Discovering kids' apps

Do family strategies vary by income?

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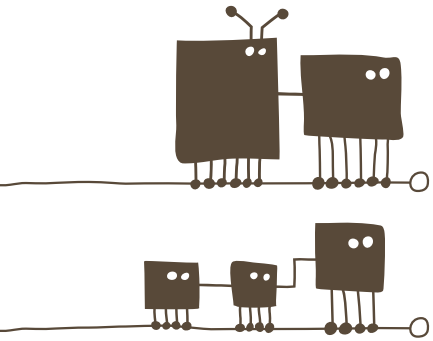
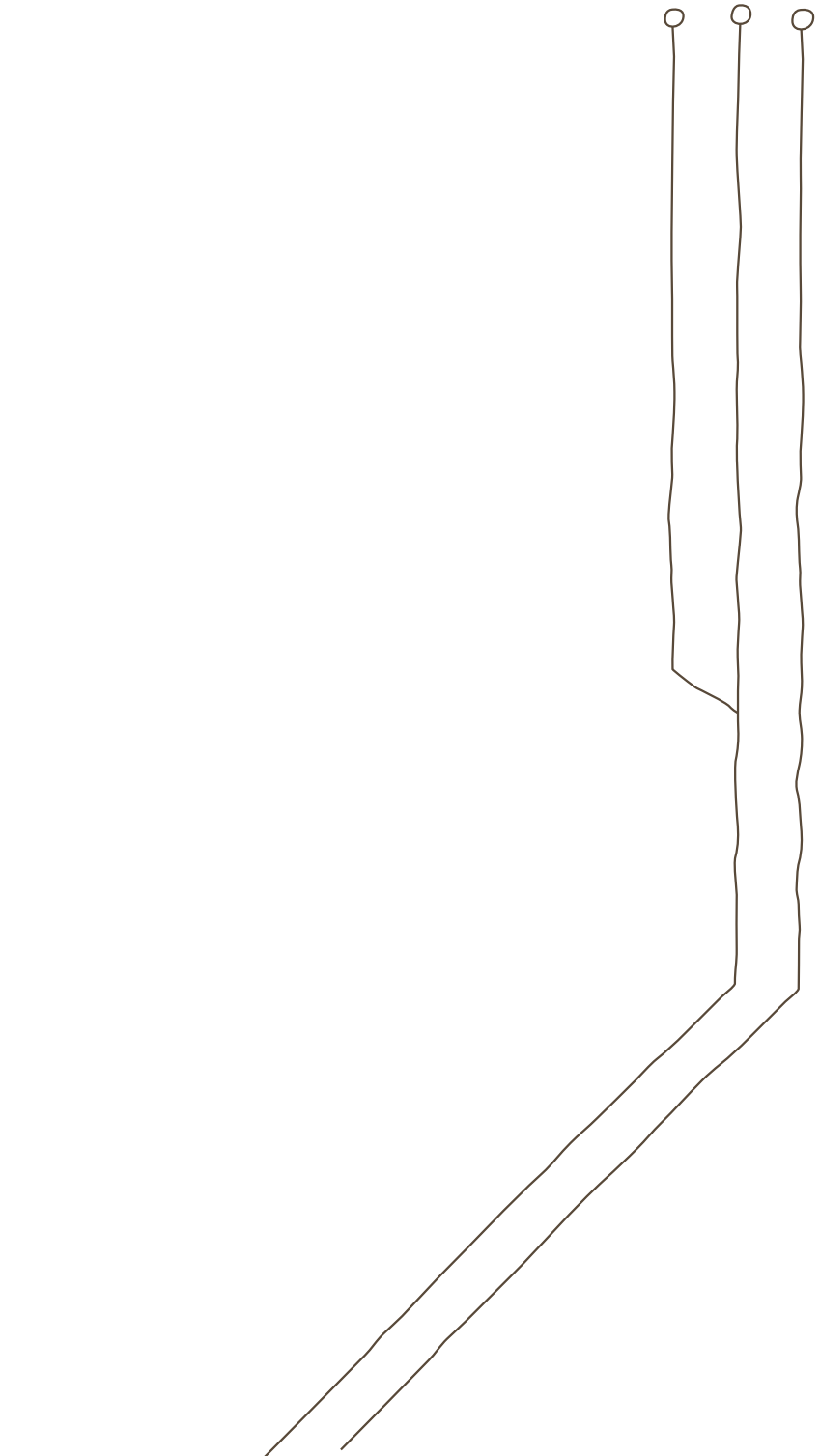
The Joan Ganz Cooney Center at Sesame Workshop



Introduction

Today's children are growing up in an increasingly digital world, where knowledge, opportunities, and social networks require access to the internet, in addition to modern devices and specific software applications. Increasingly, families across the socioeconomic spectrum have access to internet-capable technologies, although the depth, quality, and consistency of that access can vary markedly.[1,2] The Joan Ganz Cooney Center has been conducting a suite of studies investigating how families navigate the huge array of digital tools that are available. One key question is: how do families find and choose apps for young children's use? Former research has explored the information about children's educational apps that is available through app stores, and results revealed inconsistent and often scant guidance provided there for families.[3] This QuickStudy was part of an online survey that explores the family culture of app selection, including the sources of information that guide families' choices.



We know that more low-income families own mobile devices now than just a few short years ago.[4,5] As such, our goal for this QuickStudy was to dig deeper to better understand how the digital divide is shifting: instead of income-based differences in *whether* children have digital access, are there differences in *what* they are accessing and *how* families locate those resources? In particular, we set out to explore what families of young children think about apps and how they navigate the wide array of available options to determine what their children will use. With over 2.2 million apps available in the Apple store alone[6] (many of which are aimed at young children and marketed as educational), there is a wide range of quality, educational value, and price in what is offered. However, detailed information about particular apps and their educational value is often unavailable in app stores.[7] Given the limited information available to families, how do they go about searching for new apps? What sources of information do they rely on to make these decisions? Are lower- and higher-income families handling these challenges differently, and what does this mean for interpreting and addressing the modern-day digital divide?

