

Information Seeking Practices of Parents: Exploring Skills, Face Threats and Social Networks

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ABSTRACT

Parents are often responsible for finding, selecting, and facilitating their children's out-of-school learning experiences. One might expect that the recent surge in online educational tools and the vast online network of information about informal learning would make this easier for all parents. Instead, the increase in these free, accessible resources is contributing to an inequality of use between children from lower and higher socio-economic status (SES). Through over 60 interviews with a diverse group of parents, we explored parents' ability to find learning opportunities and their role in facilitating educational experiences for their children. We identified differences in the use of online social networks in finding learning opportunities for their children based on SES. Building upon these findings, we conducted a national survey in partnership with ACT, an educational testing services organization, to understand if these differences were generalizable to and consistent among a broader audience.

Author Keywords

Social Network; Parents; Educational Opportunities; Information Access

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous

INTRODUCTION

Parents are among the most important educational influences on a child. They frequently select the out-of-school activities for their children and play a critical role in facilitating learning with those activities [3,8,30]. Today, the role that parents play in finding and accessing these opportunities for their children is intricately tied to their information technology use.

There is a movement to make access to education more equitable. The recent efforts in online educational websites, tools, and games often claim to strive for the goal of providing free and accessible education or *Education for Everyone* [19,23]. However, the low cost and high availability of these resources do not guarantee adoption and use among different groups. Researchers suggest that the children of the wealthy and well-educated take more advantage of these free tools than the children of less well-off and less-educated parents. This has resulted in a greater educational divide, leaving our most vulnerable children even further behind [34,35]. While some audiences are able to navigate and critically evaluate online learning resources, low-income and low-educational families' ability to access these resources is less explored.

While it is assumed that there are differences in parents' information seeking practices as well as the technology access and use among different groups, we seek to identify some of these differences through empirical evidence provided by interviews and a national survey. This includes findings from over 60 interviews with parents across different socio-economic groups, about their ability to find learning opportunities and their role in selecting the educational experiences for their children. These findings showed differences in the use of educational technology resources between high and low socio-economic groups. Lower-socioeconomic status (SES) parents did not use educational resources as frequently; and when they did seek educational resources, their search was not as effective as their more affluent peers. This motivated us to complement the interviews with a national survey from 977 parents across the U.S. to better understand if these differences were generalizable to, and consistent among a broader audience, and if so, why those differences existed.

Initial interviews were conducted with parents from lower-SES and [22] we found three areas that called for closer examination: (1) perception of technical skills, (2) concerns about face saving, and (3) access to social networks for parenting information. Based upon these areas, we conducted additional interviews with higher-SES parents and a national survey. Combining the qualitative interviews with the quantitative data, we addressed three research questions.

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CHI 2016, May 7–12, 2016, San Jose, California, USA.

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DOI: <http://dx.doi.org/10.1145/2858036.2858586>

RQ1: Is there a systematic difference in perceived technical skills of parents from different socio-economic backgrounds?

RQ2: Do face saving concerns among parents cause them to be wary of asking for advice on social networks? Do these concerns vary in intensity among parents from different socioeconomic status?

RQ3: Is there a difference in how parents from different socioeconomic backgrounds view the effectiveness of social networking tools for attaining information about educational resources for their children?

In the following sections, we situate this study in previous work on parents' access and use of information technology and social networks. Then we explain the data collection, the methods used, and present our findings. In the discussion section, we address the research questions and address implications for design based upon the findings.

BACKGROUND

Information Technology and Parenting

In domains such as public health, targeting parents as users of online resources has proven to be effective in improving information delivery among marginalized communities. Research with mothers has begun to explore how their use of online resources for health information may lead to positive outcomes such as seeking appropriate health care [21]. Access to online resources has also been shown to improve general parenting skills. Na and Chia [29] found that access to online resources increased parents' confidence in their parenting skills, the amount of time they spent with their children, and their perceived level of knowledge of their children's development. Access to learning resources among some low-income parents has been explored, finding that access was complicated by technical issues, trust, and the use of shared devices [22]. Of course, the Internet offers more than a simple list of resources; it also offers community and social networks. To date, there has been minimal work done that looked at parent's online social networks [12,28].

