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HOME LEARNING ACTIVITIES ACROSS THE EARLY YEARS IN GREECE: A VALIDITY STUDY OF THE HOME LEARNING ACTIVITIES SCALE (HLAS)

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Abstract:
Home learning activities has widely recognized as a strong contributor to the quality of the broader Home Learning Environment (HLE). A large body of research has examined the relationship between the quality of parental involvement in different types of learning activities and the child's cognitive development. However, existing measures of Home Learning Activities (HLA) are subjects of limitations. The aim of the present study was to examine the factorial validity of the Home Learning Activities Scale (HLAS). The HLAS was developed as a comprehensive self-report measure to assess three dimensions of stimulating activities that parents engage in with their children: indoor, outdoor and digital HLA. One hundred seventy-five parents from Northern Greece completed the HLAS. Exploratory factor analysis was recruited and revealed three factors. Descriptive statistics were analyzed in order to investigate the profile and the characteristic of HLA in Greece. Consistent with previous research the current study confirmed the factorial validity of the two basic dimensions of HLA: indoor and outdoor HLA. It was also introduced and validated a third dimension, the digital HLA. Cronbach's alpha coefficient showed high internal consistency for digital and indoor HLA and adequate internal consistency for outdoor HLA. HLAS is a useful questionnaire for measuring the parental engagement in HLA. Limitations and implications for policy and practice are discussed.

Keywords: home learning environment, home learning activities, instrument for HLA, digital home learning activities, early childhood education

1. Introduction

The family is the first and probably the most influential learning context in a child's development. It is the place where children acquire and practice basic competences (e.g. language, skills, behaviors) (Sammons, Toth, Sylva, Melhuish, Siraj, & Taggart, 2015).

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Children's development depends on parental investment of resources and time and it is often within the home that many of these investments are taking place (Evangelou & Wild, 2014). Parental involvement with children at home provides many interactional opportunities that foster the development of early literacy and numeracy skills (Melhuish, Phan, Sylva, Sammons, Siraj-Blatchford, & Taggart, 2008).

1.1. The home learning environment

The last years, several researchers in the field of human development have turned their attention to the concept of Home learning Environment (HLE) and some of them have attempted to define the term. However, despite the "trending" of the HLE in researchers' interest, the existing literature lacks a complete definition for HLE (e.g. Bradley & Caldwell, 1995; Sammons et al., 2015). The present study align with Sammons' and her colleges' (2015) definition, who conceptualize the term "Home Learning Environment", regarding the early childhood years, as "*the frequency of educationally oriented activities undertaken by parents and their young children within the home – as opposed to those occurring in a pre-school or school setting or extension of that setting, such as school set homework, or school organised visits*".

A wide range of recent studies (e.g. Anders, Grosse, Rossbach, Ebert, & Weinert, 2013; Melhuish et al., 2008; Sammons et al., 2015; Son & Morrison, 2010; Sylva, Melhuish, Sammons, Siraj-Blatchford, & Taggart, 2004; Yu & Daraganova, 2015) demonstrated the critical role that the quality of the HLE can play in children's long-term developmental trajectories, with studies highlighting the importance of both the physical and psychosocial context in which children grow up. Much attention has been given to the relationship among the HLE and the development of language and vocabulary (Rodriguez & Tamis-LeMonda, 2011) or early cognitive attainment, for example early numeracy in pre-school (Anders, Rossbach, Weinert, Ebert, Kuger, Lehrl, & Maurice, 2012). The important role of the HLE was also linked with later school readiness (Forget-Dubois, Dionne, Lemelin, Pérusse, Tremblay, & Boivin 2009), emergent-reading, spelling, and mathematics attainment at primary school age (Melhuish et al., 2008).

