



Affordances of Media as Learning and Play: Children's and Mothers' Conceptions

Rebecca A. Dore¹ · Marcia S. Preston² · Roberta Michnick Golinkoff² · Kathy Hirsh-Pasek³

Accepted: 15 August 2024

© The Author(s) 2024

Abstract

Educational and playful forms of media are both pervasive in children's media landscape. Children tend to see play and learning as distinct, whereas parents tend to recognize the overlap between these categories; however, little research investigates children's and parents' conceptions of media as learning or play. Children ($N=80$, five- and seven-year-olds) and mothers ($N=40$) were shown black-and-white line drawings representing a child engaging in both media and non-media activities and asked to categorize each image as learning/not learning and as play/not play. Both mothers and children were less likely to see media as learning than non-media activities. However, children were less likely than mothers to differentiate between media and non-media activities in their conceptions of play. Both mothers and children were less likely to conceive of media activities than non-media activities as both learning and play, but this effect was stronger for mothers. These results suggest that mothers may see media more negatively and/or instrumentally, whereas children may see media as one of many options for playtime, indicating that parents should be encouraged to see media in a playful light, alongside other non-digital options for childhood play.

Keywords Media · Tablets · Television · Mobile device · Play · Learning

Résumé

Les formes éducatives et ludiques de médias sont toutes deux omniprésentes dans le paysage médiatique des enfants. Les enfants ont tendance à considérer le jeu et l'apprentissage comme des notions distinctes, tandis que les parents ont tendance à

✉ Rebecca A. Dore
dore.13@osu.edu

¹ Crane Center for Early Childhood Research and Policy, The Ohio State University, 175 E. 7Th Ave, Columbus, OH 43201, USA

² University of Delaware, Newark, USA

³ Temple University, Philadelphia, USA

reconnaître le chevauchement entre ces catégories. Cependant, peu de recherches examinent les conceptions des enfants et des parents des médias en tant qu'apprentissage ou jeu. Des enfants ($N = 80$, âgés de cinq et sept ans) et des mères ($N = 40$) ont vu des dessins au trait noir et blanc représentant un enfant participant à des activités médiatiques et non médiatiques et ont été invités à classer chaque image comme apprentissage/non-apprentissage et comme jeu/non-jeu. Les mères et les enfants étaient moins susceptibles de considérer les médias comme des activités d'apprentissage que les activités non médiatiques. Cependant, les enfants étaient moins susceptibles que les mères de faire la différence entre les activités médiatiques et non médiatiques dans leurs conceptions du jeu. Les mères et les enfants étaient moins susceptibles de concevoir les activités médiatiques que les activités non médiatiques à la fois comme un apprentissage et un jeu, mais cet effet était plus fort pour les mères. Ces résultats suggèrent que les mères peuvent voir les médias de manière plus négative et/ou instrumentale, tandis que les enfants peuvent voir les médias comme l'une des nombreuses options de jeu, ce qui indique que les parents devraient être encouragés à voir les médias sous un angle ludique, aux côtés d'autres options non numériques pour le jeu des enfants.

Resumen

Tanto los medios educativos como los lúdicos están muy extendidos en el panorama mediático infantil. Los niños tienden a ver el juego y el aprendizaje como algo distinto, mientras que los padres tienden a reconocer la superposición entre estas categorías; sin embargo, hay pocas investigaciones que investiguen las concepciones de los niños y los padres sobre los medios como aprendizaje o juego. Se mostraron a niños ($N = 80$, de cinco y siete años) y madres ($N = 40$) dibujos en blanco y negro que representaban a un niño participando en actividades mediáticas y no mediáticas y se les pidió que categorizaran cada imagen como aprendizaje/no aprendizaje y como juego/no juego. Tanto las madres como los niños tenían menos probabilidades de ver los medios como aprendizaje que las actividades no mediáticas. Sin embargo, los niños tenían menos probabilidades que las madres de diferenciar entre actividades mediáticas y no mediáticas en sus concepciones del juego. Tanto las madres como los niños tenían menos probabilidades de concebir las actividades mediáticas que las no mediáticas como aprendizaje y juego, pero este efecto fue más fuerte para las madres. Estos resultados sugieren que las madres pueden ver los medios de comunicación de forma más negativa y/o instrumental, mientras que los niños pueden verlos como una de las muchas opciones para el tiempo de juego, lo que indica que se debe alentar a los padres a ver los medios desde una perspectiva lúdica, junto con otras opciones no digitales para el juego infantil.