For this QuickStudy, we asked nearly 1,200 parents of children between 3 and 6 years old to tell us about their app searching experiences. This nation-wide sample was accessed through a panel maintained by the survey company SSI.[8] A little over half of the final sample were mothers and most were white and non-Hispanic (see page 12 for more details about the survey sample). Parents answered a variety of questions regarding their child's ownership and use of mobile apps and their own perceptions and strategies for finding those apps. The sample included families with varying household income levels, which we divided into three groups for comparison purposes: less than $50,000/year ("lower income"; 483 families), $50,000-$99,999/year ("middle income"; 403 families), and $100,000 or more/year ("higher income"; 212 families).[9]

Below we will share five key findings about income-related variations in parents' approaches to finding children's apps.

finding 1

Parents from different income brackets agree about the educational value of apps and their children use apps with similar frequency.

Across income groups, the majority of parents reported that their children use apps several times a week or even every day. The high frequency of children's app usage may reflect the fact that parents across income levels equally endorsed the belief that apps are valuable educational tools for children.

Figure 1: Parent's belief that "educational apps are valuable learning tools for children"

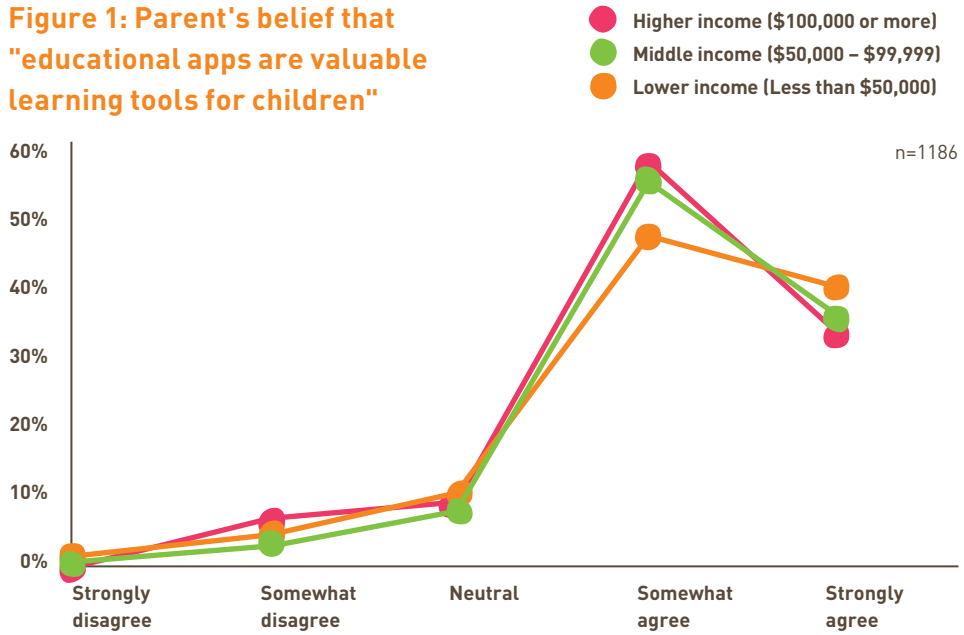
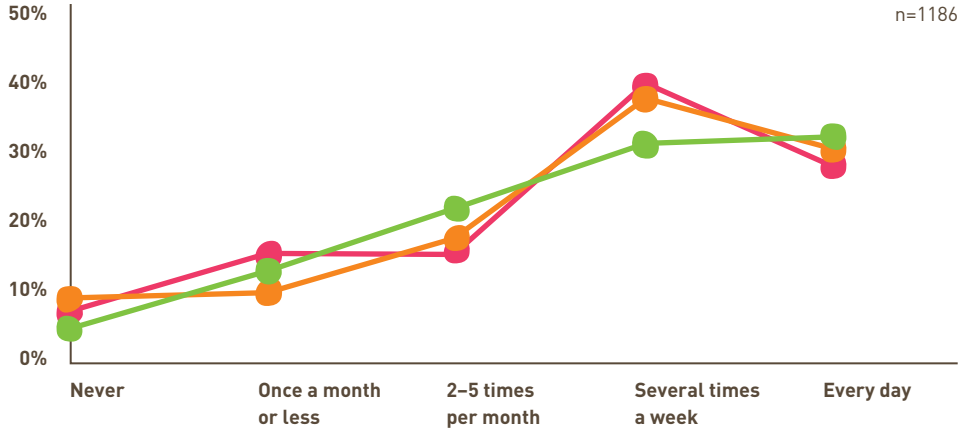


Figure 2: Child's app use frequency



finding 2

Children's app ownership varies with household income.

Among the parents whose children use apps (93% of the survey respondents), we found differences in the number of apps children have access to, with the lower income families downloading fewer apps than the middle and higher income families.[10] In addition, the proportion of children's apps that were *paid* apps increased as household income increased.[11] While 43% of the lower income families reported downloading only free apps, fewer than 10% of higher income families reported the same. On the other hand, 28% of the higher income families reported that half or more of their children's apps were paid, though this was only true for 5% of the lower income families.