In addition, researchers attempted to develop various theoretical models about HLE's structure and its relationship with other parameters. For example, the model of Kluczniok, Lehrl, Kuger and Rossbach (2013) focuses on the relationship between structural quality (parental background) and parental beliefs (educational expectations and values) with the process quality (activities, interactions) taking place in HLE during preschool age. In Morrison's (2009) theoretical model, HLE constitutes an individual dimension of parenting among warmth/responsivity and management/discipline, which refers to the parental resources, educational activities and behaviors taking place in the family context for promoting children's learning. According to Dearing's and Tang's (2010) model, the HLE is illustrated as one component of a larger child-family system that influences and is influenced by child achievement. Three elements of the HLE are critical for promoting children's achievement: (a) stimulated materials that promote children's learning within a physical environment, (b) parental engagement in

activities with their children that stimulate learning and (c) a parent-child relationship and emotional climate that is supportive of learning. In addition, Dearing and Tang (2010) acknowledge that beyond these three basic elements of the HLE family sociodemographic characteristics, parent attributes, parent efficacy, expectations, beliefs and values about the child's development, child attributes, and some other physical and psychosocial elements of the home and extended developmental contexts are crucial for the quality of the HLE and child's attainment.

According to these conceptual models, HLE is broad by its own nature and it is composed from different aspects (Manolitsis, Georgiou & Tziraki, 2013; Niklas & Schneider, 2017). In the literature two approaches are dominant in measuring HLE. Some studies (e.g., Anders et al., 2013; Caldwell & Bradley, 2003; Hindman & Morrison, 2012; Melhusih et al., 2008; Niklas & Schneider, 2017; Parker, Boak, Griffin, Ripple & Peay, 1999; Sammons et al., 2015; Son & Morrison, 2010; Sylva et al., 2004) have used the HLE concept as an "umbrella" that covers the degree of family's support in children's learning and have measured the overall quality and quantity of stimulation available to a child at home. Other studies (e.g., Anders et al., 2012; Bojczyk, Haverback & Pae, 2017; Bulotsky-Shearer, Wen, Faria, Hahs-Vaughnd, & Korfmachere, 2012; Farver, Xu, Eppe & Lonigan, 2006; Foster, Lambert, Abott-Shim, McCarty & Franze, 2005; Manolitsis et al., 2013; Niklas, Cohrssen & Tayler, 2016; Son & Peterson, 2017) have used diverse aspects of HLE, like home literacy environment, home numeracy environment and home social environment and have measured specific features of these distinct environmental contexts.

The current study adopts a broader approach for the HLE which is based on the conceptual model of Dearing and Tang (2010).Within this conceptual model, the overall quality of the HLE is linked with: a) the physical environment of the home and the learning materials, b) the frequency and the quality of the home learning activities and c) the parent-child interactions and the emotional climate of this relationship during the learning activities in the family context.

1.2. The home learning activities

Home Learning Activities (HLA) constitute an individual aspect of the broader quality of HLE (Dearing & Tang, 2010). According to Hayes, Berthelsen, Nicholson and Walker (2016) the term "Home Learning Activities" (HLA) is used "to denote a range of formal and informal activities in which parents and children engage. These activities provide opportunities for communicative exchanges and interpersonal interactions that facilitate learning". Examples of such activities include shared reading, literacy and number games, musical and craft activities as well as family activities outside of the home, such as visiting the library and going on outings to the zoo or museum.

Participation in HLA has been found to help children to develop important, literacy, numeracy and academic skills (Hayes et al., 2016; Melhuish et al., 2008; Tamis-LeMonda, Luo, McFadden, Bandel, & Vallotton, 2019). They support children's language and communication skills and it is also likely to have implications for children's social and behavioral functioning language (Foster et al., 2005). Children's

engagement in shared book-reading or other literacy activities is associated with skills in language, vocabulary, narrative construction, phonemic awareness and positive attitudes towards literacy (Rodriguez & Tamis-LeMonda, 2011; Sénéchal, LeFevre, Hudson, & Lawson, 1996; Snow & Oh, 2010). Similarly, math-related HLA relate to numeracy skills (Anders et al., 2012; LeFevre, Skwarchuk, Smith-Chant, Fast, Kamawar, & Bisanz, 2009; Purpura & Napoli, 2015; Skwarchuk, Sowinski, & LeFevre, 2014).

