Parent-child interaction in academic experiences: Scale development and validation

Abstract

The main purpose of the present study was to develop a measure examining parent-child interaction, particularly in academic experiences of children. Two studies provided evidence for reliability and validity of 19-item scale. First determining the factorial structure of Parent-Child Interaction Scale (PCIS) was aimed. 256 parents were participated in exploratory factor analysis. According to the results of item analysis, five items were excluded from the item pool because of having low factor loading. Exploratory factor analysis was applied with 14-items. Three factor solution was extracted. The three-factor structure was accounted for 51% total variance of PCIS. As for confirmatory factor analysis, the further analysis was performed with 199 parents. The three-factor structure was tested. Sufficient fit indices were found from confirmatory factor analysis. This means that three factor structure of PCIS was confirmed. Additionally, convergent validity was examined. The results from average variance extracted and composite reliability analysis revealed that convergent validity of the PCIS is sufficient. Finally, internal consistency coefficient was investigated for reliability analysis. The Cronbach's Alpha coefficient supplied evidence for reliability. Overall, it was stated that the PCIS was reliable and valid measure to assess parent-child interaction. It was well known that the concept of parent-child interaction has a wide spread of uses. It may be expressed that the PCIS has potentials to present substantial contributions in education and psychology researches.

Keywords: *Parent-child interaction; scale development; validity; reliability*

Introduction

The parent-child relationship is very crucial in growing individuals who can socialize within the society. Being a competent member of society indicates skillful use of language beyond “being an individual” (Garfinkel & Sacks, 1986, p.163). The skillful use of language can be expressed as strong communication competence and laying the groundwork for interaction. In addition to meeting existential needs, the family offers communication and interaction opportunities to the individual from the first moment of life. At the most basic level, the communication and interaction opportunities offered to the child by the family constitute the basis of childhood socialization. The integration of communication and interaction can be clearly noticed in childhood socialization (Heritage, 1984; Haspolat, 2022). Communication and interaction processes, as well as a range of cognitive, social and language skills, and various psychological processes play an important role in childhood socialization. The family environment, in which the foundations of this socialization are laid, supports cognitive and psychosocial development with appropriate parent-child interaction (Moss et al., 1988; Ronfani et al., 2015).

Children realize his or her self by interacting with family members and value their self. Parents have expectations about their children’s academic capabilities and these expectations, in turn, have important implications for children’s academic sense of self. In addition, it was reported that the quality of parent-child interactions is associated with school achievement (Hwang & Jung, 2021; Leung et al., 2021; Wang, Huebner, & Tian, 2021). As a consequence, measuring parent-child interaction in the context of academic experiences of family life will make greater contribution to understanding domain of family life.

Theoretical framework

As well known, development is an interaction of heredity and environment. This interaction also affects the time period (known as cohort effect) (Rosa & Tudge, 2013). The effect that the size of the environment has in language development was expressed by theorists such as Vygotsky, Chomsky and Piaget. Recently, there have been empirical studies investigating language development in fetuses. In general, these studies state that the fetus's familiarity with the rhythms and sounds in the mother's voice may contribute to language development (Karmiloff & Karmiloff-Smith, 2002). Similarly, it was determined that parents who rarely spoke to their children and were not successful in being a role model used a negative interaction tone to offer instructions and their children had deficiencies in their language skills (Rowe & Snow, 2020). In a more positive perspective, the simple, repetitive, cognitive and linguistic interaction presented to the child contributes to children's cognition (understanding and perception) and linguistic skills. Therefore, it was reported that increasing the quality and quantity of environmental stimuli offered to children can provide significant gains in terms of cognitive and language skills. In fact, all these statements are related to the environmental opportunities offered to the child. The family is the first environment that can offer these environmental opportunities (Ronfani et al., 2015). The more constructive the environments that the family offers to their children, the more the individual's skills (cognitive, affective, behavioral, linguistic, etc.) can improve. Developments in these skill areas can also be considered as factors that enrich family communication and interaction.