Affordances of Media as Learning and Play: Children's and Mothers' Conceptions

Media is highly pervasive in children's lives. Even before the pandemic, nationally representative data from the USA showed that five- to eight-year-olds spent over 3 h per day with screen media (Rideout & Robb, 2020) and COVID-19-related

lockdowns and remote learning have further increased child media use (Dore et al., 2021; Hartshorne et al., 2021). Previous research has examined both children's learning from media (e.g., Fisch et al., 2024; Mares & Pan, 2013) and digital play (e.g., Bird & Edwards, 2015). The goal of the current study is to understand how children and parents conceive of media as learning or play. To be maximally inclusive of the ways in which children and families use media, technology, and screens today, we use the term *media use* to include watching TV, DVDs, videos, and playing games, using a variety of devices (e.g., TV, tablet, phone, video game console), whereas we use the term *non-media* to refer to any activity that does not involve these activities or devices. Although defining *play* has historically been challenging and contentious in the literature, most definitions would include that play is behavior that is nonliteral, characterized by positive affect, and flexible (Krasnor & Pepler, 1980; Lillard, 2015).

The extent to which media is considered learning, play, or both may influence parents' and children's behaviors. For example, if children see media as both learning and play, they may approach it with a positive attitude and invest more mental effort into learning from it (Saloman, 1984; Schwab et al., 2018), whereas if mothers see media as neither play nor learning, they may use it in instrumental ways (e.g., to entertain children when they are busy) but not consider how it may encourage learning or play. This might mean that the parents who select these media do not consider the quality of the media and whether it supports their children's learning. An understanding of parents' and children's conceptions of media can inform outreach to families around healthy media use.

Children's Conceptions of Media as Learning and Play

Considering media from a playful learning perspective is crucial as media can promote children's learning (Mares & Pan, 2013). *Playful learning* incorporates learning goals in a scaffolded environment that encourages the child to use active, "minds-on," involvement rather than just swiping, promotes engagement and social interaction, and contains information that is meaningful to the child and links up to what the child already knows (Hirsh-Pasek et al., 2015). However, little research has explored children's conceptions of media as learning. Eisen and Lillard (2016) found that US three- to five-year-olds chose equally between a book and a touchscreen device for learning about six different topics. However, by age 6, children tended to choose a touchscreen device for learning, suggesting that older children may develop more nuanced understandings of the functions of media devices and recognize them as sources of information.

It is not clear whether children think of media as play. Rothlein and Brett (1987) asked US preschoolers what they did when they were not playing and the most frequent response was watching television, suggesting that children did not see TV viewing as play. However, this study is outdated, and it is not clear whether children today view media that involves activity, such as app use, as play.

Parents' Conceptions of Media as Learning and Play

Parents in the USA have mixed views about children's media use, with 75% reporting concern about their child spending too much time with media today or in the future (Rideout & Robb, 2020). However, 72% of these parents also reported that media use helps their child's learning (Rideout & Robb, 2020), suggesting parents recognize media's potential educational benefits. Hinkley and McCann (2018) found similar mixed views, citing benefits related to learning and relaxation but also concerns about potential negative effects on cognitive and social skills. Fisher et al. (2008) found that many parents viewed media use as play, suggesting some overlap in parents' conceptions.

The Current Study

Few studies explore children's and parents' conceptions of media using the same paradigm to examine concurrence. Notably, we focus on mothers to align with prior research (e.g., Fisher et al., 2008). We use a subset of data collected as part of a larger study to examine whether the format of an activity (*media* vs. *non-media*) influences the extent to which children and mothers conceive of it as learning and as play.