Overall, the importance of the HLA lies in the fact that its quality promotes more intellectual and social development than parental occupation or qualification for all children (Foster et al., 2005; Melhuish et al., 2008; Sylva & Pugh, 2005).

Regarding the dimensions of the HLA, in the research literature there have been several different ways in which HLA has been categorized. Some researchers (e.g., Melhuish et al., 2008; Sylva et al., 2004) have followed a holistic approach to capture information about the level of parental engagement in the learning activities within HLE, while others (e.g., Hindman & Morrison, 2012; Liu, Georgiou & Manolitsis, 2018; Skwarchuk et al., 2014) have categorizing activities in various dimensions. For example, the most commonly used HLA measure, "the early years HLE Index" was developed to measure the frequency of family engagement in seven activities that provided learning opportunities for children (e.g. reading to child, visiting the library, playing with numbers, painting and drawing etc.). This measure assessed the frequency and the quality of the HLA as an overall dimension (Melhuish et al., 2008). Other studies categorize HLA in a two-dimensions rationale (Bulotsky-Shearer et al., 2012; LeFevre et al., 2009; Manolitsis et al., 2013; Sénéchal & LeFevre, 2002). For example, some studies categorize home literacy versus home numeracy activities considering the learning outcomes (LeFevre et al., 2009; Manolitsis et al., 2013), other studies categorize HLA as formal versus informal learning activities or teaching versus non-teaching activities (Sénéchal & LeFevre, 2002), while other categorize home-based versus community-based educational activities (Bulotsky-Shearer et al., 2012). In addition, recent studies (Neumann, 2018) categorize HLA in digital versus non-digital HLA. Based on the initial definition about the concept of the HLA, in the present study we considered important for our questionnaire three domains of HLA: indoor, outdoor, and digital HLA.

Regarding the measurement of HLA in most studies the degree of family engagement in HLA is measured via self-report scales or semi-structured interviews with the parent (Melhuish et al., 2008; Son & Morrison, 2010; Sylva et al., 2004). These instruments typically assess how often the parent participation in the various learning and educational based experiences with the children. The items describe the type of the HLA and they mostly assessed via a Likert scale. The frequency as well as the quality of the activity matters (Hayes et al., 2016).

1.3. Measuring parental involvement in HLA in the context of HLE

Existing empirical evidence (Bradley & Caldwell, 1995; Melhuish et al., 2008; Sammons et al., 2015) have contributed significantly to an enhanced understanding of the conceptualization of HLE and the relationship between the family engagement in the HLA and the child's attainment.

Recent studies have attempted to measure parental involvement in HLE (Anders et al., 2013; Melhuish et al., 2008; Niklas & Schneider, 2017; Rodriguez & Tamis-LeMonda, 2011; Sammons et al., 2015; Son & Morrison, 2010). These studies have used six broader instruments to measure the overall quality of HLE. These most conventional measures of HLE are: an observational measure, a semi-structured interview, two questionnaires and two subscales of two broader parenting questionnaires. More specifically: (a) The Home Inventory (Caldwell & Bradley, 2003), is an observational measure of the quality and quantity of stimulation and support available to child at home. (b) The early years HLE Index (Melhuish et al., 2008), is a semi-structured interview with parents that measures the frequency with which parents and children engage in the various HLA. (c) The Questionnaire on the HLE (Niklas & Schneider, 2017), assesses the parent – child reading behavior and other activities at home. (d) The HLE Profile (Heath, Levin, & Tibbetts, 1993) is a questionnaire, which measures the frequency of specific school readiness activities and common family practices that support learning and development. (e) The Supportive HLE subscale of the Parent Involvement in Children's Education Scale (Fantuzzo, Tighe, McWayne, Davis, & Childs, 2002), measures parent behaviors that promote learning at home and (f) the HLE subscale of the Parenting Questionnaire (Morrison & Cooney, 2002), is a self-report which measures parenting behaviors in teaching literacy and math activities.