Emphasis must be placed on much more delicate psychological processes to truly understand parent-child interactions. Babies are born open to social interaction and engagement in social interaction. Therefore, the child's development takes place or is supported by communication (Stern, 1998). However, children are also very sensitive to interruptions or disturbances in these relational processes (Beebe et al., 2010). It can be predicted that a problem or inadequacy in parent-child interaction may adversely affect the child. The basis of parent-child interactions is parent-child conflict,

the communication style between them and attachment (Johnson et al., 2005). In other words, this interaction also includes psychological and social relations. Whatever the reason, the negative prognosis in parent-child interaction may cause different reflections on the child's mental structure and behaviors. In past studies, it was seen that parent-child interaction is often handled with maladaptive processes or psychopathologies (Kullberg et al. 2020; Zhang, Lee, White, & Qiu, 2020,). Parent-Child Interaction Therapy (PCIT) was reported to be effective in the treatment of these maladaptive processes or psychopathology such as disruptive behaviors, child depression, externalizing and internalizing behavior (Allen et al., 2022; Donohue et al., 2022; Lenze et al., 2011; McCabe et al., 2022), a therapy method based on parent-child interaction was used to solve an interaction-based problem. In the first phase of the PCIT approach, parenting skills are used to help children feel safe. By means of these skills, the probability of displaying appropriate and desired behaviors by the child, attention span, functional social skills increase, while attention-seeking behavior, the frequency of anger tantrums, and parental frustration decrease. The second phase of therapy is more behavioral skills focused. Parents are equipped with skills that can increase their children's behavioral competencies (McNeil & Hembree-Kigin, 2010). Recent meta-analysis revealed that PCIT is effective in reducing anxiety symptoms in children aged 2-9 (Phillips & Mychailyszyn, 2021). In another meta-analysis study, Valero-Aguayo et al. (2021) reported that disruptive, hyperactive, negative, and externalizing problems can be treated with PCIT. As a result, it can be concluded that early childhood experiences are effective in emotional development, self-control, academic performance, language and social development (Tam et al., 2012). Therefore, the application of an approach based on parent-child interaction in the treatment of these problems can be considered rational.

Conceptual framework

The present study aimed to develop a measure focusing on parent-child interaction. The theoretical framework presented above constitutes the theoretical infrastructure of the developed measure. It was evaluated that parent-child interaction can have cognitive, behavioral and motivational outcomes. The Parent-Child Interaction Scale (PCIS) focuses on evaluating parent-child interaction by focusing on these dimensions. These dimensions represented cognitive, behavioral and motivational interaction. The parent attitudes in the academic processes can be interpreted as an output of the parent-child interaction. It was proven that parent-child interaction can also be observed in academic processes (Bean et al., 2003). Similarly, parents can be dominant in directing and shaping their children's behaviors, especially with the effect of parenting styles (Hu & Feng, 2021; Schary et al., 2012). Parenting styles were considered as an important structure in the interaction between parent and child (Carapito, Ribeiro, Pereira, & Roberto, 2018). Therefore, although the determinants are based on different sources, the possible effect of parent-child interaction on the regulation of children's behavior can be clearly seen. The last evaluated structure of the PCIS was an emotional component and was based on motivation. It was shown that PCIT developed in line with the interaction between parents and children supports the change and development of emotions in children (McNeil & Hembree-Kigin, 2010). Important determinants of change in children's emotions may be hidden in communication within the family. For example, Fields-Olivieri et al. (2017) determined that the emotional states of toddlers are affected by their interaction patterns with their parents. Similarly, in a study where the effect of PCIT was tested, it was found that positive parenting skills including interaction increased which caused a decrease in maladaptive behaviors and emotions in children (Kohlhoff et al., 2020). Therefore, it was seen that the interaction between parent-child can influence emotional outputs. The last dimension of PCIS examines the parent-child interaction on motivation, which is an emotional parameter. In conclusion, PCIS consisted of three sub-factors: Impact of

Academic Achievement on Parent-Child Interaction, Parental Control on Children's Home Studying, and Decisional and Motivational Behavior of Parents.