Method

Participants

Participants were 80 children (40 five-year-olds, $M_{\text{age}}=5.51$, $SD=0.29$, range = 5.02 – 5.97, 20 boys/20 girls, and 40 seven-year-olds, $M_{\text{age}}=7.52$, $SD=0.33$, range = 7.03 – 7.98, 20 boys/20 girls) and 40 mothers ($M_{\text{age}}=37.42$, $SD=4.68$, range = 26.35 – 48.31). This sample size was determined a priori as part of the larger project and is similar to prior studies using similar methodologies to address questions in this domain (Echenique et al., 2014; Scheuer et al., 2006). Children were recruited from a university database or from childcare settings in a metropolitan area in the Mid-Atlantic region of the USA. Parents provided written informed consent, and children provided verbal assent, in accordance with [BLINDED FOR REVIEW]'s Institutional Review Board. Mothers with a four- to eight-year-old child were recruited from the same database. Participants were 80.0% White and 9.2% Black; 77.5% of mothers had a bachelor's degree or higher.

Procedure

As part of a larger study, participants visited a university laboratory and were interviewed alone with a researcher. They were shown 36 cards with black-and-white line drawings of gender-neutral children engaging in common activities. This procedure

is reminiscent of photo-elicitation methodologies used in qualitative research (Clark-Ibáñez, 2004). However, in this study, a researcher asked participants to sort the cards into learning/not learning and play/not play (order counterbalanced between participants), resulting in a quantitative measure of participants' understanding of the images. As they made their choice, participants placed each card into a basket for the appropriate category. Although participants could change a response after making a choice, this happened very rarely. The sorting task took approximately 5 to 10 min.

We were interested in conceptions of media, so we a priori chose to report on six cards for the current analysis (see Fig. 1). We first identified the only three images in the set showing media use: TV, mobile device, and video game with an adult. We then selected three non-media images with similar levels of engagement and social interaction to the three media images: book reading, drawing, and cards with an adult. The images were not labeled or categorized when presented to participants.

Results

Analytic Plan

Preliminary analysis showed no differences between five- and seven-year-olds, so they were combined for analyses. Because some cells had an average of one or zero (e.g., all mothers thought reading a book was learning), standard binomial mixed-effects regression models would not converge (see Allison, 2008). Because other approaches do not handle multilevel data, we used a Bayesian estimation approach using the *brms* package in R and penalized regression coefficients using prior distributions to ensure coefficients do not tend to infinity (Greenland & Mansournia, 2015). We estimated Bayesian mixed-effects logistic regression models with a random effect of participant to test the effect of *format* (media/non-media), *group* (child/mother) and the interaction between these factors on whether participants chose each card as play, learning, or both. We followed the approaches recommended by Greenland and Mansournia (2015) and Carpenter et al. (2017) for model parameters and interpretation.

Conceptions of Learning

For learning, there was no interaction between *format* (media vs. non-media) and *group* (mothers vs. children), 95% CI [-1.96, 0.15]. However, there were main effects of both *format* and *group*. The effect of *format* showed that both mothers and children were less likely to conceive of media activities as learning than non-media activities, $B = -1.91$, 95% CI [-2.34, -1.48]. The effect of *group* showed that overall, mothers were more likely to categorize activities as learning than children were, $B = 2.91$, 95% CI [2.24, 3.65]. See Fig. 2.