Issues of access to learning resources, particularly access across socio-economic divides persist in contributing to educational disparity in the U.S. In a study to better understand this issue, Reich [36] looked at the use of open access wikis in schools and found that higher income and higher track students were disproportionately more likely to use these resources. Similarly, in looking at the educational achievement gap, Reardon [33] suggested that the access to informal learning through technology is contributing to widening the educational divide in the U.S. This division between use has been characterized by Attewell [1] as the second digital divide: the gap between how learners use technology in different communities.

Social Networks, Capital, and Access to Information

The benefits of maintaining and drawing on a network of strong and weak ties have been well studied. Learning new

information is more likely to happen through connections that are not embedded in one's close network. This is because individuals within the same network are most likely to be exposed to the same sources of information. Therefore, establishing ties that would bridge the structural holes would increase one's chances of being exposed to new information and build social capital [15]. Social capital, commonly defined as benefits made possible by the existence of an aggregate social interactions and social structure, allows individuals to draw on resources from other members within their networks [7].

To better understand the social networks, we seek to understand the individual applications of social capital. De Souza Briggs [38] suggests that the current use of social capital as a framework, such as Putnam's [32] analysis of public engagement in *Bowling Alone*, is frequently focused on large groups and their collective dimensions in neighborhoods, cities, and even nations to identify patterns in civic engagement. In response, De Souza Briggs puts forward a framework to better understand the individual applications of social capital and to understand micro-level dimensions and the many variations of social capital better. This framework abstracts two types of social capital in relational networks that are similar to Granovetter's [15] strong and weak ties.

The first is social support wherein relationship ties are "strong" ties with individuals such as family and close friends that offer social support and help with day-to-day coping and burdens. These relationships help to ensure basic needs are met (e.g., childcare, transportation, or emotional support). The second is social leverage wherein relationship ties are often "weak". In this case, individuals interacting across large heterogeneous groups offer a greater diversity of help than strong ties. These relationships provide a broader range of opportunities and perspectives resulting in greater opportunity for upward mobility. One of the strongest predictors of upward mobility in lower-income populations correlates with social capital [5].

Lin and Dumin [26] find that there are racial and gender inequalities in the building of social capital—inequalities that perpetuate advantage and disadvantage. This is problematic when considering that these same disadvantaged groups have been shown over time to have less access to financial resources and less access to education. The lens of social networks allows us to examine individuals' weak and strong ties in supporting or not supporting the use of information technology for learning.

Online Social Networks for Parenting

Application of this framework helps in understanding socioeconomic status impact on parenting. For example, in an ethnographic analysis of low-income African American and Hispanic mothers' social support systems, Dominguez and Watkins [11] found that social support and social leverage networks can work in tandem or in tension to

impact day-to-day survival and upward financial mobility. The social support systems of these low-income parents was critical to meeting day-to-day needs and for coping with stressful life circumstances. However, these strong ties tended to be homogeneous and offered few new opportunities for upward mobility, while at the same time required time consuming and professionally limiting expectations on women.

When examining the effect of parents' social capital on their children educational achievements, the ability to bridge social capital through parents' weak ties has been linked to increased opportunities available to children [13]. Burke et al. [4] have associated active use of online social networks, which promote weak ties, with increased social capital and reduced loneliness. This suggests that the Internet may offer parents opportunities for more heterogeneous networks through weak ties that can provide information on new opportunities or new perspectives on problems [39].

Perception of Technology Skill and Appropriateness of Online Networks

In previous studies with parents from financially depressed neighborhoods, we found that a lack of perceived technical skill impacted parents' use of social networks [10,22]. They were often skilled at using technology but did not see themselves as "tech people" and did not see social networks as something "for them." We suspect there is a confluence between what people perceive as technical in nature, what information resources are for *tech people*, and the type of people who use many social networking sites.

Some work in this area has looked at the sociocultural significance of consumers' deliberate choices about not using a particular media. For instance, Portwood-Stacer has looked at the performative and political aspect of non-participation on Facebook in the context of neoliberal consumer activism [31]. Others have looked at the underlying factor, such as socioeconomic, gender, or digital access, which may pose barriers for using a specific piece of technology and force non-use for certain groups of potential users. In a study of predictors of social networking sites use among young adults, Hargittai looked at age, gender, ethnicity, and parents' education (as a proxy for total household income) among young users of several social networking sites, including Facebook, and found unequal participation based on user background and concluded that differential adoption of such services may be contributing to digital inequality [16,17].