Parent-child interaction is a subset of human interaction that enables knowledge transmission and learning (Bandura, 2000). Several theories have been developed to explain parent-child interactions (Bell, 1979; MacDonald, 1993; Pardini, 2008; Plomin, 1974; Vygotsky, 1978). On the other hand, parent-child interaction is open to be influenced by the culture and society in which the child and the parent live. Therefore, these theories lack explanation regarding parent-child interactions in Turkish families. Cüceloğlu (2017) developed a theory of parent-child interaction which considers Turkish society and culture. According to Cüceloğlu (2017) parent-child interaction consists of six dimensions: caring, adoption, uniqueness, trust, love and respect. Caring refers to parental responsiveness to the child's behaviors in which the parent encourages the child to explore and to be engaged in the environment. Adoption is a parental acceptance without any conditions. Uniqueness is to support the child in feeling that she is unique in the world. Trust is parents' focus on what their children can do now. According to Cücleoğlu (2012), love is designed to encourage the child to find herself worth being loved. Finally, respect means parental acceptance that the child is a unique and separate individual from her parents. Cüceloğlu (2017) developed his theory based on what Turkish parents ignore in their interactions

Based on our comprehensive literature review, it was determined that there are measurement tools that allow measuring parent-child interaction. Huang, Yan, Tong (2022) developed Parent-Child Interaction Rating Scale for Chinese children and parents (IRS-C) by observing interactions among Chinese parents and children. Forehand & McMahon (1981) designed The Behavior Coding Scheme (BCS) to measure parent-child interaction by observing and coding parent-child interactions. The Dyadic Parent-Child Interaction Scale (DPICS) developed by Robinson and Eyeberg (1981) is the scale for measurement of parent-child interactions by coding parent-child interactions through observation. Relationship Press Code (RPC) is another instrument which was developed through observing parent-child interaction. The Parent-Child Interaction System (PARCHISY) by Deater-Deckard, Pylas, & Petrill (1997). The IRS-C, the BCS, the DPISC, the RPC, and the PARCHISY are measures for parent-child interactions by observing and counting behaviors in parent-child interaction within definite time duration. Hence, they require external observers and their training, more time and more effort. Finally, Lange, Blonk, & Wiers (1998) designed a questionnaire called The Parent-Child Interaction Questionnaire (PACHIQ). It was designed for both parents and children. Its clinical use depends on comparison of scores of mothers, fathers, and children. Even though it can present more detailed information on parent-child interaction its use requires more time. Use of the existing instruments is difficult and demands more time and more work. However, the intended scale in the research is a self-report instrument that will be easy to use and entail less time and work.

In addition, Turkish parenting differs from Western parenting styles because the Turkish society is a collective society in which parenting styles are highly transmissive from generation to generation. As a result, cultural influence is so influential in Turkish parenting styles and Turkish parents inherit how to interact with their children from the Turkish culture (Cüceloğlu, 2017). Therefore, it does not conform to Baumrind's (1978) classification of parenting styles. Measuring parent-child interactions under Turkish cultural settings in accordance with cultural features yields clearer results than measurements designed with Western notions of parent-child interactions . Thus, existing instruments have difficulty in explaining parent-child interactions between Turkish parents and children. As a consequence, the present research aims to develop an instrument that measures parent-child interactions in accordance with Turkish culture and society. On the other hand, parental behavior is a trigger of parent-child interactions. According to Attachment Theory, which also underlies

PCIT, there are two kinds of parental behavior occurring in parent-child interaction: warmth and control (Bowlby, 1978; Putnam, Sanson, & Rothbart, 2002). Therefore, parental behaviors in parent-child interactions are going to be measured on the basis of parental warmth and parental control by taking Turkish culture into consideration.

Method

Sample, Ethical Procedures, and Process

A proposal related to the aim of the study and data collection process was prepared and submitted to the local education authority in Artvin, Turkey. A panel from the local education authority scrutinized the proposal, approved it, and gave ethical and official permission. Participant selection depended on the criterion of having a child attending primary school because parent-child interaction was expected to have been formed and stabilized and academic expectation was assumed to appear in parent-child interaction. Three primary schools were visited, and the aim of the study and data collection process were explained to primary school teachers. Twenty primary school teachers gave consent to participate and then their students were met and the data collection process was reviewed with them. A letter with a consent form containing information on the aim of the study and data collection procedure, and initial form of the PCIS were given to them to share with their parents. A total of 256 parents signed the consent form and responded to the items for Exploratory Factor Analysis (EFA) through convenience sampling. Of the parents who took part in the study for EFA, the mean age is 37.4. The same procedure was followed for Confirmatory Factor Analysis (CFA) and 199 parents participated in the study for CFA. Of the parents who participated in the study for CFA, the mean age is 39. The research sample was found adequate to generalize its findings over the population according to parameters by Roscoe & Byers (1971) arguing that a threshold number of observations must exceed five times higher than the number of variables of research or items in a scale.

