

Research report

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Parent-child joint play in the context of digital media: an integrative review

Manoela Yustas Mallmann¹

Bruna Gabriella Pedrotti¹

Maira Lopes Almeida²

Giana Bitencourt Frizzo¹

¹Universidade Federal do Rio Grande do Sul, Porto Alegre, Rio Grande do Sul, Brasil

²Universidade Federal de Goiás, Goiânia, Goiás, Brasil

Abstract

The objective was to map the existing literature on the use of digital media during parent-child play and its possible impacts on domains of child development through an integrative review. Three electronic databases were consulted. The eligibility criteria included studies whose participants were parent-children, mothers-children or fathers-children (0 to 6 years). Two judges evaluated the abstracts and thoroughly analyzed according to the eligibility criteria. The Intraclass Correlation Coefficient (ICC) was calculated to assess agreement between the two judges and found to be 0.70. Fourteen articles were selected, described, and synthesized from thematic analysis. Three themes were identified. The first, "Traditional play versus digital play," indicated that the impacts of digital media on joint play included both positive and negative aspects. The second, "Benefits to interaction in play with digital media," pointed out that caregivers were more sensitive, structuring, and encouraging during play with digital media. The third, "Impairments associated with play with media use," indicated more child isolation when playing with media and less dyadic communication during play. The use of digital media in play proved to be predominantly positive, enabling rich parent-child interactions. However, attention should be paid to the quality of communication during the activity.

Keywords: Parent-child relations; digital media; childhood play behavior; childhood development.

Brincadeira conjunta pais-criança no contexto das mídias digitais: uma revisão integrativa

Resumo

Objetivou-se mapear a literatura existente a respeito do uso das mídias digitais em momentos de brincadeira conjunta pais/mães-criança e seus possíveis impactos sobre domínios do desenvolvimento infantil através de uma revisão integrativa. Foram consultadas três bases de dados eletrônicas. Dentre os critérios de elegibilidade foram considerados estudos cujos participantes eram cuidadores-criança, mães-criança ou pais-criança (0 a 6 anos). Os resumos foram avaliados por duas juízas e analisados minuciosamente de acordo com os critérios de elegibilidade. Para avaliar a concordância entre as duas juízas, foi calculado o valor do Coeficiente de Correlação Intraclass (CCI), cujo valor encontrado foi de 0,70. Selecionou-se 14 artigos, descritos e sintetizados a partir de análise temática. Identificou-se 3 temas. O primeiro, "Brincadeira tradicional *versus* brincadeira digital", indicou que os impactos das mídias digitais para a brincadeira conjunta incluíram aspectos positivos e negativos. O segundo, "Benefícios para a interação em brincadeiras com o uso das mídias digitais", apontou que os cuidadores foram mais sensíveis, estruturantes e encorajadoras durante a brincadeira com mídias digitais. Já o terceiro, "Prejuízos associados à brincadeira com uso de mídias", indicou maior isolamento da criança ao brincar com mídias e menor comunicação da díade na brincadeira. O uso das mídias digitais na brincadeira mostrou-se predominantemente positivo, possibilitando interações ricas pais-criança. Porém, deve-se atentar à qualidade da comunicação durante a atividade.

Palavras-chave: Relações pais-criança; mídias digitais; comportamento de brincar; desenvolvimento infantil.

El juego conjunto padres-niños en el contexto de los medios digitales: una revisión integradora

Resumen

Este estudio tuvo como objetivo mapear la literatura existente sobre el uso de medios digitales durante el juego entre padres e hijos y sus posibles repercusiones en dominios del desarrollo infantil mediante una revisión integradora. Se consultaron tres bases de datos electrónicas. Los criterios de elegibilidad incluyeron estudios cuyos participantes fueran cuidadores-hijos, madres-hijos o padres-hijos (0 a 6 años). Los resúmenes fueron evaluados por dos jueces y analizados exhaustivamente según los criterios de elegibilidad. Para evaluar la concordancia entre los dos jueces, se calculó el coeficiente de correlación intraclass (CCI), que resultó ser de 0,70. Se seleccionaron y sintetizaron 14 artículos a partir de un análisis temático. Se identificaron tres temas. El primero indicaba que las repercusiones de los medios digitales en el juego conjunto incluían aspectos tanto positivos como negativos. El segundo señalaba que los cuidadores eran más sensibles, estructuradoras y alentadoras durante el juego con medios digitales. El tercero, indicaba un mayor aislamiento del niño cuando jugaba con medios y una menor comunicación diádica durante el juego. El uso de medios digitales en el juego resultó ser predominantemente positivo, ya que permitía interacciones enriquecedoras entre padres e hijos. Sin embargo, debe prestarse atención a la calidad de la comunicación durante la actividad.

Palabras clave: Relaciones padres-niños; medios digitales; conducta de jugar; desarrollo infantil.

Introduction

The literature consensuses that play is not only a right but also an essential activity of childhood. When playing, the child benefits in the most diverse domains of child development, has a way of expressing and communicating their feelings, and obtains a space for promoting social and emotional development (Amodia-Bidakowska et al. 2020; Oliveira et al., 2008). In addition, play can be seen as a facilitator of healthy growth and the child's insertion into the world (Winnicott, 1971/1975).

The child's play can occur individually, with peers, or with caregivers (Wooldridge & Shapka, 2012). This study will focus on the joint play of the young child with the caregivers, understanding it as extremely important for the pair's interaction. This allows the child to count on the caregiver to develop their cognitive, linguistic, motor, social, and emotional skills (American Academy of Pediatrics, 2016; Waldman-Levi et al. 2019).

