ANOVAs) were applied to measure differences among the age-groups and Student's t-tests were used to assess differences between children sex and presence of children reported diagnosis.

Structural validity was assessed using an exploratory factor analysis (EFA). Internal consistency of SHIP was measured by Cronbach's alpha and McDonald's ordinal Omega index. The reliability of the questionnaire's factors was calculated using the Composite Reliability index.

To assess Criterion validity, One-Way ANOVAs were used to assess differences in SHIP components (evaluated by dimensional analysis) according to age-groups. Also,

Student's t test for independent variables was applied to assess SHIP differences considering sex and reported psychiatric diagnosis in children.

Finally, convergent, and divergent validity was evaluated by examining the patterns of association between the SHIP scales and other variables (DASS-21, SDQ and PSI) using Pearson's correlations.

Results

Initially, we assessed the characteristics of both the *Total Group* and *Subgroup* exploring socio demographic differences. Second, we assessed differences in external variables, considering age groups, sex and reported of psychiatric diagnosis in children. Finally, we showed SHIP validity results according to each phase of the validity assessment, following the order: structural validity, reliability and internal consistency, criterion validity, and convergent/discriminant validity.

Sociodemographic characteristics

The *TotalGroup* and *Subgroup* were compared, searching for eventual sociodemographic differences (Supplementary Table 2.1). Results of the t-tests and chi-square did not show sociodemographic differences between the samples. The sociodemographic characteristics of the participants in both samples are described in Supplementary Table 2.2.

Parental perceptions in the external variables (DASS-21, SDQ, PSI)

Differences in the external variables by sex, presence of prior diagnoses and age-groups are analyzed in Table 2.1. Parents of boys reported higher significantly scores in *Stress* symptoms ($d = 0.44$) assessed with DASS-21, and higher scores in *Hyperactivity* ($d = 0.49$); *Emotional Problems* ($d=0.40$); *Conduct Problems* ($d .53$), *Peer Problems* ($d = 0.59$) and *Total Difficulties* ($d = 0.73$). Parents of children with prior diagnoses reported higher scores in SDQ - *Hyperactivity* ($d = 1.00$), *Emotional Problems* ($d = 0.68$), *Conduct Problems* ($d = 0.81$), *Peer Problems* ($d = 0.41$), and *Total Difficulties* ($d = 1.09$). Parents of children with gnoses $.485) = 3.30, p < 0.05, \text{ETA-Square} = 0.04$].

reported lower scores in SDQ - *ProSocial Behavior* ($d = -0.41$), PSI - *Positive Monitoring* ($d = -0.43$), and PSI-*Total Score* ($d = -0.39$).

Age differences were reported in SDQ- *Emotional Problems*, with parents of children in G1 (6-8 years) presenting higher levels than parents of children in G3 (12-14 years) [Welch's $F(2, 91.734) = 3.30$, $p < 0.05$, $\eta^2 = 0.044$]. Lower scores in PSI - *Negligence practices* were reported by parents of children in G1 (06-08 years) and G2 (09-11 years) than parents of children in G3 (12-14 Years) [Welch's $F(2, 85.812) = 3.71$, $p < 0.05$, $\eta^2 = 0.064$]. Lower scores in PSI - *Moral Behavior* were reported by parents of children in G1 (06-08 years) than parents of children in G3 (12-14 years) [Welch's $F(2, 96.485) = 3.30$, $p < 0.05$, $\eta^2 = 0.04$]

Table 2.1: External measures (DASS-21, SDQ, PSI) differences among age-groups, children sex and presence of diagnosis

Instruments	Variables	ANOVA - Age Group difference (G1. n=62); (G2. n=47); (G3. n=41); (Total. n=150).					Student's t test - Sex differences (Girls. n=62); (Boys. n=88); (Total. n=150) df=148					Student's t test - Children diagnosis differences (With Diagonis (WD). n=106); (Without Diagnosis (WOD). n=88); (Total. n=150). Df=148						
		Age Groups	Mean(SD)	F	P value	η^2	Sex	Mean(SD)	t	p value	Mean difference	Cohen's d	Reported Diagnosis	Mean	t	p value	Mean difference	Cohen's d
DASS-21	Depression	G1	12.48(10.22)	0.15	0.86	-	Girls	11.45(10.11)	0.54	0.59	0.910	-	WD	11.60(9.59)	0.72	0.47	1.31	-
		G2	11.91(9.73)															
		G3	11.32(10.61)															
		Total	12.00(10.12)					Boys					12.36(10.17)	WOD				
	Anxiety	G1	10.55(9.44)	0.11	0.89	-	Girls	9.23(9.07)	1.07	0.29	1.660	-	WD	10.02(9.11)	0.37	0.71	0.62	-
		G2	9.70(9.10)															
		G3	10.24(9.74)															
		Total	10.2(9.36)					Boys					10.89(9.55)	WOD				
	Stress	G1	20.93(10.57)	0.5	0.61	-	Girls	17.45(10.48)	2.41*	0.02	4.210	0.44	WD	20.70(10.90)	-1.39	0.17	-2.65	-
G2		19.45(10.99)																
G3		18.93(10.65)																
Total		19.92(10.69)	Boys					21.66(10.55)					WOD	18.05(10.18)				
SDQ	ProSocial Behavior	G1	8.39(1.84)	1.24	0.29	-	Girls	8.44(1.82)	-1.77	0.079	-0.590	-	WD	7.85(2.23)	2.24*	0.03	0.81	0.41
		G2	7.83(2.11)															
		G3	7.93(2.23)															
		Total	8.09(2.04)					Boys					7.84(2.15)	WOD				
	Hyperactivity	G1	5.71(2.42)	0.06	0.94	-	Girls	5.05(2.78)	2.97*	0.003	1.270	0.49	WD	6.5(2.32)	-5.57	<0.001	-2.41	1.00
		G2	5.89(2.90)															
		G3	5.80(2.77)															
		Total	5.79(2.65)					Boys					6.32(2.43)	WOD				
	Emotional Problems	G1	3.63(2.31)	3.30*	0.04	0.04	Girls	3.66(2.33)	2.39*	0.01	0.910	0.04	WD	4.63(2.25)	-3.76	<0.001	-1.50	0.58
		G2	4.47 (2.21)															
		G3	4.73 (2.32)															
		Total	4.19 (2.32)					Boys					4.57(2.25)	WOD				
		G1	2.53(1.80)	0.82	0.44	-	Girls	2.16(1.80)	3.18*	0.002	1.020	0.53	WD	3.20(1.90)	-4.43	<0.001	-1.49	0.81

Instruments	Variables	ANOVA - Age Group difference (G1. n=62); (G2. n=47); (G3. n=41); (Total. n=150).					Student's t test - Sex differences (Girls. n=62); (Boys. n=88); (Total. n=150) df=148					Student's t test - Children diagnosis differences (With Diagonis (WD). n=106); (Without Diagnosis (WOD). n=88); (Total. n=150). Df=148						
		Age Groups	Mean(SD)	F	p value	η^2	Sex	Mean(SD)	t	p value	Mean difference	Cohen's d	Reported Diagnosis	Mean	t	p value	Mean difference	Cohen's d
PSI	Conduct Problems	G2	2.98(1.91)															
		G3	2.85(2.35)															
		Total	2.76(1.99)				Boys	3.18(2.02)					WOD	1.7(1.68)				
	Peer Problems	G1	2.22(2.04)				Girls	1.66(1.73)					WD	2.65(2.28)				
		G2	2.45(2.48)	0.38	0.69	-			3.53**	<0.001	1.24	0.59			-2.25	0.02	-0.88	0.41
		G3	2.59(2.17)				Boys	2.91(2.37)					WOD	1.77(1.91)				
	Total of Difficulties	Total	2.39(2.21)															
		G1	14.10(5.49)				Girls	12.53(6.16)					WD	16.98(5.86)				
		G2	15.79(6.51)	1.49	0.23	-			4.40**	<0.001	4.445	0.73			-6.01	<0.001	-6.28	1.09
		G3	15.98(7.65)				Boys	16.98(6.07)					WOD	10.70(5.72)				
		Total	15.14(5.47)															
		Positive Monitoring	G1	10.56(1.59)				Girls	10.79(1.39)					WD	10.43(1.53)			
G2	10.96(1.10)		2.84	0.06	-			-1.24	0.21	-0.30	-			2.36*	0.02	0.61	0.43	
G3	10.29(1.59)					Boys	10.49(1.51)					WOD	11.05(1.20)					
Moral Behavior	Total	10.61(1.46)																
	G1	9.98(1.81)				Girls	10.21(1.94)					WD	10.34(1.37)					
	G2	10.28(1.39)	3.29*	0.04	0.04			0.49	0.62	0.13	-			-0.64	0.53	-0.18	-	
Inconsistent Punishment	G3	10.76(1.30)				Boys	10.34(1.28)					WOD	10.16(2.01)					
	Total	10.29(1.58)																
	G1	3.21(1.81)				Girls	3.02(1.60)					WD	3.51(1.64)					
Negligence	G2	3.34(1.71)	0.33	0.71	-			1.84	0.07	0.54	-			-1.89	0.06	-0.60	-	
	G3	3.51(1.86)				Boys	3.56(1.88)					WOD	2.91(2.01)					
	Total	3.33(1.79)																
	G1	2.63(1.63)				Girls	2.74(1.99)					WD	3.03(2.00)					
	G2	2.68(1.67)	3.71*	0.03	0.06			1.1	0.27	0.35	-			-0.81	0.42	-0.28	-	
	G3	3.73(2.32)				Boys	3.09(1.84)					WOD	2.75(1.70)					

Instruments	Variables	ANOVA - Age Group difference (G1. n=62); (G2. n=47); (G3. n=41); (Total. n=150).					Student's t test - Sex differences (Girls. n=62); (Boys. n=88); (Total. n=150) df=148					Student's t test - Children diagnosis differences (With Diagonis (WD). n=106); (Without Diagnosis (WOD). n=88); (Total. n=150). Df=148						
		Age Groups	Mean(SD)	F	p value	η^2	Sex	Mean(SD)	t	p value	Mean difference	Cohen's d	Reported Diagonosis	Mean	t	p value	Mean difference	Cohen's d
		Total	2.95(1.91)															
	Relaxed Discipline	G1	2.45(1.74)									WD	2.78(2.10)					
		G2	2.51 (2.23)	0.64	0.53	-	Girls	2.47(2.19)	0.64	0.52	0.21	-			-1.81	0.07	-0.65	-
		G3	2.90(2.15)				Boys	2.68(1.88)					WOD	2.14(1.73)				
		Total	2.59(2.01)															
	Negative Monitoring	G1	5.71(3.21)									WD	5.95(2.10)					
		G2	6.30(1.97)	0.7	0.49	-	Girls	6.05(2.35)	-0.11	0.91	-0.05	-			0.49	0.62	0.23	-
		G3	6.17(2.17)				Boys	6.00(1.92)					WOD	6.18(2.60)				
		Total	6.02(2.60)															
	Physical Abuse	G1	1.52(1.67)									WD	2.12(2.04)					
		G2	2.25(2.03)	2.05	0.13	-	Girls	1.56(1.97)	1.38	0.17	0.45	-			-2.96	0.003	-1.01	-
		G3	1.80(2.20)				Boys	2.01(1.92)					WOD	1.11(1.51)				
		Total	1.83(1.95)															
	PSI-Total Score	G1	5.03(6.94)									WD	3.38(7.60)					
		G2	4.15(6.31)	0.5	0.46	-	Girls	5.16(8.58)	-1.35	0.18	-1.67	-			2.10*	0.04	2.74	0.39
		G3	2.93(9.34)				Boys	3.49(6.59)					WOD	6.11(6.93)				
		Total	4.18(7.49)															

Note: η^2 = eta-squared; sd= standard deviation, G1=06-08 years; G2=09-11 years; G13 = 12-14 years; WD = with diagnosis; WOD = without diagnosis;

* p < 0.05 and **p<0.001.

Structural validity, reliability, and internal consistency

The dimensionality of SHIP in the total sample was analyzed with an exploratory factor analysis (EFA). The Kaiser-Meyer-Olkin (KMO) test was high (0.77), and Bartlett's sphericity test was significant (1250, $df = 105$, $p < 0.001$), demonstrating good adequacy of the sample. A Polychoric matrix was used because of the non-normal distribution of the data assessed by Kolmogorov-Smirnov test ($p > 0.05$). In addition, the extraction method applied was the Robust Diagonally Weighted Least Squares (RDWLS) (Asparohov & Muthen, 2010).

The Factor software provided indices for evaluating scale one-dimensionality. The UniCo (one-dimensional congruence) was 0.72 (values above 0.95 indicate one-dimensionality), the ECV (explained common variance) was 0.70 (values above 0.85 indicate one-dimensionality) and the MIREAL (average of the item's residual absolute loads) was 0.33 (values less than 0.30 indicate one-dimensionality). These results suggested that SHIP can be treated as a multidimensional scale.

The EFA model adequacy was also evaluated using goodness-of-fit indicators: Root mean Square Error of Approximation (RMSEA) = 0.075 (values less than 0.80 and more than 0.10 indicate good EFA model fit (Brown, 2006)), Comparative Fit Index (CFI) was 0.978 and Tucker-Lewis Index (TLI) was 0.970 (CFI and TLI values more than 0.90 indicate good fit (Brown, 2006)).

The number of dimensions to retain was analyzed with the parallel analysis (PA) technique (Timmerman, & Lorenzo-Seva, 2011) with data's random permutation and Robust Promin rotation method (Lorenzo-Seva & Ferrando, 2019c). We decided to retain two factors, based on PA. The factors were interpreted according to the content described in the items. The first factor, named *Factor 1 - Child Behavior*, was composed of six sentences describing children's behaviors in school activities. The second component, named *Factor 2 - Parental*

Involvement was composed of nine items describing parents' attitudes and practices during involvement. The parallel analysis results are presented in Table 2.2.

Table 2.2: 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

Note: The number of factors to retain is two. *Two factors had % of variance of real-data greater than the 95% of random variance.

In general, the items presented a good factor loading. All items of *Factor 1- Child Behavior* showed loadings ranging 0.40 to 0.98. Items of *Factor 2- Parental Involvement* showed loading ranging 0.34 to 0.82. Furthermore, 5 items (1, 9, 10, 11 and 16) of *Factor 2* presented cross loadings (items that had factor loading above 0.30 in both factors).

The H-index was used to evaluate the factors' stability and the quality of factor representation. High scores (>0.70) in the H-index indicate a well-consolidate latent variable and good replicability (Ferrando & Lorenzo-Seva, 2018). The replicability indexes of the two components were satisfactory (*Factor 1 - Child Behavior*, H-observed = 0.93; *Factor 2- Parental Involvement*, H-observed = 0.77), suggesting good factors' replicability. The factor loadings, factors' composite reliability and H-index scores are reported in Table 2.3.

Table 2.3: Internal consistency of SHIP and factorial loading with two factors.

Item	Mean	sd	Factor 1	Factor 2	Communality
1. I help my child with homework whenever he or she needs it.	4.39	0.925	-0.383	0.828	0.506
2. I think my child could be more independent in doing homework	2.22	1.242	0.403	-0.148	0.123
3. I consider that the homework's responsibility belongs only to my child.	3.91	1.330	0.168	0.347	0.209
4. I have no patience to teach my child during homework and I give all the correct answers.	4.46	0.961	0.069	0.485	0.275
5. I try to help my child with homework so that he or she participates in the resolving process.	1.86	1.104	0.211	-0.740	0.432
6. I just check if the task has been done and I rarely help with the execution.	4.11	1.151	-0.242	0.447	0.147
7. It is very difficult for me to help my child with homework.	3.59	1.399	0.373	0.443	0.506
8. I think that other people are better able to help my child with homework than I am.	3.69	1.450	0.301	0.350	0.321
9. I think my help with homework can negatively impact my child's learning.	4.05	1.239	0.341	0.356	0.368
10. My child needs a lot of time to do homework.	2.72	1.398	0.465	-0.098	0.179
11. My child asks me for help with homework when he or she encounters difficulties.	4.19	1.094	-0.402	0.545	0.233

12. I think my child doesn't like to do homework.	2.60	1.443	0.901	-0.068	0.753
13. My child does not know the importance of homework and only does it as an obligation.	2.68	1.486	0.896	-0.038	0.769
14. There are frequent discussions between me and my child during homework time.	2.80	1.481	0.986	-0.150	0.842
15. My child is disobedient during homework time.	3.17	1.521	0.970	-0.095	0.856
			Factor 1		Factor 2
Composite Reliability			0.911		0.761
H-Latent			0.952		0.814
H-Observed			0.933		0.775

Note: sd= standard deviation.

