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RECEIVED 20 April 2024
ACCEPTED 29 July 2024
PUBLISHED 27 August 2024

CITATION
Reich SM, Mayfield KT, Krager A, Franza D,
Martin E and Cabrera N (2024) *Four hours with
dad, but 10 minutes with mom: variations in
young children's media use and limits based
on parent gender and child temperament.*
Front. Dev. Psychol. 2:1420406.
doi: 10.3389/fdpys.2024.1420406

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Four hours with dad, but 10 minutes with mom: variations in young children's media use and limits based on parent gender and child temperament

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Introduction: Research on children's media use has disproportionately focused on maternal reports of use. As such, we know little about how mothers' and fathers' reports of children's media use align, how such reports might be related to parental beliefs about the benefits of media for children, or the potential differential impact of child characteristics, such as temperament and gender.

Method: Using a sample of 210 low-to-moderate income, racially and ethnically diverse families, we asked new mothers and fathers about their child's media use and limits at 9, 18 and 24 months of age.

Results: On average, reports of co-use of media, children's use of media alone, exposure to background television, diversity of daily media use, and use of media for behavior management did not significantly differ between mothers and fathers and were moderately correlated, $r(df) = 0.2-0.7$. However, comparisons within dyads found that parents did not often agree on their child's media use. Couples also tended to report different limitations on use, with fathers reporting much larger time limits. For both mothers and fathers, stronger beliefs in the benefits of media when children were infants were predictive of more reported media use at 24 months. Infant negative emotionality was predictive of the use of media for behavior management for both mothers and fathers, and for other types of media use for fathers.

Conclusion: Parents of the same child reported media use over the first two years differently, which may indicate informant effects in media research or actual differences in young children's media use with each parent. Given the risks of media use in early childhood to displace important developmental processes, understanding young children's media use within the family system is important.

KEYWORDS

media, digital technology, parenting, early childhood, temperament, infancy, fathers, toddler

1 Introduction

Increasingly, pediatric organizations around the world recommend that infants and toddlers abstain from any media use, perhaps with the exception of video chat (Chassiakos et al., 2016; World Health Organization, 2019; Australian Department of Health, 2021). However, extant research finds that children engage with media at a young age, often before 18 months (Tang et al., 2018; Levine et al., 2019). This is not surprising given the range of devices children have access to in their homes (e.g., tablets, phones, computers, video games), and research—even before increases due to the COVID-19 pandemic—found that children under 2 years of age use media devices on average for 1–2 hours a day (Elias and Sulkin, 2019). Currently, the bulk of studies on young children's media use rely on maternal, rather than paternal, reports with little consideration of whether media use and limits for the same child differ by parent. Further, little work has considered how children's media limits and use might evolve from infancy through toddlerhood, or what might contribute to stability or changes in use, such as parents' beliefs about the benefits of media and child characteristics like gender or temperament. Thus, we explore longitudinally, mother-reported and father-reported media habits of children from 9 to 24 months of age and how such use is related to children's gender, difficult temperament, and parents' beliefs about the benefits of media.

1.1 Young children's media use

With the ubiquitous presence of digital devices in homes (Huber et al., 2018; Statista, 2023), very young children are exposed to media on a regular basis (AAP Council on Communications and Media et al., 2016; Elias and Sulkin, 2019; Brushe et al., 2023), most often through television programs (on televisions or streamed through mobile devices; Huber et al., 2018; Ofcom, 2023). This television/TV-like use includes child-focused programming as well as background television and adult-focused programming. Though less common, research also finds infants and toddlers use tablets and apps regularly as well (Paudel et al., 2017; Pew Research Center, 2020; Radesky et al., 2020; Brushe et al., 2023).

Studies have identified a variety of reasons why parents opt for their young children to engage with media. Reasons include beliefs in the benefits of media as an educational tool or necessary skill for the future (Elias and Sulkin, 2019; Ochoa and Reich, 2020; Griffith, 2023), wanting to support cultural practices (like songs in another language; Ochoa and Reich, 2020), and desires to distract, occupy, or emotionally calm children (Beyens and Eggermont, 2014; Coyne et al., 2017; Elias and Sulkin, 2017, 2019; Nikken, 2019). Interviews with parents about their young children's media use find an assortment of reasons for use within the same household, including education, distraction, entertainment, and family time (Brito et al., 2017; Elias and Sulkin, 2019; Ochoa and Reich, 2020; Tang et al., 2021; Thompson et al., 2023). Thus, young children's media use could be for children's learning, general family functioning, or the mental health of one or both parents.

Other than some notable exceptions, the vast majority of research to date on children's media use and parents' reasons for enabling that use is based on samples of predominantly, if not exclusively, mothers. Thus, little is known about if or how young children's media use might differ with mothers and fathers. Though alignment in parenting rules is an important aspect of coparenting (McHale et al., 2002), little work has compared the media allowances and limits between parents of the same child to see how they align. Nor has research considered that mothers and fathers may estimate children's media use differently. If parents' reports are similar, then media research could utilize either parent. If not, then greater consideration is needed as to potential informant effects based on parent gender or recognition that perhaps media practices may vary between mother-child and father-child dyads.

Cross-sectional studies find mothers' and fathers' screen use to be linked to children's screen time (Tang et al., 2018; Lee et al., 2022), with fathers' use of screens to control behavior being associated with children's greater screen time on the weekends (Tang et al., 2018). Parents' rules and restrictions around media use are related to children's later media use and problems with media use in the future (Collier et al., 2016; Mares et al., 2018; Shawcroft et al., 2023). However, little research has explored how the limits that mothers' and fathers' set for their very young children's media use might align or differ. A survey of parents of children between 2 and 17 years of age found that when parents had differing levels of media restriction, there was more conflict around media use and displays of problematic behaviors by children (Mares et al., 2018). However, these data were cross-sectional and both caregivers were not surveyed; instead, respondents (mainly mothers) were asked to report on their partners' practices.