The context in which joint play with parents takes place plays an important role, and it is relevant to pay attention to the type of activity in which the child can engage (Kwon et al., 2013). In addition, the characteristics of the toy or object used to play are also relevant, contributing to the quality of that experience (Miller et al., 2017; Sosa, 2016). As the toy itself has been modernizing, as well as the use of technological resources as an instrument for playing, there is a significant increase in research comparing the analog toy with one involving the use of digital media (Almeida & Frizzo, 2021; Marsh et al., 2020). In addition, recent studies that sought to map the use of media in the routine of families indicate that an increasing number of young children use digital media (Azevedo et al., 2022) and specifically for play (Rideout & Robb, 2020; Skaug et al., 2018a).

With this, many studies sought to investigate the influence of different types of toys and their possible associations with parent-child interaction and child development. Studies focus on the behaviors and engagement of caregiver-child interactions during play (Marsh et al. 2020; Neumann, 2017; Woodridge & Shapka, 2012). Concerning child development, associations with the socioemotional, cognitive, and language domains are mainly investigated both in analog play (Ho et al., 2017) as well as non-digital (Becker et al., 2022; Hiniker et al., 2018; Skaug et al. 2018A) and comparatively between the two (Almeida & Frizzo, 2021).

Some studies have investigated the type of toy and its association with communication between parents

and the baby during play and with language development. When comparing electronic toys with traditional toys (Miller et al., 2017) and with books (Sosa, 2016), studies suggest a tendency for parents to attribute the interactive function of play to the toy itself. As a result, this ends up showing a decrease in the quantity and quality of communication between caregivers and the baby, as well as lower vocalization of babies when they used electronic toys, compared to the other two contexts (traditional and books) (Miller et al., 2017; Sosa, 2016). In addition, the use of electronic toys in joint parent-baby play can contribute to caregivers being less involved in the game, communicating less and being less responsive, delegating to the toy some interactions with the child due to its stimuli, such as sounds and repetition of phrases (Sosa, 2016).

Some studies have emphasized the potential of mobile devices to contribute to parents having an active participation in play, communicating more with the child and stimulating learning (Neumann, 2017), as well as greater sensitivity and support in moments involving the mobile device (Skaug et al., 2018a). On the other hand, other studies have found contrasting results, suggesting that the format of mobile devices and the content of the applications themselves may contribute to a decrease in the need to share the activity, decreasing joint engagement (Hiniker et al., 2018; Radesky & Christakis, 2016). This becomes especially worrisome concerning children up to three years of age, as it can negatively impact the quality of parent-baby interaction in moments of play (Hiniker et al., 2018; Wooldridge & Shapka, 2012).

In general, it is visible that, just as there are many questions about the risks and benefits of the use of digital media by children in early childhood (Domingues & Montanari, 2017), there also does not seem to be consensus on its use when inserted in the context of joint parent-child play (Hiniker et al. 2018). Identifying what are the relevant aspects of understanding and deepening this phenomenon is essential, considering the relevance of play and parent-child interaction for child development in the current technological context. Although the literature provides supporting information for caregivers about which type of toy to choose for their children (Healey et al., 2019), no review studies have yet been found that synthesize scientific evidence regarding the impact of digital media on parent-child joint play. It is believed that this information can collaborate to guide caregivers and professional practice.

Given the above, this article consists of an integrative literature review to map the existing scientific literature on joint parent-child play in the context of digital media. It is more specifically seeking to understand how digital media are being used in the interaction between child caregivers during play, in terms of behaviors and engagement of both parents and children.

Method

This study is an integrative review of the literature commonly used in health. It aims to bring a global and comprehensive understanding of the research topic it is proposed to explore (Dhollande et al., 2021). To identify and select studies that addressed the different contexts of play and their associations with the behaviors (e.g., engagement, shared attention, interaction) of the young child and the pair caregiver-child during joint play, a search was performed in the following electronic databases: Scopus, MEDLINE, and PsycInfo. The search was conducted and completed in March 2022. Abstracts, titles, and keywords were considered in the search.

We used the PICO (Table 1) for organizing the database search and defining the research question. In this study, the research question was: identify, evaluate, and synthesize the current scientific knowledge about the use of digital media in moments of joint play parents/mothers-child and its possible impacts on child development domains. The descriptors used were:

Study eligibility and selection criteria

The eligibility criteria adopted were as follows: (1) empirical studies, (2) articles published in any language, (3) articles published in the last ten years, (4) articles whose participants were caregivers-child, mothers-child or fathers-child, being children in early childhood, as considered by law 13.257 (2016), between 0 to 6 years and 11 months. Studies focusing only on educational aspects of digital media use and not on the play were excluded. Theses, dissertations, and conference proceedings were also excluded. Initially, the number of duplicate articles was examined. After removing duplicates, the articles were sorted by title and abstracts, evaluated by two judges independently and thoroughly analyzed according to the eligibility criteria. Cases of disagreement were resolved by consensus and discussion with a third researcher. In the end, the included articles were read in full and analyzed, and their data extracted to an Excel spreadsheet.

The intraclass correlation coefficient (ICC) value was calculated to assess the agreement between the two judges. The ICC found was 0.70, which is considered a good reliability (Koo & Li, 2016). The data presented adequate statistical significance ($p < 0,001$). In case of disagreement between the judges, the criteria were resumed and discussed with a third researcher to establish consensus. After the selection, the researchers read the articles' full text. Fifteen studies were included in this review. The selection strategies can be seen in Figure 1.

Table 1.