The internal consistency of *SHIP -Total Score* was assessed using the McDonald's ordinal Omega test ($\alpha = 0.81$) and Standardized Cronbach's alpha ($\alpha = 0.81$). The results indicated high scores in both parameters. Reliability of the factors were assessed by Composite Reliability (*CR*) index (Valentini & Damásio, 2016). Both dimensions showed high values (*Factor 1 - Child Behavior*, $CR = 0.91$; *Factor 2 - Parental Involvement*, $CR = 0.76$). The correlation between *Factor 1 - Child Behavior* and *Factor 2 - Parental Involvement* was statistically significant ($\alpha = 0.40$). *Total Score* was correlated positively with both factors, but it showed higher correlation with *Factor 1 - Child Behavior* ($\alpha = 0.89$) than *Factor 2 - Parental Involvement* ($\alpha = 0.79$).

The Reckase parameterization was used to evaluate the item's discriminations and items' thresholds (Reckase, 2006). Regarding the items' thresholds (Supplementary Table 2.3). it was found no unexpected response patterns (all items increased the level of latent trait according to higher scale response categories).

Item Response Theory was used to assess power discrimination of the items (Table 2.4) and the results reveals that the most discriminating item of *Factor 1 - Child Behavior* was Item 15 (“My child is disobedient during homework time.”) and of *Factor 2 - Parental Involvement* was Item 1 (“I help my child with homework whenever he or she needs it.”). The most discriminating item on the whole questionnaire was also item 15.

Table 2.4: Items discrimination.

Items	Factor 1	Factor 2	Total Score
1	-0.545	1.177*	1.297
2	0.430	-0.158	0.458
3	0.189	0.390	0.434
4	0.081	0.570	0.575
5	0.280	-0.982	1.022
6	-0.263	0.484	0.551
7	0.531	0.630	0.824
8	0.365	0.424	0.560
9	0.429	0.448	0.620
10	0.513	-0.108	0.524
11	-0.459	0.622	0.773
12	1.814	-0.136	1.819
13	1.865	-0.079	1.867
14	2.481	-0.376	2.509*
15	2.554*	-0.251	2.566

Note: * most discriminating item of each dimension.

Criterion Validity

Criterion validity was analyzed as the instrument's ability to discriminate groups by sex, age and presence of diagnosis (Table 2.5). Student's t tests for independent variables and One-way ANOVAs were used. Parents of girls reported significantly higher scores in *Factor 1 - Child Behavior* in comparison with parents of boys ($d = 0.33$). Parents of children with prior diagnoses reported lower scores in *Factor 1- Child behavior* ($d = 0.57$) and in *Total Score* ($d = 0.42$).

Differences in SHIP dimensions among age groups were analyzed with One-way ANOVA. Results of the post-hoc Bonferroni test indicated that Parents of children in G1 (6-8 years) presented higher scores in *Factor 2 - Parental Involvement* [Welch's F (2, 101.106) = 5.08, $p < 0.05$, ETA-Square= 0.05] and in *Total Score* [Welch's F (2, 104.46) = 2.74, $p > 0.05$, ETA-Square = 0.04] in comparison to the other two groups.

Table 2.5. SHIP differences in age-groups, children sex and child diagnosis.

Instru ments	Variables	ANOVA - Age Group difference (G1, n=71); (G2, n=60); (G3, n=45); (Total, n=176).					Student's t test - Sex differences (Girls, n=70); (Boys, n=106); (Total, n=176), <i>df</i> =174					Student's t test - Children diagnosis differences (WD, n=120); (WOD, n=56); (Total, n=176), <i>df</i> =174						
		Age Groups	Mean(<i>sd</i>)	<i>F</i>	<i>p</i> value	η^2	Sex	Mean(<i>sd</i>)	<i>T</i>	Mean difference	<i>p</i> value	Cohen's <i>d</i>	Reported Diagnosis	Mean(<i>sd</i>)	<i>t</i>	Mean difference	<i>p</i> value	Cohen's <i>d</i>
SHIP	Factor 1 - Child Behavior	G1	17.18(5.99)				Girls	17.41(6.08)				WD	15.07(6.36)					
		G2	14.68(6.33)					15.37(6.37)					WOD	18.55(5.60)				
		G3	16.60(5.56)	2.740	0.069	-			-2.12	-2.05	0.035	0.33			-3.51	-3.48**	<0.001	0.57
		Total	16.18(6.32)															
	Factor 2 - Parental Involve ment	G1	35.55(4.18)				Girls	34.39(4.36)				WD	34.14(4.69)					
		G2	33.60(4.37)					34.16(4.86)					WOD	34.48(4.61)				
		G3	33.07(5.30)	5.08*	0.008	0.05			-0.31	-0.23	0.754	-			-0.45	-0.34	0.653	-
		Total	34.25(4.66)															
	Total Score	G1	52.73(8.67)				Girls	51.80(8.62)				WD	49.22(9.27)					
		G2	48.28(9.36)					49.53(9.54)					WOD	53.04(8.66)				
		G3	49.67(9.28)	4.19*	0.018	0.04			-1.61	-2.27	0.110	-			-2.60	-3.820*	0.010	0.42
		Total	50.43(9.23)															

Note: η^2 = eta-squared; *sd*= standard deviation, G1=06-08 years; G2=09-11 years; G13 = 12-14 years; WD = with diagnosis; WOD = without diagnosis;

* $p < 0.05$ and ** $p < 0.001$.

Convergent and discriminant validity

Convergent and discriminant validity of SHIP were analyzed with Pearson's correlations between the SHIP scales' scores and three external measures (DASS-21, SDQ and PSI) (Table 2.6).

The scores of *Factor 1 - Child behavior* correlated significantly with all SDQ scales ($p < 0.05$), being positive only with *ProSocial Behavior*. The correlations of *Factor 1 - Child Behavior* with SDQ ranged from $r = -0.24$ for *Peer Problems* to $r = -0.53$ for *Total Difficulties*. There were no observed significant correlations between *Factor 1 - Parental Involvement* and DASS-21 ($p > 0.05$). *Factor 1 - Child Behavior* significantly correlated with four PSI subscales: *Positive Monitoring* ($r = 0.19$); *Inconsistent Punishment* ($r = -0.21$); *Relaxed Discipline*; ($r = -0.18$) and *PSI - Total Score* ($r = 0.26$). All the correlations between Factor 1 and PSI subscales were below $r = 0.30$, being positively correlated only with *Positive Monitoring*.

Factor 2 - Parental Involvement was significantly correlated with SDQ - *Emotional Problems* ($r = -0.28$), SDQ - *Conduct problems* ($r = -0.20$), SDQ - *Total Difficulties* ($r = -0.22$). There were no observed significant correlations between *Factor 2 - Parental Involvement* and DASS-21 ($p > 0.05$). PSI-*Positive Monitoring* ($r = 0.17$) and PSI - *Relaxed Discipline* ($r = 0.16$) correlated with *Factor 2 - Parental Involvement*.

Significant correlations were observed for all SDQ and SHIP - Total Score, ranging from $r = -0.19$ for *Peer Problems* to $r = -0.48$ for *Total Difficulties*. There were no observed significant correlations between *Total Score* and DASS-21 ($p > 0.05$). *Total Score* correlated with PSI below $r = 0.30$, with the following PSI subscales: *Positive Monitoring* ($r = 0.22$); *Inconsistent Punishment* ($r = -0.21$); *Relaxed Discipline*, ($r = -0.21$) and *PSI Total Score*, ($r =$

Table 2.6: Correlations results among SHIP, DASS-21, SDQ and PSI.

	Sociodemographic Characteristics						SHIP			DASS-21		
	SES Total Score	Number of children per mother	Parents's age in years	Children age in years	Parents's Formal schooling	Children's Formal schooling	Factor 1 - Child Behavior	Factor 2 - Parental Involvement	Total Score	Depression	Anxiety	Stress
SES Total Score	1											
Number of children per mother	0.070	1										
Parents's age in years	.233**	-0.021	1									
Children age in years	-0.087	-0.025	.199*	1								
Parents's Formal schooling	.390**	-0.137	.162*	0.082	1							
Children's Formal schooling	-0.017	-0.007	.226**	.904**	0.100	1						
Factor 1 - Child Behavior	-0.073	0.089	0.021	-0.060	-0.151	-0.038	1					
Factor 2 - Parental Involvement	0.074	0.066	0.005	-.216**	-0.011	-.234**	.366**	1				
Total Score	-0.013	0.095	0.017	-0.151	-0.111	-0.145	.882**	.762**	1			
Depression	-0.039	0.131	-.168*	-0.060	0.007	0.011	-0.121	0.042	-0.063	1		
Anxiety	-0.074	0.150	-.162*	-0.024	0.027	0.064	-0.057	0.000	-0.040	.683**	1	
Stress	0.082	0.115	-.183*	-0.093	0.074	-0.022	-0.118	-0.001	-0.082	.661**	.724**	1
ProSocial	-0.048	.178*	0.145	-0.094	-0.033	-0.074	.279**	0.128	.259**	-0.011	-0.033	-0.084
Hyperactivity	0.028	0.022	-0.132	0.003	0.076	-0.067	-.455**	-0.090	-.363**	0.005	0.045	.229**
Emotional Problems	-0.115	0.020	-0.061	.248**	0.024	.181*	-.314**	-.285**	-.363**	.221**	.257**	.273**
Conduct Problems	-0.064	-0.122	-0.017	0.098	-0.012	0.078	-.470**	-.197*	-.427**	0.036	0.116	0.125
Peer Problems	-0.109	0.125	-0.116	0.074	0.027	0.007	-.242**	-0.054	-.195*	0.138	.181*	0.077
Total Difficulties	-0.087	0.021	-0.121	0.145	0.045	0.064	-.526**	-.218**	-.476**	0.139	.208*	.256**
Positive Monitoring	.242**	-0.026	0.133	-0.063	-0.034	-0.082	.195*	.173*	.224**	-0.074	-0.095	-0.064
Moral Behavior	-0.013	0.083	0.051	.218**	0.097	0.109	0.037	-0.048	0.002	-0.108	-0.013	-0.001
Inconsistent Punishment	-0.009	0.010	-0.106	0.104	0.086	0.079	-.207*	-0.122	-.206*	.183*	.252**	.418**

	SDQ					PSI							Total	
	ProSocial	Hyperactivity	Emotional Problems	Conduct Problems	Peer Problems	Total Difficulties	Positive Monitoring	Moral Behavior	Inconsistent Punishment	Negligence	Relaxed Discipline	Negative Monitoring		Physical Abuse
Stress														
ProSocial	1													
Hyperactivity	-.242**	1												
Emotional Problems	-.0137	.205*	1											
Conduct Problems	-.482**	.511**	.298**	1										
Peer Problems	-.416**	.269**	.319**	.407**	1									
Total Difficulties	-.438**	.731**	.643**	.763**	.691**	1								
Positive Monitoring	0.083	-.163*	-.207*	-.172*	-.224**	-.270**	1							
Moral Behavior	-0.016	0.045	0.130	0.043	0.037	0.090	.231**	1						
Inconsistent Punishment	-.224**	.185*	.276**	.319**	0.080	.300**	-0.112	0.085	1					
Negligence	-0.025	0.078	.322**	.166*	.231**	.277**	-.387**	0.014	.419**	1				
Relaxed Discipline	-.199*	0.153	.248**	.316**	.172*	.307**	-.286**	-0.064	.388**	.355**	1			
Negative Monitoring	0.010	0.141	0.125	.220**	0.021	.178*	0.007	.244**	.217**	.228**	.313**	1		
Physical Abuse	-0.124	.170*	0.123	.260**	.217**	.268**	-.172*	-0.071	.423**	.416**	.239**	0.156	1	
Total	0.155	-.221**	-.303**	-.372**	-.224**	-.389**	.488**	.184*	-.638**	-.710**	-.691**	-.528**	-.633**	1

Discussion

In the present study, we investigated preliminary psychometric properties of a newly developed questionnaire to assess PIH. Parents of children aged between 6 and 14 years, recruited through social networks, were remotely and asynchronously assessed through the internet during the COVID-19 pandemic. Results indicated that SHIP's structure comprises two factors, *Factor 1 - Child Behavior* and *Factor 2 - Parental Involvement*. The SHIP Total Score was also analyzed. Internal consistency of SHIP - Total score was high.

Parents of girls reported higher scores in *Factor 1 - Child Behavior* than parents of boys. Parents of children with prior diagnoses reported lower scores in *Factor 1 - Parental Behavior* and SHIP Total Score. Parents of younger children reported higher scores in *Factor 2 - Parental Involvement*, and Total Score. Parental responses to SHIP did not correlate with self-reported parental symptoms of anxiety, depression, and stress. *Factor 1 - Child Behavior* had weak to moderate correlations with all SDQ scales reporting parental perceptions of child's behavior and weak correlations with self-reports of parental practices assessed by four PSI subscales. *Factor 2 - Parental Involvement* had weak correlations with self-report of parental practices with two PSI subscales. SHIP - *Total Score* had weak to moderate correlations with all SDQ scales reporting parental perceptions of child's behavior and weak correlations with self-reports of parental practices assessed by four PSI subscales. First, the meaning of these results is discussed next, considering structural validity, criterion, validity, convergent and discriminant validity (Reeves & Marbach-Ad, 2016). Second, the contribution of these results to the interpretation of SHIP scores is discussed.

Internal structure. An EFA indicated that SHIP is composed of two dimensions. Assessment of item associations and retention of dimensions was performed through parallel analyses. Two factors could be extracted. Coefficients for the two factors corresponded to currently accepted criteria for multidimensionality (Grolnick & Slowiaczek, 1994; Bauch,

1994; Pomeratz et al., 2005, Hong et al., 2010). The first factor was called Factor 1 - Child Behavior and comprised items describing children's behavior and attitudes regarding homework activities. This first factor showed high item reliability and replicability (Composite Reliability = 0.91; H-observed = 0.93). The second factor was called Factor 2 - Parental Involvement and comprised items reporting parental behaviors and attitudes regarding homework supervision. Factor 2 showed good item reliability and precision (Composite Reliability = 0.76, and H-observed = 0.78). Omega alpha for SHIP - Total Score was 0.81. The composite reliability and H indexes and internal consistency indexes reached criteria of reliability (>0.70). Internal consistency for *Factor 2* was lower than that for SHIP - *Factor 1*. Our hypothesis is that parents could find it easier to report on the child's behavior than on their own behaviors.

Test-criterion relationships. Parents of girls reported higher scores in SHIP *Factor 1 - Child Behavior* than parents of boys. This is consistent with previous reports that parents perceive more positive school homework-related behaviors in girls than in boys (Lee, 2007; Carter & Wojtkiewicz, 2000). Evidence indicates that girls are more conscientious than boys, getting more willingly involved with school homework (Carter, & Wojtkiewicz, 2000). Boys, otherwise, present a higher frequency of hyperactive/impulsive and oppositional behaviors (Tiet et al., 2001; Russell et al., 2014). In the present study, results from SDQ indicated that parents of boys report higher scores in behavior problems (Table 2.1). Parents also reported higher positive involvement for girls than for boys in *Factor 1 - Child Behavior*, however, these differences were not statistically significant.