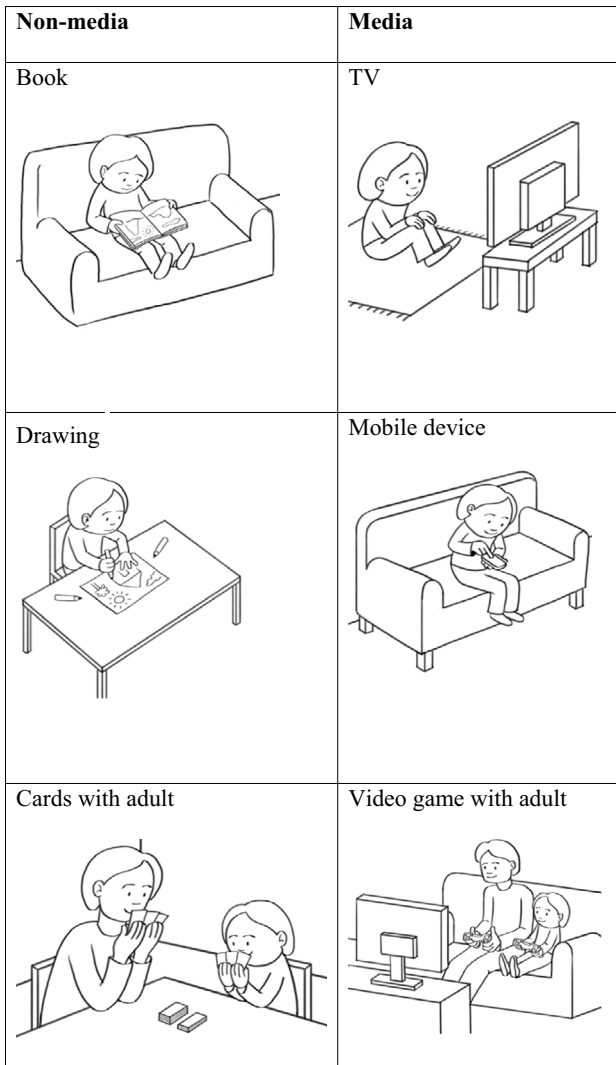


Fig. 1 Media and non-media images

Conceptions of Play

In the model predicting conceptions of play, the interaction between *format* (media vs. non-media) and *group* (child vs. mother) was significant, $B = -0.96$, 95% CI $[-1.64, -0.29]$. The effect of format on conceptions of play was stronger for mothers than children, such that mothers were less likely to conceive media activities as play than non-media activities, $t(229) = -3.45$, $p < 0.001$, whereas children did not show this distinction, $p = 0.85$. See Fig. 3.

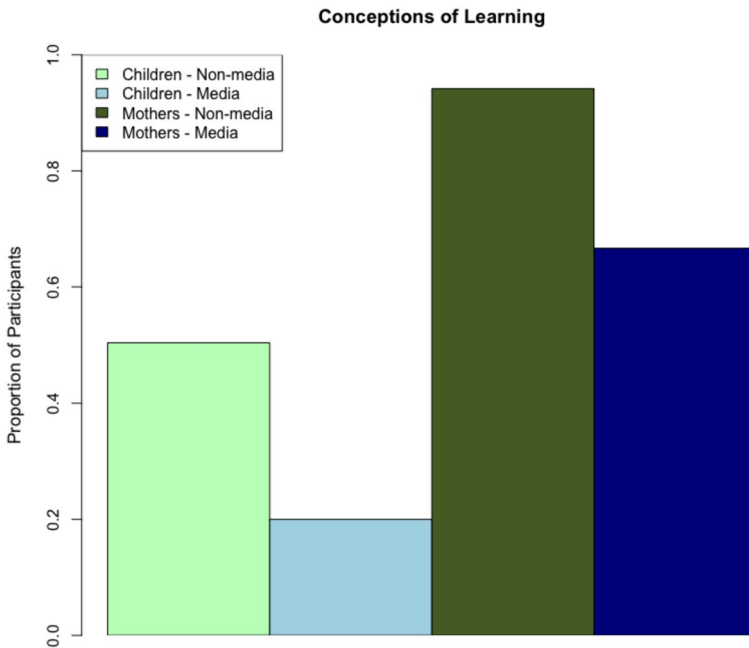


Fig. 2 Conceptions of learning

Conceptions of Learning and Play

In the model predicting conceptions of both learning and play, the interaction between *format* (media vs. non-media) and *group* (child vs. mother) was significant, $B = -0.94$, 95% CI $[-1.75, -0.16]$. Both mothers and children were less likely to conceive of media activities than non-media activities as both learning and play, but this effect was stronger for mothers. See Fig. 4.

Discussion

The goal of this study was to use the same methodology to examine children's and mothers' conceptions of media and non-media activities as learning and play. Our results showed that children's and mothers' views of media as learning and play demonstrated both important similarities and meaningful differences.