However, the last decades the content of the HLE has been differentiated. A number of factors such as the penetration of new technologies into our lives (smart phones, tablets, etc.), the time that the child spend in front of the screen, the dominance of digital educational materials in the daily life of children have brought about significant changes in the content and quality of activities in which the parent and the child are engaged (Danby, Fleer, Davidson, & Hatzigianni, 2018). The daily routines between the children and parents have been adjusted to the new technological lifestyle and therefore the content of the family learning activities has been inevitably changed (Griffith & David, 2019).

Additionally, the existing measures of both HLE and HLA have limitations. The intense penetration of "smart" devices (tablets and smartphones) into the modern lifestyle has introduced new types of digital activities into everyday routine of every family (Neumann, 2018). This innovation is not reflected in the obsolete research tools for assessing the quality of HLE, which were mainly developed in the 1980s, resulting in a significant gap in the relevant international literature.

1.4. The current study

The Greek family context is an intriguing cultural context with influences from both the west and the east. In terms of structure and function the Greek family presents many similarities with other countries. As well as other countries, the reduction of marriages, the increase in the number of divorces, single parent families and unmarried families are elements identified in the Greek family context. However, the Greek society shares greatly the values of emotional relationship and care among family members, which lead to a more conventional and traditional model for the relations between family

members (Pyrgiotakis, 2008). This condition inevitably influences the quality of the parent-child relationship and, by extension, the learning stimulations, which provided from parent to child.

The purpose of the present study is to examine the factorial validity of the Home Learning Activities Scale (HLAS), which is a subscale of a broader measure of the HLE, and its invariance across Greek families with children aged 4 to 7 years old.

The current study aims to provide a complete picture of family engagement in HLA at the contemporary technological reality. In particular we set two research objectives: 1) we introduce the Home Learning Activities Scale (HLAS), a new scale for measuring the HLA, which includes the usage of digital media in the family's daily routine, 2) we assess for the first time the profile and the characteristic of HLA in Greek families.

2. Material and Methods

This study is a pilot study from a wider research design of a doctoral dissertation that evaluates the quality of the Home Learning Environment in Greek families with children in preschool age. The current study has been financially supported by General Secretariat for Research and Technology (GSRT) and the Hellenic Foundation for Research and Innovation (HFRI) (Scholarship Code: 291).

2.1. Participants

A multistage sampling technique was used in order for the participants to be a randomized and representative sample of the general population of Northern Greece. Participants were recruited through kindergartens and elementary schools, which are located in Northern Greece and consisted of 175 parents. The sample consisted of 147 mothers and 28 fathers. The average age was M = 37.57 years ($S.D.$ = 4.72) for mothers and M = 43.56 years ($S.D.$ = 6.7) for fathers. Most of the parents had a high educational background. Specifically, 63,7% of the mothers and 44,8% of the fathers were graduated from a higher or highest educational foundation or had a master or doctoral degree. The majority of the parents were Greek (93.6% of the mothers, 96.5% of the fathers) and currently living together (96%).

Most children for whom the questionnaire was completed were boys (93 boys and 82 girls). The questionnaire was completed by parents of children with a mean age of 6 years old ($M.$ = 74.7 months, $S.D.$ = 10.56). Data derived from families with children, who attended the kindergarten and the first class of the elementary school. The average number of children living in the family was $M.$ = 2.23 ($S.D.$ = .94), ranging from 1 to 8.

2.2. Instruments-Measures

The HLAS instrument includes three subscales categorized in three dimensions: indoors, outdoors and digital activities. The HLAS consisted of 18 items: 8 items described indoor HLA, 5 items measured the digital activities that parents undertake with their children and 5 items were related to outdoor HLA. The HLAS is a self-report

measure, which is completed by the parent. The items are rated with a six-point Likert scale, indicating how often parents engage in the learning activity with the child (1 = never to 6 = always).