Measure

Parent-Child Interaction Scale (PCIS)

This research aims to develop the Parent-Child Interaction Scale (PCIS), which measures parent-child interaction in a valid and reliable way. First, relevant literature was reviewed in order to write item on theoretical basis (Barnard, 1990; Cüceloğlu, 2017; Henderson, 1980; Kildare & Middlemiss, 2017; Lytoon, 1980; Poulain, Ludwig, Hiemich, Hilbert, & Kiess, 2019). Based on the literature review, 19 items were prepared. Furthermore, the PCIS provided three response choices: "*Agree", "Partially Agree",* and *"Disagree"*, hence the initial draft of the scale emerged. The 19 items were investigated by 3 researchers with expertise on parent-child interaction. Prior to the data collection for data analysis, five parents living in Artvin were found through mailings and were interviewed to ask whether the 19 items were easily understood. The items were modified by taking their responses into consideration as result of the responses from the parents.

Data analysis

EFA was conducted through R with its *psych* and *EFA utilities* CFA was computed with IBM Amos. Besides convergent validity results were revealed through R with its *lavaan* package. Before the analysis, missing values were found in R and then they were recoded with mean values by coding x [is.na(x)] <- mean (x, na.rm = TRUE).

To test the structural validity of the PCIS, the approaches to item analysis, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), convergent validity, and reliability analysis were followed. Item analysis may make easy to perform an assessment as to the consistency among items

and between items and whole measure. By means of item analysis, the deficiencies of the measure may be determined (Nunnaly & Bernstein, 1994). After item analysis, the EFA procedures were adopted. EFA is a basic statistical approach to determine the factorial structure of the measure (Field, 2009). In line with results from EFA, CFA was applied to verify the factorial structure of the measure. CFA which was applied to determine to what extent the factorial structure, based on theoretical background, is consistent with real data that was considered functional (Clark & Watson, 2016). The results of the CFA was assessed depending on some fit indices. In this investigation, standardized root mean residual (SRMR), root mean square error of approximation (RMSEA), Tucker–Lewis index (TLI), comparative fit indices (CFI), incremental fit index (IFI), goodness of fit index (GFI), and adjusted goodness of fit index (AGFI) were used to determine model fit (Kline, 2016). For structural validity, convergent validity subsequently was performed. The values from Average Variance Extracted (AVE) and Composite Reliability (CR) were used to determine whether the convergent validity was adequate. Internal consistency coefficient from Cronbach Alpha was used to get evidence for reliability. In relevant literature, it was recommended that the value of .70 and above is a sufficient cut-off value for a reliable measure (Field, 2009).

Results

Item Analysis

Before the items analysis, a Z-score was calculated in each of the items for each of the participants' responses. It was observed that all of the participants' Z-scores for each item ranged between -3 and 3 which is an acceptable interval. As a result, it was found that there is no residual in the data set. Item analysis was conducted through corrected item-total correlation. Results of the item analysis are displayed in Table 1. Corrected item-total correlation has a substantial impact on reliability. Moreover, items with a corrected item-total correlation higher than .30 measures the same traits and dispositions. On the contrary, items with a lower corrected item-total correlation than .30 assess different dispositions or traits from overall items. Therefore, Item 1, Item 9, Item 15, Item 16, and Item 19 were discarded from the test due to lower corrected item-total correlation (Nunnaly & Bernstein, 1994).

Table 1. Item Analysis with Corrected Item Correlation Results

Item	Standard Deviation	Scale Mean If Item Deleted	Corrected Item Total Correlation
Item 1	.89	41.71	.22
Item 2	.72	40.27	.33
Item 3	.80	39.50	.35
Item 4	.79	38.43	.45
Item 5	.82	38.75	.40
Item 6	.91	37.24	.54
Item 7	.76	37.72	.51
Item 8	.88	38.93	.46

Item 9	.79	41.89	.13
Item 10	.79	39.07	.50
Item 11	.84	37.88	.48
Item 12	.83	39.61	.38
Item 13	.79	39.38	.45
Item 14	81	38.02	.49
Item 15	.75	37.30	.18
Item 16	.75	41.69	.12
Item 17	.78	40.60	.36
Item 18	.74	39.11	.50
Item 19	.87	40.72	.28