Figure 3: Number of apps child owns

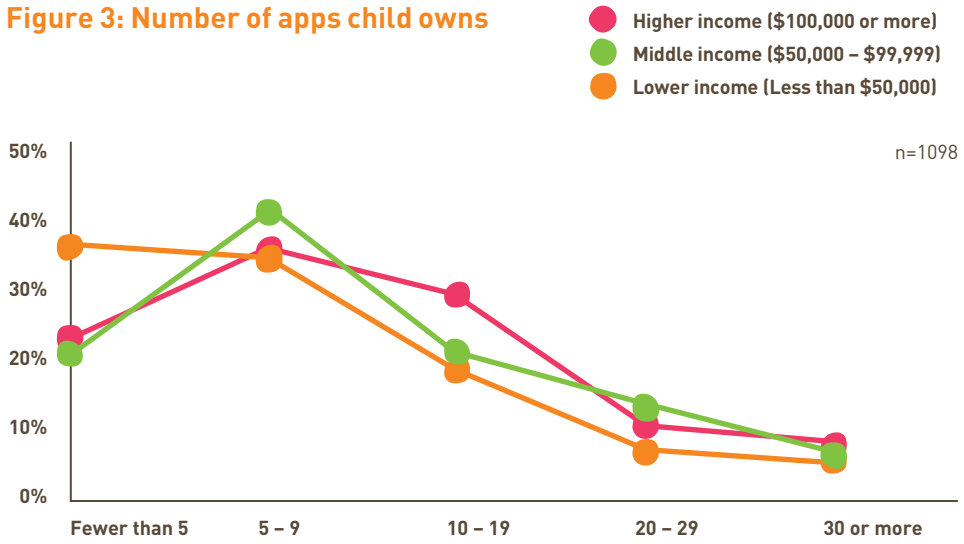
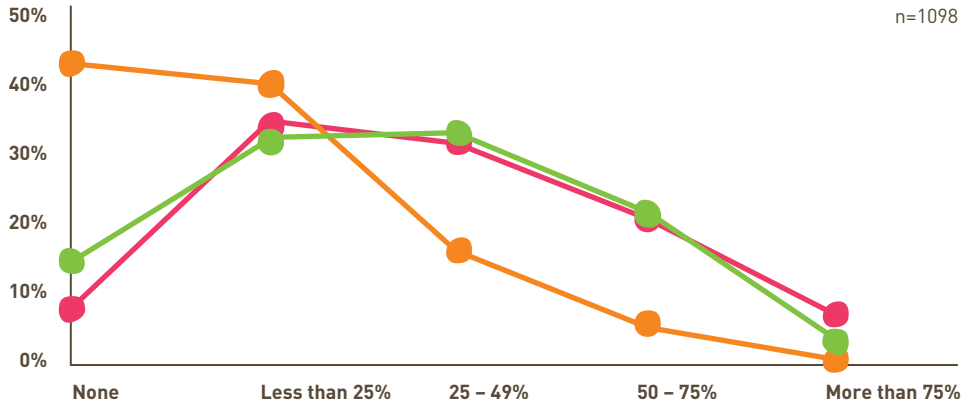


Figure 4: Percent of apps that are paid



finding 3

Parents from different income brackets rely on different top sources of information about children's apps.

Parents whose children use apps were shown a list of 15 sources of information they might use to find their children's apps, and parents were asked to select their top 5 options (see list of 15 queried sources on page 12). While many parents across income levels relied on "relational" sources such as friends, family, and teachers, middle and higher income parents were especially likely to list these relational sources as their "top" sources of information, compared to lower income parents.[12] On the other hand, lower income parents were more likely than higher income parents to indicate that their primary sources of information were features within app stores—such as the search bar, app descriptions, app store rankings, and consumer reviews.[13] Notably, lower income families were just as likely to list an app store source among their top sources as they were to list a relational source while the middle and higher income parents tended to favor relational sources.

Figure 5: Relational sources

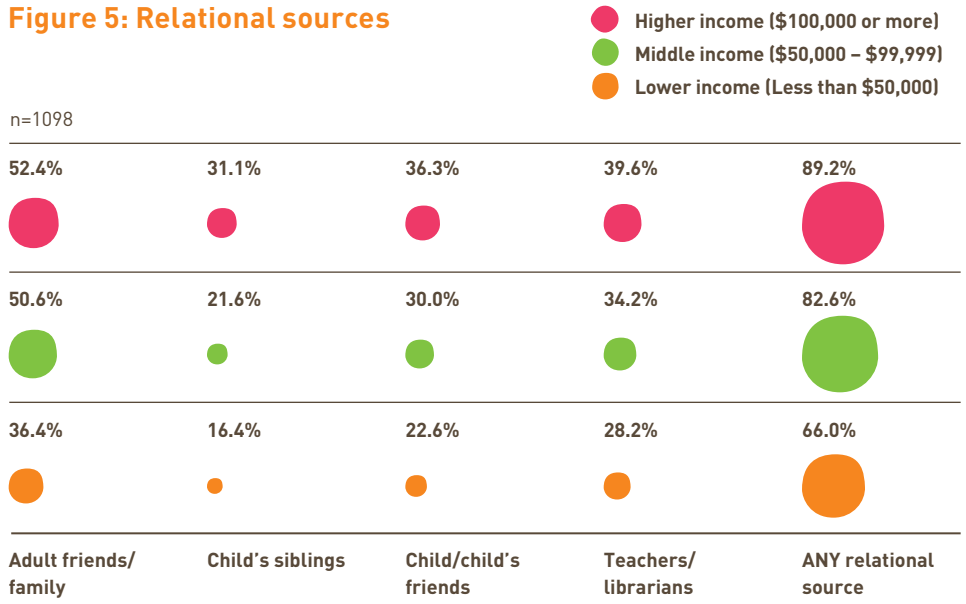
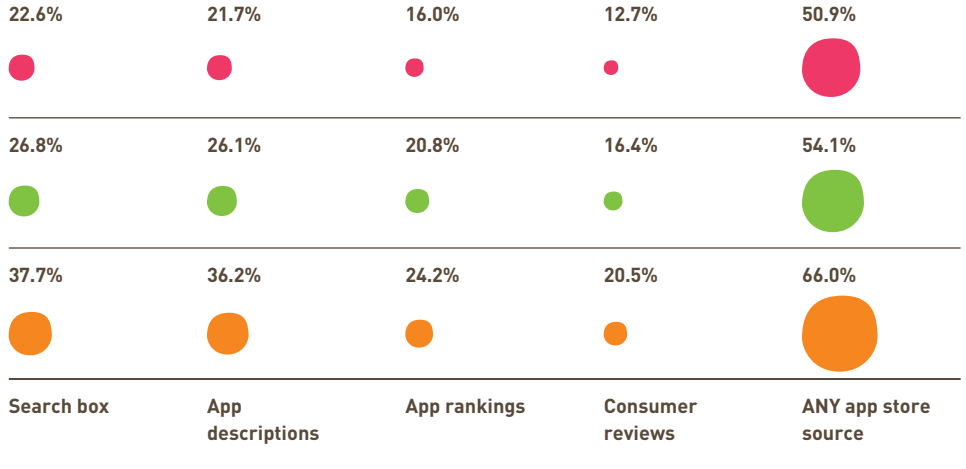


Figure 6: App store sources



finding 4

Parents in different income brackets vary in their impressions of the usefulness of app descriptions and their desire for more expert guidance.