2.2.1. Scale development

A mixed methods approach was used to develop the HLAS comprising of the following six steps: 1) Overview of the literature, study and translation of the available tools / items that could evaluate HLA. 2) An item bank was created by pulling and adapting items from the following existing measures and studies: (a) HLE Index (Melhuish et al., 2008), (b) Home Inventory (Caldwell & Bradley, 2003), (c) Questionnaire on the HLE (Niklas & Schneider, 2017), (d) HLE subscale of the Parenting Questionnaire (Morrison & Cooney, 2002), (e) Comprehensive Early Childhood Parenting Questionnaire (Verhoeven, Deković, Bodden & van Baar, 2017), (f) Parent Questionnaire KS1 (Sylva et al., 2004), (g) Parenting measure (Hartas, 2015), (h) the pictographic questionnaire for digital technologies (Palaiologou, 2016) and (i) parenting questionnaire assessing the usage of touch screen tablets (Neuman, 2017). 3) Item selection from the item bank, item adaption in the Greek context and new items construction. 4) Configuring the final item board and send it to seven specialists. 5) Feedback from the seven academic specialists in three axes for each item: (a) possible correction (e.g. in the wording), (b) how well the dimension that we have defined covers the meaning of the item, (c) what is the rationale behind the proposal / justification. 6) Development of the HLAS. A first pilot study was employed in 20 participants for assessing the content validity and verify wording of the items. The initial version of the scale consisted of 28 items: 12 items described indoor HLA, 11 items were related to outdoor HLA and 5 items assessed the digital activities that parents conduct with their children. After employing exploratory factor analysis (which is described in the results of the present study) ten of the initial items were dropped because of redundancy or ambiguity. An overview of the remaining 18 items and how they are clustered in (sub)domains of HLAS is provided in Appendix 1.

2.3. Data analysis plan

Given that the present study was an initial attempt to examine the psychometric properties of the items related to the family engagement in HLA in the Greek context, Exploratory Factor Analyses were conducted using IBM SPSS Statistics for Windows Version 25 (IBM Corp, 2017).

Bartlett's Test of Sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy were used to evaluate the strength of the relationships among the 29 items measuring family engagement in HLA. Principal axis factor analysis was employed. For determining the number of factors exported, two criterions were used: 1) factors with the eigenvalue or characteristic criterion greater than one (eigenvalue ≥ 1) were considered to be reliable and maintained, 2) scree plot test was employed and scree plot graph was assessed. In cases, where these two criteria led to a different number of factors, the decision was based on the scree plot graph as the most reliable (Williams, Brown, & Onsman, 2010). The oblique rotation method used was direct

oblimin rotation because factors were expected to be linked. For evaluating the factor loadings, the rotated factor matrices were examined. Items with factor loadings ≤ 0.3 were considered to be "low loading" items and dropped. Finally, the internal consistency for each factor was assessed by Cronbach's alpha coefficients.

On a further level, descriptive statistics were analyzed to assess the characteristics of HLA in the Greek families. Mean scores were used to estimate the degree of parent's engagement in a range of learning activities undertaken with the child.

3. Results

3.1. Factor structure and reliability of HLAS

Exploratory factor analysis (EFA) was employed for assessing the psychometric properties of the HLAS. A basic prerequisite of exploratory factor analysis is that the results must be stable. This is ensured if there is a proportion between the number of participants and the number of items (Williams et al., 2010). Several such proportions have been proposed in the past ranging from 5: 1 to 20: 1 (Streiner, 1994).

Table 1: Exploratory factor analysis for HLAS

Items	Factor		
	1	2	3
5. The parent plays with the child with literacy applications on an iPad or on a tablet or on a laptop	.881		
7. The parent plays with the child with numeracy applications on an iPad or on a tablet or on a laptop	.865		
3. The parent helps the child to read an e-book on an iPad or on a tablet or on a laptop	.783		
14. The parent serf on internet with the child	.704		
15. The parent plays video games with the child	.662		
11. The parent does craft activities with the child (puzzle, Lego crafts etc.)		.780	
10. The parent does art activities with the child		.714	
8. The parent plays with the child shapes recognition/ learning games		.701	
9. The parent plays with the child for learning spatial relationships		.689	
12. The parent plays role games or with other toys with the child (e.g. the baker and the customer, or with dolls or toy cars)		.664	
13. The parent sing and dance with the child or listen to music with him/her		.563	
2. The parent reads with the child from a book and they discuss about it		.517	
4. The parent helps the child write letters and words		.397	
24. The parent attends cultural events with the child (cinema, theater, museum, concerts)			.651
20. The parent visits the library with the child			.527
23. The parent takes the child to an art activity (e.g. dance, ballet, painting, music)			.505
22. The parent takes the child to a sport activity (e.g. football, swimming)			.483
21. The parent does physical activities with the child (e.g. ride a bike, swimming, dance)			.487
Percentage of explicable variance (%)	61.4	40.8	28.1
Eigenvalues	3.43	3.82	2.11
Cronbach's alpha	.885	.835	.647