Coparenting research stresses the importance of parental alignment of rules and support of each other as parents (McHale et al., 2002; McHale and Lindahl, 2011; Campbell, 2023). Studies in domains other than media find that disagreements among parents in rules to be linked to child opposition and lower satisfaction with parenting (Hill and Holmbeck, 1987) and discrepancies among parents, especially coparenting conflict and undermining are tied to parenting stress, lower self-efficacy, and depression (Campbell, 2023). Conversely, couples' support of one another is linked to more involved parenting of toddlers and more cooperative parenting practices (Murphy et al., 2017). However, research is lacking on the alignment of couples' rules for their children's media use, which may be especially important when professional pediatric recommendations internationally for the ages in our sample (9–24 months) are abstinence or very minimal use (e.g., AAP Council on Communications and Media et al., 2016; Australian Department of Health, 2021).

Most research on young children's media use and parental rules about their use relies on samples of predominantly white, middle-class families, limiting our understanding of the media use and limits for ethnically, racially, and economically diverse young children. Given that research with older children finds that those from households with low incomes have more daily use of media than children from homes with more financial resources, and that Black and Latine youth consume more media than their white peers (Nagata et al., 2022; Hedderson et al.,

2023), more research examining diverse samples with younger ages is needed to better understand the range of media use in early childhood.

1.2 Child influences on media use

Emerging research suggests that child characteristics might influence children's media use. Age is the most robust contributor to children's media use, with older children tending to use more media than younger ones (Rideout and Robb, 2020; Rideout et al., 2022). However, little research has considered how mothers' and fathers' rules and allowed uses change for their young children over time. Gender, on the other hand, has inconsistently been related to screen time, with some finding males to use media more in early childhood than females (Przybylski and Weinstein, 2017) and others finding gender unrelated to media use in other samples (Veldman et al., 2023). Children's behaviors and dispositions appear to be related to media use in early childhood. For instance, mothers' ratings of infant crying and fussiness (Thompson et al., 2013) and high physical activity levels (Nabi and Krcmar, 2016) are associated with TV viewing. Greater behavioral dysregulation in infants and toddlers is also linked to increased digital device use (Levine et al., 2019) including parents' greater likelihood to use mobile devices to calm less well-regulated children down (Radesky et al., 2016, 2020). Such findings suggest that media use in early childhood may be associated with temperamental characteristics, with more difficult behaviors (e.g., fussiness, high activity levels, negative emotionality) being tied to more media use, especially to calm and distract the child (Coynne et al., 2021). Thus, in order to better understand how mothers and fathers of the same child allow use and set limits over time, it is important to consider if children's age, gender, and temperament are similarly or differentially tied to those choices.

1.3 Parents' positive beliefs about media

Research consistently finds parental beliefs about media to be associated with children's media use, with beliefs about its benefits being linked to greater use (Elias and Sulkin, 2019; Ochoa and Reich, 2020; Griffith, 2023). For instance, a national survey of parents with children between 8 and 18 years of age found that positive beliefs about media were associated with greater media use (Lauricella and Cingel, 2020). Similarly, a daily diary study over a 1-week period found associations between parents' beneficial views of media and higher levels of television viewing for their 3–5-year-old children (Njoroge et al., 2013). Though beliefs are robustly associated with use, most studies are cross-sectional or very short time frames and involve preschool-age or older children, raising questions about how parental beliefs relate to media use from infancy to toddlerhood. This is especially important when media use at these young ages is contrary to most pediatric recommendations.

1.4 Study aims

Given that most research on very young children's media use has focused on mothers' choices, often within white, affluent families, little is known about parenting choices over time, from infancy through age two, or reported uses by fathers or racially, ethnically, and economically diverse families. In considering parents' media limits and permitted use for their young children, a considerable gap remains around the similarities or differences in couples' reports of their young children's media use cross-sectionally and over time and how their beliefs about media and their children's own characteristics influence those choices. Therefore, we assess new mothers' and new fathers' media limits and practices with their children from infancy to toddlerhood, consider how their reports align from 9 to 24 months, and how their beliefs about media and their child's age, gender and temperament might be related to reported use.

2 Method

Data are drawn from the Baby Books 2 study, a NICHD-funded parenting intervention in which educational information about typical child development was provided through bilingual English/Spanish baby books, given when children were 9, 12, 15, 18, and 24 months of age. Participants were recruited through community outreach (e.g., WIC locations, pediatric offices, Head Start centers, nurse home visiting programs) in Orange County, CA and the Washington DC area, when their first child was 6–9 months of age. At baseline, all heterosexual couples were cohabiting, able to read English or Spanish at a first-grade level or higher, and had a family income of no more than \$70,000. Data were collected through home visits and phone calls when children were 9, 12, 15, 18, 21, and 24 months, with books provided at all but one (21 months) of these waves. Data from the 9, 12, 18, and 24 month waves are used for this paper. Participants were randomly assigned to 1 of 4 groups following baseline data collection. Three groups received educational intervention books designed for mothers (mom book group), books designed for fathers (dad book group), or both book types (both-book group) and one group served as a control, receiving commercially produced books (see Reich and Diaz, 2020 for more details). Information about temperament was collected via phone call when children were 12 months old. Due to social distancing policies during the COVID-19 pandemic, some of the later home visits were changed to video-chat and phone calls. All materials and procedures were reviewed and approved by two university Institutional Review Boards.

2.1 Participants

Two hundred ten families participated in the Baby Books 2 intervention (420 parents and 210 children). These parents were predominantly Latine (67.6%), followed by Black (13%), White (7%), Asian (5%), and multiethnic or other (7%). About half of the couples were married (though another 43% reported living

TABLE 1 Participant characteristics.