Conceptions of Media as Learning

Both children and mothers conceived of non-media activities as better for learning than media activities, perhaps reflecting the popular press notion that "screen

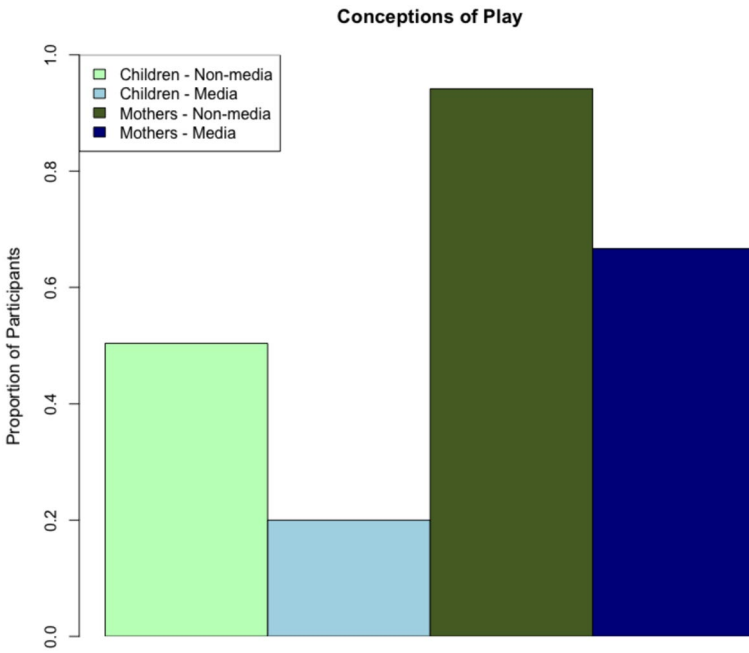


Fig. 3 Conceptions of play

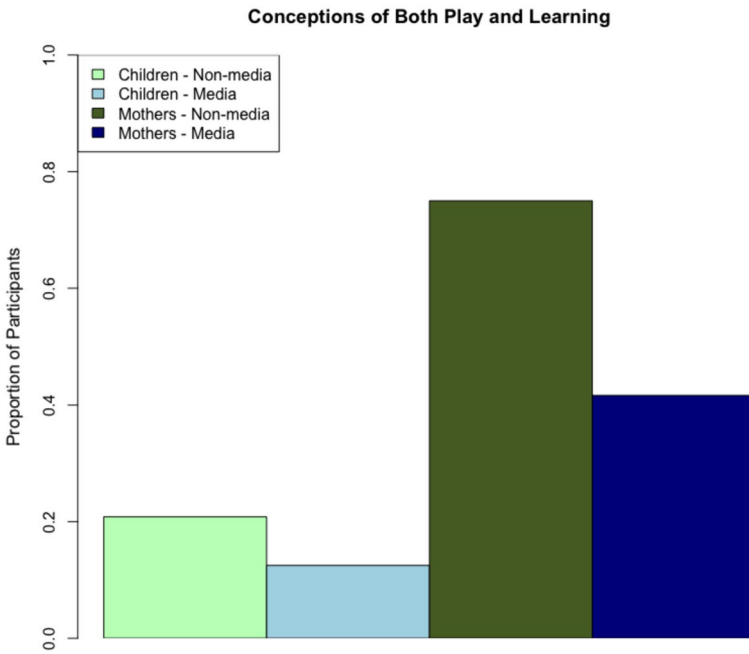


Fig. 4 Conceptions of both play and learning

time” is vacuous. However, research demonstrates benefits of educational media (e.g., Mares & Pan, 2013) and most parents report that their child’s media use helps their learning, despite concerns about children spending too much time using media (Rideout & Robb, 2020). Thus, these findings suggest there may be value to providing outreach to parents about the potential benefits of high-quality media use and guidance on finding high-quality content (Hirsh-Pasek et al., 2015). That children tend not to see media as learning suggests that they may be less likely to invest the mental effort required to obtain knowledge or skills from the content (Saloman, 1984; Schwab et al., 2018). Notably, children’s views of learning were quite restricted, primarily to reading a book and to a lesser extent drawing, both activities that are likely to occur in a school context, whereas mothers were able to see the potential for learning in a broader swath of activities. Prior research has shown that it was not until age 6 that children preferred to learn from a touchscreen over a book (Eisen & Lillard, 2016), suggesting that the five- and seven-year-olds in the current study may be in a transitional phase where they are beginning to recognize media as a source of information.

Conceptions of Media as Play

Mothers were less likely to see media activities as play than non-media activities, whereas children were equally likely to see media and non-media activities as play. That children saw media as play is somewhat counter to some older research (Rothlein & Brett, 1987), suggesting that the changing interactivity of modern technology may have influenced the conceptions of children today. The difference between mothers and children may reflect a cohort effect, as children but not mothers in this study grew up with opportunities for digital play through modern technology (Bird & Edwards, 2015). This difference may have implications for how children and mothers approach media and its role in family life. For example, mothers may see media more negatively and/or instrumentally, whereas children may see media as one of many options for playtime.