PICO criteria for defining descriptors

	P	I	Co
Meaning	Population or problem: who? Which participants?	Interest: what is the phenomenon of interest?	Context: where? In what context?
Descriptors	"Mother-child" OR "parent-child" OR "parent child Relations" OR "parent child relationship" OR "parent-offspring interaction" OR "parent-child interaction".	"play behavior" OR "toy play" OR "digital play" "Parent-child interaction" OR "play patterns" OR "playtime" OR "shared play" OR "joint play" OR "childhood play behavior" OR "childhood play development" OR "digital play" OR "technology play" OR "parent-child play" OR "mother-child play" OR "joint media engagement" OR "joint attention."	"Screen time" OR "smartphone" OR "tablet" OR "TV" OR "digital media" OR "digital media use" OR "computer" OR "iPhone" OR "iPad".

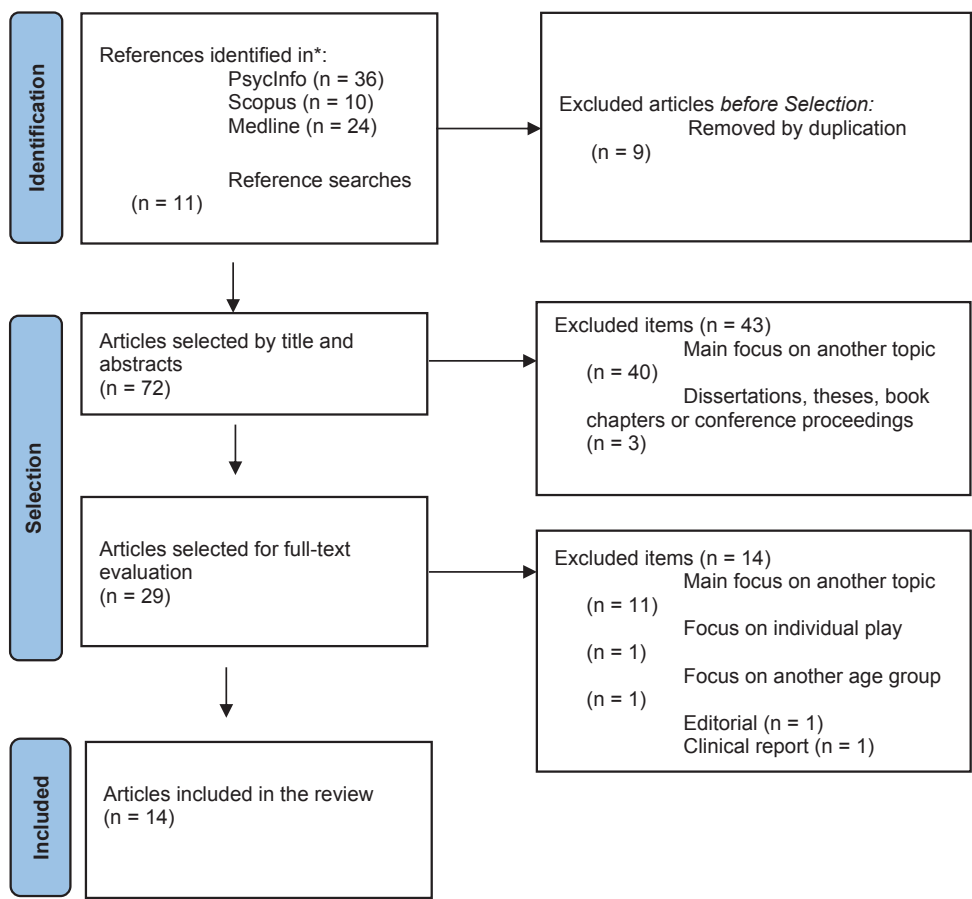


Figure 1. PRISMA 2020-based flowchart to demonstrate the literature review process (Page et al., 2021).

Data extraction

A table was built in Excel to extract the following data from the studies: authors, year of publication, objectives, design, participants, instruments, and main results.

Summary of results

This review aimed to map the existing scientific literature on Mother-Baby joint play in the context of digital media, more specifically seeking to understand how digital media are being used in the interaction of child caregivers during play, in terms of behaviors and engagement of both parents and children.

Initially, the main characteristics of the studies were analyzed descriptively, such as the year of publication and the country of origin of the study. Subsequently, the synthesis of the results was constructed from inductive thematic analysis (Braun et al., 2019), following the steps recommended by the authors. Thematic analysis is a method that identifies, analyzes, and defines themes from the collected data and their

presented patterns. The researcher plays an active role in the process (Braun et al., 2019). The analysis consisted of six steps, as recommended by the authors, which are: a) familiarization with the data; b) generation of initial codes; c) search for themes; d) review of themes; e) definition and naming of themes and; f) production of the final report. The data from the selected studies were read repeatedly by two researchers. Then, themes were created, discussed exhaustively, and presented in the results.

Results

This integrative review included 14 articles. Table 2 presents the main characteristics of each study included in the analysis, the description of the participants, the objectives, the methodology used, the instruments applied, and the main results found in each study.