In the present study, no statistical differences were observed between parents of girls and boys in the PSI parental practices subscales (Table 2.1). This is in accordance with studies suggesting that parents get involved with boys and girls in similar ways (Silinskas & Kikas 2019; Bhanot & Jovanovic, 2005). However, other studies indicate parents of boys tend to use

strategies based on behavior control while parents of girls cultivate higher expectations for girls, which in some cases may be unrealistic (Braza et al., 2015). Girls are recipients of more negative feedback (Kast & Connor, 1988). The so-called "tiger-mom" parenting style has been widely discussed (Shin & Wong, 2013, Xie & Li, 2019). Families of children from Far-Eastern Countries tend to cultivate higher expectations regarding their children's academic achievement. This is associated with better achievement and low self-efficacy (Lee et al., 2009, Stankov, 2010). This was not observed in the present study. Interestingly, Lee and coworkers (2009) observed that youngsters from Far-Eastern countries had higher math achievement and reported lower math self-efficacy while youngsters from countries such as Brazil and Turkey had lower math achievement and reported higher math self-efficacy.

Consistently with reports of higher frequency of behavior problems in children with psychiatric diagnoses and learning difficulties (Callahan et al., 1998; Xiao et al., 2022; Sipila-Thomas et al., 2020), parents of children with prior diagnoses reported lower scores in *SHIP - Factor 1 - Child Behavior* and *SHIP Total Score*. These results are consistent with those of *SDQ*. Parents of children with prior diagnoses reported higher scores in general behavior problems. (Table 2.1). Parents of children without a prior diagnosis also reported more positive parental practices (Table 2.1). Most diagnoses reported by parents involved behavioral problems. Studies show that children with a neurodevelopmental diagnosis have more problematic behaviors in relation to school activities, which are often associated with learning difficulties, consequently affecting behavior during school homework (Sipila-Thomas et al., 2020).

No significant between group diagnosis differences were found in *SHIP - Factor 2 - Parental Involvement*. However, parental reports of the total number of parenting practices and positive monitoring practices assessed with *PSI* were higher for children without a

previous diagnosis (Table 2.1). Relations between *Factor 2 -Parental Involvement* and PSI *Positive Monitoring* will be analyzed in the section on Convergent and discriminant validity.

Parents of younger children reported higher scores in *Factor 2 -Parental Involvement*, and SHIP - *Total Score*. In the present study, we analyzed reports of parents from children spanning from ages 6 to 14 years. No significant sociodemographic differences were observed across age groups. Higher parental involvement with school homework has been consistently reported for younger than for older children of ages similar to those analyzed in the present report (Barger et al., 2019; Wei et al., 2019). Older children tend to be less dependent on parents to do school homework (Cooper et al., 2000; Pattal et al., 2008). From puberty on, the pattern of parental involvement also changes. Parents of adolescents are more involved in helping their children to make occupational choices than with daily school homework (Núñez et al., 2015; Falbo et al., 2001; Deslandes & Rousseau, 2008).

Predictive test-criterion relationships are reported in a companion paper in this thesis (Chapter 3). The authors report the sensitivity of SHIP to assessment changes of PIH after an internet-based cognitive-behavioral intervention during the COVID-19 pandemic.

Convergent and discriminant validity. Evidence of convergent and discriminant validity for SHIP were assessed through correlations with the external variables symptoms of parental anxiety, depression, and stress (DASS-21), child's behavior problems (SDQ) and parenting style (PSI). Lack of correlations between the SHIP scales and DASS-21 indicates that SHIP scores are not influenced by parental perceptions of their own internalizing symptoms.

Weak to moderate correlations between SHIP *Factor 1 - Child Behavior* and all subscales of SDQ, with common explained variance from 0.24% to 0.47%. indicate convergent validity. Weak correlations were observed for SDQ Prosocial behaviors ($r = 0.24$) and SDQ *Peer Problems* ($r = -0.24$). Moderate correlations were observed for SDQ

Hyperactivity ($r = -0.46$), SDQ *Emotional Problems* ($r = -0.31$), and SDQ *Conduct Problems* ($r = -0.47$). Content analysis indicates that only one item in the subscale SDQ *Hyperactivity* specifically addresses problems with school homework ("Can't sit still when s/he has to do school homework or eat; moves around a lot, bumping into things, knocking things over"). This suggests that SDQ taps on more general behavioral problems, which may impact on the school homework specific items assessed by *Factor 1 - Child Behavior*.

Weak correlations were also observed between SHIP Factor 2 - Parental Involvement and PSI *Positive Monitoring*. A content analysis also suggests that Factor 2 - Parental Involvement and PSI *Positive Monitoring* assess different aspects of parental involvement. Factor 2 assesses instrumental parental involvement (e.g., I help my child with homework whenever he or she needs it.) while *Positive Monitoring* assesses emotional aspects of the involvement (e.g., "I ask how their day at school was and listen carefully to their answers"). Correlations between Factor 1 - Child Behavior and Positive Monitoring were $r = 0.19$, suggesting just 4% of shared variance. This result indicated that *Factor 1 - Child Behavior*, assesses a specific dimension of PIH, not assessed by *Positive Monitoring*.

Interpretation of SHIP scores. Analysis of test-criterion relationships and convergent and discriminant validity suggest SHIP assesses specific dimensions of PIH. SHIP dimensions are not related to parental self-reported internalized symptoms assessed by DASS-21. *Factor 1 - Child Behavior* may reflect school homework specifically related to aspects of more general behavioral disorders assessed by SDQ, such as internalizing and externalizing symptoms. *Factor 2 - Parental Involvement* assesses instrumental aspects of PIH, in contrast to PSI *Positive Monitoring*, which assesses emotional involvement. Items tapping homework organization and physical structure were eliminated because they did not fulfill criteria of structural validity in the current version.

Further studies will be required to refine SHIP's structure regarding theoretical models of PIH. In the current version, SHIP focuses on children's behavioral problems and instrumental aspects of PIH. Ideally, an instrument to assess PIH should more explicitly consider dimensions such as autonomous support vs. control practice (Pomerantz et al., 2015), and mastery-oriented vs. performance-oriented beliefs (Watkins, 1997). Further studies are needed to elucidate the ecological correlates and sensitivity to intervention of the dimensions assessed by SHIP.

Results of the present study point to SHIP's potential to assess parents' involvement in school activities, more specifically during homework. There are few reports in the literature of instruments validated in Brazilian Portuguese to assess the involvement of parents in school (de Carvalho, 2006). To the best of our knowledge, there is still no questionnaire to specifically assess parental involvement in homework in Brazilian Portuguese (Glidden, 2015).

This type of assessment has taken on great importance in the COVID-19 pandemic, when the daily parental school homework-related daily workload increased (Stewart, 2021; Laguna et al., 2021). Internal structure and consistency, test-criterion relationships, and convergent and discriminant analyses of validity suggest PIH may be reliability assessed through the internet.

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STUDY 2

Effects of WebParents during the COVID-19 pandemic assessed by SHIP: preliminary results

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Abstract

The COVID-19 pandemic increased the need for internet-based programs to promote parental involvement with school homework. Data on the efficacy of WebParents, an internet-based cognitive-behavioral program to promote parental involvement with school homework, are reported. 64 families of typically developing children from 6 to 14 years were recruited by convenience through social networks. In addition to measures of parental symptoms, child behavioral problems and parenting style, the program effects were analyzed with SHIP, a self-report measure of Parental Involvement with School Homework. The program included teaching techniques of positive attention, differential reinforcement, routine organization, emotional regulation and flexibility of thoughts and feelings. The program was developed in six 90-minute sessions, twice in the week. Results were similar to those reported for face-to-face interventions. The intervention resulted in moderate improvements in parental symptoms of internalizing disorders and parental school homework involvement. In addition, weak effects were observed on children's behavior and parenting styles. User satisfaction reports were positive. Results suggest that WebParents may be effective in promoting parental involvement with school homework through the internet, and that SHIP is sensitive to the effects of the intervention. Further randomized and controlled studies are required to establish the efficacy of WebParents.

Keywords: School homework, Parental involvement, Counseling, Cognitive-behavioral intervention, Internet-based intervention

Introduction

Parental involvement in children's school homework activities (PIH) has been repeatedly associated with school adjustment and family health (Sheridan et al., 2019; Spencer et al., 2020). Demands for PIH increased during the COVID-19 pandemic, potentially stressing parents and children and promoting negative effects on learning and school achievement (Garbe et al., 2020). In this study we present the results of a short-term internet-based group intervention (based on cognitive-behavioral theory) to promote PIH in parents of children between 06 and 14 years old during the pandemic period.

Homework is considered as an important pedagogical tool to promote student learning. Evidence showed that homework is related to better academic achievement, improvement of motivation and interest in school, and it was also associated with the development of socio-emotional skills such as auto-efficacy (Bas & Cigerci, 2017, Schunk & Zimmerman, 1994, Cooper et al., 2006). In addition, homework is also a common way for parents to get involved with their children's school life (Walker et al., 2004, Cooper et al., 2000). Many parents, children and teachers believe that parental help in homework is a relevant part of parenting responsibilities (Núñez et al., 2015, Cunha et al., 2015). PIH can be defined as a set of parental practices, strategies, expectations, emotions, and beliefs used to educate, motivate, correct, and manage children behavior during schoolwork at home (Hoover-Dempsey et al. 2001, Pomerantz et al., 2007), being a multifaceted construct (Grolnick and Slowiaczek, 1994, Hoover-Dempsey and Sandler, 1997). Studies have accumulated evidence showing that parental support and participation in school activities have positive impacts on children's learning and academic achievement (Hill & Tyson, 2009; Patall et al., 2008, Cia et al., 2008). This result is explained by the fact that parents are an important source of help and motivation for the students (Trautwein & Ludtke, 2006; Gonzalez-DeHass et al., 2005).

Trautwein & Ludtke (2006), for instance, showed that parents play an important role in improving student expectations, motivation and consequently enhancing student's efforts during homework. The authors developed a multilevel model to explain the factors that would influence students' effort and motivation in homework. In the proposed model, parental involvement was assessed considering parent-children communication, parental expectations about children's achievements, attitudes, and interest about academic life. Furthermore, parents' support was divided considering the quantity (frequency and time spent) and the quality of help in homework supervision (type of provision of help, level of interference and level of parental "pedagogical knowledge"). The results showed that the quality of involvement was more strongly related to students outcomes than frequency of help. Finally, the authors also confirmed other results in literature demonstrating that higher frequency of controlling practices and unwanted interference can be detrimental to children and adolescents' school achievement and motivation.

A meta-analysis of 448 studies also showed positive associations between parental involvement and children's adjustment in school, demonstrating effect size ranging 0.13 to 0.23 (Barger et al., 2019). Parental involvement increased children's social and emotional outcomes, and also reduced children behavior problems and delinquency. However, the authors showed a negative association between PIH and children's achievement, but they found that PIH was positively related to improving children's engagement and motivation (Barger et al., 2019). Other studies also suggested that PIH has less impact in achievement itself, showing more mediating effects in proximal achievement-related variables such as children's motivation and socioemotional skills (Pattal, et al. 2008, Cooper et al., 2000; Moroni et al., 2015; Silinskas et al., 2015).

These results stressed the importance of focusing on the quality of parental involvement and not just on the frequency of this type of support (Watkins, 1987; Núñez et

al., 2015). The quality of PIH has been operationalized in different ways in the literature. A widely used classification of PIH distinguishes the quality of involvement between control and support types. On one hand, the control type describes an involvement based on rigid parental control and pressure, adding to an excessive use of restrictions and punishments methods and the establishment of strict rules. This type of involvement is very detrimental both to children and parents, being related to negative impacts on school motivation, achievement, and parent-children relation (Pomerantz et al., 2005, 2007; Dumont et al., 2014). On the other hand, the support type is based on consistent and positive help, without imposing unwanted interference. The main objective of this second dimension is to develop students' autonomy for study (Pomerantz et al., 2005, Núñez et al., 2015; Hoover-Dempsey et al., 2001). This second type, when applied correctly, enables parents to be more efficient in helping their children, ensuring children's obedience, homework completion and stimulating children's interest and motivation in school (Núñez et al., 2015; Gonida & Cortina, 2014).

In a longitudinal study with 2,830 students from grades 5 and 7 Dumont and colleagues (2014) classified the quality of PIH using three parental dimensions: responsiveness (parental demonstration of affection and attention, helping children learn how they feel in relation to others), control and structure provision (referring to parental provision of environmental organization, and structuring of learning settings). Their objective was to investigate the relation between quality of PIH, family socioeconomic status (SES) and student outcomes in reading achievement, effort, and homework procrastination over the grades. The results showed that higher control levels in grade 5 predicted lower achievement in grade 7, and lower achievement in grade 5 predicted higher levels of parental control in grade 7. Moreover, there were no differences in quality of PIH among the SES groups.

Similar results were presented by Silinskas and Kikas (2019), who also found a reciprocal relation between parental quality of involvement, persistence in math homework

and students' math skills. Student perceptions of parent quality of help (control and support) and parental perceptions of students persistence in math homework were evaluated. Higher levels of perceived parental support in Grade 6 predicted more homework persistence in Grade 9. Furthermore, students with better scores in math skills in Grade 6 showed more parental support in Grade 9. On the other hand, poorer math skills in Grade 3 were related to increased children's perception of parenting control in Grade 6. Moreover, perceived high level of parental control in Grade 6 was related to higher perception of parental support in Grade 9.

This last result can be explained by the fact already described in other studies that parents tend to be more present and offer more support in earlier grades, which can be viewed by the younger children as control type (Dumont et al. 2012, 2014; Cooper et al., 2000). Moreover, as a function of their cognitive development, children can become more accurate in judging parental involvement over time (Hoover-Dempsey et al., 2001; Deslandes & Rousseau, 2008.).

Results from the Silinskas and Kikas' (2019) study also showed changes in parental involvement influenced by children's sex. They observed that parents perceived less math homework persistence in boys, and boys reported more perceived control than girls. The research about sex influence on parental involvement have mixed results. However, some authors observed that parents tend to be more participative with their daughter's education, and more intrusive and controlling with boys' supervision (Bhanot & Jovanovic, 2005; Dumont et al., 2012, Carter & Wojtkiewicz, 2000, Cooper et al., 2000). Furthermore, studies found that PIH effects in learning achievement is lower for girls. Girls tend to be more frequently targeted by negative feedback and by higher levels of parent expectations on their performances, negatively affecting the sense of autonomy and motivation (e.g., Kast & Connor, 1988; Koestner et al., 1989).

Therefore, although parents recognize their role in children's education, many of them do not have enough and adequate pedagogical and educational practices to offer good quality support (Cooper et al., 2006; Cooper & Nye, Pomerantz et al., 2007, Balli, 1997). The parents' lack of repertoire of positive and non-coercive practices, added to children's characteristics and difficulties, increases the probability of parents using less effective and more harmful practices (Salvador, 2007). Studies already showed that homework can cultivate negative feelings and attitudes in parents and children (Cunha et al., 2015). In addition, when PIH is permeated by coercive and control practices, PIH can increase the levels of stress and anxiety in both parents and children, also aggravating children's behavior, and having negative impacts on parent-child relation (Cooper et al., 2000, Moé et al, 2020, Pattal et al., 2008).

One study, for example, observed that parents who use coercion to discipline their children in everyday situations are more likely to use coercion practices in academic situations. The results showed that positive parenting practices were related to higher students' academic achievement and adolescents' involvement in school, however, negative parenting practices were related to depressive symptoms in students. Moreover, students' academic achievement correlated positively with higher scores of involvements of parents and students in school activities and negatively correlated with students' depressive symptoms. (Salvador, 2007).