	All parents	Mothers	Fathers
	N (%)	N (%)	N (%)
Education			
Less than high school	73 (17.3%)	22 (10.5%)	51 (24.3%)
High school diploma or equivalent	96 (22.9%)	43 (20.5%)	53 (25.2%)
Some college	121 (28.8%)	65 (31%)	56 (26.7%)
2- or 4-year college degree	44 (10.5%)	25 (11.9%)	19 (9%)
Some graduate school or higher	86 (20.5%)	55 (26.2%)	31 (14.8%)
Race/ethnicity			
Hispanic/Latine	284 (67.6%)	142 (67.6%)	142 (67.6%)
Black, non-hispanic	54 (12.9%)	27 (12.9%)	27 (12.9%)
White	31 (7.4%)	14 (6.7%)	17 (8.1%)
Other	51 (12.1%)	27 (12.9%)	24 (11.4%)
Nativity			
Born in the U.S.	195 (46.4%)	103 (49%)	92 (43.8%)
Born outside the U.S.	225 (53.5%)	107 (51%)	118 (56.2%)
Marital Status			
Married or living as married	353 (84%)	174 (82.9%)	179 (85.2%)
Other	67 (16%)	36 (17.1%)	31 (14.8%)
Income			
<\$11,000	28 (6.7%)	18 (8.6%)	10 (5%)
\$11,000–45,000	191 (45.5%)	101 (48%)	90 (42.8%)
More than \$45,000	154 (36.6%)	64 (30.5%)	90 (42.8%)
Missing income	47 (11.2%)	27 (12.9%)	20 (9.4%)
Working	486 (68%)	95 (45%)	190 (90%)
Attending school	60 (14%)	36 (17%)	24 (11.5%)
Language			
English only	63 (15%)	26 (12.4%)	37 (17.6%)
Spanish only	53 (12.6%)	30 (14.3%)	23 (11%)
Bilingual	277 (66%)	142 (67.6%)	135 (64.3%)
Multilingual	27 (6.4%)	12 (5.7%)	15 (7.1%)
	Mean (SD)	Mean (SD)	Mean (SD)
Parental age	28.3 (6.35) Range 18–53 years	27.15 (5.69) Range 18–43 years	29.51 (6.76) Range 18–53 years

as married) and slightly over half (53.5%) were born outside of the United States. Most parents were bilingual (66%), and all but 12.6% spoke English. At baseline (9 months), 45% of mothers and 99% of fathers were working and 17% of mothers and 11.5% of fathers were attending school. See Table 1 for details. Due to the COVID-19 pandemic, participation in data collection at 18 and 24 months was lower than earlier waves, with data from 420 parents at 9 months, 302 parents at 18 months, and 281 parents at 24 months.

2.2 Measures

2.2.1 Parenting of children's media use

Mothers and fathers were asked about their child's different types of media use 9, 18, and 24 months. These closed-ended questions about the frequency of exposure were rated on a 5-point Likert scale (0 = never or rarely, 1 = some days each week, 2 = most days each week, 3 = once a day, 4 = several times each day). Items included use alone (e.g., put the TV, DVD, or stream

programs for your child to watch alone), with the parent (e.g., play on tablet, iPad and/or smartphone together), passive/background TV use (TV on even when no one is watching, TV/streaming during mealtimes, when trying to fall asleep), and use to manage behavior (rewards, punish, calm or distract; e.g., Give your child a tablet, iPad, and/or smartphone as a reward for being good). Children's frequency of media use alone (solo use), with the parent (co-use), to manage behavior, and passive TV use were all averaged, with 0 indicating never or rarely and 4 indicating use several times each day. Parents, at 9 and 24 months, were asked (yes/no) about eight types of media activities the child did on a daily basis and these were summed (e.g., watching/streaming TV or movie, watching YouTube videos, playing an app/game, playing on a mobile device, playing on a laptop or computer, video chatting, looking through digital pictures, and looking at/reading electronic books). At 9 and 24 months, parents were also asked two open-ended questions, "Do you set limits on how much time your child is using technology like TV, tablet, smartphone?" and "What kind of limits do you use?"

Using an inductive qualitative coding strategy, broad themes and patterns across the sample were identified before responses were thematically coded. Responses were aligned by child so that each dyad's (mother/father) limits could be compared. Answers that were of the same type (e.g., time limits, use to get things done), stated the same complete restriction ("doesn't use anything"/"don't give him anything") or were mildly different in limit (e.g., "rarely uses it at all"/"rarely watch TV 15–20 min tops") were scored as aligned. Time limits that were within double of the partner (e.g., "20–30 mins every day"/"no more than 1 hour") were coded as slightly misaligned. Disagreement in limits (misalignment) was code when one parent reported no limits and the other described limits, when one parent reported that the child had no media use and the other parent reported media use, and when time limits were discrepant by more than 50% (e.g., "she can only watch TV 20–30 minutes"/"no more than 2 hours a day"). Alignment patterns were collaboratively coded by the first and fifth authors.

Media use was not a primary aim of the BB2 project, which resulted in fewer media use questions being asked at the 18-month home visit compared to 9- and 24-month visits given other data collection priorities and time constraints.

2.2.2 Parents' beliefs about children's media use

Parents were asked, at 9 and 24 months, how much they agreed or disagreed (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree) with five statements about the benefits of children's use of media. These were: *TV, tablets and phones are useful for distracting children when they are being difficult. TV and games help young children learn to speak English or another language. Children are never too young for educational games on a tablet, iPad or smartphone. Smartphones and tablets make parenting easier. Children need to be skilled with computers and other devices to be successful in life.* A summary score of the beliefs was calculated in which higher values indicate greater agreement in the benefits of digital media use.

2.2.3 Temperament

Children's temperament was assessed with the EAS Temperament Scale, a parent report of how certain traits are or are not characteristic of a child (Buss, 1991; Mathiesen and Tambs, 1999; Buss and Plomin, 2013). For this analysis, we focus on the emotionality subscale which indicates more negative affect/difficult temperament. The five items query about intense negative emotional reactions (e.g., "child reacts intensely when upset," "child cries easily") and were summed with higher values indicating more negative emotionality. Because mothers' and fathers' alignment in temperamental ratings were only moderate (Intraclass correlation between couples was 0.43 with 95% confidence intervals of 0.3, 0.61), each parents' own rating of emotionality was used for analyses.

2.2.4 Background

At the baseline home visit, parents reported the background characteristics of themselves and their child. This included parental age, gender, country of origin, race and ethnicity, marital status, educational attainment, employment, and family income. Parents also reported on their child's age, gender, and race and ethnicity.