The countries with the highest number of publications in terms of place of publication were the

Table 2.
Articles included in the analysis

Article	Objective	Participants	Method and instruments	Main Results
Skaug, S., Englund, K. T., Saksvik-Lehouillier, I., Lydersen, S., & Wichstrøm, L. (2018), Norway	Examine the possible effects of using tablets <i>versus</i> toys and watching television in moments of joint play in Mother-Baby interaction.	22 Mother-Baby pairs: Babies 19-30 months (M= 24.90 months; SD= 3.56).	Cross-sectional and randomized study. EAS-Emotional Availability Scale; Questionnaire of media habits.	Maternal sensitivity and structuring were greater in the joint play with a tablet than with traditional toys and television; non-hostility was lower during toy play.
Eisen, S., Matthews, S. E., & Jirout, J. (2021), United States	Explore parents' and children's gender beliefs about different types of toys, investigate whether parents' and children's beliefs relate to each other, and how often children play with different toys.	60 parent-child pairs: Children 4-7 years (M= 64.94 months; SD= 10.82). Parents' age and gender were not recorded.	Quantitative and cross-sectional study. Parent Belief Questionnaire (general questions about play and specific questions about the child).	Parents consider digital media to be gender-neutral. However, they have beliefs about the preference for space toys (boys) and non-space toys (girls) and about the superior ability of girls to play with non-space toys. The children had no gender beliefs about their preference or ability for media or toys.
Lee, J. & Wood, E. (2020), Canada	Examine parental engagement with children in different contexts, considering spatial play with 3D blocks and puzzles versus apps used on mobile devices with the same types of play.	32 parent-child pairs (25 mothers and seven fathers). Children 37-67 months (M= 51.50; SD= 8.85). Parents 21-49 years old (25 mothers and seven fathers).	Quantitative, cross-sectional, and observational study. Quiz on children's types of math activities; questions about media use and play; Piccolo - Parenting Interactions with Children: Checklist of Observations Linked to Outcomes.	Parents engaged actively and positively in both play contexts, and there was mostly a child-centered interaction style. Parents provided greater support in the context of 3D play than in 2D, showing greater responsiveness and teaching.
Wilkinson, P., Taylor, J., & Readman, M. (2018), United Kingdom	Evaluate the effectiveness of a mobile phone application that encourages parent-child play in the "real world."	28 caregivers of children aged 3-5 years.	Mixed methods study: Quiz with questions about the tested app and practices about playing	Parents tend to consider digital play as an individual activity, not co-engagement.

(Continued)

Table 2.
Articles included in the analysis (Continuation)

Article	Objective	Participants	Method and instruments	Main Results
Sung, J. (2018), South Korea	Examine how children and their mothers experience two types of toys (traditional vs. electronic).	48 children 3-4 years (M= 49.77 months). 48 mothers 30-45 years (M= 36.13; SD= 3.61).	Cross-sectional and correlational quantitative study. Quiz on the design of children's toy; Piccolo - Parenting Interactions with Children: Checklist of Observations Linked to Outcomes.	The mothers, however, presented more interactive behaviors during the use of the electronic toy, with a greater focus on the toy's characteristics than on the child's behavior.
Ho, A., Lee, J., Wood, And., Kasses, S., & Hinckley, C. (2017), Canada	Examine the amount and types of spatial vocabulary parents produce when engaged in playtime with their children at two distinct times: 3D play with blocks and puzzles and 2D play on an iPad.	34 children 37-67 months (M= 50.97; SD= 7.58). Primary caregivers (26 mothers, seven fathers, and one grandmother).	Cross-sectional quantitative study. Questionnaire on the use of mobile devices; Spatial Language Coding Scheme.	No differences were found in the overall mean of parental spatial vocabulary when engaged in the 2D x 3D moment.
Ewin, C. A., Reupert, A., McLean, L. A., Ewin, C. J. (2021), Australia	To investigate whether the quality and quantity of parental language differ at different times: parents' mobile device use, parents' magazine reading, joint play with a toy, and at time of joint play with a mobile device.	24 parent-child pairs: Children 2-3 years and 11 months. Caregivers (22 mothers and two fathers).	Cross-sectional quantitative study. Amount of parent language: number of utterances and words per minute; parent language quality: number of new words per minute.	Parents produced the highest number of utterances per minute and more new words while playing with toys.
Ewin, C. A., Reupert, A. E., McLean, L. A., Ewin, C. J. (2020), Australia	Investigate parental acceptance of <i>joint media engagement</i> (JME), the support offered by parents and children in moments of JME, and the impact of JME on parent-child interaction.	27 articles were included in the review.	Systematic review according to PRISMA guidelines.	Most parents offer cognitive, physical, technical, and effective support during the JME, but depending on the device, they can also provide passive supervision. The JME can increase the child's engagement in the activity but reduce the quality of the language, which can negatively impact the interactional aspects of the parent-child duo.

(Continued)

Table 2.
Articles included in the analysis (Continuation)

Article	Objective	Participants	Method and instruments	Main Results
Skaug, S., Englund, K. T., Wichstrøm, L. (2018), Norway	To examine, in a cross-sectional and longitudinal way, the association between watching television and the child's interaction with parents.	First stage: 953 children (M = 4 years; SD = 0.18). Second stage: 795 children (M = 6.7 years; SD = 0.25).	Quantitative, cross-sectional and longitudinal study; EAS-Emotional Availability Scale Interview with parents about the child's habits related to TV.	Faced with the excessive use of television, children showed less involvement with their parents in playing with toys.
Hiniker, A., Lee, B., Kientz, J. A., Radesky, J. S. (2018), United States	Examine parent-baby play in the presence of applications (use of the tablet) compared to playing with analog toys.	15 father-baby pairs (10 mothers and 5 fathers). Children 4-6 years.	Qualitative and observational study; Questionnaire on the use of media.	Most pairs featured more exchanges and dialogue and created a shared play space in the session with analog toys. Playing with the tablet, the children remained more turned to the tablet, away and in the opposite position to the parents, who addressed the child less in the game with <i>tablets</i> .
Marsh, J. Lahmar, J. Plowman, L., Yamada-Rice, D., Bishop. J., & Scott, F. (2020), United Kingdom	Examine how much the use of tablets and its applications promote the play and creativity of children up to 3 years.	Phase 1: 954 parents of children up to 3 years. Phase 2: 4 families with children up to 3 years.	Mixed methods study. Online questionnaire on children's access to technology in general and tablets, and the support provided by parents in these activities.	The study indicates that tablets and apps can potentially promote children's play and creativity. The play with the tablet makes it possible to promote cognitive (including linguistic), bodily, affective, social and cultural aspects of child development.