Face Saving in Online Social Networks

In social networks, people carefully curate their online personas; and therefore, one reason for non-participation may stem from refraining from sharing information about themselves where there is a face saving threat. Previous research shows that people use face saving mechanisms, tactics to preserve their credibility or reputation, in how they present themselves on social media (e.g., [27]). These

mechanisms become particularly important when the subject is sensitive. A recent study on how new mothers share photos and updates about their babies on Facebook revealed that parents had intricate concerns about sharing information about their child online [24]. In the context of this study, parents may be hesitant about sharing parenting practices and risk the chance of those practices being negatively judged by their connections. Therefore, we hypothesize whether face saving concerns among parents cause them to be wary of asking for advice on social networks, and whether these concerns vary in intensity among parents from different socioeconomic backgrounds.

METHODS

Data collected for this study includes qualitative semi-structured interviews with 63 parents, and an online survey with 977 parents.

Semi-Structured Interviews

Researchers conducted semi-structured interviews in three rounds with three different parent audiences. All three rounds used the same interview protocol, which started with questions about participants' children, their ages, and gender. After this introduction, researchers asked a series of questions about technical access issues outlined by DiMaggio et al.'s five dimensions of digital access [9]. Researchers then asked a series of questions about the participants involvement in formal and informal (out-of-school) education of their children (based on the parenting role outlined by Barron et al. [3]), the role that technology plays in their child's education, and their expectations for their child's future. At the end of the session, researchers asked participants to answer a survey about demographic information such as their employment and relationship status, partners in parenting, and number of children.

Interviews generally took between 30 minutes to an hour (a few outliers were two hours) and were audio recorded, transcribed, and coded by multiple researchers for emergent and anticipated patterns related to access, information seeking practices, and parenting roles (see Table 1).

Researchers established the codebook by building upon codes developed in a previous study regarding a parent's role in developing their child's technological skills [3]. We expanded those codes to include non-technical learning. In addition, we used codes developed from an analysis of digital inequalities [9] that had been used in previous studies [22]. During the coding process, other parenting roles emerged (i.e., *monitoring*) and other access issues emerged (i.e., *social networks*) (see Table 1). Two researchers coded, refined codes, and trained on coding reaching .80+ inter-rater reliability on 20% of the first round interviews. Inter-rater reliability is reported using Cohen's Kappa statistic—Cohen [6]. Landis and Koch [25] describes the kappa values of: .81-1.0 = very good agreement. One of the researchers coded the remaining interviews. The authors reviewed the groups of excerpts for each code in order to identify patterns in the data.

Code	Description
Connection with School ¹	Any aspects a parent's relationship with schools & teachers, including issues of: (1) trust, (2) authority, (3) intimidation, or (4) frequency.
Parent Role: Monitoring ¹	Parent checks with their child or school to make sure the child is doing homework, attending school, and maintaining grades.
Parent Role: Learner ²	Parent learns technical skills/content or non-technical skills/content from child.
Parent Role: Resource Provider ²	If a parent pays money for a resource or they already have it and they lend it.
Parent Role: Learning Broker ²	Parent provides access to learning experiences through networking, searching, driving or other ways that enable learning.
Parent Role: Collaborator ²	Parent and child working on something together throughout the experience, from start to finish.
Parent Role: Teacher ²	Parent identifies a learning goal and helps the child achieve that learning goal, but eventually fades from learning experience.
Parent Role: Consultant ² / Mentoring ¹	Parent provides information /advice /encouragement to child on non-academic issues such as business or artistic design.
Social Networks ¹	Use of online or offline social networks to gain information about parenting.
Digital Access ³	Ways in which access is impacted: (1) means, (2) autonomy, (3) variations in purpose, (4) social support, or (5) skill.

Table 1: Summary Codebook for interviews; ¹ emergent code, ² anticipated code based on [3], ³ anticipated code based on [9].

Researchers conducted a first round of interviews with 28 parents in economically depressed neighborhoods in a Southern U.S. urban area. These parents were generally lower-SES with family annual incomes below \$50k. Researchers compensated participants with \$15 for their time. A greater number of female participants followed the same pattern of imbalance in (1) parents' participation we observed at a local parent center, and (2) school events where we recruited. Recruited parents had a diverse range of engagement levels with their child's education, from presidents of Parent Teacher Associations to parents who rarely visited their child's school.