2.3 Analytic plan

In order to understand children's early media habits, how limits and media use align between mothers and fathers, and how they change over time, we first looked at frequencies of different types of media use when children were 9, 18, and 24 months of age and correlated how these frequencies of use (passive TV, solo use, co-use, behavior management, daily types of use). We also used *t*-tests to assess if mothers' and fathers' ratings significantly differed. To assess alignment in ratings between couples, intraclass correlations (ICCs) were calculated for each wave. Beliefs about media benefits and open-ended responses about limits were also compared. Next, to examine potential links between child characteristics and frequencies of media use by mothers and fathers, correlations between children's emotionality at 12 months and previously discussed types of media use were examined. Repeated measure ANOVA was used to assess potential changes in media use from infancy to toddlerhood. Finally, five separate regression analyses for mothers and fathers were estimated to examine potential links between parents' beliefs about media benefits at 9 months and frequency of media use (passive TV exposure, solo use, co-use, behavior management, daily use) at 24 months. In addition to controlling for parent sociodemographic characteristics (age, race, education, income), models included child gender, temperamental emotionality, and study group assignment as covariates. Data were analyzed with STATA 14.2 and R Studio version 4.3.1.

3 Results

3.1 Patterns of media use in infancy: 9 months

A large portion of the children in this study engaged with media regularly in infancy. At 9 months, 23% of parents reported that

TABLE 2 Media use and beliefs as reported by mothers and fathers at 9, 18, and 24 months.

	9 mo			18 mo			24 mo			9–24 mo
	Mother	Father	<i>t</i> -test (M vs. F), corr (M&F), ICC (couple), (95% CI)	Mother	Father	<i>t</i> -test (M vs. F), corr (M&F), ICC (couple), (95% CI)	Mother	Father	<i>t</i> -test (M vs. F), corr (M&F), ICC (couple), (95% CI)	
	Mean (sd), range	Mean (sd), range		Mean (sd), range	Mean (sd), range		Mean (sd), range	Mean (sd), range		
Average solo-use ^a (across devices)	1.03 (0.7), 0.29–4.43	1.04 (0.76), 0.29–4.71	<i>t</i> = −11, <i>p</i> = 0.92, <i>r</i> = 0.7, ICC couple = 0.82*** (0.75, 0.87)	–	–		1.9 (0.81), 1–4.29	1.93 (0.78), 1–4.29	<i>t</i> = −0.25, <i>p</i> = 0.8, <i>r</i> = 0.61, ICC couple = 0.75** (0.65, 0.83)	All: F = 236.2***, Mom: F = 101***, Father: F = 47.6***
Average co-use ^a (across devices)	1.38 (0.89), 0.2–4	1.36 (0.91), 0.2–5	<i>t</i> = 0.15, <i>p</i> = 0.88, <i>r</i> = 0.7, ICC couple = 0.82** (0.75, 0.87)	–	–		2.2 (0.77), 1–4.6	2.31 (0.84), 1–5	<i>t</i> = −1.1, <i>p</i> = 0.26, <i>r</i> = 0.59, ICC couple = 0.73*** (0.61, 0.81)	All: F = 164.1***, Mom: F = 68.4***, Father: F = 100.5***
Average background TV ^a	2.2 (0.86), 1–4.8	2.25 (0.89), 1–5	<i>t</i> = 0.57, <i>p</i> = 0.57, <i>r</i> = 0.37, ICC couple = 0.54*** (0.4, 0.65)	–	–		2.31 (0.84), 1–4.6	2.30 (0.9), 1–4.6	<i>t</i> = 0.09, <i>p</i> = 0.92, <i>r</i> = 0.59, ICC couple = 0.74*** (0.63, 0.82)	All: F = 7.128**, Mom: F = 5.8**, Father: F = 1.65
Average behavior ^a management	1.09 (0.99), 0–5	1.11 (1.09), 0–5	<i>t</i> = −0.17, <i>p</i> = 0.87, <i>r</i> = 0.22, ICC couple = 0.66*** (0.55, 0.74)	1.91 (1.08), 0–4	1.87 (0.94), 0–4	<i>t</i> = 0.63, <i>p</i> = 0.72, <i>r</i> = 0.57, ICC couple = 0.64*** (0.5, 0.74)	1.9 (1), 1–5	1.91 (0.93), 1–5	<i>t</i> = −0.09, <i>p</i> = 0.93, <i>r</i> = 0.51, ICC couple = 0.62* (0.46–0.73)	All: F = 142.7***, Mom: F = 72.5***, Father: F = 69.9***
Types of daily uses ^b	1.99 (1.5), 0–6	1.76 (1.37), 0–5	<i>t</i> = −0.107 <i>p</i> = 0.29, <i>r</i> = 0.4, ICC couple = 0.57** (0.44, 0.68)	–	–		3.13 (1.46), 0–6	3.25 (1.57), 0–6	<i>t</i> = −0.67, <i>p</i> = 0.51, <i>r</i> = 0.42, ICC couple = 0.58** (0.4, 0.7)	All: F = 223***, Mom: F = 102.1***, Father: F = 123.6***
Media beliefs ^c	2.24 (0.57), 0–2.8	2.5 (0.55), 0–3	<i>t</i> = −4.74, <i>p</i> < 0.001, <i>r</i> = 0.3, ICC couple = 0.43*** (0.2, 0.59)	–	–		2.39 (0.53) 1–3.8	2.58 (0.49), 1.4–3.6	<i>t</i> = −2.98, <i>p</i> = 0.003, <i>r</i> = 0.32, ICC couple = 0.45** (0.2, 0.62)	All: F = 20.68***, Mom: F = 19.1***, Father: F = 3.88

^aRange for Solo-use, Co-use, Background TV, and Behavior Management: 0 = never or rarely, 1 = some days each week, 2 = most days each week, 3 = once a day, 4 = several times each day.

^bCount of types of media used on average day.

^cRange of mean beliefs response: 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree.

p* < 0.05, *p* < 0.01, ****p* < 0.001.

their infant was not using media at all, with 10% explicitly stating that the child was too young (e.g., “*When she gets bigger*”). For the other 77%, television watching was the most common use of media for infants, with half of parents saying their 9-month-old watches TV daily and 82% of homes having the TV on some to all the time. For most children, this was the only type of daily media use. Table 2 indicates the frequency of each type of use across infants. As for types of limits new parents had for their infants’ media use, these ranged from time-limited (e.g., “*when rocking him to sleep, 5 minutes max*”) and purposeful (e.g., “*FaceTime with grandparents for 10 minutes*”) to higher daily amounts (e.g., “*The limit is 4 hours*”).