When parents were asked how much they agreed with the statement "children's app descriptions rarely contain useful information," parents in the higher income group tended to agree, on average (i.e., a mean of 5.3 on a scale from 1: strongly disagree to 7: strongly agree). Conversely, lower income parents' average stance was fairly neutral about the statement (i.e., a mean of 3.9).[14] And while some parents in each of the three income groups reported wanting more information from experts about choosing educational children's apps, higher income parents agreed more strongly with this sentiment than did lower income parents;[15] one-third of lower income parents were either neutral or reported not wanting additional information from experts.

Figure 7: "App descriptions rarely tell you anything useful about a children's app"

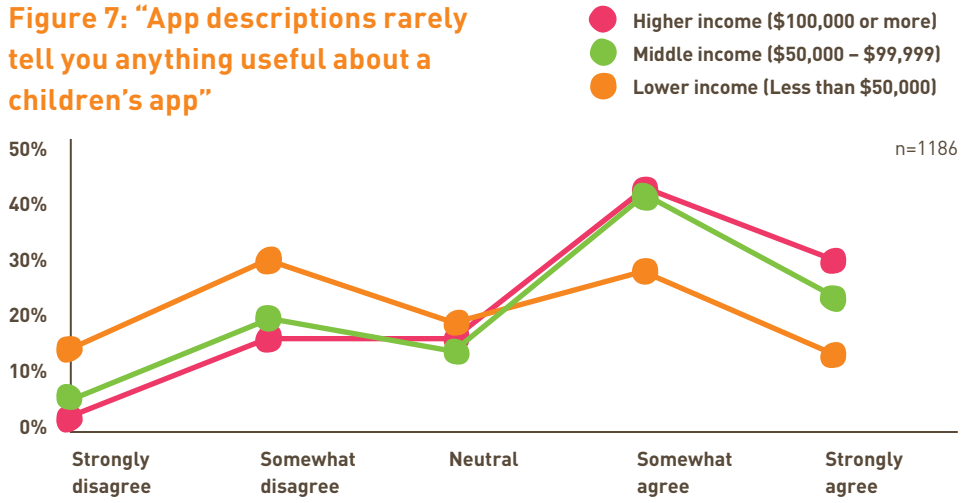
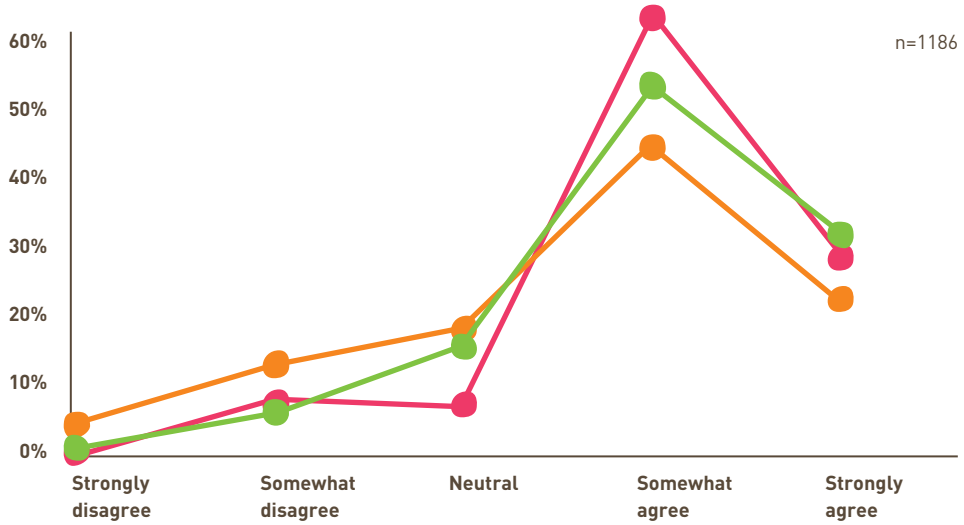


Figure 8: "I would like more information from experts about how to choose good apps for my child's learning"



finding 5

Parents from the three income brackets are involved in the selection of their children's apps in different ways.

For both middle and higher income parents, about equal numbers of families reported that the parent chooses most apps or the child chooses most apps, with the equal sharing of responsibility between parent and child being less common.[16] Lower income parents, on the other hand, showed a clear tendency toward heavier parent involvement: Nearly half of them reported choosing apps for their child most of the time and nearly a third of them reported sharing most decision power with their child. Lower income parents were less likely than parents from the other income groups to report allowing their child to choose most apps themselves.

To better understand the app selection process, another survey question asked how often parents use "app trialing" as a strategy—downloading and trying an app themselves before letting their child use it. Middle and higher income parents reported slightly more frequent "app trialing" when selecting their children's apps than the lower income parents reported.[17]

Figure 9: "Who chooses most of the apps your child uses?"