Moé and colleagues (2020) studied the impacts of stress in parental involvement in school. The authors proposed a framework model of a vicious cycle where levels of stress in parents increase with the enhancement of what they called parental "need frustration" (defined as "the experience of lack of competence and of connection and to be pressured to do things not chosen or considered with no personal meaning" (pg. 2)). Results showed that higher levels of parental "need frustration" contribute to an increase in children's "need frustration" and stress levels, because need frustrated parents tend to adopt more "need-thwarting

practices” (practices based on control support in which parents use more authoritarian commands and, according to the authors, enhance the children's “experience of being controlled or pressured, not capable, and not connected to or cared for by others” (pg. 2)).

Stress influences in PIH can be understood as a two way path in which the difficulties related to PIH provoke increasing levels of stress, and higher levels of stress maintain and aggravate PIH difficulties and problems (Moé et al., 2020; Pressman et al., 2015.). Therefore, in addition to the fact that PIH is challenging work itself, due to the complexity of the interaction of the factors involved, the problems related to PIH are also aggravated by the lack of parental repertoire in using more positive and efficient practices and attitudes during homework supervision (Cooper et al., 2000).

Thinking about these challenges and difficulties related to PIH, in the last two decades, evidence has accumulated showing the efficacy and efficiency of parents interventions programs to help parents deal with children’s schoolwork (Breaux et al., 2019; Fishel & Ramirez, 2005; Patall et al., 2008; Rhoades & Kratochwill, 1998). Studies showed that parental interventions are a great therapeutic alternative to strengthen parent-school partnership, improve the school development of children and adolescents, and promote quality of life (Dumont et al., 2014; Sheridan et al., 2019). Most examples in literature of short-term, PIH intervention programs have been conducted individually, face-to-face in small samples of participants, and using more applied behavior techniques than cognitive-behavior ones (Russo et al., 2020; Power, 2001). Examples of evidence-based parental interventions to improve PIH, that were inspirations for the program used in this study, are described next.

In an older example in literature, Rhodes and Kratochwil (1998) applied a face-to-face 5-session parental training program to improve students' homework accuracy and completion. Program schedule and contents were adapted from a group program intervention created by researchers of University of Utah, named “Do It Yourself Homework Manual: A Sanity Saver

for Parents” (Olympia et al., 1990). The authors also included suggestions and strategies from a second published manual: *The Homework Solution: Getting Kids to Do Their Homework* (Sonna, 1990). Finally, the intervention covered four steps: 1) problem identification (data collection), 2) problem analysis (management of homework time, setting and strategies); 3) plan implementation (behavior management, application of role-plays, parenting training to teach parents practices involving problem solving, communication, give positive instruction) and 4) Treatment Evaluation (post-evaluation and four-session of follow-up using telephone contact). The participants were parents of four males students (three from grade 6 and one from grade 4), who presented problems to complete homework. The results showed that all parents observed an increase in children's homework compliance and a decreased behavior problems during homework execution. Moreover, teachers also reported improved levels of homework completion. The follow-up data collected four months after the intervention showed that children whose parents participated in the intervention had returned to the same level of their colleagues who did not show problems with homework before the intervention. Finally, both parents and teachers declared high levels of satisfaction and acceptability of program structure (Rhodes and Kratochwil, 1998).

Later, Habboushe and colleagues (2001) showed the results of a seven-sessions parental training program for children with attention-deficit/hyperactivity disorder (ADHD) and homework problems, named the “Homework Success Program”. The program included psychoeducation of the principles of applied behavior theory (Skinner, 2003), as well as strategies for managing children's behavior, productivity and functioning during homework time. The program also emphasized the importance of improving communication and collaboration between teachers and parents. The results of the intervention in a group of five families showed reduction of children's problems, and increased rates of homework completion. The authors concluded that homework can be good alternatives to promote

learning in children with ADHD, who often need additional opportunities to improve learning.

Another study demonstrated the effectiveness of a 12-session parent training program to improve the socio-educational skills of parents, teach parenting skills, and promote pro-academic behavior in children. Participants were divided into two experimental groups (group 1 with 29 participants including both parents and Group 2 with 36 mothers) and one control group (34 children including both parents). Results showed improvements, after intervention, in children's scholar achievement scores (writing, arithmetic and reading skills) in both groups 1 and 2. Furthermore, the study showed a reduction of children's negative behaviors perceived by teachers in groups 1 and 2. Further, it was observed improvements in students' positive behaviors perceived by teachers in group 1. No significant change was observed in the control group (Cia et al., 2010).

Moé and coworkers (2020) also developed a pro intervention to promote positive parental practices, need-supportive practices, and fulfill parental psychological needs. During four 90 minutes sessions, a problem describing a regular homework parent-child interaction was discussed in groups of fifteen participants. Parents were invited to search for solutions to the problems by taking the children's perspective and adopting more need-supportive behaviors (promote a "caring and respectful climate" at home, provide affection and positive feedback and help children with problem solving). The intervention results showed reducing levels of children ($d = 0.41$) and parents' stress ($d = 0.30$) and decreased the use of need-supportive practices according to parents ($d = 0.21$) and children report ($d = 0.23$).

Results presented before indicated the potential of parenting interventions to help parents dealing with school and homework activities. More recently, during the COVID-19 pandemic, these types of interventions, adapted to virtual environments, were in higher

demand and became a relevant way to promote health assistance to families (Fogler et al., 2020).

The transition from face-to-face to remote teaching during COVID-19 pandemic was not an easy process for most families around the world (Salari et. al., 2020, Karpman et al., 2020). In the pandemic period, researchers observed an aggravation of children's behavior and emotional problems (Spinelli et. al, 2020; de Miranda et. al., 2020) and a decline in parental mental health (Russell et. al., 2021; Calvano et. al., 2021; Adams et. al., 2021). Moreover, parents had to assume a greater role in the education of their children and deal with difficulties in adapting to a new and different routine at home (Novianti & Garzia, 2020; Grossi e cols., 2020; Salari et. al., 2020; Laguna et al., 2021).

Emergency remote teaching was adopted in many countries (Stewart, 2021). In Brazil, schools closed in March 2020, and more than 50 million students were out of school (Unesco, 2021b) and most of the students started to use the internet to access school classes and materials (Cunha et al., 2020; Ferreira et al., 2020). However, despite the data showing that 80% of Brazilian states provided teacher supervision, many students did not receive quality guidance from teachers and most of them suffered from lack of internet access, impacting their studies, and increasing parents burden (Ferreira et al., 2020; Laguna et al., 2021).

Novianti & Garzia (2020) surveyed the characteristics of parental involvement during the COVID-19 pandemic in the context of Indonesia. Parents reported that during the isolation period their children studied less. The authors identified in their study that 87% of those responsible for parental involvement during the pandemic were mothers. Likewise, parents also reported difficulty in organizing children's routine. Many parents also reported the challenge of keeping children motivated to study at home, while trying to create situations that could favor the child's retention of knowledge. Another difficulty reported was to

understand the school contents and adequately help the children according to what was requested.

During virtual learning, the lack of teacher physical support and the increasing amount of time that students spend at home with their parents contributes to emphasizing the importance of parental participation in school life (Lui et al., 2021).

Internet-based parenting interventions are not recent in literature. In a meta-analysis, Nieuwboer and coworkers (2013) reviewed the results of 12 experimental studies evaluating the effects of online interventions to improve skills, including behavior, attitudes, and knowledge. The results showed positive and statistically significant medium effect size (*ES*) regarding parents outcomes ($ES = 0.67$) and children outcomes ($ES = 0.42$).

Therefore, even though there is a lack of studies on internet-based parenting intervention, interesting publications have already been reported in literature. These studies range from the development of new programs (Silveira et al., 2021; Neufeld & Szupzynski, in press) the adaptation of face-to-face traditional evidence-based programs, such as the Positive Parenting Program - Triple P (Sanders et al., 2007). In a previous study we developed a short-term parental intervention based on the internet. Our results showed promising effects of the intervention to improve parent's symptoms of depression, anxiety and stress and promote children behavior. Furthermore, we found that parents reported good acceptability of internet-based intervention.

The present study

Therefore, considering the ascending relevance of internet-based and the increased demands of the parents regarding homework supervision. The present study expands on previous results by Silveira and coworkers (2021) with a larger sample, introducing the assessment of intervention effects in parental involvement in homework. The School Homework Involvement of Parents (SHIP) questionnaire was used as a primary outcome to

measure effects of WebParents intervention. We found that after intervention, parents reported improvements in involvement with homework and children behavior, with moderate size effect. Secondary outcomes showed similar results from our previous study, being observed improvement of parental perceptions of anxiety, depression and stress symptoms, and reduction of children behavior problems and increase of parental perceptions of *ProSocial Behavior*. The different results in this present study, we observed reduction of parental perceptions of abuse physical practices.

Methods

Participants

This study was conducted according to procedures recommended by the Helsinki Declaration of ethics in research with humans. The project was approved by the Ethics Board of Universidade Federal de Minas Gerais (Project 's title: “Desenvolvimento e estudo da viabilidade de pandemia "Web Pais": Orientação parental das atividades escolares em casa em tempos”. “CAAE” number: 34687220.9.0000.5149). The research was conducted online. Data was collected through Google Forms and Google Meets was used for intervention sessions. Participants from all over Brazil were recruited through divulgation in social media. Parents who were interested in participating, firstly filled the free and informed consent term and a form with sociodemographic questions and the assessment instruments. Enrollment happened between September 2020 and August 2021.

We received one hundred and ninety-five applications. Forty-six families were not invited to the intervention. Ten children presented ages incompatible with the study. Thirty-two parents reported children diagnoses such as Intellectual disability ($n = 6$), autism spectrum disorder ($n = 20$), genetic syndromes ($n = 4$) and intellectual giftedness ($n = 2$). Further, one mother was not invited because of Bipolar Affective Disorder diagnosis, one

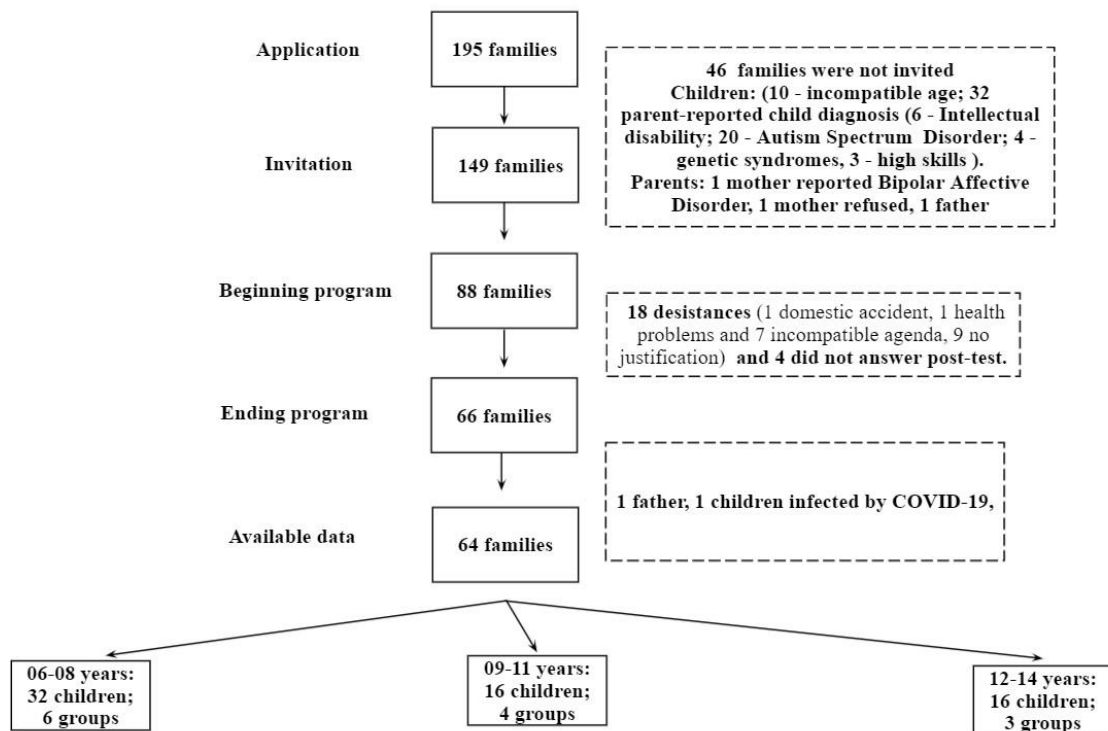
mother declined to participate after enrollment, and one father declined for not being able to participate directly on the child's supervision.

One-hundred and forty-nine families were invited to participate in the WebParents intervention. Eighty-eight families accepted the invitation and started to participate in the program. During intervention, there were eighteen dropouts: one grandmother due to a domestic accident, one mother due to a health problem, seven parents had an incompatible agenda, and nine parents gave no justification. Further, four participants did not answer the post-test. In one of the intervention groups, both parents attended the program, but only the mother's responses were analyzed. In one case, the aunt's responses were excluded because the child was infected by COVID-19 during the intervention process. The final sample was sixty-four families, consisting of 59 biological mothers, two biological fathers, one adoptive mother, one aunt and one godmother. Participants recruitment is presented in Figure 3.1.

Parents were divided in 13 intervention groups according to children's age. There were six groups of parents of 06–08-year-olds ($n = 32$ families), four groups of 09–11-year-olds ($n = 16$ families) and three groups of 12-14-year-olds ($n = 16$ families).

Applications were related to concerns with the restrictions caused by the COVID-19 pandemic in family daily life, such as: decreasing in social support due to social isolation and restrictions on family contacts (with grandparents and other relatives), difficulties in organizing family and children's study routine. Parents also perceived an increase in family conflicts, in addition to parent's concerns about the use of digital devices. Participant recruitment is presented in Figure 3.1

Figure 3.1 Flowchart demonstrating recruitment of participants, study 2.



Instruments

The socioeconomic status was estimated with the Brazil Economic Classification Criterion (CCEB), created by the Brazilian Association of Research Companies (ABEP, 2011). This instrument is used to estimate the SES of Brazilians based on data related to their purchasing power and level of education. It uses a categorical classification evaluating the number of household employees (maids), motor vehicles, computers and other electronics and appliances available at home. In addition, it also surveyed whether the residence is connected to the sewage network and if the residence street is paved.

The main outcome measure used to evaluate intervention effects was the SHIP. Secondary therapy outcomes were measured by parental report of symptoms of depression, anxiety, and stress (Depression Anxiety and Stress Scale - DASS-21), parenting practices (Parenting Style Inventory - PSI) and parental perceptions about their child's behaviors problems (Strengths and Difficulties Questionnaire - SDQ). Finally, a questionnaire was used

to evaluate participants' satisfaction in attending the WebParents program. These instruments are described in more detail next.

School homework involvement of parents SHIP (SHIP). SHIP is a questionnaire to assess dimensions of parental involvement with school homework which was developed by the authors. Questionnaire development and preliminary evidence of validity is presented in the chapter of this dissertation. SHIP has 15 items and was based on an interview used by Cooper and coworkers (2000). To answer the questions the respondents are asked to choose the best option using a 5-points Likert scale. The reference points were: 1) "I do not agree at all", 2) "I agree a little", 3) "I somewhat agree", 4) "I strongly agree", and 5) "I completely agree". The questionnaire assesses two dimensions related to parental involvement. *Factor 1 - Child Behavior* was composed with six sentences describing children behavior during homework activities (e.g., "I think my child could be more independent in doing homework."). The other dimension was *Factor 2 - Parental Involvement*, which refers to nine sentences describing parental attitudes related to involvement with children's homework (e.g., "I try to help my child with homework so that he or she participates in the resolving process."). The two factors were calculated through the sum of the items referring to each dimension. The *Total Score* of the scale was also considered (sum of all items together). In summary, preliminary results of the scale (Chapter 2) showed that the two factors encountered in the exploratory factor analysis demonstrated satisfactory fit to the parameters of reliability (Composite Reliability indicator: *Factor 1* = 0.91 and *Factor 2* = 0.76) and replicability (H-observed: *Factor 1* = 0.93 and *Factor 2* = 0.78). Internal consistency of the scale in the original study with 176 participants was Cronbach's alpha = 0.81. Results of convergent and discriminant validity showed that SHIP was correlated to external instruments that assess parenting practices (Parenting Style Inventory (PSI) (Gomide, 2006) and children behavior problems (Strengths and Difficulties Questionnaire (SDQ) (Fleitlich et al., 2000).