Of the parents who reported that their child did not use media yet, 84% shared that they had the television on at mealtimes, kept it on even when no one was watching, and engaged in co-use of media with their child, like looking at pictures together or video-chatting with relatives. Thus, only 18% of all parents consistently reported no media use by their 9-month-old across all media use variables (i.e., no solo use, co-use, use to manage behavior, passive TV, limitations with use descriptions, and no devices in a given day) and only 8% of couples both reported that their child was not using media across all these variables (17 children).

There were no significant differences in mean levels of media reported by mothers and fathers (range from *not all or rarely to several times a day*), though correlations ranged from 0.22 to 0.7 between all mother and father reports of types of media use (passive TV, solo use, co-use, use for behavior management, and types of daily use). See Table 2 for details. Again, only 17 couples agreed that their child was not using media yet. In comparing covariation across couples, intraclass correlations (ICCs) ranged from 0.54 to 0.83 and were significant.

In comparing parents’ descriptions of limits for their 9-month-old’s media use, 54% of couples aligned in their descriptions of limits (i.e., described same type of limit). Most of the agreements were among couples who reported no limits at all or no use of media at all, typically because they believed the child was too young for media (“*currently none, but future, yes*”). About a quarter of couples agreed that they had time limits, but only 14 couples reported the same time limit. Some of the discrepancies were minor (e.g., mother: “*less than 5 minutes*” vs. father: “*give it for a little time – plus or minus 10–15 minutes*”) and others were much larger (e.g., mother: “*only 30 minutes*” vs. father: “*2–3 hours a day*”). A subset of parents described limits based on specific needs such as putting child to sleep (e.g., “*for baby to sleep*”), distracting child (“*only in car, to get in car seat*”), needing to do something (“*puts on TV when need to cook*”), or to calm (“*she only gets phone when fussy*”). No parents mentioned quality of media content/programming as part of their limits. Time limits, for those that allowed use of media, ranged from 5 minutes to 4 hours per day. When couples disagreed on time limits, fathers tended to report much larger time limits than mothers (typically 2–6 times longer than mothers). Mothers and fathers mean beliefs about the benefits of media were significantly correlated at 9 months ($r = 0.57, p < 0.01$), with fathers having significantly more favorable beliefs about the benefits of media than mothers [$t_{(418)} = 4.757, p < 0.0001$ CI (–0.37, –0.15)]. ICC across couples was significant at 0.43 (CI = 0.2–0.59).

3.2 Patterns of media use at 18 months

Parents reported more media use by their child at 18 months than at 9 months, but due to constraints on data collection, not all types of media use were asked at this wave. Only 17 parents reported that their child was not using media of any kind, and only three couples agreed that their child had no use. Mothers and fathers reported non-significant differences in mean levels of media use for behavior management, with mothers’ and fathers’ responses correlated 0.57 and couples’ ICC of 0.73 (CI = 0.6–0.8) (see Table 2).

3.3 Patterns of use at 24 months

Parents reported significantly more of every type of media use than previous waves (with the exception of fathers’ report of background TV) (see Table 2). By 24 months, 38 parents reported that their child was not using media at all (which is slightly higher than the 18-month wave), and both parents agreed that their child was not using media in only six families. Television continued to be the most common source of media use, with 93.2% of parents reporting that their child watched TV and 84% reporting that the TV is typically on at mealtimes or when no one is watching. Parents reported significantly more types of media activities each day by their toddler, and increased use of devices for behavior management (see Table 2 for details). Time use limits ranged greatly from a few “*30-second videos on YouTube*” to “*3–4 hours a day*”. Table 2 indicates the frequency of passive TV use, solo use, co-use, use for behavior management, and types of daily use.

Like the previous waves, correlations of mothers’ and fathers’ reporting on their children’s media use were moderate, ranging from 0.42 to 0.61 and ICC across couples ranged from 0.58 to 0.75. Similar open-ended responses (e.g., Mother: “*only 30 minutes a day*” vs. father: “*30–60 a day*” or mother: “*only as a special treat*” vs. father: “*we try to limit it*”) for media limits were found in 33% of couples. The other 2/3 of parents reported more pronounced misalignments in limits with some disagreeing about use at all (mother: “*only let her watch a movie a day*” vs. father: “*don’t want her to use, too soon*”), and some having very different time limits (mother: “*no more than 10 minutes per day*” vs. father: “*Four hours total a day*”). In general, fathers’ open-ended limits included much larger estimates of time use than mothers. Unlike limits listed at 9 months, parents of toddlers offered few limits beyond time (e.g., “*two hours max a day*”), duration of specific activities (e.g., “*2 hours to watch movie*”), or time of day (e.g., “*she can watch shows for 15 min before bed*”, “*only when he is eating*”). A few parents mentioned using media to distract (e.g., “*lets him use only when busy*”) or in response to good or bad behavior (e.g., “*If she behaves, she can watch more. If not, she can’t watch it*”). No parents mentioned the quality of programming or activity as part of their limits, though a few mentioned “*educational*” TV or videos.

Mothers’ media beliefs became more positive over time, with scores significantly increasing from 9 to 24 months, $M = 0.18, t_{(150)} = 4.37, p < 0.01, 95\% \text{ CI } (0.10, 0.27)$, while fathers’ mean media beliefs, though higher than mothers, remained stable from 9 to 24 months. Mothers’ and fathers’ media beliefs were significantly

correlated $r = 0.55, p < 0.01$ and couples' ICC was 0.62 (CI = 0.46–0.73).