Round two interviews were conducted with 15 parents from higher-SES families (with annual family incomes generally above \$50K) in small towns and rural areas in the mid-west of the U.S. These interviews were conducted in collaboration with ACT Inc. Researchers compensated participants with \$15 for their time. Participants were recruited through ACT employee networks and snowball

sampling by asking recipients to forward recruitment text to any parents with school-aged children who might be interested in participating in the interview.

In round three, researchers conducted interviews with 20 parents from higher SES backgrounds, from suburban and urban areas across the U.S, but concentrated in the southwest. There was no financial compensation for these participants. Forty students in a graduate level class on qualitative methods conducted these interviews. While there was less consistency in the quality of these interviews, the great majority were of a similar quality to the interviews conducted by other researchers on our team. Two students participated in each interview to help keep notes and to make sure no questions or opportunities for further probing were overlooked. All students had done at least one interview as a class assignment previous to this and most teams consisted of at least one student with human computer interaction research experience in the industry or in academia. Most of these families had incomes above \$50K, but several were graduate students with family income below that level. Because of their high education level and earning potential, we considered them as part of our higher SES group. Student interviewers recruited participants through personal networks, which contributed to an over sampling of graduate students. This was taken into consideration in analysis of data by placing greater emphasis on the non-graduate student participants, which were over 85% of our interviews with higher-SES parents.

Online Survey

The online survey was conducted in partnership with ACT. ACT is a non-profit national testing and assessment organization that engages parents across broad socio-economic and geographic boundaries in the U.S. The survey was distributed to 10,000 randomly selected individuals. These were parents of school age children who had taking one of the ACT tests or used their services. In addition, we used snowball sampling, by asking email recipients to forward the survey to other parents with school-aged children who might be interested in taking the survey. Approximately 1,500 people accepted the invitation and started the survey. ACT scrubbed the data, eliminating incomplete or obvious erroneous responses, resulting in 978 completed surveys containing valid data. Of those 978, one respondent did not answer any of the questions analyzed within this paper so it was excluded, yielding 977 participant data points. Responses to the ACT survey were gathered over two and a half weeks during July 2014.

Online surveys about information technology have inherent biases [37]. Some of this bias is mitigated by the mission of ACT, to serve students from broad demographic backgrounds by engaging parents early in their children's K-12 careers, but parent involvement was dependent upon their use and access to a computer and the Internet. The survey was further limited in that it was only offered in English, eliminating the parent population that would have

more likely engaged with a Spanish language survey. However, the response rates from parents of different races, educational backgrounds, and income levels indicate responses from a wide range of participants that provide comparative data for analysis. ACT compensated participants with a \$5 gift card for participating, and estimated survey time was 30 - 45 minutes. Survey questions focused on parents' information seeking attitudes and practices in regard to education and general parenting advice. The survey concluded with demographic information, including age, gender, household income, and parents' highest degree of education.

The ages of parents were representational of those with school age students with majority (68%) of participants being between 30 and 49 years of age, and the second largest group (28%) was between 50 and 64 years of age. Similar to our interviews, female participants were over-represented in our data (81%). Our recruiting method (sending email to parents who had enrolled their child in ACT tests or services) suggests that female participants are over representative of the parents who are involved information gathering for children's educational activities.

Self-reported Racial Identity	% of Respondents
Indian or Alaskan Native	2.5%
Asian	8.7%
Black or African American	12.3%
Other	2.6%
White or Caucasian	73.7%

Table 2. Reported racial identity of survey participants.

The racial representation was relatively balanced when compared with national data [41] (see Table 2). However, participants' ethnicity was asked in a two-part question. First, we asked them to indicate whether they were Hispanic or non-Hispanic. The next question went on to ask about their specific ethnicity. An error in the survey design resulted in having only 20 participants that answered the 'Hispanic or non- Hispanic' questions, which made race and ethnicity data unreliable for comparative analysis.

Educational Attainment	% of Respondents
Doctorate or professional degree	7.70%
Master's degree	19.84%
Bachelor's degree	32.37%
Associate degree / Vocational	15.18%
Some college, no degree	13.16%
High school diploma or equivalent	8.32%
Less than high school degree	4.42%

Table 3. Reported educational attainment of survey participants.

The educational breakdown of participants is shown in Table 3. The majority (60%) of participants had a bachelor's degree or beyond.