* All loading factors under .300 are missing.

In the present study the number of participants was relatively small (n = 175) and given that the study has an exploratory character we employed separate EFAs for each conceptual group of items. Thus, three EFAs were employed (which are presented in detail on Table 1 above.

Exploratory factor analysis was employed to the 5 items, which evaluate the digital HLA. The eigenvalues above unity criterion indicated one factor (*KMO* = .833, *Bartlett's test* = 496.62, *df* = 10, $p < .001$), as well as the scree plot. All items yielded significant loadings, ranging from .881 to .662. The internal consistency for this factor was high (α = .885).

Responses to the 12 items that assessed the indoor HLA were subjected to exploratory factor analysis. The eigenvalues above unity criterion indicated that four factors should be retained (*KMO* = .801, *Bartlett's test* = 533.43, *df* = 28, $p < .001$), whereas the scree-plot suggested one reliable factor. Application of a new exploratory factor analysis was carried out, in which one factor was requested. Eight items yielded significant loadings, ranging from .780 to .397. Four items (1. The parent discusses with the child, 6. The parent helps the child to learn numbers and mathematical concepts, 16. The parent watches TV with the child, 17. The child helps parent with household, e.g. water the flowers, feed the pet etc.) showed statistically significant low loading below .30 and were removed. The Cronbach's alphas for this factor was *a* = .835, which indicates a high level of internal consistency for this factor.

Results of the initial exploratory factor analysis in the 11 items, that assessed the outdoor home learning activities showed three factors (*KMO* = .750, *Bartlett's test* = 98.46, *df* = 10, $p < .001$). However, the examination of the scree plot graphic showed that one factor must be maintained. Results of the following exploratory factor analysis, in which one factor is requested, showed that all items displayed statistically significant loadings, ranging from .651 to .467. Six items (18. The parent discuss with the child about how was his/her day at school, 19. The parent plays with the child at the playground or at the park, 25. The parent goes with the child at the church, 26. The parent takes the child with him to the super market, 27. The parent takes the child with him/her to visit relatives or friends. 28. The parent does small trips with the child) yielded statistically significant low loading, below .30 and were removed. The Cronbach's alphas for the family structure factor was α = .647 which indicates an adequate level of internal consistency for this factor.

3.2. The profile of HLA in Greek families

In order to investigate the profile and characteristics of HLA in Greek families descriptive statistics were analyzed. The results showed (table 2) that parents used to take the child to do a physical activity (e.g. play football, swimming) very often (*M.* = 5, *S.D.* = 1.54). According to parents, they often read to the child from a book and they discuss about it (*M.* = 4.78, *S.D.* = 1.24). In addition, they often sing and dance with the child or listen to music with him/her (*M.* = 4.54, *S.D.* = 1.17). In Greek families parents sometimes play with the child games to learn spatial relationships (*M.* = 3.83, *S.D.* = 1.38) or to recognize the shapes (*M.*= 3.68, *S.D.* = 1.37). As related to digital HLA,

participants declared that they rarely play with the child with literacy (*M.* = 2.66, *S.D.* = 1.51) and numeracy (*M* = 2.59, *S.D.*=1.51) applications on an iPad or on a tablet or on a laptop and they also rarely play video games with the child (*M.* = 2.7, *S.D.* = 1.31).