Factor Analysis

After the item analysis, the EFA was carried out. The EFA helps to identify interrelated items that can be clustered into the same construct. Thus, the EFA facilitates discovery of a latent construct which consists of interrelated items (Field, 2009; Harrington, 2008). Item 2, Item 3, Item 4, Item 5, Item 6, Item 7, Item 8, Item 10, Item 11, Item 12, Item 13, Item 14, Item 15, Item 17, Item 18 were included in the EFA. The Kaiser-Meyer-Olkin Coefficient and Barlett Test demonstrate whether the data large enough to conduct EFA. The KMO was found .86 and Barlett test was significant (X^2= 4396,01, p< .001). These results proved that the data are large enough for EFA (Field, 2009; Henson & Roberts, 2006). The Varimax rotation method was used because it maximizes the dispersion of factor loadings and makes clusters more interpretable (Field, 2009; Pohlman, 2004). Eigenvalue was considered as the basis to decide the number of factor. Findings revealed that Item 15 is cross-loaded item among the factors and there are three factors whose Eigenvalues are over 1. As a consequence, the PCIS with 14 items was decided to consists of three factors. Findings of EFA and reliability analysis were presented in Table 6.

Table 2. Exploratory Factor Analysis (EFA) Results

Item	**Factor 1**	**Factor 2**	**Factor 3**	**Cronbach Alpha If Item Deleted**
Item 8	.72			.79
Item 6	.70			.79
Item 14	.70			.80
Item 12	.70			.79
Item 7	.65			.80
Item 11	.50			.80

Item 17		.74		.80
Item 13		.72		.80
Item 10		.70		.80
Item 18		.67		.80
Item 3			.77	.80
Item 5			.75	.80
Item 2			.52	.80
Item 4			.47	.80
Eigenvalues: 7.06	**Total Variance Explained:** 51 %			
KMO: 85	**Barlett Test of Sphericity:** X^2 = 4396,01; p< 0.001			
Overall Cronbach Alpha: .81				

EFA was cross-checked by re-conducting EFA with oblique rotation in order to manifest any other latent variables or construct. Results of EFA with oblique rotation were displayed in Table 3.

Table 3: Results of EFA with Oblique Rotation Method

Item	**Factor 1**	**Factor 2**	**Factor 3**	**Cronbach Alpha If Item Deleted**
Item 8	.74			.79
Item 12	.72			.79
Item 14	.71			.80
Item 6	.69			.79
Item 7	.65			.80
Item 11	.48			.80
Item 17		.78		.80
Item 13		.73		.80
Item 10		.70		.80
Item 18		.69		.80
Item 3			.80	.80
Item 5			.78	.80
Item 2			.51	.80
Item 4			.43	.80