3.4 Parenting beliefs, age, child gender and temperament, and children's media use

In considering characteristics of the child that might be related to media use and how parents' beliefs about the benefits of media may change over time, correlations between mothers' and fathers' reports of their media beliefs at 9 months, frequency of media use at 24 months, and child emotionality at 12 months were examined. Since both mothers and fathers reported on their child's emotionality at 12 months, their subjective perception of temperament was used. Mothers' reports of their child's emotionality were only significantly correlated with their reports of children's media use for behavior management at 24 months of age, $r = 0.19, p < 0.05$. For fathers, reports of their child's negative emotionality were significantly correlated with passive TV use ($r = 0.20, p < 0.05$), solo media use ($r = 0.21, p < 0.05$), co-use of media ($r = 0.19, p < 0.05$), and media use for behavior management at 24 months of age ($r = 0.27, p < 0.05$).

Next, five regression models were run for each parent type to examine links between mothers' and fathers' beliefs about the benefits of media at 9 months and reports of their child's media use at 24 months. Each model included the child's emotionality at 12 months and child gender as covariates and controlled for parental age and education level. Initial model estimates also included mothers' and fathers' self-reported race/ethnicity, and income, but as none were a significant covariate in any model, they were removed for parsimony. Study condition was significant in only one model but included in all models to account for non-independence (see Tables 3, 4 for details).

Fathers' beliefs about the benefits of media at 9 months were significantly associated with higher average frequencies of media use at 24 months across all models (passive TV use, solo use, co-use, use for behavior management, and daily types of use), while mothers' beliefs about media at 9 months were associated with higher toddler media use in every model except total types of daily media use. Child emotionality was linked to higher media use in all models for fathers, except for types of daily media use. For mothers, children's negative emotionality was only associated with higher media use for behavior management. Child gender was a significant predictor of more types of daily media use and higher co-use for mothers, with use/co-use being higher with daughters. However, child gender was not a significant covariate in any of the father models. Fathers' age was consistently associated with less media use across models. Parental education was also related to less media use for some, but not all models. Finally, a larger portion of the total variance of children's media use was explained in the father models, ranging from 0.22 to 0.40, as compared to the mother models, ranging from 0.18 to 0.26.

4 Discussion

Children in this sample were regular media users from infancy to toddlerhood. Though the American Academy of Pediatrics and

TABLE 3 Regressions of associations between mothers' media beliefs at 9 months, child emotionality at 12 months, child gender, and child media use at 24 months.

	Avg. passive TV			Avg. daily use			Avg. solo use			Avg. co-use			Avg. behavior management		
	Est.	SE	t (CI)	Est.	SE	t (CI)	Est.	SE	t (CI)	Est.	SE	t (CI)	Est.	SE	t (CI)
Intercept	1.96**	0.50	3.94 (0.97, 2.94)	0.42**	0.11	3.75 (0.20, 0.65)	1.78**	0.46	3.91 (0.88, 2.68)	2.33**	0.45	5.16 (1.44, 3.22)	1.73**	0.50	3.49 (0.75, 2.71)
Media beliefs ^a	0.47**	0.11	4.19 (0.25, 0.70)	0.05	0.03	1.86 (−0.00, 0.10)	0.39**	0.10	3.79 (0.18, 0.60)	0.31**	0.10	2.99 (0.10, 0.51)	0.33**	0.11	2.96 (0.11, 0.56)
Child emotionality ^b	0.02	0.02	1.02 (−0.02, 0.05)	0.00	0.00	0.54 (−0.01, 0.01)	0.03 ⁺	0.02	1.94 (0.00, 0.06)	0.02	0.02	1.00 (−0.02, 0.05)	0.04*	0.02	2.44 (0.01, 0.08)
Age	−0.02	0.01	−1.49 (−0.04, 0.01)	0.00	0.00	−0.99 (−0.01, 0.00)	−0.02	0.01	−1.70 (−0.04, 0.00)	−0.03*	0.01	−2.27 (−0.05, 0.00)	−0.03*	0.01	−2.28 (−0.05, −0.00)
Education	−0.08	0.05	−1.57 (−0.19, 0.02)	−0.02	0.01	−1.26 (−0.04, 0.01)	−0.15**	0.05	−3.12 (−0.25, 0.06)	−0.07	0.05	−1.55 (−0.17, 0.02)	−0.13*	0.05	−2.45 (−0.24, −0.03)
Child gender ^c	0.00	0.14	−0.02 (−0.27, 0.27)	0.05	0.03	1.68 (−0.01, 0.11)	0.19	0.13	1.48 (−0.06, 0.44)	0.25*	0.13	2.03 (0.01, 0.50)	0.23	0.14	1.64 (−0.05, 0.50)
Study condition ^d	−0.11	0.15	−0.75 (−0.41, 0.19)	−0.08*	0.03	−2.25 (−0.15, −0.01)	−0.19	0.14	−1.34 (−0.46, 0.09)	−0.20	0.14	−1.48 (−0.48, 0.07)	−0.12	0.15	−0.80 (−0.42, 0.18)
R ²	0.18			0.13			0.27			0.20			0.23		

N = 147. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

^aMedia beliefs was measured at 9 months of age.

^bChild emotionality is a temperament scale measured at 12 months of age.

^cGender 0 = son, 1 = daughter.

^dStudy Condition 0 = control, 1 = intervention. Significant relationships are bolded.

TABLE 4 Regressions of associations between fathers' media beliefs at 9 months, child emotionality at 12 months, child gender and child media use at 24 months.