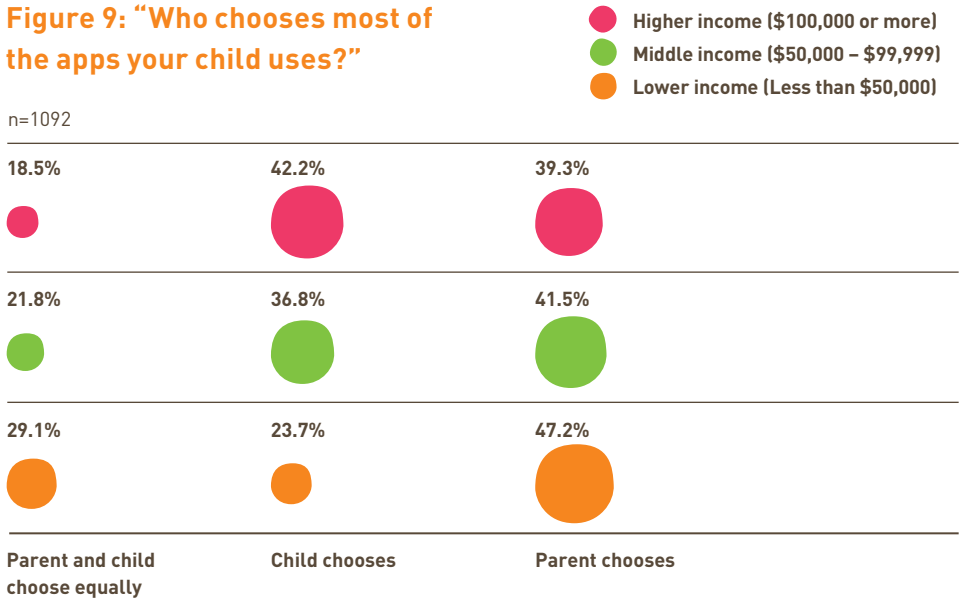
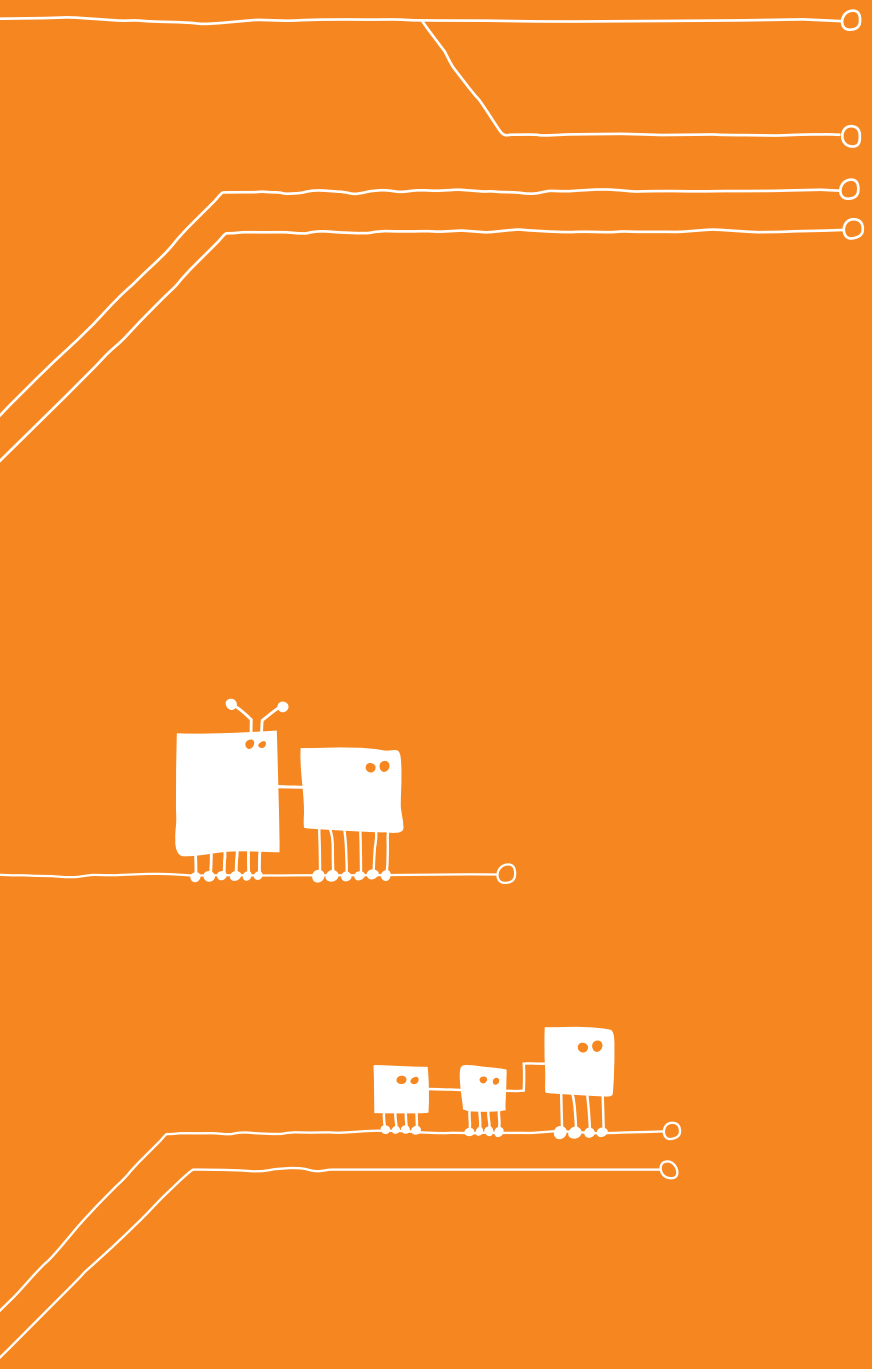
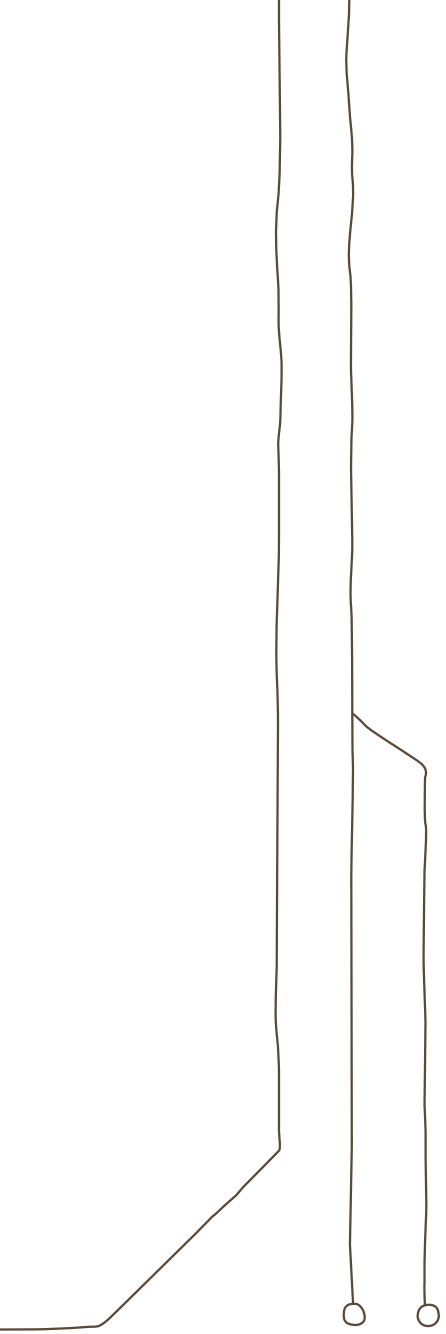