Eigenvalues: 7.07 **Total Variance Explained:** 51 %

KMO: 85 **Barlett Test of Sphericity:** X^2 = 4391,61; p< 0.001

Overall Cronbach Alpha: .81

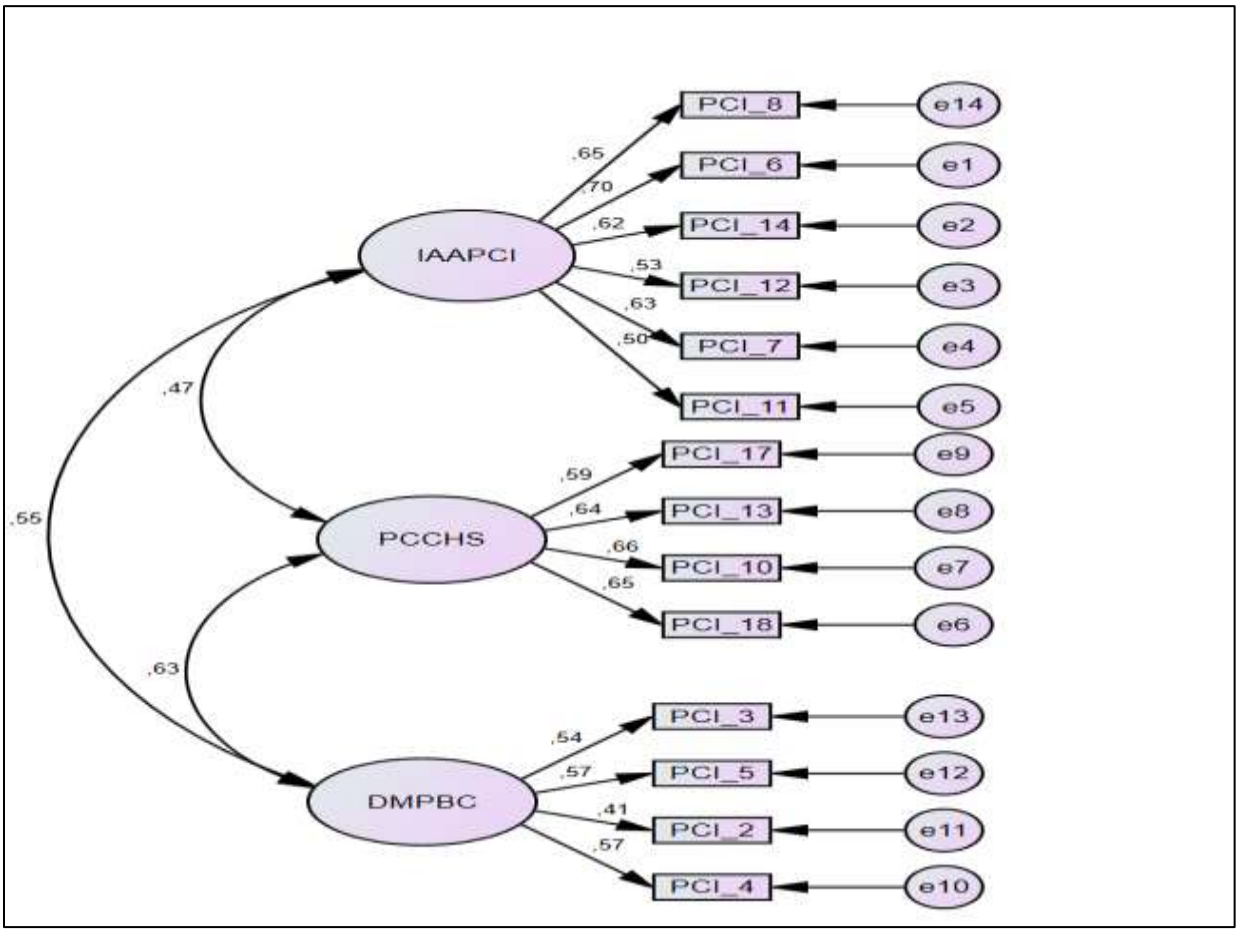
The KMO was .86 and Barlett Test was significant (X^2 = 4391,61; p< 0.001). Results of The KMO and Barlett Test proved that the data were large enough to conduct EFA with oblique rotation method. It was found that there were 3 factors whose Eigenvalue is higher than 1.00. It was observed that all of the items fell under the same factors that were revealed through varimax rotation. Similarly, it was also seen that solution with three factors explains % 51 of variance. As a consequence, it was identified that EFA with oblique rotation overlapped with EFA with varimax roation.

It can be observed from Table 2 and Table 3 that three factors solution with 14 items explains 51 % of total variance. When the number of factors has to explain 50 % of the total variance at least is taken into consideration, it can be considered that the three factors solution with 14 items is strong enough to identify the latent construct from the data (Merenda, 1997). On the other hand, it was seen that there is no item whose factor loading was less than .30. Therefore, the items clustered under the same factor were found to be strongly interrelated each other (Field, 2009). Finally, factors were named. When a name is given to a factor, common characteristics of items in the factor is considered. The first factor was named as "*Impact of Academic Achievement on Parent Child Interaction (IAAPCI)".* The second factor was labeled as "*Parental Control on Children's Home Studying (PCCHS)"* and the last factor was titled as "*Decisional and Motivational Behavior for Children (DMBPC)"*.

Confirmatory Factor Analysis

CFA is a way for factor analysis to reveal whether a constructed model is confirmed or not. Additionally, CFA presents information on such construct validity allowing acceptance or rejection of the model. CFA was conducted by reporting standardized root mean residual (SRMR), root mean square error of approximation (RMSEA), Tucker–Lewis index (TLI), comparative fit indices (CFI), incremental fit index (IFI), goodness of fit index (GFI), and adjusted goodness of fit index (AGFI). As a result of CFA, it was observed that SRMR= .03, RMSEA=05, TLI= .90, CFI= .90, IFI= .91, GFI= .95, AGFI= .95. Lower RMSEA changing between 0 and .05 indicates robust model fit. Values of CFI, TLI, IFI, AGFI, GFI, IFI .90 or above are evidence of acceptable model fit. SRMR values up to .05 are proof of a close-fitting model. On the other hand, all standardized factor loadings vary between .41 and .70 and correlations between all of three factors are moderate in the model. As a result of CFA, it was concluded that the PCIS has good model fit and its theoretical model was confirmed by the data (Marsh, Balla & McDonald, 1988).