Table 2: Averages for the characteristics of HLA in Greece

Items	M	S.D.
22. The parent takes the child to a sport activity (e.g. football, swimming)	5	1.54
2. The parent reads with the child from a book and they discuss about it	4.78	1.24
13. The parent sing and dance with the child or listen to music with him/her	4.54	1.17
4. The parent helps the child write letters and words	4.42	1.37
24. The parent attends cultural events with the child (cinema, theater, museum, concerts)	4.38	1.44
10. The parent does art activities with the child	4.26	1.16
11. The parent does craft activities with the child (puzzle, Lego crafts etc.)	4.23	1.17
21. The parent does physical activities with the child (e.g. ride a bike, swimming, dance)	4.08	1.52
23. The parent takes child to an artistic activity (e.g. dance, ballet, painting, music)	4.06	2.08
9. The parent plays with the child games to learn spatial relationships	3.83	1.38
8. The parent plays with the child shapes recognition games	3.68	1.37
12. The parent plays role games or with other toys with the child (e.g. the baker and the customer, or with dolls or toy cars)	3.66	1.36
14. The parent serf on internet with the child	3.10	1.48
20. The parent visits the library with the child	2.86	1.69
5. The parent plays with the child with literacy applications on iPad or tablet or laptop	2.66	1.51
7. The parent plays with the child with numeracy applications on iPad or tablet or laptop	2.59	1.51
3. The parent helps the child to read an e-book on iPad or tablet or laptop	2.44	1.37
15. The parent plays video games with the child	2.07	1.31

4. Discussion

The current study was designed to examine the psychometric properties of the Home Learning Activities Scale (HLAS). In addition, it was attempted to survey for the first time the profile and the characteristic of the HLA in the Greek context. For the purpose of this study a new measurement was developed.

The results provided a comprehensive perspective on the dimensions of the HLA. Three factors of family engagement in learning activities included indoor activities, outdoor activities and digital activities captured the structure of HLA in Greek families with children in early childhood education. An exploratory factor analysis including all final eighteen items provided a good fit with the intended three factor structure and showed that all factor loadings had a greater value than .30 . The reliabilities of the factors were acceptable and relatively high for a self-report parenting questionnaire. Consequently, the HLAS appears to be a useful measure for assessing the parental engagement in HLA, as the instrument has a good construct validity and satisfactory reliability and could be easily completed by the participants of the study.

Many of the existing measures of HLA have limitations (Totsika & Sylva, 2004). Some of the conventional measures on parental engagement in HLA are based on direct observations or face-to-face interviews, which are subjects of limitations regarding

participants responses bias (Aspland & Gardner, 2003). The present study introduced a comprehensive self-report measure, which is easily and shortly completed by a parent.

In addition, most of the existing measures assessed a limited range of learning activities undertaken by parents with their children (Hayes et al., 2016; Rodriguez & Tamis-LeMonda, 2011). Research on the HLA has mainly focused on children's experiences inside the house (Melhuish, et al., 2008; Morrison & Cooney, 2002). Certainly, indoor HLA, for example shared book reading, telling and discussing stories, doing art and craft activities, playing number games etc., are associated with language growth, offer incidental learning about literacy and numeracy and promote positive approaches to learning (Sammons et al., 2015). Nevertheless, outdoor HLA, like visiting a library or a museum, doing a sport, attending cultural events etc. have been found to promote children's social outcomes and positively influence children's interest in learning and information processing (Foster et al., 2005). Therefore, HLA should be evaluated in a broader approach including the range of elements, which influence child's development (Broffenbrenner & Morris, 1998; Zachopoulou, Grammatikopoulos, Gregoriadis, et al., 2013). The HLAS includes items, which covers the range of learning experiences that influence child's competences in literacy, numeracy, arts, drama, music, physical activity and usage of digital technologies.