Moreover, results of criterion validity showed that the scale scores were sensible to the variability in children's characteristics, such as age and sex. Utilization of SHIP in the present article will contribute to complement SHIP criterion validity. In the current study, considering data from 64 participants, the internal consistency was Cronbach' alpha = 0.70 for the *Total Score*, Cronbach' alpha = 0.61 for *Factor 1 - Child Behavior*, and Cronbach' alpha = 0.31 for *Factor 2 - Parental Involvement*.

Depression Anxiety and Stress Scale - short form (DASS-21) (Lovibond & Lovibond, 1995): this is a reduced version of the instrument that measures symptoms of anxiety, stress and depression in adults from 18 to 75 years. In this version, the instrument has 21 items, maintaining the structure of the extended version but with the advantage of being applied in half the time (Vignola & Tucci, 2014). The DASS-21 is a self-report scale composed of three subscales in a four-point Likert format (0,1,2,3 - "I totally disagree" =0 to "I totally agree" = 3.). Each of the subscales have seven sentences, separately measuring the emotional states of depression, anxiety and stress felt by the participant with reference to the previous week. The DASS-21 has been frequently published in research on adult mental health (Oei et al., 2013). The instrument was validated to Brazilian context by Vignola & Tucci (2014). In the current study, the internal consistency considering 64 cases was Cronbach's alpha = 0.88 for the Depression scale, Cronbach's alpha = 0.88 for the Anxiety scale and Cronbach's alpha = 0.92 for the Stress scale.

Parenting Style Inventory (PSI)- Inventário de Estilos Parentais (IEP) (Gomide, 2006): is an instrument that assesses the resources and strategies used by parents to educate their children. This instrument has been consistently used in Brazilian literature about parenting intervention and showed well established validation data (Gomide, 2006). The PSI encompasses seven parenting practices: positive practices (*positive monitoring* and *moral behavior*) and negative practices (*Physical Abuse*, *Negative Monitoring*, *Inconsistent*

Punishment, Negligence and Relaxed Discipline). The *Total Score* is obtained by subtracting the scores for positive practices from negative ones. The IEP consists of 42 items, which consider the frequency of the behaviors listed in ten episodes, but without considering a timing window. Participants need to record their answers according to the scale “Never” = 0 to 2 times; “Occasionally” = 3 to 7 times; “Always” = 8 to 10 times. Considering data from 64 participants in the current study, the internal consistency Cronbach's alpha = 0.34 for *Positive Monitoring*, Cronbach's alpha = 0.23 for *Moral Behavior*, Cronbach's alpha = 0.49 for *Inconsistent Punishment*, Cronbach's alpha = 0.51 for *Negligence*, Cronbach's alpha = 0.49 for *Relaxed Discipline*, Cronbach's alpha = 0.18 for *Negative Monitoring*, Cronbach's alpha = 0.58 for *Physical Abuse* and Cronbach's alpha = 0.72 for *Total Score*.

Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997; validated in Brazil by Fleitlich et al., 2000): it's a questionnaire that has been utilized to assess behavior and mental health problems from four- to seventeen-year-old children. The instrument is composed of twenty-five questions that cover five areas: *ProSocial Behavior, Hyperactivity, Emotional Problems, Conduct Problems* and *Peer Problems*. Each subscale contains five statements, and the answer ranges in a scale between “0= Not True”, “1 = Somewhat True” and “3 = Certainly True”. Distinct scores are obtained for each subscale, as well as the *Total Score* is calculated summing all scale items. To answer that, the parents were requested to consider the last six months. The internal consistency considering 64 cases was Cronbach's alpha = 0.69 for *ProSocial Behavior*, Cronbach's alpha = 0.72 for *Hyperactivity*, Cronbach's alpha = 0.64 for *Emotional Problems*, Cronbach's alpha = 0.53 for *Conduct Problems*, Cronbach's alpha = 0.65 for *Peer Problems* and Cronbach's alpha = 0.69 for total of difficulties.

Consumer Satisfaction. The *Consumer Satisfaction Questionnaire* was developed by the research team in a previous study (Silveira et al., 2021). The questionnaire consists of ten

items, addressing aspects related to observed changes in children's behavior, in the relationship between parents-children and changes in parenting practices ("1 = little improvement" to "5 = much improvement"), followed by a question assessing the difficulties faced by parents during the intervention ("1 = little difficulty" to "5 = many difficulties") and a self-assessment query about program involvement ("1 = unable to practice at home" to "5 = all practices performed at home"). The final questions assess parents' opinion about the usefulness of the strategies discussed in the program ("1 = little useful" to "5 = very useful"); whether parents would recommend the intervention to other people (coded as "Yes" or "No") and a question asking the parents' opinion about the online intervention approach ("face-to-face better than remote", "face-to-face similar to remote", "remote better than face-to-face"). Finally, it was asked what grade (range 1 to 5) the respondents would give to the program schedule, material used and therapists group conduction. In a previous study we observed that the instrument was sensible to evaluate parental opinion about the intervention program (Silveira et al., 2021).

Assessment procedures

Parents answered the pre-test at least a week in advance of the intervention's start. The post-test was preceded in the first week after the intervention's program ended. Only the data of participants who completed at least three sessions (50% of the intervention) were considered in the analysis.

Intervention program

The rationale and methods of intervention were described in previous publications (Silveira et al., 2021; Neufeld & Szupzynski, in press). The theoretical structure, content discussed and the schedule of sessions of the WebParents program was based on similar parenting interventions models already described in the literature. An overview of the

program and the reference bases used for creation of each session are provided in Table 3.1.

The program's final version combined psychoeducation, skills training strategies, behavior management strategies and work with thoughts and emotional flexibility. Each of the sessions was structured with predefined content discussions that aimed to cover important aspects of development, behavior and cognition that could influence the relationship between parents and children during school homework. Small adaptations were eventually made, according to the age and to the demands brought by the parents in the first session.

Furthermore, there were efforts to adequate the program to the online environment, according to the recommendations reported by Fogler and coworkers (2020) about adaptation of parent training programs to online contexts. A set of actions were adopted to better serve the participants' needs in the online environment. Participants were instructed on how to access the meeting platform and organize a silent therapy space that protects their privacy before the first session. Parents were asked to keep their cameras on throughout the session, helping to keep group bonding and also helping therapists to check for non-verbal reactions. Therapists also tried to establish a clear and collaborative therapeutic contract for the proper functioning of the dynamics proposed in a virtual environment (Silveira et al., 2021).

We also reported preliminary evidence of WebParents efficacy in a previous study (Silveira et al., 2021). We used a pre-post test design to assess the effects of the intervention in 50 participants. Results showed improvements in parental self-perceptions of anxiety, depression, and stress symptoms after the intervention. Also, it was found that parental perceptions of children's ProSocial Behavior improved. A reduction of behavior problems in children was also observed. There were no observed differences regarding parenting practices scales. The consumer satisfaction questionnaire indicated participants were satisfied with attending the program.

Table 3.1. Structure of WebParent’s program.

Session	Goals	Action Plans	Strategies used (Based on)
1	“Does a child come with an instruction manual?”	Happy Hour (positive attention), frequency and identification of adaptative and maladaptive behaviors.	Parenting Styles, psychoeducation, interaction dynamics among group members. (Neufeld, 2018; Pinheiro et al., 2006; Bolsoni-Silva et al., 2012; Barkley, 2002)
2	” Understanding behavior laws.”	Happy Hour, systematic verbal reinforcement of adaptative behavior (praise).	Functional analysis, working with antecedents, behavior and consequences [ABC], differential reinforcement and positive attention (Pinheiro et al., 2006; Bolsoni-Silva et al., 2012; Barkley, 2002; Kazdin, 2005)
3	“Calibrating parents’ expectations.”	Happy Hour, routine recording, and agenda planning.	Routine organization and goals definitions about homework tasks (Power et al, 2001). Parent and children communication (educational social skills) (Pinheiro et al., 2006; Bolsoni-Silva et al., 2012)

Session	Goals	Action Plans	Strategies used (Based on)
4 “What do emotions have to tell us?”	Emotions and their functions, emotional regulation strategies, helping children to understand emotions;	Happy hour, identification and recording of emotions during interaction with the child.	Psychoeducation of Beck’s cognitive model, valuing parents' self-development and flexibilization of thoughts, attitudes, and emotions (Beck, 2012, Neufeld & Maehara, 2011, Neufeld et al., 2018, Russo et al., 2020).
5 “The lens that distorts the world.”	Thought Identification; discussion about cognitive distortions and parenting practices, understanding how thoughts influence behavior, how to adaptively change sets.	Happy hour, Identification and recording of thoughts during interaction with the child.	
6 “Survival formula.”	Program review, problem-solving in future family challenges; feedback on the program and closing.	Responding to a post-test online form.	Therapy finalization (Barkley, 2002; Kazdin, 2005, Neufeld & Maehara, 2011, Neufeld et al., 2018, Russo et al., 2020

Intervention procedures

The participants were divided into thirteen intervention groups, according to the order of subscription and agenda availability. On average each group was composed of five participants, with a minimum of three and a maximum of nine. The program was conducted by two therapists, using the platform Google Meet in 90-minute sessions, twice a week, for three weeks. There were, approximately, two groups active per month.

The therapist team was composed of two doctors in psychology, experts in parenting interventions, a psychologist and four assistant therapists. The groups were administered by the first author, as the main therapist, who was accompanied by two assistant therapists (one co-therapist and an observant therapist). The main therapist was a psychologist and a postgraduate student with extensive experience in parental interventions, having previously attended more than thirty families and having received more than six-hundred hours of supervision.

The co-therapists had an active role during the therapy sessions - their function included helping the main therapists to conclude the intervention program schedule, observing the participants' demands, making notes, and paying attention to the time progress. On the other hand, the observant therapists referred to the co-therapists attending the group intervention for the first time. Assistant therapists had to participate at least one time as observant therapists before assuming co-therapist function. This way, the observant therapist's role was only to observe and learn the intervention process.

The assistant therapists were psychology undergraduate students training in parental interventions. They attended training classes to learn the WebParents protocol. The training was conducted in six meetings in which the contents of each session were discussed. A total of three training sessions were offered, always at the beginning of the academic semesters in 2020 and 2021. The assistant therapist changed turns and functions among them according to their availability to attend the intervention groups. Finally, all the team of therapists attended

weekly online supervision sessions headed by one doctor in psychology to assess therapy progress. Moreover, to develop therapeutic competencies and skills, strategies such as dramatization exercises and role-play were utilized during supervision time.

Statistical analysis

The statistical analysis was described in three steps: 1) parental perceptions baseline, 2) pre-posttest comparison of intervention effects and 3) moderators of intervention effects.

1) parental perceptions baseline

First, sociodemographic characteristics (parent's age in years, number of children per women, parent's formal schooling, parent's sex, marital status, children sex) differences in children's sex were analyzed using Student's t test for independent measures and Chi-Squared tests. Students' t tests were also used to assess the differences between boys and girls considering the baseline data (pre-test results in SHIP, DASS-21, SDQ and PSI).

Similarly, One-Way ANOVAS and Chi-Squared tests were used to assess socio demographic differences among the three age groups (06-08(G1), 09-11(G2) and 12-14 years(G3)). Moreover, age-group differences in pre-test results of outcome measures (SHIP, DASS-21, SDQ and PSI) were analyzed using One-Way ANOVAs.

Bonferroni post hoc method was used for ANOVAs tests and because of the heterogeneity of variance, Welch correction was requested (Field, 2017). The effect sizes of the groups differences were also calculated using Cohen's d for independent Student's t test and ETA-Squared for ANOVA.

2) pre-post test comparison of intervention effects

The effects of the intervention in the primary (SHIP) and secondary (SDQ, PSI, DASS-21) outcome measures were evaluated considering the differences between pre-and post-test results in the instruments. Student's t tests for dependent measures were applied. The effect sizes of the time differences were calculated using Cohen's d.

It is important to mention that data had a non-normal distribution (assessed by Kolmogorov-Smirnov and Shapiro-Wilk tests ($p>0.001$)). Because of this, bootstrapping procedures (1000 re-samplings; 95% CI BCa) were used in all Student's t tests and ANOVAs to statistical correction of differences in group sizes and sample deviations from distribution of normality, increasing the confiability of the results (Haukoos & Lewis, 2005).

3) moderators of intervention effects

Firstly, Pearson's Correlations were performed to complement the assessment regarding the relation among the pre-test results of all outcome measures and sociodemographic variables.

A Multiple Linear Regression was performed to assess if the pre-test data and sociodemographic characteristics would be impacting on the Net Effect Scores calculated from subtraction of the post-and pretest of the scales *Factor 1 - Child Behavior*; *Factor 2 - Parental Involvement* and SHIP-Total Score. The independent variables were inserted using the Enter method and they were chosen based on the correlation and the baseline ANOVA's results.

Results

Results are presented in six sections: 1) sociodemographic characteristics of participants; 2) attendance to the program; 3) baseline parental perceptions; 4) pre-post test comparison of intervention effects; 5) moderators of intervention effects, and 6) user-satisfaction questionnaire.

Sociodemographic characteristics of participants

The sociodemographic characteristics of the participants are described in Table 3.1

The average number of children per family was 1.91 (SD = 1,23). Most of the families were from the State of Minas Gerais (59.40%), followed by other Southern states (14.10%).

Moreover, 87.40% of the participants were from higher socio economics status (A, B1 and B2 levels). A higher frequency of parents of children between 06-08 years old could be observed. The 09-11 years old group showed the highest average result regarding family SES. Most of the caregivers reported previous children's diagnoses (76.57%) such as, attention deficit hyperactivity disorder (ADHD), Oppositional Defiant Disorder (ODD), anxiety, depression, and dyslexia/dyscalculia.

Table 3.2. Sociodemographic characteristics of participants.

Age Group (years)			Total sample (6-14 years)	6-8 Years	9-11 years	12 -14 years
C h i l d r e n	N		64	32	16	16
	Age in years (mean, SD)		9.38 (2.66)	7.16 (1.02)	10.00 (0.82)	13.19 (0.75)
	Sex (% female)		33.00	40.60	25.00	25.00
	Formal schooling (mean, SD) in years		4.28 (2.28)	2.06 (0.98)	5.00 (0.97)	8.00 (0.97)
	School type (% private school)		72.00	71.90	81.30	62.50
	Age in years (mean, SD)		41.25 (6.07)	39.03 (4.58)	42.81 (6.80)	44.13 (6.57)
P a r e n t	Sex (% female)		97.00	96.90	93.80	100
	Marital status (% married)		84.40	87.50	87.50	75.00
	Number of children per mother (mean, SD)		1.91 (1.23)	2.09 (1.65)	1.63 (0.50)	1.81 (0.54)
	Formal schooling (mean, SD) in years		14.41 (1.49)	14.25 (1.77)	14.34 (1.47)	14.80 (0.64)
	SES Total Score (mean,SD)		38.97 (9.38)	35.91 (9.11)	44.38 (9.13)	39.69 (7.92)
s	SES Categories (%)	A	23.40	15.60	37.50	25.00
		B1	35.90	34.40	43.80	31.30

Age Group (years)		Total sample (6-14 years)	6-8 Years	9-11 years	12 -14 years
	B2	28.10	31.30	18.80	31.30
	C2	10.90	15.60	0	12.50
	DE	1.60	3.10	0	0
Residence State (%)	Minas Gerais (MG)	59.40	59.40	56.30	62.50
	Other South Eastern States	14.10 (SP, RJ, ES)	16.70 (SP, RJ)	18.80 (SP, RJ)	6.3- (ES)
	South	7.80 (RS, PR)	6.30 (RS)	6.30 (PR)	12.60 (RS,PR)
	North	1.60 (PA)	3.10 (PA)	0	0
	Northeast	12.60 (RN,BA,PB)	15.60 (BA, RN)	6.30 (BA)	12.60 (BA, PB)
	Center West	4.80 (DF,GO,MS)	0	12.60 (GO,DF)	6.30 (MS)

Note: SD = Standard deviation; SES: Socioeconomics; 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).