Figure 1: Three Factor Construct with Standardized Item Loadings and Correlations Between the Three Factors



Note. IAAPCI = Impact of Academic Achievement on Parent Child Interaction, PCCHS = Parental Control on Children's Home Studying, DMBPC = Decisional and Motivational Behavior for Children

Convergent validity

To explore convergent validity of the PCIS, Average Variance Extracted (AVE) and Composite Reliability (CR) were evaluated. The AVE is a measure that reveals amount of variance explored by a construct in a comparison with amount of variance due to measurement error. Hence, the AVE shows the level of explanation by the latent variable in the observed variables and it also indicates convergent validity (Cheung & Chang, 2017). In the current study, AVE were calculated .44, .50, and .41 for sub-factors, respectively. Additionally, CR values were found to be higher than .70 (.82, .80, .73, respectively). It was reported that the AVE value higher than .50 refers convergent validity (Hair et al., 1998). On the other hand, Fornell and Larcker (1981) stated that, in the case of AVE, less than .50 but CR higher than .60, convergent validity of the construct is sufficient. In our study, CR values were determined as > .60 though AVE values were assessed to be less than .50. Based on this recommendation, it was determined that the convergent validity was adequate.

Reliability

As for reliability, the Cronbach Alpha coefficient was employed to reveal internal consistency of the PCIS. As result of the reliability analysis, overall Cronbach Alpha Coefficient of the PCIS was found to be .81 and it was seen that deleting any items did not lead to an increase of the Cronbach Alpha. On the other hand Cronbach Alpha of the factors were found to be .77 for the IAAPCI, .75 for PCCHS, .70

for the DMBPC Based on this analysis it was concluded that the PCIS has a coherent internal consistency (Field, 2009).

Discussion

The main purpose of the current paper was to develop and test the psychometric properties of PCIS. To examine parent-child interaction based on more academic situations, the PCIS was developed. This measure focused particularly on parent-child interactions in academic experiences. Additionally, by the PCIS, academicians and counsellors could explore the barriers in parent-child interaction and eventually perform more direct interventions to decrease the maladaptive effects of interactions. This exploration can support not only interventions towards addressing parent-child interactions but also introduce preventive efforts.

According to the literature and previous scale development studies, items for the PCIS were created to reveal parent-child interactions, particularly in academic settings. To investigate the psychometric properties of the PCIS, item analysis, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), convergent validity, and reliability analysis were performed. First, item analysis showed that five items had low item-total correlation. Therefore, these items were excluded from the item pool and further analyses were performed with 14 items. Second, three factors emerged in EFA: Impact of Academic Achievement on Parent Child Interaction, Parental Control on Children's Home Studying and Decisional and Motivational Behavior for Children. The PCIS with a three factor accounted for 51% total variance of parent-child interactions. Third, a three-factor solution was tested by means of CFA. According to the CFA results, the three-factor model showed an acceptable fit to the data. Standardized factor loadings ranged between .41 and .70. Fourth, to provide additional evidence for structural validity, convergent validity of the PCIS was examined. Average variance extracted (AVE) and composite reliability (CR) could supply further findings for convergent validity. In the current paper, two AVE values were lower than .50. On the other hand, CR values were higher than .70. Based on the present literature (Fornell & Larcker, 1981), we decided that convergent validity was sufficient. Overall, it can be concluded that the factorial structure of the PCIS was valid in the Turkish sample. After securing the validity of the findings, the reliability of the PCIS was assessed via Cronbach's Alpha internal consistency coefficient. Results from the reliability analysis showed that the whole measure and its sub-factors had adequate internal consistency. Therefore, it can be stated that the PCIS was reliable measure.