Furthermore, smart devices and technological media are well integrated in children's lives (Danby, Fleer, Davidson, & Hatzigianni, 2018). Children under 5 years old seem to be very familiar using touch-based devices and subsequently parents engage in various digital and non-digital activities at home (Neumann, 2018). However, the existing findings are relative limited and there is some recent empirical evidence (Danby, Fleer, Davidson, & Hatzigianni, 2018; Neumann, 2018; Palaiologou, 2016) regarding the digital learning practices at home. The obsolete research tools don't include items for measuring digital learning activities (Palaiologou, 2016). The HLAS includes five items comprising digital HLA factor, which assess digital stimulations, which parents provide to children at home. It is worth noting that this factor exhibited high internal consistency, which demonstrates its dominant role in measuring HLA.

Regarding the profile of HLA in Greek context results showed that parents often are engaged in indoor and outdoor HLA and rarely are involved in digital HLA. More specifically, almost half of the participants declared that always attend the child to a sport activity and very often do common physical activities (e.g. ride a bike, swimming, dance) (Grammatikopoulos, Gregoriadis & Zachopoulou, 2012). They, also, do often artistic activities, for example attending cultural events with the child (cinema, theater, museum, concerts), take child to an artistic activity (e.g. dance, ballet, painting, music) or doing music, art and craft activities. Moreover, in line with previous studies (LeFevre et al., 2009; Manolitsis et al., 2013), which were conducted in Greek families, literacy activities are implemented often by Greek parents with their child, for example shared-book reading, writing letters, and sometimes mathematical activities, for example games to learn spatial reasoning or shapes.

However, parental involvement in digital HLA exhibited the lowest mean scores, which means that Greek parents rarely or never use digital media for learning

purposes. These findings show that Greek parents seem to engage rather in traditional than advanced digital learning activities. Evidence showed (Davies, 2011) that parents were considered to be less digital literate that their children. Consequently, in the Greek context families maybe use digital media but not for educational purposes. However, this statement should be investigated in depth with a bigger and more representative Greek sample.

5. Strengths and limitations

The results of this study should be interpreted in the light of its limitations. A key strength of this study lies in the kind of sample. Although the results of the present study are encouraging, they should not be generalized to a cultural context other than that of Greece.

In addition, the quality of interactions such as parental warmth and support during HLA is important but did not measured in this study. The physical quality of the home environment (e.g. the house, the neighborhood), the type of the educational materials, that exist at home, as well as the quantity and the quality of them didn't assessed. According to Dearing and Tang (2010) HLA are included in a broader context of the HLE. The interactions of individual factors in this context influence child's development (Bronfenbrenner & Morris, 1998). Consequently, the subject of HLA should be examined in a holistic approach in respect of all the parameters, which constitute the HLE.

6. Implications for policy and practice

Further research activity is needed to extend the knowledge on the suitability of the HLAS and to measure the quality of family involvement in child's learning activities in other cultural and educational settings. If cross-cultural factorial validity of the scale is established, then researchers can compare their own findings with those of others and acquire a general picture of the parents' engagement in children's learning activities in different cultural settings.

The scale could also be used in combination with other scales for measuring the overall quality of the HLE (Zachopoulou, Grammatikopoulos, Gregoriadis, et al., 2013). The respectively results could be used for developing family interventions especially for "at-risk" families.

Future studies regarding the validity of the scale should use multiple methods, such as observations of parent-child interactions, to examine the relation between the HLAS and actual parenting behavior (Papadopoulou & Gregoriadis, 2017). Another important next step is to examine the suitability of the scale in other target groups (e.g., low-educated parents, clinical samples).

7. Conclusion

Learning experiences at home and parent's involvement in their child's early learning is important for development and later academic success (Melhuish et al., 2008; Sammons et al., 2015; Yu & Daraganova, 2014). The present study examined the validity of a new measurement of HLA in Greece. Results showed that, the scale seems successful in assessing parental involvement in three domains of HLA, for parents of 4 – 7 year-olds: indoor, outdoor and digital HLA. Factorial validity and reliability were confirmed. The innovation of the scale is attributed in the inclusion of items, which are referred to contemporary digital practices that children are involved in. The profile and the characteristic of HLAs in the Greek context were also investigated. Further research could use these findings in combination with other measurements for evaluating the overall quality of the HLE.

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