Attendance to the program

Twenty-six parents (40.60%) attended all six sessions. Nineteen parents were absent in one (29.70%), ten in two (15.60%) and nine in three (14.10%) sessions. Data from 18 participants who did not attend at least three sessions were excluded from the analyses.

Baseline parental perceptions

1) Sociodemographic characteristics

Considering all ages together, no sex differences were observed in the sociodemographic variables at the pre-test. Results about age-group differences in sociodemographic characteristics showed that families of G2 groups had higher SES [(Welch's F (2, 32,974) = 4.58, $p < 0.05$) ETA-Square: 0.01] in comparison to families of G1 (Supplementary Table 3.1). In addition, as expected there were differences between age-groups also regarding parent's age [(Welch's F (2, 27,40) = 4.88, $p < 0.05$) ETA-Square:0.14].

2) *Parental perceptions in the secondary variables (DASS-21, SDQ, PSI)*

However, regarding the baseline of outcome results, boys showed higher levels of parental perceptions in SDQ – *Peer Problems* ($d = 0.26$) and SDQ - *Total Difficulties* ($d = 0.28$) than girls. Age-groups differences in the baseline data showed that before the intervention, parents of children in G1 presented significantly higher scores in *Factor 1 - Child Behavior* [(Welch's F (2, 31.185) = 3.50, $p < 0.05$) ETA-Square: 0.10)] and *PSI - ProSocial Behavior* [(Welch's F (2, 30.787) = 3.709, $p < 0.05$), (ETA-Square: 0.094)] than parents of children in G2 (Table 3.2).

Table 3.2. Differences in pre-test considering age-groups and children.

Instruments	Variables	ANOVA - Age Group difference G1 (n=32) G2 (n=16) G3 (n=16); Total (n=64)					Student's t test - Sex differences Girls (n=21) Boys (n=43) Total (n=64). df= 62					
		Age Groups	Mean(sd)	F	p value	η 2	Sex	Mean(sd)	t	p value	Mean difference	Cohen's d
SHIP	Factor 1 - Child Behavior	G1	16.44(5.36)	3.500	0.043	0.10	Girls	15.33(5.50)	-0.652	0.517	-1.008	x
		G2	12.38(5.31)									
		G3	13.38(6.23)									
		Total	14.66(5.78)									
	Factor 2 - Parental Involvement	G1	34.63(4.35)	0.550	0.582	x	Girls	33.76(4.00)	0.496	0.622	0.564	x
		G2	34.13(3.86)									
		G3	33.19(4.48)									
		Total	34.14(4.24)									
	Total Score	G1	51.06(7.73)	2.522	0.097	x	Girls	49.10(7.05)	-0.201	0.842	-0.444	x
		G2	46.50(7.62)									
		G3	46.56(9.06)									
		Total	48.80(8.25)									
DASS-21	Depression	G1	12.44(9.43)	0.280	0.758	x	Girls	10.29(8.54)	0.813	0.419	1.993	x
		G2	11.25(9.26)									
		G3	10.38(9.01)									
		Total	11.63(9.18)									
	Anxiety	G1	9.38(8.72)	0.025	0.975	x	Girls	8.00(7.18)	0.995	0.324	2.372	x
		G2	9.63(9.72)									
		G3	10.00(9.21)									
		Total	9.59(8.95)									
	Stress	G1	21.00(9.53)	0.213	0.810	x	Girls	19.14(9.65)	0.973	0.334	2.764	x
		G2	22.38(13.17)									
		G3	19.63(10.61)									
		Total	21.00(10.68)									
SDQ	ProSocial Behavior	G1	8.59(1.74)	3.71	0.036	0.094	Girls	8.14(1.71)	-0.403	0.688	-0.213	x
		G2	7.31(1.54)									
		G3	7.50(2.48)									

Instruments	Variables	ANOVA - Age Group difference G1 (n=32) G2 (n=16) G3 (n=16); Total (n=64)					Student's t test - Sex differences Girls (n=21) Boys (n=43) Total (n=64). df= 62					
		Age Groups	Mean(sd)	F	p value	η 2	Sex	Mean(sd)	t	p value	Mean difference	Cohen's d
PSI	Hyperactivity	Total	8.00(1.97)									
		G1	6.25(2.24)									
		G2	6.56(2.94)	0.086	0.918	x	Girls	6.05(2.48)	0.773	0.442	0.49	x
		G3	6.44(2.10)				Boys	6.53(2.31)				
		Total	6.38(2.36)									
	G1	3.81(2.25)										
	G2	5.06(2.72)										
	Emotional Problems	G3	4.13(2.25)	1.233	0.305	x	Girls	3.52(2.29)	1.61	0.133	1.011	x
		Total	4.20(2.39)				Boys	4.53(2.39)				
		G1	2.53(1.54)									
		G2	2.25(1.69)									
		G3	3.31(2.33)									
	Conduct Problems	Total	2.66(1.82)	1.083	0.352	x	Girls	2.19(1.47)	1.44	0.154	0.69	x
		G1	2.31(1.94)				Boys	2.88(1.92)				
		G2	2.19(2.71)									
		G3	2.88(2.22)									
		Total	2.42(2.20)									
	Peer Problems	G1	14.91(4.85)	0.43	0.652	x	Girls	1.62(1.50)	2.092	0.041	1.20	0.26
		G2	16.06(6.34)				Boys	2.81(2.39)				
		G3	16.75(7.44)									
		Total	15.66(5.91)									
Total of Difficulties		15.66(5.91)	0.504				0.610	x				
G1	10.91(1.25)	Boys		16.88(6.03)								
G2	10.94(0.93)											
G3	10.50(1.21)											
Total	10.81(1.17)											
Positive Monitoring	G1	10.28(1.20)	0.746	0.382	x	Girls	10.71(1.19)	0.468	0.642	0.146	x	
	G2	10.00(1.46)				Boys	10.86(1.17)					
	G3	10.81(1.28)										
	Total	10.34(1.30)										
	Total	10.34(1.30)										
Moral Behavior	G1	10.00(1.46)	1.527	0.223	x	Girls	10.43(1.33)	-0.362	0.718	-0.13	x	
	G2	10.81(1.28)				Boys	10.30(1.30)					
	G3	10.81(1.28)										
	Total	10.34(1.30)										
	Total	10.34(1.30)										

Instruments	Variables	ANOVA - Age Group difference G1 (n=32) G2 (n=16) G3 (n=16); Total (n=64)					Student's t test - Sex differences Girls (n=21) Boys (n=43) Total (n=64). df= 62				
		Age Groups	Mean(sd)	F	p value	η 2	Sex	Mean(sd)	t	p value	Mean difference
Inconsistent Punishment	G1	3.16(1.55)									
	G2	3.38(1.96)				Girls	3.05(1.43)				
	G3	3.88(1.67)	10.016	0.374	x	Boys	3.56(1.79)	1.14	0.26	0.511	x
	Total	3.39(1.69)									
Negligence	G1	2.50(1.50)									
	G2	2.81(1.83)				Girls	2.52(1.69)				
	G3	3.25(2.11)	0.834	0.445	x	Boys	2.88(1.79)	0.769	0.445	0.360	x
	Total	2.77(1.75)									
Relaxed Discipline	G1	2.63(1.77)									
	G2	2.00(1.317)				Girls	2.42(1.48)				
	G3	2.44(1.46)	0.960	0.393	x	Boys	2.43(1.83)	-0.023	0.981	-0.01	x
	Total	2.42(1.59)									
Negative Monitoring	G1	5.69(1.91)									
	G2	6.19(2.04)				Girls	5.43(1.99)				
	G3	5.44(1.37)	0.733	0.488	x	Boys	5.91(1.73)	0.989	0.327	0.478	x
	Total	5.75(1.82)									
Physical Abuse	G1	1.75(1.44)									
	G2	3.00(2.28)				Girls	2.00(1.55)				
	G3	1.69(1.78)	2.100	0.141	x	Boys	2.07(1.96)	0.143	0.887	0.070	x
	Total	2.05(1.82)									
PSI-Total Score	G1	5.47(5.77)									
	G2	3.56(1.64)				Girls	4.33(6.00)				
	G3	4.63(6.15)	0.492	0.616	x	Boys	4.33(6.00)	-0.864	0.391	-1.39	x
	Total	4.78(6.02)									

Note: **p<0.001 & *p<0.05. df= degrees of freedom,

Pre-posttest comparison of intervention effects

Results of pre-post comparison are presented in four sections: 1) parental perceptions of involvement in school homework; 2) parental perceptions of child behavior; 3) Parental perceptions of mental health; 4) parental perceptions of parenting practices (Table 3.3).

1) parental perceptions of involvement in school homework

Informally, most parents reported difficulties in managing children's behavior during homework throughout the program. Parents also expressed doubts about the best way to handle these difficulties. Results indicated significant improvements in the SHIP- *Total Score* ($d = 0.75$) and in *Factor 1 - Child Behavior* ($d = 0.60$) and *Factor 2 - Parental Involvement* ($d = 0.46$).

2) parental perceptions of child behavior

Informally, most parents mentioned that their children were having problems dealing with motivation, presenting more emotional and behavioral problems. Results showed significant improvements in the SDQ-ProSocial Behavior ($d = 0.26$) and significant reduction in SDQ-*Total Score* after the intervention ($d = 0.32$).

3) parental perceptions of mental health

Before the program, parents perceived a higher score on stress level followed by depression and anxiety levels. Informally, parents reported experiencing more stressful situations during the COVID-19 pandemic. Parents also perceived an increase in pressure and responsibility at home, facts they perceived to trigger mental health problems.

Results showed a significant reduction in scores of *Stress* ($d = 0.57$), *Anxiety* ($d=0.51$), and *Depression* symptoms ($d=0.41$). Stress scores were the aspect that suffered the greatest reduction in post-test, followed by Anxiety and Depression.

4) Parental perceptions of parenting practices

Informally, it was observed that parents struggled with child behavior management, and they very frequently admitted increasing the use of punitive and negative monitoring practices during difficult situations with their children, mainly the ones related to school homework supervision. Results demonstrated a significant reduction in the PSI-Physical Abuse after intervention ($d = 0.216$)

Table 3.3: Differences in pre and post test

		Pre-test		Post-test		t test statistics (Bootstrapping sample)			
		Mean	sd	Mean	sd	t	df	p-Value	Cohen's d
SHIP	Factor 1 - Child Behavior	14.66	5.78	17.38	5.90	-4.76**	63	<0.001	-0.60
	Factor 2 - Parental Involvement	34.14	4.24	35.69	4.19	-3.68**	63	<0.001	-0.46
	Score Total	48.80	8.25	53.06	8.65	-5.98**	63	<0.001	-0.75
DASS-21	Depression	11.63	9.18	8.50	8.18	3.30*	63	0.002	0.41
	Anxiety	9.59	8.95	6.06	6.93	4.06**	63	<0.001	0.51
	Stress	21.00	10.67	16.25	8.50	4.57**	63	<0.001	0.57
SDQ	Prosocial	8.00	1.97	8.36	1.60	-2.08*	63	0.042	0.26
	Hyperactivity	6.38	2.36	5.98	2.54	1.98	63	0.052	-
	Emotional problems	4.20	2.39	4.02	2.19	0.84	63	0.405	-
	Conduct problems	2.66	1.82	2.50	1.83	0.90	63	0.369	-
	Peer Problems	2.42	2.20	2.11	1.96	1.91	63	0.060	-
	Total Difficulties	15.66	5.91	14.61	6.04	2.53*	63	0.014	0.32
	Positive Monitory	10.81	1.17	10.86	1.10	-0.27	63	0.784	-
	Moral Behavior	10.34	1.30	10.17	1.45	0.88	63	0.381	-

		Pre-test		Post-test		t test statistics (Bootstrapping sample)			
		Mean	sd	Mean	sd	t	df	p-Value	Cohen's d
PSI	Inconsistent Punishment	3.39	1.69	3.03	1.71	1.71	63	0.093	-
	Negligence	2.77	1.75	2.58	1.61	1.03	63	0.307	-
	Relaxed Discipline	2.42	1.59	2.13	1.64	1.47	63	0.148	-
	Negative Monitoring	5.75	1.82	5.52	2.05	1.12	63	0.266	-
	Physical Abuse	2.05	1.82	1.72	1.79	2.17*	63	0.034	0.27
	Total	4.78	6.02	6.06	5.94	-1.81	63	0.075	

Note: **p<0.001 & *p<0.05. df= degrees of freedom.

Moderators of intervention effects

Cross-correlations of parental perceptions in the outcome measures at the pre-test are exhibited in Supplementary Table 3.2. The results specifically of correlations among pre-test results of SHIP, sociodemographic characteristics and secondary outcomes measures showed that is presented in Table 12. *Factor 1* and *Factor 2* of SHIP did not significantly correlate with sociodemographic characteristics. Only *Total Score* correlated to *children's age in years* and *children formal school*. SHIP scales did not correlate with DASS-21.

Factor 1 - Child Behavior correlated significantly with the PSI - *Positive Monitoring* ($r = 0.27$) and the following SDQ subscales: *Hyperactivity* ($r = -0.27$), *Emotional Problems* ($r = -0.37$), *Conduct Problems* ($r = -0.31$), *Peer Problems* ($r = -0.35$) and *Total Difficulties* ($r = -0.50$). *Factor 2* correlated with SDQ - *Emotional Problems* ($r = 0.32$), PSI-*Positive Monitoring* ($r = -0.26$) and PSI *Negligence* ($r = -0.26$). Finally, *Total Score* correlated with PSI - *Positive Monitoring* ($r = 0.32$) SDQ - *Emotional Problems* ($r = -0.43$), *Peer Problems* ($r = -0.29$) and *Total Difficulties* ($r = -0.42$).

As the age and sex groups differed at the pre-test on some sociodemographic characteristics and parental perceptions on the secondary outcome measures, possible moderation effects were analyzed with Multiple Linear Regression. Independent variables selected were Children sex, Children age in years, SES Total Score, SDQ Total Difficulties, SDQ Peers Problems and *ProSocial Behavior*. Results were non-significant for all three SHIP scores (Supplementary Table 3.3).

User-satisfaction questionnaire

Participant's satisfaction with the intervention program was assessed using *Consumer Satisfaction Questionnaire* (Silveira et al., 2021). Results are presented in Table 3.4. On a scale from 1 to 5, parents rated an average of 3,59 ($sd= 1.07$) for improvement in child's behavior, relationship with child, program, parenting practices and family's routine after the intervention. Difficulties encountered in the program realization were rated by parents on average of 2.25 ($sd = 1.19$). Parents assessed their own participation on average of 3.63 ($sd =0.90$) points. Parents rated an average of 4.68 ($sd = 0.59$) points about how much they considered the tools worked during the intervention useful. Overall, average ratings of the parents' program opinion, considering, program's schedule, material presented and therapy conduction, were above four points ($M = 4.65, sd = 0.61$). One hundred per cent of the participants reported “yes” to recommend the intervention to another family. Finally, all parents considered the online modality similar or better to presential intervention and no-one considered the online therapy worse.