Figure 10: "I download apps myself and test them before letting my child use them"



Questions and considerations for further research

These findings suggest there are some ways in which families' approaches to young children's app use is similar across family income levels: there were no differences in parents' perceptions of the educational value of apps or in the frequency of young children's app use, for example. Also, most parents in each income bracket reported relying heavily on relational sources (family, friends, etc.) for information about available apps. There were differences, however, in other, often more subtle, aspects of how families navigate young children's app use. Understanding and unpacking those differences in the context of other research can inform our understanding of today's digital divide and our efforts to help families make informed decisions about app selection: the best strategies for supporting families might vary based on characteristics and needs of different families. This QuickStudy examined only income-based differences; we urge researchers to examine additional socio-cultural variations in the family app ecology and how they may interact with income differences. Below we pose questions that the current investigation raises for researchers and producers, especially those concerned with digital equity for our nation's children and families.



- **Children in lower-income homes tended to have fewer apps than their peers from more affluent homes, and the apps they did have were more likely to be free instead of paid apps.** Previous research has demonstrated that children's language and literacy apps that are highly rated by expert reviewers tend to cost more than apps that are simply promoted by app stores as "top apps," though the link between cost and quality of children's apps has not been confirmed empirically.[18] This information is critical; if quality is related to cost, children in homes with fewer resources may not have access to as many high-quality educational apps as their higher-income peers.

  – Is app cost in fact positively related to quality among most children's apps?

  – Can a dedicated focus on producing high-quality free apps alleviate these concerns?

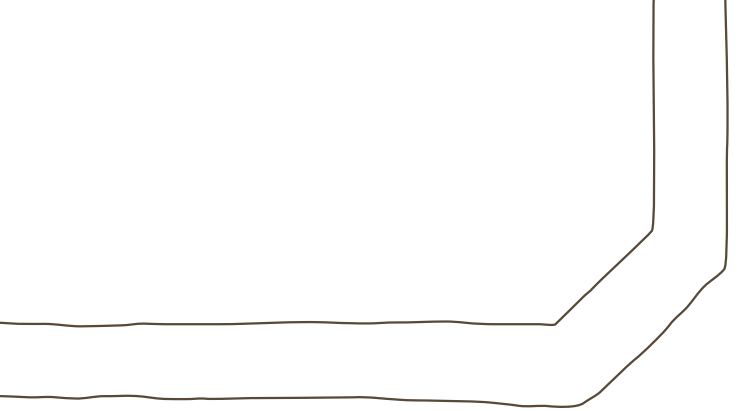
- **These exploratory data indicate some income-based differences in how families locate children's apps.** In particular, parents in lower income families were more likely to list app store features as top sources of information guiding their selection of children's apps than middle and higher income parents. These same parents also indicated higher rates of belief in the usefulness of descriptions within the app store. Thus, the extent, nature, and veracity of information provided by developers and app stores may have particular repercussions for families with fewer financial resources. Notably, the present survey asked only which sources parents utilize most, with no detail regarding how they use these sources or what kind of information is provided.

  – Which information sources are most effective for discovering high-quality children's apps? Might the most useful sources vary with characteristics of families?

  – Can targeted guidance from teachers, librarians, and other media mentors assist families in best utilizing available sources in their efforts to locate high quality apps?

- **In this study, the vast majority of lower income parents—76%—reported that they or another caregiver choose their children's apps exclusively or together with the child.** Perhaps because of this high degree of engagement in the selection of apps at the outset, lower income parents are somewhat less likely than middle or higher income parents to test out an app themselves before letting their children use it.

  – Does the higher rate of parent participation in app selection uncovered here among lower income parents reflect a broader level of engagement with children's apps? For example, are lower income parents also more likely to co-use apps with their children?