(Continued)

Table 2.

Articles included in the analysis (Continuation)

Article	Objective	Participants	Method and instruments	Main Results
Neumann, M. M. (2017), Australia	To examine the extent to which parents use supportive behaviors during a joint activity on the tablet, the relationships between this behavior during joint activity on the tablet and sociodemographic variables, use of the <i>tablet</i> at home, and age of the child.	55 parent-child pairs (46 mothers and nine fathers). Children 2-5 years (M = 3,49; SD = 0,72).	Quantitative and cross-sectional study. Survey on the use of digital media, especially the <i>tablet</i> . Parental support behavior was coded according to Neumann & Neumann (2016).	The most evident parental behavior was cognitive, followed by affective. The least observed was the technical A negative association was found between the age of the child and the technical support provided by the parents.
Sosa, A. V. (2016), United States	To investigate whether the type of toy used during play is associated with the quantity and quality of parent-child communication.	26 Mother-Baby pairs. Babies 10-16 months.	Quantitative and cross-sectional. Lena Software: number of parent words, number of content-specific words, number of child vocalizations, number of conversation turns, and number of parent responses per minute.	During play with electronic toys, fewer words from parents, fewer conversation turns, fewer responses from parents, and less specific content production were identified than in play with toys and books. In all analyses, books provided better communication interaction than electronic toys.
Wooldridge, M. B., & Shapka, J. (2012), Canada	To compare the quality of Mother-Baby interaction during two moments of play with toys: with and without electronic resources.	25 Mother-Baby pairs. Babies 16-24 months (M = 19.75 months)	Quantitative and cross-sectional study. Quiz on family play pattern. Piccolo - Parenting Interactions with Children: Checklist of Observations Linked to Outcomes.	When playing with non-electronic toys, mothers obtained higher Piccolo scores in the categories of responsiveness, teaching, and encouragement.

United States, with four, and Canada and Australia, with three. Ten of the 14 articles selected were quantitative, one qualitative, two mixed methods, and one review. Regarding quantitative articles, most (n=9) were cross-sectional. Although some studies had participating fathers, most were done with mothers or with most mothers and some fathers in the same sample.

Regarding the objectives, the main research question generally focused on investigating parent-child interaction and child development outcomes in different play contexts, usually comparing traditional toys with electronic and/or digital media. Although factors associated with the quality of play were not investigated, this can impact child development.

Another important point concerns the instruments used to evaluate different aspects of parent-child interaction during play. Of the 14 studies included in this review that evaluated parent-child interaction, five used instruments for this purpose, and the use of two main instruments was noticeable. Three articles (Lee & Wood, 2020; Sung, 2018; Wooldridge & Shapka, 2012) used the Parenting Interactions with Children: Checklist of Observations Linked to Outcomes - PICCOLO® (Roggman et al., 2013a; Roggman et al., 2013b). Two other studies (Skaug et al., 2018a; Skaug et al., 2018b) used the Emotional Availability Scale - EAS (Biringen et al., 2000), which evaluates paternal and infantile behaviors.

From the results of the studies, inductive thematic analysis (Braun et al., 2019) was used. Initially, the researchers thoroughly read the data and generated initial codes. These codes were grouped around themes, considering their similarities and particularities. Ultimately, the themes were reviewed, defined, and named and will be presented below. Three themes were constructed that mainly dealt with the associations between joint play in the context of digital media and caregiver-child interaction during play (involving behaviors and engagement of both parents and children) and child development. They were: "traditional play *versus* digital play," "benefits for interaction in play with the use of digital media," and "harms associated with play with the use of media."

Traditional play versus digital play

Of the 14 articles included in the review, it was identified that, although with different objectives, 8 of them investigated aspects related to the effects of different types of toy and play context, involving or the use of electronic toys or some mobile device, such as

smartphones and tablets (Ewin et al., 2021; Hiniker et al., 2018; Ho et al., 2017; Lee & Wood, 2020; Skaug et al., 2018A; Sung, 2018; Wooldridge and Shapka, 2012; Sosa, 2016). For example, Hiniker et al. (2018), in their study of 15 children aged 4 to 6, 10 with their mothers and five with their fathers, examined, in general, how parent-child play took place in the presence of apps on tablets *versus* analog toys.

The authors pointed out that, during play with analog toys, the pairs tended to create shared spaces for exchanges with greater dialogue and engagement than joint play with the tablet (Hiniker et al., 2018). These results are similar to the findings of Wooldridge and Shapka (2012). The authors conducted a study with 25 mother-baby pairs, with babies between 16 and 24 months, and found higher levels of maternal responsiveness and encouragement during play with traditional toys, such as books, geometric shapes, and plastic animals, compared to their electronic versions, which emitted lights and voices.

On the other hand, Sung's (2018) study compared maternal interactive behaviors, child play behaviors, and the conceptions of 48 3-year-olds about two toys: a stuffed dog and a virtual dog. The researcher identified that the mothers showed positive affection and were more responsive during the games with the virtual dog, presenting more interactive behaviors in general.

In addition, the pilot randomized control group study by Skaug et al. (2018a) investigated the emotional availability of 22 mothers of babies up to two years of age while playing with a tablet and with traditional toys, as well as watching a television show. The researchers identified that mothers were more sensitive and structuring during tablet play than in the other two contexts. This result was attributed to the shared attention during use, which increases the pair's reciprocal cooperation. They also highlighted that mothers participating in the study were more likely to act hostile toward their children during games with traditional toys than in the other two contexts. One possible interpretation was that because play with toys is less structured, children may present "bad behaviors," arousing a more hostile reaction from their mothers.