Table 3.4: Means of each item evaluated in the consumer satisfaction questionnaire.

Variable	Mean (<i>sd</i>)
Have you been able to observe changes in your child's behavior after the intervention program?	3.44 (1.13)
Have you been able to observe an improvement in your relationship with your child after the intervention program?	3.90 (0.87)
Were you able to observe changes in your parenting practices after the intervention program?	3.81 (1.03)
Have you been able to observe an improvement in your family's routine after the intervention program?	3.22 (1.26)
Did you have any difficulties during the intervention process?	2.25 (1.19)
What grade would you give for your participation in the proposed activities to be carried out at home?	3.63 (0.90)
Do you think the tools learned during the intervention were useful to you?	4.68 (0.59)
How would you rate the program's schedule?	4.60 (0.64)
How would you rate the material presented on the program?	4.54 (0.71)
What grade would you give the therapist for conducting the group?	4.81 (0.47)

Note: *sd* = standard deviation

Discussion

In this study, we assessed the effects of a short-term group, synchronous and internet-based intervention program to promote parental involvement with schoolwork during the

COVID-19 pandemic. We expand previous results of WebParents intervention (Silveira et al., 2021) with a larger sample, also introducing a questionnaire (SHIP) assessing parental involvement with homework as a primary outcome measure.

Participants consisted of 64 parents or surrogates of children aged from 06 to 14 years. Results indicated improvements in parental perceptions of PIH in all three SHIP scales: *Factor 1 - Child Behavior, Factor 2 - Parental Involvement, Total Score*. Improvements of PIH were paralleled by improvements in parental perceptions of children's prosocial behaviors and reduction of parental perception of children behavior problems assessed with the SDQ, parental symptoms of anxiety, depression and stress assessed with the DASS-21, and less physical abusive parental practices assessed with the PSI.

Internet-based parenting interventions have great potential to reach many families (Breitenstein et al., 2014). Internet access in Brazil has been increasing, being estimated that in 2019, 82.7% of Brazilian households had access to the internet (IBGE, 2019). Some authors see this growing access as a good opportunity to also achieve more families with internet-based parenting interventions (Almondes & Theodoro, 2021). However, at same time, it is estimated that approximately 19.7 million Brazilian households still do not have a good quality of internet access (CETIC, 2019a). This number is equivalent to 29% of the total of households surveyed. 59% of those reported not having internet access, said being unable to pay for a private internet plan and 25% do not have a network available in the regions where they live. Additionally, 41% of respondents did not have a computer, and 49% of them did not know how to use the internet (CETIC, 2019a). Moreover, it is estimated also that 99.5% of household access to the internet in Brazil is mostly via cell phone (IBGE, 2019a).

In this study, communication with parents was done via Whatsapp, a fact that facilitated participant recruitment. However, even though most of the participants were from a higher socioeconomic stratum, we frequently observed that parents missed intervention

sessions because of problems with their internet connection (comprising approximately 20% of absence justifications) or because children were using the family's cell phone or computer to access school task. This form, access to the internet alone does not guarantee access to internet-based interventions, being low-income populations more affected by these difficulties (Cunha, 2020; Legey et al., 2021).

As almost 90% of families in this study belonged to higher SES, results may possibly generalize only to this population segment. Other studies already showed that the result for the low-income population is still incipient in literature of internet-based parenting intervention, despite other variables, due to a lack of structure and internet access (Legey et al., 2021; Horowitz et al., 2002).

A high dropout rate of participants in face-to-face parenting interventions has been reported (Whittaker & Cowley, 2012). The dropout rate in the present study was lower than is commonly reported in the literature, similar to those found in the previous study with the same intervention (Silveira et al. 2021). Evidence showed that dropout patterns in the online modality of Cognitive Behavior Therapy (CBT) intervention are similar from the face-to-face modality (Preschl et al., 2011). However, there is no literature comparing attrition rated in these two-therapy modality regarding parental intervention. We hypothesized that parents tend to commit more with internet-based intervention because online modality reduces problems related to childcare while attending to the therapy, fatigue, poor traffic conditions, poor public transportation, or not being able to reach the therapy location at all (Breitenstein & Gross, 2014; Meadan & Daczewitz, 2015). It is important to mention that difficulties with internet access are, otherwise, a factor that contributes to dropouts (Frankel & Simmons, 1992). In WebParents, we observed that some parents struggled with internet access, but this was not decisive to dropouts.

The relatively effective size data in this study contributes to its statistical validity.

Although a considerable number of studies in the literature on parent interventions do not report effect sizes, in this study the effect sizes are comparable to those reported in face-to-face interventions (Nieuwboe et al., 2013; Spencer et al., 2020, Lee et al., 2012). A meta-analysis of online parenting interventions studies showed statistically significant effects sizes for child outcomes (ES = 0.42) and parents outcomes (ES = 0.67) (Nieuwboe et al., 2013). We mostly encountered moderate effect-sizes for the pre- and post-test comparisons in the present study, ranging from $d = 0.26$ to $d = 0.35$ (Cohen, 1992). Effect sizes were moderate for the primary measures (SHIP) and DASS-21 scales compared to those of SDQ-Peers Problem and PSI-Physical Abuse, which were lower. These results emphasize the internal validity of the intervention, that concerns the extent to which the measured outcomes can be explained by participation in the program. The effects were not related to differences in sociodemographic characteristics and parental perceptions at the pre-test indices. This suggests that the intervention results were not mainly influenced by external factors assessed at the baseline, contributing to interpreting the pre-post differences as a consequence of the therapeutic process. Possible weaknesses are related to outcomes being assessed only from parental perceptions and lack of comparison group and follow-up data.

Closing of schools during the COVID-19 pandemic heightened parental demands for involvement with school. This situation was not completely new. Closing of schools are recurrently observed in epidemic or catastrophic situations (Meyers & Thomasson, 2017). For example, school remained closed during the polio epidemic in the USA in the 1930s (Strauss, 2020; Foss, 2020). At that time, radio-based instruction was offered (Strauss, 2020; Foss, 2020). The novelty of the COVID-19 pandemic was the dimension in which schools' closing affects the world population. Most countries responded with emergency remote learning programs, mostly internet-based but also using other media such as radio and TV (Bozkurt et al., 2020). These programs met variable degrees of success, varying from one country to the

other (Jnr & Noel, 2021).

The Brazilian educational system was fast to react. However, the effectiveness of this reaction was low. During virtual learning, many students faced a lack of structure to access online classes and materials on the computer (Barreto & Rocha, 2020, Nascimento et al., 2020). Moreover, children did not receive enough supervision from their children (Ferreira et al., 2020; Barreto & Rocha, 2020, Nascimento et al., 2020).

One important ingredient missing in most emergency remote learning programs worldwide is assistance to parents coping with the demands imposed by remote learning. Our results indicate that internet-based parental intervention is effective in helping parents cope with the demands of remote learning. This should be considered, as pandemic situations may recur in the future.

Research consistently shows that parent involvement is extremely relevant for school learning and academic achievement (Cooper et al., 2000; Núñez et al., 2015; Barger et al., 2019). When parents support children aiming for the development of autonomy, giving help according to children's needs, parental involvement with school life can be a protective factor to learning development, improving learning achievement and developing a sense of responsibility and interest in school (Moroni et al., 2015; Pattal et al., 2008; Silinskas et al., 2015).

WebParents results also suggest that internet-based parental intervention could be useful outside the pandemic context. Internet-based interventions are also extremely convenient for practical reasons and virtual modality of intervention is very acceptable by parents (Silveira et al., 2021; Neufeld et al., 2021; Antonini et al. 2012). Most parents in Brazil have a low degree of formal schooling, no feeling up to the task of helping their children with school homework (Laguna et al., 2021). The challenge is to reach lower income and lower education populations with this type of program. Especially designed smartphone

interventions could achieve the goal of inclusion in internet-based interventions, as this is the most widely popular internet modality in Brazil.

To the best of our knowledge, this is the second study to report the effects of online group interventions to promote PIH during the COVID-19 pandemic. Results suggest that the online, synchronous intervention was effective in fostering parental involvement with school homework during the COVID-19 pandemic, with effects on parental perceptions of children's behaviors, parental perceptions of own health and practices. The results found are in line with those already reported in the literature on face-to-face and internet-based interventions (Reese et al., 2012; Cia et al., 2008).

In the WebParents program, we applied behavior strategies to improve parent's repertoire to manage children behavior, using non coercive practices and developing better ways to provide homework support (Kazdin, 2006; Power, 2001). The results showed that parents observed changes in children's behavior after the intervention, not only observed reduction of behavior problems, but also reported more positive behavior in children. Much of the literature of parenting interventions focuses on changing children's behavior problems (Wyatt Kaminski et al., 2008; Solomon & Schoonover, 2017; Lee et al., 2012).

In our previous study we observed the same results regarding changing in general behaviors. Our differential in the present study was to evaluate changings also in behaviors related to homework. After the intervention, parents reported improvements of children's behavior in homework. This result can be explained by the fact that parents were stimulated to observe more positive behaviors to apply differential reinforcement.

Results suggest that SHIP is sensitive to and adds construct validity to the assessment of interventions to promote PIH. The intervention resulted in parallel modifications of parental perceptions of children's behavior, parental anxiety, depression, and stress as well as parental practices. However, correlations among SHIP and these secondary outcome measures

were low to moderate, suggesting that SHIP assesses a specific component of parental involvement with school homework.

In addition, beliefs, expectations, and emotions of parents were also a subject worked in therapy, teaching parents to recognize their feelings and thoughts and to apply strategies to improve cognitive flexibility (Beck, 2012). DASS-21 results, even if it was not the focus of the intervention, showed that the use of these CBT strategies, adding to therapeutic assistance and group support, seemed to influence the reduction of parents' perceptions of Stress, Anxiety and Depression symptoms. Other face-to-face parenting interventions observed improvements in parents' mental health (Potharst et al., 2019, Mullis, 1999). Mental health problems in parents are related to decreased parents' ability to support children with studies (Dumont, 2012, 2014). During pandemic, studies demonstrated a worsening in mental health problems in the parental population (Adams et al., 2021).

Cognitive-behavioral therapy is not usually the first choice when compared with the traditional use of applied behavior theory in parenting training interventions (Westphal & Habigzang, 2016; Russo et al., 2021). However, evidence already showed promising results of the application of CBT approaches in parenting interventions (Wong et al., 2018; Neufeld et al., 2021, Hassenfeldt et al., 2015). One example of intervention based on CBT, that was an inspiration to WebParents, was PROPAIS, developed by Neufeld and coworkers (2018).

The first sessions of PROPAIS were focused on helping parents to manage children behaviors, the last sessions focused on teaching parents about the cognitive model and applying CBT techniques (such as Socratic questioning, record of dysfunctional thoughts and evidence analysis (Beck, 2020). PROPAIS results demonstrated, in its two versions (PROPAIS 2 short-term with 06 sessions and PROPAIS 1 long-term with 12 sessions) that participation in intervention were related to improvements of parental positive practices and reduce problematic ones (Neufeld et al., 2018; Neufeld & Maehara, 2011; Russo et al, 2020).

In addition, PROPAS were also adapted and applied to virtual modality during pandemic and also showing positive results (Neufeld & Szupzynski, in pres). In our first study describing WebParents results, we did not observe changes regarding parenting practices. However, in this study, using a larger sample, we observed a significant reduction of physical abuse practices, with low effect size. The low effect size observed in this scale could be explained because scores at the baseline were very low and remained low after the intervention. However, these results showed parents could observe changes in their own practices after intervention.

Therefore, promising results of the online intervention suggest that this modality could be incorporated to the psychological interventions palette outside the pandemic context. This could be potentially associated with lower costs, time, and effort economy, reaching a wider audience and others. One important challenge is to reach individuals from a wider spectrum of socioeconomic backgrounds.

An internet-based, parental intervention to promote PIH seems to be, at least, as effective as face-to-face interventions. Internet-based interventions are convenient, potentially reaching a larger audience at a low resources expenditure. In Brazil, and underdeveloped countries in general, internet inclusion is one main challenge. Especially designed smartphone interventions could possibly enable access to this resource to a wider publicum. Internet-based, parental interventions to promote PIH could also be type outside the pandemic context. It is also important to consider that this type of intervention could be useful with parents of neurotypical children. Future research should address these questions. The present results also suggest that SHIP assess components of PIH.

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General Conclusion

The objectives of the present study were 1) to present the development of a scale to measure parental involvement in homework, and 2) to investigate the effects of a brief, internet-based parental intervention. In study 1, promising results were found in relation to evidence of the instrument's effectiveness. Initially, the questionnaire was constructed based on a previously published semi-structured interview (Cooper, 2000). Results of the factor analysis indicated two dimensions in the scale. These two dimensions were theoretically considered during the construction of the study, being included in the considered aspects ((1) parental involvement during homework time; (2) children's attitudes and behaviors observed by parents (3) situations of parental stress during homework supervision; (4) conflict situations between). Factor 1 was named *Factor 1- Children Behavior* representing the items on which parents should report on the child's behavior during homework. Factor 2, named *Factor 2 – Parental Involvement*, was represented by items describing parents' attitudes towards supervision of household activities. The results of the internal structure go towards the multidimensionality of the parental involvement construct (Dumont et al., 2014; Pomerantx et al., 2005).

The questionnaire showed high internal consistency ($\alpha=0.81$). In addition, it was observed that the instrument showed differences in relation to sex, age of children and presence of diagnosis. Literature data has previously shown that children's behaviors while performing homework can be observed in different ways by parents depending on the child's characteristics (Cooper, 200; Dumont et al, 2014). In this study, we emphasized the characteristics of sex, age and whether the child had a previous diagnosis.

The results of the differences between the groups were consistent with the differences found by the external variables that evaluated parenting practices (PSI) and child behavior

(SDQ). The results of evidence of convergent and discriminant validity further reinforce the consistency of the results described above. Overall, *Factor-1 Children Behavior* correlated with all subscales that measured child behavior and *Factor 2- Parental Involvement* correlated less with SDQ and more with the parenting scale. The total score correlated with all SDQ scales and four PSI subscales. These results corroborate the evidence of convergent validity.

Theoretically, these results indicate that in *Factor 1*, aspects related to inattention and conduct problems are more addressed. Regarding *Factor 2*, aspects related to positive monitoring seem to be more shared. Discriminant validity evidence showed that SHIP did not correlate with DASS-21 that mediates symptoms of stress, anxiety, and depression in parents. Theoretically, it was expected that SHIP would not correlate with DASS-21 because they measure different constructs. For future studies, it is indicated to increase the sensitivity of the questionnaire to better assess the types of parental involvement, following the PIH classification models. In addition, the application of the questionnaire to a more socio-demographically representative sample is indicated.

Finally, in study 2, the effects of the WebParents program (Silveira et al., 2021) on parental involvement and on the behavior of children aged 6-14 years during homework were evaluated. For this purpose, a pre-post test design was used. The results showed that parents observed improvements in children's behavior after the intervention, in addition to observing improvements in involvement during homework.

In addition, the results of the secondary measures showed similar results to those previously published, with the difference that, now in a larger sample, a significant reduction in physical abuse practices was found after the intervention. The results from WebPais corroborate the evidence demonstrating the effectiveness of internet-based parenting interventions (Spencer et al., 2020; Neufeld & Szupzynski, in press; Breitenstein et al., 2014). For future studies, it is recommended to evaluate the effects of WebPais outside the context of

a pandemic.

In sum, this thesis results in two main products, a questionnaire to assess parental involvement in homework and an internet-based intervention program. Both products have important educational and clinical implications.