	Avg. passive TV			Avg. daily use			Avg. solo use			Avg. co-use			Avg. behavior management		
	<i>Est.</i>	<i>SE</i>	<i>t</i> (CI)	<i>Est.</i>	<i>SE</i>	<i>t</i> (CI)	<i>Est.</i>	<i>SE</i>	<i>t</i> (CI)	<i>Est.</i>	<i>SE</i>	<i>t</i> (CI)	<i>Est.</i>	<i>SE</i>	<i>t</i> (CI)
Intercept	1.58**	0.48	3.27 (0.62, 2.52)	0.25*	0.12	2.11 (0.02, 0.49)	0.97*	0.43	2.28 (0.13, 1.82)	0.97*	0.47	2.08 (0.04, 1.89)	1.07*	0.45	2.37 (0.18, 1.96)
Media beliefs ^a	0.71**	0.11	6.28 (0.49, 0.94)	0.12**	0.03	4.40 (0.07, 0.18)	0.64**	0.10	6.31 (0.44, 0.87)	0.75**	0.11	6.82 (0.53, 0.97)	0.50**	0.11	4.74 (0.29, 0.71)
Child emotionality ^b	0.04*	0.02	2.43 (0.01, 0.08)	0.01	0.00	1.50 (−0.00, 0.02)	0.04*	0.02	2.51 (0.01, 0.07)	0.04*	0.02	2.20 (0.00, 0.07)	0.06**	0.02	3.32 (0.02, 0.09)
Age	−0.05**	0.01	−4.58 (−0.07, −0.03)	−0.01*	0.00	−2.30 (−0.01, −0.00)	−0.03**	0.01	−3.41 (−0.05, −0.01)	−0.03**	0.01	−3.26 (−0.05, −0.01)	−0.03**	0.01	−3.58 (−0.05, −0.01)
Education	−0.11*	0.05	−2.22 (−0.20, 0.01)	−0.02*	0.01	−2.12 (−0.05, −0.00)	−0.10*	0.04	−2.48 (−0.19, −0.02)	−0.05	0.05	−1.14 (−0.14, 0.04)	−0.09	0.04	−1.97 (−0.17, 0.00)
Child gender ^c	0.18	0.13	1.42 (−0.07, 0.44)	0.01	0.03	0.44 (−0.05, 0.08)	0.19	0.11	1.62 (−0.04, 0.41)	0.23	0.13	1.85 (−0.02, 0.48)	0.06	0.12	0.51 (−0.18, 0.30)
Study condition ^d	−0.06	0.15	−0.38 (−0.35, 0.24)	−0.07	0.04	−1.94 (−0.14, 0.00)	−0.01	0.13	−0.11 (−0.27, 0.24)	−0.19	0.14	−1.32 (−0.47, 0.09)	0.10	0.14	0.71 (−0.18, 0.37)
R ²	0.40			0.24			0.37			0.38			0.31		

$N = 125$. * $p < 0.05$, ** $p < 0.01$.

^aMedia beliefs was measured at 9 months of age.

^bChild emotionality is a temperament scale measured at 12 months of age.

^cGender 0 = son, 1 = daughter.

^dStudy Condition 0 = control, 1 = intervention. Significant relationships are bolded.

other professional organizations recommend no media use other than video-chat at these ages, and only high-quality media use for no more than an hour in the toddler period (AAP Council on Communications and Media et al., 2016), most families were not following these recommendations. As others consistently find (e.g., Hish et al., 2021; Bellagamba et al., 2021), these children used television/TV-like streaming more than any other form of media. This included background television, as well as up to 4 hours a day of direct television watching (assuming mothers' and fathers' reports overlap and should not be summed). This could have significant impacts on children's language, socioemotional, cognitive, and physical development. Meta-analyses find that young children's media use, especially television viewing, is linked to lower language skills (Madigan et al., 2020). This finding could be due to displacement of opportunities to hear language and produce language in responsive interactions (Pempek and Kirkorian, 2020), as experimental studies confirm that both watching television and having television on in the background reduce language in the child's environment as well as their efforts to produce language (Kirkorian et al., 2009; Pempek et al., 2014). Some also propose that screens might create a digital bubble in which children engage in less private speech, which may affect language development and executive function (Bochicchio et al., 2022).

Further, decades of research have linked young children's television viewing with poor physical health outcomes, such as reduced gray/matter volume in the visual cortex, hypothalamus and sensorimotor areas of the brain (Takeuchi et al., 2013), weight gain (Jackson and Cunningham, 2017), poor nutritional intake, and reduced physical activity (Cox et al., 2012). Television viewing is associated with poor socioemotional and cognitive outcomes as well (Anderson and Pempek, 2005; Desmarais et al., 2021). Thus, our finding of regular TV exposure and use for almost all of the children in this study is important and potentially concerning.

The low-to-moderate incomes of our sample may play a role in the high use of media at these young ages, as studies have found family income to be negatively associated with media use (i.e., households with low incomes tend to watch more television than well-resourced homes; De Craemer et al., 2018; Chen and Adler, 2019; Ramírez et al., 2021). Our sample lacked high incomes to make such comparisons, though we did not find income to be linked to media uses with the low-to-moderate income ranges in our sample. Though studies find that children from ethnic and racial minority groups tend to use more media than their White, majority peers (Thompson et al., 2010; Goode et al., 2020), we did not observe differences based on race or ethnicity, though our sample was predominantly non-white.

Families in this study had multiple devices in their homes, but television was by far the most commonly used form of media for infants and toddlers. Mobile devices, such as tablets and smartphones were less commonly used, though parents did report use often and at higher rates from 9 to 24 months. In the open-ended discussions of limits, parents also mentioned these mobile devices, such as the child being given the phone when fussy. Though tablets and smartphones have more potential for interactivity, which can be beneficial to learning (Xu, 2023), they also have the potential to expose children to inappropriate advertising and persuasive design features that make discontinuing use challenging (Meyer et al., 2019; Radesky et al., 2022). Importantly, research has found that parents tend to have difficulty

recalling their children's mobile device use, often underestimating (35.7%) or overestimating (34.8%) children's tablet and smartphone use in comparison to objective (logging) measures of use (Radesky et al., 2020).

4.1 Mother vs. father informants

The vast majority of research on children's use of media utilizes maternal reports of frequency, duration, and types of use (Paudel et al., 2017; Eirich et al., 2022). Our findings indicated few significant differences in mothers' and fathers' reporting of media use on average, with reports being moderately correlated. Parents of the same child rarely selected the same frequency of use as their partner, but in the aggregate, mothers' and fathers' total ratings were comparable. This suggests utility to either mother or father report for aggregated and larger sample studies but caution when looking at specific uses for specific children. In considering limits, which were mainly time limits, the majority of couples did not agree on the limitations around their child's use of media. In some cases, one parent reported no use while the other reported regular daily use. Even when both parents agreed that the child had limits on media use, they often had sizable discrepancies (e.g., 10 min vs. 4 hrs per day). Since actual use of media was not recorded, we do not know whether one parent was more valid in their reporting or if young children have different media use and limitations with each parent. This is an area that warrants further investigation, as a small body of research finds that children may have different media practices with each parent (Connell et al., 2015; Nikken and Schols, 2015), and children's media use with mothers may be associated with different child outcomes than media use with fathers (Tang et al., 2018).