Conceptions of Media as Learning and Play

Both mothers and children were less likely to conceive of media activities than non-media activities as both learning and play, but this effect was stronger for mothers. This lack of overlap suggests that families may be missing opportunities to engage in playful interactions around educational media that could both entertain and support children’s developing skills and knowledge. That this effect was stronger for mothers likely reflects the low levels of conceiving of media as play and suggests that mothers may prefer to encourage alternate, non-media activities that they believe fulfill both learning and play roles in children’s lives and could restrict media to instrumental uses, like calming children or keeping them occupied when caregivers are busy (Elias & Sulkin, 2019).

Limitations and Future Directions

One limitation is that we included only three examples of each format. Although our media examples included more passive (television) and active (mobile device, video game) forms of media, we did not include tablet or computer use, which may be more highly associated with learning, given the prevalence of these devices in school environments. Future research should include a broader range of media devices to understand how mothers and children conceive of different types of media use. Importantly, we focused on mothers' and children's conceptions of media as learning and play. Future research should examine whether these conceptions influence children's actual enjoyment and learning. Finally, we did not have information about mothers' or children's media use, which could influence their conceptions about these concepts and should be measured in future studies on this topic.

Conclusions

Our results showed that children had unique conceptions of media as opportunities for learning and play, which would be difficult to compare to adults using different methodological approaches. Although this study focused only on mothers' and children's conceptions of learning and play and not their actions or behaviors, these conceptions may influence children's opportunities for and attitudes toward media and its role in their families' lives. Children's restricted conceptions of the activities that afford learning may limit their openness to learning from media, whereas mothers, who had broader conceptions of what constituted learning but were less likely to see media as learning and as play, may not consider how they could use media with their children as an opportunity for playful learning. Overall, these findings use a consistent methodological approach to shed light on how both mothers and children view media in families' lives.

Acknowledgements Thank you to the parents and children who participated in this study. We thank members of the UD Child's Play Learning and Development Lab for their assistance in data collection and coding and the Play and Learning Scholars around the World (PALS) researchers for contributions to protocol and measure development.

Author Contribution Rebecca A. Dore was involved in conceptualization, formal analysis, writing—original draft. Marcia S. Preston helped in conceptualization, data curation, investigation, methodology, project administration, writing—review & editing. Roberta Michnick Golinkoff contributed to conceptualization, funding acquisition, methodology, resources, supervision, writing—review & editing. Kathy Hirsh-Pasek helped in writing—review & editing.

Funding This work was supported by the Institute of Education Sciences [R305B130012] and the LEGO Foundation.

Data Availability The data that support the findings of this study are available from the corresponding author upon reasonable request.

Code Availability The materials used in this study are available from the corresponding author upon reasonable request.

Declarations

Conflict of interest The authors have no relevant financial or nonfinancial interests to disclose.

Ethical Approval This study was approved by the University of Delaware's Institutional Review Board.

Informed Consent Parents provided written informed consent, and children provided verbal assent.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