– *How effective are parent-driven selection, parent app-trialing, and other strategies in surfacing high-quality children's apps? What benefits are there to including children in the app selection process?*

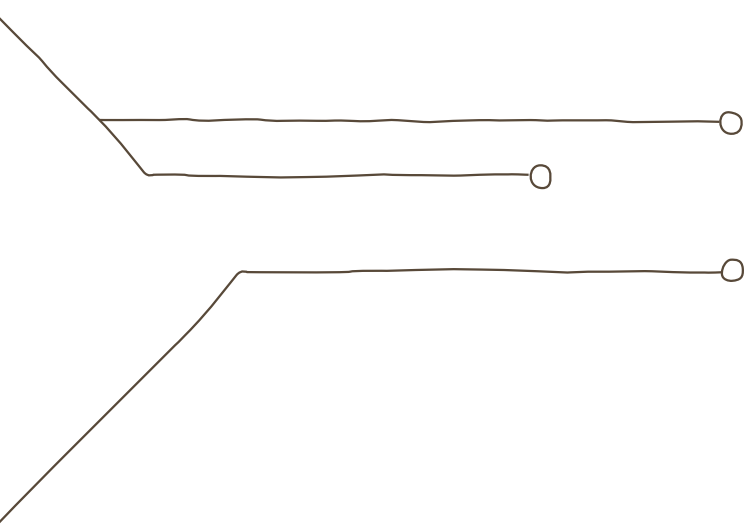
– *Can researchers, producers, and media mentors develop innovative ways to disseminate information to families about suggested apps and app selection techniques in ways that also fit into families' lifestyles?*

- **Lower income parents as a group showed slightly less interest in receiving more information from experts on how to select high-quality children's apps.** This finding is in contrast to prior research, which has indicated a higher desire for more expert-provided advice about general educational media among disadvantaged parents.[19] Regardless of the reason, the lower level of interest among lower income parents should inform communication and framing efforts by those providing expert information, as they may be less eager for this information relative to their higher income peers and relative to their desire for guidance about educational media generally.

  – *Does this finding hold with other samples of parents? If so, might it reflect a difference in parents' self-efficacy or anxiety levels regarding general educational media versus children's apps specifically?*

  – *Could it be that many parents do not feel a need for "more" advice from experts because they do not currently receive advice from experts regarding apps and therefore do not view it as a valuable resource?*

Research regarding best practices for children's educational app design has not kept pace with the proliferation of apps, and there is currently scant specific guidance to offer families as they navigate the huge array of apps available for children. Prior research on children's educational media at a broader level (not just apps on handheld devices) suggests that many parents who are aware of expert recommendations endeavor to follow those guidelines (e.g. from the American Academy of Pediatrics).[20,21] Our charge now is twofold: 1) to accumulate more empirically-driven guidance on how to choose and evaluate high-quality apps for children, and 2) to find methods to distribute that guidance in ways that will reach families across income and other demographic lines.



About the quick study

Methods

Study Design

This study utilizes an online, cross-sectional survey of 1,186 US parents with children between 3 and 6 years of age.[22] Participants were invited to the survey through a large national panel recruited by SSI (Survey Sampling International), a large polling company. Parents with more than one child between 3 to 6 years of age were asked to respond with regards to only one child (i.e., "target child"). All data were collected in October, 2016. Participation required approximately 15 minutes of a parent's time. Study procedures were approved by an independent Institutional Review Board.

Participants

In total, 1,200 parents agreed to participate and completed the full survey. We excluded data from 14 parents who reported that their target child was 7 years old, yielding our final analysis sample of 1,186 parents. The characteristics of the final participant sample and their target children are described in the tables below. More than half of the sample were mothers (56.7%), and most reported that they were White/non-Hispanic (78.2%). The majority of children used apps at least once a month (85.5%), and most owned fewer than 10 apps (66.8%).

Data Analysis

Parents were divided into 3 groups based on whether their annual household income was less than $50,000 (lower income), between $50,000 - $99,999 (middle income), or $100,000 or more (higher income). After examining means and frequency tallies for the full sample, we conducted tests to analyze differences based on parents' household income (i.e., compared values and frequency counts for variables among lower, middle, and higher income parents). We used cross tabulations with chi square tests for analyses involving frequency counts and analysis of variance (ANOVA) tests to assess differences in means for continuous variables. Statistical test values and corresponding p values are indicated for significant results.

Table 1: Characteristics of the parent sample (N = 1186)

	% of sample
Parent's household income	
Less than $50,000	**44.8**
$50,000 - $99,999	**35.9**
$100,000 or more	**19.3**
Parent's education level	
High school diploma or less	**26.6**
Some college / Associate	**35.0**
Bachelor's degree	**22.8**
Advanced degree	**15.6**
Parent is male	**43.3**
Parent's race/ethnicity	
White / non-Hispanic	**78.2**
African American	**8.6**
Hispanic (any race)	**8.4**
Other race/ethnicity*	**(4.8)**

* Includes parents reporting more than one race

Table 2: Characteristics of the target children (N = 1186)

	% of sample
Target child's age	
3 – 4 years	**45.8**
5 – 6 years	**54.2**
Target child is male	**52.1**
Target child's app use	
Never	**7.4**
Less than once a month	**6.8**
1-4 times a month	**22.9**
Several times a week	**33.9**
Every day	**29.0**
Target child's estimated number of apps**	
Less than 5	**28.6**
5 - 9	**38.2**
10 - 19	**21.3**
More than 20	**11.9**

**Among app-using children only (n = 1,098).

Table 3: Top sources of information parents use to find children's apps

	% of sample
Relational sources	
Adult family / friends	**44.7**
Child's siblings	**21.1**
Child / child's friends	**28.0**
Teachers / librarians	**32.6**
App store sources	
Search box in app store	**30.8**
App descriptions in app store	**29.7**
App rankings in app store	**21.4**
Consumer reviews in app store	**17.5**

	% of sample
Other sources	
Google / online searches	**27.5**
Parenting / other online blogs	**16.0**
TV advertisements	**12.1**
In-app advertisements	**5.9**
Parenting / other magazines	**8.3**
Expert review sites	**2.8**
Other	**0.3**

Note: Parents were instructed to select their "top 5" sources; n = 1,098 parents whose children use apps at all

References and footnotes

[1] Rideout, V. (2013). *Zero to eight: Children's media use in America 2013*. San Francisco, CA: Common Sense Media.

[2] Rideout, V. & Katz, V.S. (2016). *Opportunity for all? Technology and learning in lower-income families*. New York, NY: The Joan Ganz Cooney Center at Sesame Workshop.