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Appendix

Appendix 1

Supplementary Table 2.1: Sociodemographic differences between TotalGroup and SubGroup

Sociodemographic variables		<i>N</i>	Mean(<i>sd</i>)	<i>t</i>	<i>df</i>	<i>p</i> value	Mean difference
Parent's age years in years	TotalGroup	176	40.98(6.73)	-0.246	324	0.81	-0.183
	SubGroup	150	41.16(6.61)				
Number of children per women	TotalGroup	176	1.88(1.00)	0.075	324	0.941	0.008
	SubGroup	150	1.87(1.01)				
Parent's Formal Schooling	TotalGroup	176	14.22(1.68)	-0.361	324	0.717	-0.065
	SubGroup	150	14.29(1.56)				
Children age in years	TotalGroup	176	9.59(2.51)	-0.124	324	0.901	-0.035
	SubGroup	150	9.62(2.53)				
Children formal schooling	TotalGroup	176	4.47(2.53)	-0.191	324	0.849	0.054
	SubGroup	150	4.52(2.56)				
SES-Total Score	TotalGroup	163	36.88(9.98)	-0.149	324	0.882	-0.169
	SubGroup	150	37.05(10.17)				

Sociodemographic variables		<i>N</i>	Frequency (%)	χ^2	<i>df</i>	<i>p</i>
Parent Sex (famele)	TotalGroup	176	94.30	0.015	1	0.933
	SubGroup	150	94.00			
Marital Status (married)	TotalGroup	176	72.20	0.434	3	0.45
	SubGroup	150	73.30			
School Type (private school)	TotalGroup	176	62.5	0.281	1	0.596
	SubGroup	150	65.30			
Children Diagnosis (with diagnosis)	TotalGroup	176	68.18	0.235	1	0.628
	SubGroup	150	70.67			
Children SEX (female)	TotalGroup	176	39.80	0.082	1	0.775
	SubGroup	150	41.30			
	SubGroup	150	27.33			0.859

Notes: ** $p < 0.001$ & * $p < 0.05$. *df*= degrees of freed

Appendix 2

Supplementary Table 2.2. Sociodemographic characteristics of participants in TotalGroup and SubGroup.

		Age Group (years)	Total sample (6-14 years)	6-8 Years	9-11 years	12 -14 years
		N	176	71	60	45
Children	Age in years (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) in years		4.47 (2.53)	2.10 (1.44)	4.87	7.67 (1.28)
	School type (% private school)		62.50	64.80	63.30	57.80
TotalGroup	Age in years (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)		72.20	71.80	80.00	62.20
	Number of children per mother (mean, SD)		1.88 (0.99)	1.94 (1.26)	1.75 (0.68)	1.93 (0.86)
	Formal schooling (mean, SD) in years		14.22 (1.68)	14.11 (1.83)	14.08 (1.82)	14.58 (1.10)
	Parents	Residence State (%)	Minas Gerais	54.50	60.6	50.00
Other Southeastern States			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)	2.80 (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)	2.80 (DF)	6.,70 (DF, GO)	4.40 (DF, MS)
		Age Group (years)	Total sample (6-14 years)	6-8 Years	9-11 years	12 -14 years
SubGroup	Children	N	150	62	47	41
		Age in years (mean, <i>sd</i>)	9.62 (2.53)	7.11 (0.83)	10.00(0.81)	12.98(0.79)
		Sex (% female)	41.30	48.40	34.00	39.00

Parents	Formal schooling (mean, <i>sd</i>) in years	4.52 (2.56)	2.18 (1.50)	4.87 (0.80)	7.66 (1.26)
	School type (% private school)	65.30	71.00	66.00	56.10
	Age in years (mean, <i>sd</i>)	41.16 (6.62)	39.44(6.42)	42.47(6.72)	42.27(6.36)
	Sex (% female)	94.00	93.50	93.60	95.10
	Marital status (% married)	73.30	74.20	83.00	61.00
	Number of children per mother (mean, <i>sd</i>)	1.87 (1.01)	1.97 (1.33)	1.70 (0.55)	1.90 (0.86)
	Formal schooling (mean, <i>sd</i>) in years	14.29 (1.56)	14.18 (1.80)	14.21 (1.54)	14.54 (1.14)
	SES Total Score (mean, <i>sd</i>)	37.05 (10.17)	36.89 (9.65)	38.57 (10.58)	35.54 (10.48)
	SES Categories (%)				
	A	20.70	21.00	23.40	17.10
	B1	31.30	32.30	29.80	31.70
	B2	24.70	25.80	31.90	14.60
	C2	21.30	19.40	12.80	34.10
	DE	2.00	1.60	2.10	2.40
	Residence State (%)				
	Minas Gerais	58.00	59.70	57.40	56.10
	Other Southeastern States	16.70 (RJ, SP, ES)	14.60 (RJ, SP, ES)	21.30 (RJ, SP)	14.60 (RJ, SP, ES)
	South	7.40 (PR, SC, RS)	6.40 (PR, RS)	2.10 (PR)	8.60 (PR, SC, RS)
	North	1.40 (AC, PA)	3,2 (AC, PA)	0	0
	Northeast	14.00 (BA, PB, AL, CE, MA, RN)	14.50 (BA, PB, MA, RN)	14.90 (BA, RN)	12.10 (BA, PB, AL, CE)
Center West	2.70 (DF, GO, MS)	1.60 (DF)	4.20 (DF, GO)	2.40 (MS)	

Note: SD = Standard deviation; SES: Socioeconomics; 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).

Appendix 3

Supplementary Table 2.3: Items thresholds

Items	Threshold₁₋₂	Threshold₂₋₃	Threshold₃₋₄	Threshold₄₋₅
1	-3.606	-2.182	- 1.387	-0.432
2	-0.324	0.389	0.993	1.638
3	-1.541	-1.096	-0.461	-0.016
4	-2.349	-1.858	-1.200	-0.593
5	0.057	0.943	1.683	2.420
6	-1.899	-1.340	-0.655	-0.093
7	-1.636	-1.064	-0.315	0.453
8	-1.396	-0.863	-0.315	0.156
9	-2.056	-1.286	-0.739	-0.108
10	-0.630	-0.174	0.611	1.154
11	-2.002	-1.486	-0.943	-0.098
12	-0.650	-0.057	1.082	2.209
13	-1.017	0.000	1.017	1.891
14	-1.395	-0.287	0.840	2.341
15	-1.870	-1.161	0.225	1.591

Appendix 4

Supplementary Table 3.1. Sociodemographic differences in pre-test considering age groups and children sex.

Variables	ANOVA - Age Group difference G1 (N=32) G2 (N=16) G3 (N=16) Total (N=64).					Student's t test - Sex differences Girls (N=21) Boys (N=43) Total (N=64) df= 62					
	Age Groups	Mean(sd)	F	p value	η^2	Sex	Mean(sd)	t	p value	Mean difference	Cohen's d
Parent's age years in years	G1	39.03(4.58)	4.88	0.015	0.1	Girls	40.76(5.49)	0.45	0.66	0.73	-
	G2	42.81(6.80)									
	G3	44.12(6.57)				Boys	41.49(6.39)				
	Total	41.25(6.07)									
Number of children per women	G1	2.09(1.65)	1.25	0.291	-	Girls	2.05(1.88)	-0.639	0.525	-0.21	-
	G2	1.63(0.50)									
	G3	1.81(0.54)				Boys	1.84(0.75)				
	Total	1.91(1.23)									
Parent's formal schooling	G1	14.25(1.77)	3.21	0.128	-	Girls	14.67(0.91)	0.568	0.572	0.124	-
	G2	14.34(1.47)									
	G3	14.80(0.64)				Boys	14.79(0.77)				
	Total	14.41(1.49)									
Children age in years	G1	7.16(1.02)	2.64**	<0.001	0.014	Girls	8.76(2.59)	1.294	0.201	0.913	-
	G2	10.00(0.82)									
	G3	13.19(0.75)				Boys	9.67(2.68)				
	Total	9.38(2.66)									
Children formal schooling	G1	8.00(0.97)	200.51**	<0.001	0.04	Girls	3.76(2.61)	1.09	0.278	0.773	-
	G2	5.00(0.97)									

SES-Total Score	G3	2.06(0.98)	4.584	0.018	0.01	Boys	4.53(2.68)	1265.00	0.211	3.143	-	
	Total	4.28(2.28)										
	G1	39.69(7.92)										
	G2	35.91(9.11)										
	G3	44.38(9.13)										
	Total	38.97(9.38)										
<hr/>												
		Frequency (%)	χ^2	<i>df</i>	<i>P</i>	Frequency (%)		χ^2	<i>df</i>	<i>p</i>		
<hr/>												
Parent Sex (female)	G1	96.90	1.032	2	0.598	Girls	95.24		0.277	1	0.599	-
	G2	93.80										
	G3	100.00										
	Total	97.00										
Marital Status (married)	G1	87.50	5.722	6	0.455	Girls	85.71		3.142	3	0.37	-
	G2	87.50										
	G3	75.00										
	Total	84.40										
<hr/>												
						Sex X Age-Groups		Frequency (%)	χ^2	<i>df</i>	<i>p</i>	
<hr/>												
Children Sex (females)	G1	40.60	1.772	2	0.412	Girls	G1	61.90	1.772	2	0.412	
							G2	19.04				
							G3	19.04				
	G2	25.00				Boys	G1	44.19				
							G2	27.90				
							G3	27.90				
Total	33.00											

Note: η^2 = eta-squared; *sd*= standard deviation, G1=06-08 years; G2=09-11 years; G13 = 12-14 years; * $p < 0.05$ and ** $p < 0.001$.

Appendix 5

Supplementary Table 3.2. Cros-correlation results

	Correlations								
	Factor 1 - Child Behavior	Factor 1 Parental Involvement	Total Score	Parent's age in years	Number of children per woman	Parent's formal schooling	Children age in years	Children formal schooling	SES-Total Score
Factor 1 - Child Behavior	1								
Factor 1 - Parental Involvement	.338**	1							
Total Score	.875**	.751**	1						
Parent's age in Years	-0.188	0.022	-0.121	1					
Number of children per woman	0.183	0.069	0.164	-0.177	1				
Parent's formal schooling	-0.052	-0.072	-0.074	.327**	0.071	1			
Children age in Years	-0.238	-0.201	-.270*	.426**	-0.105	.299*	1		
Children formal schooling	-0.221	-0.212	-.264*	.424**	-0.108	.289*	.985**	1	
SES-Total Score	-0.053	0.212	0.072	0.170	0.140	.463**	0.192	0.165	1
Depression	-0.132	0.088	-0.047	-0.199	0.101	0.059	-0.154	-0.141	0.014
Anxiety	-0.037	-0.009	-0.031	-0.194	0.132	0.064	0.017	0.037	-0.065
Stress	0.007	0.099	0.055	-0.213	0.041	0.066	-0.096	-0.065	0.080
ProSocial Behavior	0.181	-0.019	0.117	0.069	0.183	0.010	-0.230	-0.246	-0.223
Hyperactivity	-.271*	0.063	-0.157	-0.079	0.105	-0.124	0.013	0.028	0.017
Emotional Problems	-.374**	-.319*	-.426**	-0.056	-0.080	0.059	0.105	0.123	-.259*
Conduct Problems	-.313*	-0.047	-0.244	0.021	-0.213	-0.027	0.188	0.207	-0.016
Peer Problems	-.354**	-0.073	-.285*	-0.179	0.179	-0.020	0.097	0.088	0.013
Total Difficulties	-.487**	-0.145	-.416**	-0.114	0.011	-0.041	0.141	0.158	-0.098
Positive Monitoring	.273*	.256*	.323**	0.150	-0.090	0.167	-0.105	-0.100	.256*
Moral Behavior	0.014	-0.101	-0.042	0.118	0.030	0.142	0.196	0.192	-0.069
Inconsistent Punishment	0.055	-0.165	-0.047	-0.124	-0.089	0.084	0.140	0.131	-0.003
Negligence	0.004	-.260*	-0.131	-0.038	-0.069	0.080	0.152	0.198	-0.241
Relaxed Discipline	0.123	-0.049	0.061	-0.113	-0.117	-0.003	-0.105	-0.077	-0.133

Correlations									
	Factor 1 - Child Behavior	Factor 1 - Parental Involvement	Total Score	Parent's age in years	Number of children per woman	Parent's formal schooling	Children age in years	Children formal schooling	SES-Total Score
Negative Monitoring	0.031	-0.067	-0.013	0.059	-0.224	-0.086	-0.030	-0.005	-0.107
Physical Abuse	0.012	-0.069	-0.027	-0.185	-0.048	0.168	0.062	0.076	-0.058
Total	-0.006	0.204	0.100	0.168	0.147	-0.008	-0.043	-0.073	0.190

Correlations									
	Depression	Anxiety	Stresse	ProSocial Behavior	Hyperactivity	Emotional Problems	Conduct Problems	Peer Problems	Total Difficulties
Factor 1 - Child Behavior									
Factor 1 - Parental Involvement									
Total Score									
Parent's age in Years									
Number of children per woman									
Parent's formal schooling									
Children age in Years									
Children formal schooling									
SES-Total Score									
Depresion	1								
Anxiety	.665**	1							
Stress	.676**	.725**	1						
ProSocial Behavior	-0.021	0.036	-0.005	1					
Hyperactivity	0.023	0.131	0.221	-0.137	1				
Emotional Problems	0.191	0.229	0.227	-0.030	0.054	1			
Conduct Problems	-0.071	0.081	0.079	-.297*	.404**	.253*	1		
Peer Problems	0.173	0.138	0.009	-.267*	0.229	.378**	.362**	1	
Total Difficulties	0.129	0.221	0.207	-.258*	.630**	.645**	.706**	.728**	1

Correlations								
	Positive Monitoring	Moral Behavior	Inconsistent Punishment	Negligence	Relaxed Discipline	Negative Monitoring	Physical Abuse	Total
Conduct Problems								
Peer Problems								
Total Difficulties								
Positive Monitoring	1							
Moral Behavior	0.085	1						
Inconsistent Punishment	0.062	0.104	1					
Negligence	-.270*	-0.020	.348**	1				
Relaxed Discipline	-0.051	-0.102	.399**	.315*	1			
Negative Monitoring	0.097	0.205	.390**	.255*	.300*	1		
Physical Abuse	0.124	0.167	.392**	.362**	0.125	.354**	1	
Total	0.220	0.123	-.688**	-.715**	-.628**	-.609**	-.597**	1

Note: * $p < 0.05$ and ** $p < 0.001$.

Appendix 6

Supplementary Table 3.3: Moderators of intervention effects, results of Multiple Linear Regression

Net Effect of Fator 1 - Child Behavior (adjusted $r^2 = -0.068$)			
Predictors	<i>Beta standardized coefficients</i>	<i>T</i>	<i>P</i>
Constant	-	-0.216	0.830
Children age	0.104	0.689	0.494
Children sex	0.054	0.342	0.734
SES Total Score	-0.149	-0.950	0.347
ProSocial Behavior	0.073	0.455	0.651
Peer Problems	-0.007	-0.027	0.979
Total Difficulties	-0.118	-0.470	0.641
Net Effect of Fator 2 - Parental Involiment (adjusted $r^2 = -0.03$)			
Constant	-	-0.506	0.616
Children age	0.121	0.818	0.418
Children sex	0.067	0.440	0.662
SES Total Score	-0.182	-1.180	0.244
ProSocial Behavior	0.145	0.928	0.358
Peer Problems	0.006	0.025	0.980
Total Difficulties	-0.125	-0.507	0.614
Net Effect of Total Score (adjusted $r^2 = -0.08$)			
Constant	-	-0.366	0.716
Children age	0.108	0.728	0.470
Children sex	0.032	0.209	0.835
SES Total Score	-0.176	-1.137	0.261
ProSocial Behavior	0.118	0.747	0.459
Peer Problems	-0.072	-0.301	0.765
Total Difficulties	-0.072	-0.293	0.771