The emergence of the three sub-factors of parent-child interaction from EFA and CFA were as expected in line with previous developmental psychology literature (Kerr et al., 2003). The three factors constituting the PCIS seemed to be consistent with research of parent-child interactions. To emphasize concerning the PCIS, a few features needed to be presented. First, the basic elements of parent-child interactions were identified by previous researchers. Hence, we made interpretations from previous identifications and reflected on them, creating the item pool of PCIS. Second, the analytical approach of the present paper was very strong. The advanced statistics were applied to get evidence for reliability and validity. Third, the PCIS is a brief measure and has three factors. This structure can enable administration and assessment. The PCIS seems to be a useful measure of parent-child interactions, particularly in academic situations. Therefore, it can be reasonably expected that academicians and school counsellors may develop new directions for children with undesired parent interaction. Additionally, because of the fact that the PCIS was related to academic features, it can be also expected that teachers may provide further support to their students. As for counselling aims, school counsellors can apply the PCIS to assess parent-child interaction. Especially, the PCIS can be used in determining the students which have deficiencies in educational area because of parent-child interaction and prepare therapy protocols.

The results revealed that the PCIS was valid and reliable. The PCIS was a three -point likert type scale and consisted of 14 items. Scores from the PCIS range from 14 to 70. The high score refers positive and adaptive parent-child interactions. To interpret the concept of parent-child interaction, the PCIS is useful, valid and reliable measure. Consequently, the PCIS having strong theoretical framework can be used further researches focusing on parent-child interactions.

Parent-child interaction has seminal implications for development in social-emotional and cognitive domains (Chenk, Kong, Gao, & Mo, 2018; Rowe & Snow, 2020). Developing an instrument that measures parent-child interaction allows a determination of influential factors in these dyadic relationships. Identification of the factors, in turn, enables a change in social-emotional and cognitive outcomes by improving parent-child interactions. As Peccoud (2014) states, if you cannot measure, you cannot manage, and PCIS will permit management of parent-child interaction through measurement.

As aforementioned, the IRC-S, the BCS, the RPC, the DPICS, and the PARCHISY are the instruments for measurement of parent-child interaction. Therefore, they require observation of parent-child interaction over time and coding behaviors breaking out in parent-child interactions thereby entailing more time and more effort than self-report measurements in clinical use and data collection for research. Thus, it can be argued that PCIS is easier to use for clinical and research purposes.

Parent-child interactions are prone to be influenced by cultural variables and they form the basis for parent-child interaction (Preveoo & Tamis-Lemonda, 2017). The Turkish culture is different from Western culture because Turkish culture has a collectivistic orientation while Western culture is individualistic. Therefore, the instruments which were developed along with Western culture are less likely to yield a clearer picture of parent-child interaction in Turkish households (Aspland & Gardner, 2003; Clark, 1985; Deater-Deckard et al., 1997; Petrill Dishion et al., 2002; Lange et al., 1998; Robinson & Eyberg, 1981). On the other hand, PCIS was developed along with Cüceloğlu's (2017) dimensions of witnesses in parent-child interaction which addresses parent-child interactions in terms of the Turkish culture on a theoretical level. Hence, PCIS is able to produce more reliable, more valid and more suitable results in measurements of parent-child interaction in Turkish families.

Limitations of the research:

PCIS was developed for Turkish parents and takes Turkish cultural characteristics into consideration so its reliability and validity need testing through sampling from other countries. Thus, its findings cannot be generalized over other countries. Furthermore, patterns of parent-child interaction may vary from generation to generation, so reliability and validity may be vulnerable to generational cohorts. In future research, validity and reliability can be re-calculated with the parents of next generations.

Another limitation is related to the structure of PCIS's measurement. PCIS is a self-report instrument and self-report measurement depends on the assumption that respondents are capable of evaluating their self in terms of items asked in the instrument and report their thoughts and ideas in a sincere and honest way without any bias. In the development of PCIS it was assumed that the participant parents responded sincerely and honestly without any bias. Correlation between PCIS and any other parent-child interaction instrument test which are s based on objective criteria of what is

right or wrong will help to explore power of PCIS's measurement. Finally, it is recommended that future studies should eliminate the stated limitations and have excellent quality which will be able to increase the external validity of the PCIS.

As for final limitation, discriminant and predictive validity of PCIS were not tested in the present study. Correlation between scores from the PCIS and scores from any other instruments can be revealed and discriminant and predictive validity can be tested in future research.

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