[3] Vaala, S., Ly, A., & Levine, M.H. (2015) *Getting a read on the app stores: A market scan and analysis of children's literacy apps*. New York, NY: The Joan Ganz Cooney Center at Sesame Workshop.

[4] Rideout, V. (2013). *Zero to eight: Children's media use in America 2013*. San Francisco, CA: Common Sense Media.

[5] Rideout, V. & Katz, V.S. (2016). *Opportunity for all? Technology and learning in lower-income families*. New York, NY: The Joan Ganz Cooney Center at Sesame Workshop.

[6] Statista (2017, Jan). Number of apps available in the Apple app store from July 2008 - January 2017. Available from: statista.com/statistics/263795/number-of-available-apps-in-the-apple-app-store/

[7] Vaala, S., Ly, A., & Levine, M.H. (2015) Getting a read on the app stores: *A market scan and analysis of children's literacy apps*. New York, NY: The Joan Ganz Cooney Center at Sesame Workshop.

[8] SSI recruits participants to its national panel a variety of ways (e.g., website banner ads; social media). For this study they sent email invitations to panel members who had previously indicated they were parents of children between 3-6 years (confirmed via screener questions at the start of the survey). We set limited quotas to ensure diversity in socioeconomic status (e.g., sending a higher proportion of emails to panel members with lower household incomes). However, this sample should not be considered "nationally representative" as it was not drawn using probability sampling techniques. See: https://www.surveysampling.com/site/assets/files/1069/esomar-28-questions.pdf

[9] $50,000 or less per year was chosen as the criterion for the lower income group based on income distribution in our sample, as well as the U.S. cut-off for classification as low-income among a family of 4 people (i.e., 200% of the poverty level or $48,600; Cauthen, N.K. & Fass, S. (2008). *Measuring poverty in the United States: Fact Sheet*. New York, NY: National Center for Children in Poverty).

[10] Parents reported the number of apps that had been downloaded for their target child's use, on a response scale from 1 (less than 5 apps) to 6 (40 or more apps). An analysis of variance test indicated a significant difference in the average number of apps among families of the three income levels, $F(2, 1097) = 15.32$, $p < .001$. Post-hoc tests indicated that lower income parents reported that their children had fewer apps ($M = 2.02$ on the 6-point scale, $SD = 1.09$), compared to middle ($M = 2.35$, $SD = 1.08$) and higher income parents ($M = 2.38$, $SD = 1.10$).

[11] $X^2(6,1098) = 215.61$, $p < 0.001$.

[12] Listed ANY relational source: X^2 (2, N = 1098) = 56.81, $p < .001$. Recommendations from adult friends/family: X^2 (2, N = 1098) = 24.08, $p < .001$. Suggestions from child's siblings: X^2 (2, N = 1098) = 19.38, $p < .001$. Suggestions from child/friends: X^2 (2, N = 1098) = 15.18, $p < .01$. Recommendations from teachers/librarians: X^2 (2, N = 1098) = 9.59, $p < .01$. In each case, lower income parents differed from the higher income parents. Lower income parents differed from middle income parents with regards to recommendations from adult family/friends, suggestions from child/child's friends, and listing ANY relational source (i.e., at least one).

[13] Listed ANY app store source: X^2 (2, N = 1098) = 19.54, p < .001. App store search box: X^2 (2, N = 1098) = 20.38, p < .001. App descriptions in store: X^2 (2, N = 1098) = 18.94, p < .001. Consumer reviews in store: X^2 (2, N = 1098) = 6.69, p < .05. App rankings in store: X^2 (2, N = 1098) = 5.99, p = .05. In each case, lower income parents differed from the higher income parents. Lower income parents differed from middle income parents with regards to use of app descriptions and search box in app stores, and listing ANY app store source (i.e., at least one).

[14] On a scale of 1 (strongly disagree) to 7 (strongly agree), higher income parents (M = 5.26, SD = 1.67), middle income parents (M = 4.85, SD = 1.80), and lower income parents (M = 3.90, SD = 1.96), responded differently, F (2,1185) = 378.01, $p < 0.001$. A post-hoc (Tukey) analysis revealed that all three income groups were significantly different from one another.

[15] Using a scale of 1 (strongly disagree) to 7 (strongly agree), lower income parents (M = 5.09, SD = 1.58) middle income parents (M = 5.71, SD = 1.25) and higher income parents (M = 5.79, SD = 1.17) showed differing levels of agreement, F (2,1185) = 124.31, p < 0.001. A post-hoc (Tukey) analysis revealed that the lowest income group agreed with the statement significantly less than the other two groups did, and those groups did not differ significantly from one another.

[16] $X^2(4,1092) = 31.24$, $p < 0.001$.

[17] On a scale of 1 (Never) to 5 (Always), middle (M = 4.02, SD = 0.91) and higher income (M = 4.08, SD = 0.91) parents, on average, report more frequent app trialing than lower-income parents (M = 3.84, SD = 1.04), $F(2,1097) = 6.29$, $p < 0.01$. A post-hoc (Tukey) analysis revealed that the lowest income group was significantly different from the other two higher-income groups, who did not differ from one another.

[18] Vaala, et al. (2015)

[19] Rideout, V. (2014). *Learning at home: Families' educational media use in America*. New York, NY: Joan Ganz Cooney Center.

[20] Beck, A.L., Takayama, J., Badiner, N., & Halpern-Felsher, B. (2015). Latino parents' beliefs about television viewing by infants and toddlers. *Journal of Health Care for the Poor and Underserved, 26*, 463-575.

[21] Lapierre, M.A., Piotrowski, J.T., & Linebarger, D.L. (2014). Assessing the relationship between pediatric media guidance and media use in American families. *Clinical Pediatrics,*53(12), 1166-1173.

[22] The survey also contained an experimental portion, not reported here, in which parents viewed and answered questions about a description of a hypothetical children's app.

advancing children's learning in a digital age

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