- Allison, P. D. (2008). Convergence Failures in Logistic Regression. *SAS Global Forum*, (5), 1–11. Retrieved from <http://www2.sas.com/proceedings/forum2008/360-2008.pdf>
- Bird, J., & Edwards, S. (2015). Children learning to use technologies through play: A digital play framework. *British Journal of Educational Technology*, 46(6), 1149–1160. <https://doi.org/10.1111/bjet.12191>
- Carpenter, B., Gelman, A., Hoffman, M., Lee, D., Goodrich, B., Betancourt, M., Brubaker, M., Guo, J., Li, P., & Riddell, A. (2017). Stan: A probabilistic programming language. *Journal of Statistical Software*, 76(1), 1–32.
- Clark-Ibáñez, M. (2004). Framing the social world with photo-elicitation interviews. *American Behavioral Scientist*, 47(12), 1507–1527.
- Dore, R. A., Purtell, K. M., & Justice, L. M. (2021). Media use among kindergarteners from low-income households during the COVID-19 shutdown. *Journal of Developmental & Behavioral Pediatrics*, 42(8), 672–676.
- Echenique, M., Márquez, S., & Scheuer, N. (2014). What helps most in learning how to draw a human figure? A study of children's epistemological, pictorial and learning conceptions/¿ Qué ayuda más para aprender a dibujar una persona? Un estudio de las concepciones epistemológicas, pictóricas y de aprendizaje en la niñez. *Culture and Education*, 26(1), 103–131.
- Eisen, S., & Lillard, A. S. (2016). Just Google it: Young children's preferences for touchscreens versus books in hypothetical learning tasks. *Frontiers in Psychology*. <https://doi.org/10.3389/fpsyg.2016.01431>
- Elias, N., & Sulkin, I. (2019). Screen-assisted parenting: The relationship between toddlers' screen time and parents' use of media as a parenting tool. *Journal of Family Issues*, 40(18), 2801–2822.
- Fisch, S. M., Fletcher, K., Abdurokhmonova, G., Davis, L., Fisch, N., Fisch, S. R., & Hirsh-Pasek, K. (2024). "I wonder, what if, let's try": Sesame Street's playful learning curriculum impacts children's problem solving. *Journal of Children and Media*, 18(3), 334–350.
- Fisher, K. R., Hirsh-Pasek, K., Golinkoff, R. M., & Gryfe, S. G. (2008). Conceptual split? Parents' and experts' perceptions of play in the 21st century. *Journal of Applied Developmental Psychology*, 29(4), 305–316.
- Greenland, S., & Mansournia, M. A. (2015). Penalization, bias reduction, and default priors in logistic and related categorical and survival regressions. *Statistics in Medicine*, 34(23), 3133–3143. <https://doi.org/10.1002/sim.6537>
- Hartshorne, J. K., Huang, Y. T., Paredes, P. M. L., Oppenheimer, K., Robbins, P. T., & Velasco, M. D. (2021). Screen time as an index of family distress. *Current Research in Behavioral Sciences*. <https://doi.org/10.1016/j.crbeha.2021.100023>

- Hinkley, T., & McCann, J. R. (2018). Mothers' and father's perceptions of the risks and benefits of screen time and physical activity during early childhood: A qualitative study. *BMC Public Health*, *18*(1), 1–8.
- Hirsh-Pasek, K., Zosh, J. M., Golinkoff, R. M., Gray, J. H., Robb, M. B., & Kaufman, J. (2015). Putting education in “educational” apps: Lessons from the Science of Learning. *Psychological Science in the Public Interest*, *16*(1), 3–34. <https://doi.org/10.1177/1529100615569721>
- Krasnor, L. R., & Pepler, D. J. (1980). The study of children's play: Some suggested future directions. In K. Rubin (Ed.), *Children's play* (pp. 85–95). Jossey-Bass.
- Lillard, A. S. (2015). The development of play. *Handbook of child psychology and developmental science*, 1–44.
- Mares, M.-L., & Pan, Z. (2013). Effects of Sesame Street: A meta-analysis of children's learning in 15 countries. *Journal of Applied Developmental Psychology*, *34*(3), 140–151. <https://doi.org/10.1016/j.appdev.2013.01.001>
- Rideout, V., & Robb, M. B. (2020). *The Common Sense census: Media use by kids age zero to eight, 2020*. Common Sense Media.
- Rothlein, L., & Brett, A. (1987). Children's, teachers; and parents' perceptions of play. *Early Childhood Research Quarterly*, *2*(1), 45–53.
- Salomon, G. (1984). Television is “easy” and print is “tough”: The differential investment of mental effort in learning as a function of perceptions and attributions. *Journal of Educational Psychology*, *76*, 647–658.
- Scheuer, N., de la Cruz, M., Pozo, J. I., Huarte, M. F., & Sola, G. (2006). The mind is not a black box: Children's ideas about the writing process. *Learning and Instruction*, *16*(1), 72–85.
- Schwab, F., Hennighausen, C., Adler, D. C., & Carolus, A. (2018). Television Is still “Easy” and print Is still “Tough”? more than 30 years of research on the amount of invested mental effort. *Frontiers in Psychology*, *9*, 1098.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.