The study by Lee & Wood (2020), conducted with 32 parent-child pairs (between 37 and 67 months), aimed to investigate whether parental engagement differs in 2D spatial play *versus* 3D. It suggests that parents have the potential to actively and positively engage in both contexts of play. However, in general, parents provided greater support in the context of 3D play

than in 2D play, presenting greater responsiveness and teachings in 2D play.

In addition, three studies sought to compare different types of toys and how each context can impact the quantity and quality of communication between the parent-child duo, both in samples with children under 3 years of age (Ewin et al., 2021; Sosa, 2016), as with children between 3 and 6 years old (Hor et al., 2017). The results of the study with children under 3 years of age point to a higher quality of communication and quantity of words from parents during play without using digital media (Ewin et al., 2021). With older children, Ho et al. (2017) investigated the vocabulary of spatial words in 2D and 3D games, finding no significant differences in the different contexts of play. Still, when comparing traditional play contexts with electronic toys or books, the study by Sosa (2016) highlighted that the highest quantity and quality of communication occurred during the shared reading of books, followed by the traditional toy and, finally, the electronic.

Benefits for interaction in games with the use of digital media

The second sub-theme, “benefits for interaction in games with the use of digital media,” focused on the eight articles that pointed out positive aspects of parent-child interaction in children’s games with the use of digital media (Ho et al., 2017; Lee & Wood, 2020; Marsh et al., 2020; Neumann, 2017; Skaug et al., 2018A; Sung, 2018)

The recent study by Marsh et al. (2020) emphasized the possibilities of playing with mobile devices, focusing on using applications. The study’s results showed the potential of tablets and applications to promote cognitive (including linguistic), bodily, affective, social, and cultural aspects of child development and allow children to develop creative play.

According to some recent studies on the subject, the use of digital media, both for moments of play and learning, can promote the engagement of the parent-child duo (Lee & Wood, 2020; Skaug et al., 2018A; Sung, 2018). For example, when comparing engagement during traditional or virtual play with children between 3 and 5, Lee & Wood (2020) observed that parents engaged actively and positively in both contexts. Although conducted with younger children (up to 30 months), the study by Skaug et al. (2018a) investigated the quality of Mother-Baby interaction and pointed to the higher quality of interaction during play with tablets, specifically concerning maternal sensitivity and structuring.

The concept of JME (joint media engagement), which refers to the existing engagement during the use and sharing of digital media, has been widely studied in the literature and also involves positive aspects of the use of digital media (Ewin et al., 2020). In their systematic review, Ewin et al. (2020) specifically investigated the impact of JME on parent-child interaction. The review included 27 articles. The authors identified in the studies presented in the review that children generally engage more than their parents in playing with mobile devices. In contrast, parents, on the other hand, are more involved in playing without digital media.

Finally, it is also relevant to point out that articles such as Ho et al. (2017) and Neumann (2017), based on the results of their studies, emphasize the potential of digital media, suggesting that they can be introduced in contexts of play, when used as a tool that contributes to parental support and guidance (Ho et al., 2017), in addition to strengthening the potential of tablets. Its applications promote children’s learning, especially when well-used by parents and caregivers.

Damages associated with playing with the use of digital media

The third sub-theme, “damages associated with playing with the use of digital media,” encompasses damages associated with using digital media as a tool for playing. Some studies point to the trend of the format and design of mobile devices contributing to play or activity being done in a more individualized way (Ewin et al., 2020; Hiniker et al., 2018), impairing interaction.

Studies included in this review also examine the role of parents during play with digital media or electronic toys. They may consider playing with media use more individualized, often withdrawing from the play and delegating to the technological resource interactions and exchanges they could have with the child (Miller et al., 2017; Sosa, 2016; Wilkinson et al., 2018). Hiniker et al. (2018) also observed that in moments of play with a tablet, children often remained physically facing the device, often even with their backs to caregivers, making it difficult to engage in play.

Although some studies on JME present positive points, as already mentioned, other studies present in the review indicated a negative impact of JME on the quantity and quality of parent-child communication. Studies generally compare play with digital media or electronic toys to play with traditional toys and books (Ewin et al., 2021; Sosa, 2016) and suggest that, in the age group up to 3 years, digital media and electronic toys tend to decrease the quantity and quality of

communication and language between parents and children (Ewin et al., 2021; Sosa, 2016).

Given the results, this review highlights the focus that studies in the area have given to the benefits and harms of using digital media during play for children. It also reveals the realization of studies comparing different play contexts, especially between traditional and virtual/electronic toys. These data make it possible to trace possibilities that will be discussed below.

Discussion

This study aimed to map the existing scientific literature on joint parent-child play in the context of digital media, more specifically seeking to understand how digital media are being used in child caregivers' interactions during play. Although the theme has been studied in several countries, there is still a lack of studies in Latin America and Africa since the studies in this review come only from North America, Europe, and Asia. This is relevant data since the most recent Common Sense Media census showed a substantial increase in the use of mobile media by children since 2020, especially among Latin American families (Rideout & Robb, 2020).

New studies that include greater ethnic and socioeconomic diversity in the samples may help to establish more clearly the impacts of digital media on parent-child interaction, considering race, ethnicity, income, and education, combined with different research designs that are not only quantitative and cross-sectional, which are the majority in this review. For example, black caregivers with low socioeconomic income tend to perceive more educational benefits of digital media for children than white caregivers (Rideout & Robb, 2020). Other studies have identified that many caregivers offer digital media to children out of their own need, not out of children's need, as a resource to entertain children at times when they need to stick to other tasks (Mallmann & Frizzo, 2019) or as an educational resource for young children (Beck et al., 2015). Therefore, the qualitative literature presents evidence that parental beliefs focus on the benefits of children's individual media use, not on the possible potentialities of use as a play and family interaction tool.