Mothers and fathers did endorse significantly different beliefs about the benefits of media for children, with fathers' being more favorable. It is unclear as to why men held more positive beliefs than women in this sample. Studies over the past three decades have found that men tend to use internet technologies more than women (Morahan-Martin, 1998; Goswami and Dutta, 2015; Qazi et al., 2022), which may be related to more positive beliefs about their benefit. Research has found links between parental beliefs about media and children's media use (Njoroge et al., 2013; Domoff et al., 2017; Griffith, 2023). However, the majority of these studies focused on mothers' beliefs about media. Some notable exceptions include mothers and fathers (Cingel and Krcmar, 2013; Hinkley and McCann, 2018; Ochoa and Reich, 2020), but few studies have considered beliefs within couples or across time. Our findings demonstrate that positive beliefs about the benefits of media are related to both mothers' and fathers' decisions about their young child's media use. Given men's significantly more positive beliefs than women, future work should further explore the link between fathers' beliefs and their children's media use, especially over time.

4.2 Child contributions to media use

How parents perceived their child's negative emotionality was related to decisions about their child's media use. For both mothers and fathers, negative emotionality was linked to more parental reports of using media to reward, punish, calm, and

distract children. A growing body of research is documenting how children's difficult temperament is linked to higher use of media, from toddlerhood onward (Nabi and Krcmar, 2016; Coyne et al., 2021; Shin et al., 2021). The use of media to help manage behavior might limit young children's opportunities to cultivate self-regulatory skills and executive functions. In a sample of 3–5-year-olds, Radesky et al. (2023) found that the use of media to calm children was predictive of lower executive functioning skills 3 and 6 months later (Radesky et al., 2023). Similarly, Coyne et al. (2021) found that use of devices for behavior regulation was tied to stronger emotion reactivity and problematic media use in 2–3-year-olds. As such, children with more difficult temperaments might be at risk for missing valuable opportunities for cultivating these important self-regulatory processes. Given the stronger relationship between father-reported media uses and child negative emotionality, it is possible that these risks might be greater with fathers than mothers.

Interestingly, children's negative emotionality was linked to fathers', but not mothers', reporting of more passive TV exposure, use of media alone, and co-use of media. Limited research has explored differences in mothers' and fathers' reports of their young children's media use, but extant work has noted interesting differences. For instance, a survey of parents of children 8 years and younger found that fathers were significantly more likely than mothers to spend time co-using videogames and computers with their child (Connell et al., 2015). An older experimental study of television viewing found that family TV watching resulted in less talking and positive interactions toward children for fathers, but not for mothers (Brody et al., 1980). Research indicates that children might have different media experiences with mothers and fathers and our findings suggest that temperament might be associated with these differences. Future work should consider the intersection of child characteristics with those of their parents, including parental beliefs, gender, and dispositions.

Also associated with differences in children's media use were parental age and education, with older and better educated parents reporting lower rates of media use for their young children. Research, in a variety of aspects of parenting, finds that more education and older age are linked to positive parenting practices and better child outcomes (e.g., Ragozin et al., 1982; Tearne, 2015; Yildirim et al., 2020). These findings suggest that media limits and access might be another parenting domain linked to these characteristics.

4.3 Limitations

This study, utilizing data from a longitudinal parenting intervention, was limited in its measurement of media use. First, only parental reports of media use were possible. Without more objective measures, there is no way to know the accuracy of their reports with young children's actual use or the quality of the programming or media used. Second, though the frequency of types of use was captured, total screen time was not. Thus, estimates of total time using media were not possible. Third, the 18-month home visit utilized a shorter media measure due to time constraints of direct assessments needed for the main aims of the grant, and as

a result, information comparable to the 9- and 24-month average solo use, co-use, passive TV use, and types of daily use were not available. Fourth, some of the data were collected during the COVID-19 pandemic, which contributed to missing data and likely resulted in different media patterns for those interviewed before or during the social distancing policies in place. Fifth, data are not available as to how much time each parent spent with their child during waking hours. Most parents worked and we do not have data on whether they worked from home or during the day or night. Finally, all parents were new parents, low-to-moderate income and living in California or the Washington DC area. As such, findings may not generalize to other types of parents.

5 Conclusion

Extant research focusing on young children's media use is highly reliant on maternal reports, often lacking consideration of fathers' perspectives. By interviewing both mothers and fathers of the same child about their media use, we were able to compare media practices and limits within couples. Though average values in the aggregate were not significantly different, mothers and fathers rarely agreed on their young child's media use and often reported different frequency and limits for use. Such findings indicate the need for more research to understand whether mothers and fathers simply report different values or if children have different media experiences with each parent. Importantly, parents' beliefs that media is beneficial and how they view their child's emotional reactivity are significantly related to the types of media their young children use. Thus, interventions to reduce media use in early childhood may benefit from targeting parents' beliefs about media, as well as helping to cultivate skills for managing their children's negative emotions without screens.

Data availability statement

The datasets presented in this article are not readily available, as families did not consent to sharing their data at enrollment. Requests to access the datasets should be directed to SR, smreich@uci.edu.

Ethics statement

The studies involving humans were approved by University of California, Irvine IRB and University of Maryland IRB. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

Author contributions

SR: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project

administration, Resources, Supervision, Visualization, Writing – original draft, Writing – review & editing. KM: Formal analysis, Methodology, Supervision, Writing – original draft, Writing – review & editing. AK: Data curation, Formal analysis, Investigation, Writing – review & editing. DF: Data curation, Formal analysis, Investigation, Writing – review & editing. EM: Conceptualization, Data curation, Investigation, Writing – review & editing. NC: Conceptualization, Data curation, Funding acquisition, Methodology, Project administration, Supervision, Writing – review & editing.

Funding

The author(s) declare financial support was received for the research, authorship, and/or publication of this article. The research reported in this publication was supported by the Eunice Kennedy Shriver National Institute of Child Health and Human Development of the National Institutes of Health under award numbers R01HD078547 and R03HD102448. The content is solely

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