In addition, children in poverty are often unable to exercise their right to play due to the obstacles experienced, compromising their socio-emotional development (Milteer et al., 2012). Thus, one should be aware of the various confounders that can harm child

development, which are also associated with greater media use (Ashton & Beattie, 2019).

It was observed that most of the studies included in the analysis were quantitative, nine being cross-sectional and only one longitudinal. Given the important changes in children's abilities that occur due to early childhood growth and increased interest in mobile devices (Archer et al., 2021), longitudinal studies can contribute to understanding the specificities of each age group. In addition, they can contribute to understanding which play contexts are more appropriate for each age and, thus, generate more robust evidence about the theme.

Regarding the participants of the studies, only three of them were conducted exclusively with mothers (Skaug et al., 2018A; Sung, 2018; Wooldridge & Shapka, 2012). The rest included fathers and other caregivers, such as grandparents, although always in smaller numbers than mothers. This can be considered a methodological advance of the studies included in this review since there are essential differences between the child's joint play with the mother and the father's (Amodia-Bidakowska et al., 2020). Knowing the paternal view and the dynamics of playing only with the father is relevant, although studies have not focused on this difference. Parents contribute to child development and the bond between the pair and tend to participate more frequently and more actively in moments of play (Amodia-Bidakowska et al., 2020).

A wide variability was observed in the age of the children, from 10 months to 7 years of age. This is highly relevant since there are substantial differences concerning play and learning throughout Early Childhood (Courage & Howe, 2010). In the first three years of life, the brain develops most rapidly, a critical development period. For this reason, the child is more receptive and vulnerable to the stimuli of the environment in which it is placed. Still, children develop and learn about the world around them through play and interaction with their caregivers. For development to occur healthily during this period, this environment must be rich in verbal stimuli and permeated by positive interactions between the child and their caregivers (Neto & Gonçalves, 2019). In this sense, the context of play is an essential opportunity to provide these stimuli to the child. Therefore, it is essential to adhere to digital media's potentialities and limitations in the context of play.

In addition, the scientific literature points out that the use of digital media increases with age (Archer

et al., 2021; Martinot et al., 2021; Pedrotti et al., 2022; Rocha et al., 2021), highlighting the importance of the developmental period in which the child is and his ability to use digital media. It is essential to note that the form of use can vary significantly according to age group. With regard to the possible influences of media use in the context of play and learning in childhood, the literature suggests that young children can benefit from digital media as learning tools, especially when used in conjunction with caregivers (Archer et al., 2021).

The quality of the interaction of the parent-child duo during joint play with and without the use of digital media was investigated in some of the studies included in this review (Lee & Wood, 2020; Sung, 2018; Skaug et al., 2018a; Skaug et al., 2018b; Wooldridge & Shapka, 2012). How the interaction was evaluated is crucial for understanding how studies in the area have approached this construct and for providing parameters on the accuracy of these evaluations. Among the main instruments used is the Parenting Interactions with Children: Checklist of Observations Linked to Outcomes - PICCOLO® (Roggman et al., 2013a; Roggman et al., 2013b), which presents indicators of reliability and construct validity and predictive validity in studies conducted with a large number of parents of children and various ethnicities (Roggman et al., 2013a; 2013b). Although it evaluates parents' interactions with their children, the instrument focuses only on parental behaviors and does not present categories of child behaviors.

The second most used instrument was the Emotional Availability Scale - EAS (Biringen et al., 2000), which evaluates both paternal and infantile behaviors, having as a theoretical basis the construct of emotional availability (Biringen et al., 2000). The EAS is not an open-access instrument but presents substantial validity evidence (Lotzin et al., 2015). These two main instruments show that studies in the area tend to use instruments that present some psychometric evidence. However, none of them is freely accessible, which makes it difficult to accurately evaluate the construct in contexts with scarce financial resources for research, such as developing countries.

With regard to the impact of digital media on joint play, the theme “traditional play *versus* digital play” allowed us to observe that comparing different contexts of play is a frequent form of investigation into possible differences between the use of traditional toys, electronics, digital media, and books (Almeida & Frizzo, 2021). In general, when comparing the

contexts of play, there seems to be a consensus on the format of mobile devices, which contributes to their individualized use (Hiniker et al., 2018), and on children's behaviors since children tend to be more engaged in the game itself during the use of digital media (Ewin et al., 2020). Both are important points for future research on the subject.

Regarding the theme “benefits for interaction in games with the use of digital media”, the study from Marsh et al. (2020) presents the tendency to seek to integrate digital games with the already known playful world of childhood without the intention of one overlapping the other, but of complementing each other (Lee & Wood, 2020). In this sense, they point to the increase in smart toys, which connect electronically to the most diverse devices, allowing the child to simultaneously have both online and offline experiences.

These toys relate to the recent and increasingly frequent studies involving the *Internet of Toys* (Marsh et al., 2020), which, although highly technological, seeks to keep the child connected with toys and real-world experiences. In contrast, Healey et al. (2019) emphasize the importance of care when choosing the type of toy. The authors emphasize the importance of choosing toys that contribute to children's language, symbolization, creativity, and logical reasoning. They also emphasize the care with toys, especially virtual ones, considered educational, although no evidence supports such information.

Regarding the negative aspects involving digital media play, from the theme “damages associated with playing with media use,” it was possible to identify that the use of digital media can distance, both emotionally and physically, the people involved in the activity. This issue is of extreme relevance, especially to children under 3 years of age. In addition, it brings an important alert since it precisely meets one of the main recommendations on the subject, which is the use in conjunction/interaction with parents and caregivers (AAP, 2016).

With regard to the communication of the parent-child duo during joint play, some studies emphasize that most of the time, there is a decrease in its quantity and quality in the presence of digital media and electronic toys (Ewin et al., 2021; Miller et al., 2017; Sosa, 2016). A Brazilian study conducted with 3,155 children under five years of age indicated that the daily time of exposure to screens considered excessive, that is, above that recommended by the World Health Organization, was associated with impairments in child development,

including language and communication (Rocha et al., 2021). In contrast, the French cohort study by Martinot et al. (2021), which explored cross-sectionally and longitudinally the exposure of 1,562 children under six years of age to screens and their possible influence on language development, highlights the importance of the context in which the use of screens occurs to understand its impact.

In this sense, the authors identified that, in general, daily screen time was not associated with language development, except in the cross-sectional analysis at two years of age (in which higher language scores were observed for intermediate screen time). However, TV exposure during family meals was consistently associated with lower scores in language development: always-on (*versus* never) television at age two was associated with lower verbal IQ at age five to six, regardless of daily screen time and baseline language score (Martinot et al., 2021).

These results pay attention to the importance of both considering the context in which the use of digital media is made, which can have different impacts at different times in the routine in which the use is made, as well as promoting longitudinal studies to understand more consistently how the influence of screens occurs throughout development. Moments in which there is typically more significant family interaction, such as the time of meals and games between parents and children, for example, may be more likely to reduce the quality and quantity of communication due to the use of digital media.

Given the above, the present study gathered evidence regarding the impacts of digital media for play on children and their caregivers. From the selected studies, it was possible to verify trends regarding the investigations of the area. The themes found showed that the objectives focus on comparisons and the pursuit of benefits and harms. It is interesting to note that contrary to studies on the impacts of digital media on child development that show mostly the damages, the studies reported here also reported the benefits of this use for play. In this way, it is worth considering the functions these digital media can occupy during play. That is, whether the act of play, by inaugurating a space of creativity in the child's routine, can make the digital become a powerful tool or, on the contrary, if it closes the possibilities by individualizing the game. The results seem to show that further studies are needed to solve this dilemma by indicating which factors may contribute to the benefits or harms.

Final Remarks

This study observed that the themes included both positive and negative aspects. It identified the positive potential of playing with mobile devices and the possibility for children to develop creative games that stimulate their development with sensitive caregivers and different mobile devices. However, other studies have indicated that children generally engage more than parents in playing with mobile devices. In contrast, parents are more involved in playing without digital media, eventually impairing the quantity and quality of parent-child communication.

Two instruments were identified for the evaluation of parent-child interaction: the PICCOLO® and the EAS. It should be noted that both are paid instruments, which can make them difficult to access for countries such as Brazil, which has little budget for research. In addition, this study did not find any conducted in Latin America or Africa. However, this may have been a limitation due to the selected descriptors and databases. It is suggested that future studies may broaden the search to try to identify research from these regions.

Thus, it is important to encourage research on joint parent-child play in digital media and develop instruments for evaluating parent-child interaction in the context of play that are more appropriate to Brazilian reality. Finally, it is noteworthy that studies investigating the potential and limitations of digital media as a resource for family play enable more assertive guidance for parents to encourage the proper use of these devices by adults and children.

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About the authors:

Manoela Yustas Mallmann – Psychologist graduated from PUCRS, Master's and Doctoral student in Psychology at UFRGS. She conducts research in the areas of child development, the parent-baby relationship, and the use of digital media in families with babies and young children.

ORCID: <https://orcid.org/0000-0001-7774-4479>

E-mail: manoelaymallmann@gmail.com

Bruna Gabriella Pedrotti – Psychologist, Master's in Psychology, and Doctoral student in Psychology at the Federal University of Rio Grande do Sul. She works on research in Psychology in the maternal-infant area, including post-partum depression, child development, parent-baby interaction, parent-baby psychotherapy, and digital media use by babies and their families.

ORCID: <https://orcid.org/0000-0002-7910-9054>

E-mail: brunagabriellapedrotti@gmail.com

Maíra Lopes Almeida – Professor of Psychology at the Federal University of Goiás (UFG). BA and MS in Psychology from the Federal University of Uberlândia (UFU, Brazil). PhD in Psychology from the Federal University of Rio Grande do Sul (UFRGS). She completed a postdoctoral internship at Sherbrooke University (Québec, Canada). Associate member of the Assessment and Intervention in Child and Adolescent Development Research Group of the National Association for Research and Postgraduate Studies in Psychology (Anpepp). She is interested in how psychological factors, such as mental health and parental stress, can influence children's use of digital media.

ORCID: <https://orcid.org/0000-0002-6956-9858>

E-mail: maira.lpalmeida@gmail.com

Giana Bitencourt Frizzo – Psychologist, graduated from the Federal University of Santa Maria. Master's and Doctoral degrees in Psychology from the Federal University of Rio Grande do Sul. Postdoctoral fellow at the same university. Currently an Associate Professor at the Federal University of Rio Grande do Sul and a CNPq productivity researcher.

ORCID: <https://orcid.org/0000-0001-8106-4441>

E-mail: gifrizzo@gmail.com

Contact:

Rua Ramiro Barcelos, 2600/112
Instituto de Psicologia, Universidade Federal do Rio Grande do Sul
Porto Alegre-RS, Brasil
CEP: 90035-003
Phones: +55 (51) 3308-5111 / +55 (51) 9955-9295