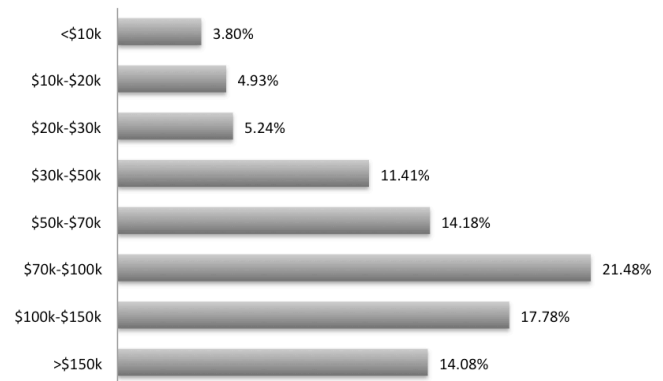


Figure 1. Reported income of survey participants.

While we asked for greater granularity within the survey, for the purposes of analysis, we placed participants in four categories for annual income (1) \$10k – \$30k (low-income), (2) \$30K - \$70K (lower middle-income), (3) \$70K – \$150K (upper middle-income), and (4) \$150K or higher (high-income). As demonstrated in Figure 1, our data is skewed toward higher income populations, but there were enough responses across income levels to offer comparative data.

FINDINGS

Our first round of interviews highlighted three areas that needed further exploration: (1) perception of technical skills, (2) concerns about face saving, and (3) access to social networks for parenting information. Based upon these areas, we conducted two more rounds of interviews that included parents in higher-SES and a national survey. In our analysis, we sought to bring together the interview findings concerning these issues and the survey findings. In the Findings section below, each of these areas is expressed as a research question, and the findings that inform answers to these questions from both the interviews and the survey are presented.

RQ1: Is there a systematic difference in perceived technical skills of parents from different socio-economic backgrounds?

In previous work, we found a perception among lower-SES female parents that they did not have strong technical skills. This seemed to hamper their interest in talking about and using information technology [10,22]. We did not observe the same perception among higher-SES parents. Rather than avoiding technology, they often had the confidence to try and teach their children technology. In some cases, such as Shoshanna (all names are pseudonyms) who was confident in purchasing books to foster an interest in technology, and who also planned to teach something to her child that she acknowledged that she might find difficult.

So I got her a couple of books on Python programming, and she kind of dabbled in it a little, but not very much...I have agreed that basically she's going to try to, ya know, basically do like a CS one this summer, and it will need to-it will be kind of self plus mom directed. So we'll see how that goes, I mean that will definitely be an experiment in a level of involvement that I have not had. (Shoshanna, higher-SES parent)

Using interview findings to answer RQ1, we found that lower-SES parents perceived they had lower technical skills and higher-SES parents did not express concern about their technical skills. To better understand the generalizability of this finding, we surveyed participants about their perceived level of technical skill in working with computers in general, concentrating on Internet skills specifically. We asked the participants to rate their perceived skills in seven different general areas (see Table 4 for exact wording of statements) on a 5 point Likert scale. A principal component factor analysis was completed to determine the number of factors addressed by the question. A single component was identified, which had an Eigenvalue greater than 1 and which explained 71.97% of the variance. Therefore, we concluded that the statements addressed a single underlying construct: perceived level of technical skill. The loading for each statement can be seen in Table 4. Because each loading is greater than 0.7, these seven questions were collapsed into a single composite score.

Statement	Loading
I consider myself to be good with computers.	.874
I feel like I can fix most problems on my computing devices on my own.	.889
I feel like I can find my way around on computers without help from others.	.877
I feel comfortable using the Internet on computers.	.856
I feel like I'm good at searching online (for instance via Google) and can find information that I am looking for	.855
I feel comfortable using portable devices such as smart phones or tables (general use).	.852
I feel comfortable using the Internet on portable devices such as smart phones or tablets.	.725

Table 4. Factor loading per statement on perceived technical skill.

Findings from the interviews demonstrated that lower-SES parents admitted a lower perceived technical skill level, while higher-SES parents did not [10,22]. Therefore, in the survey data we examined, if there was a correlation between perceived technical skill and income or education level of the parents. We found a positive correlation between perceived technical skill and income (Spearman's

$\rho = 0.150, p < 0.01$) and between perceived technical skill and parental education level (Spearman's $\rho = 0.180, p < 0.01$). Spearman's ρ is used because we have one continuous variable (perceived technical skill) and one categorical variable (income or education). These results support our interview findings and indicates that more affluent parents and those with more education perceive that they have higher technical skills.

RQ2: Do face saving concerns among parents cause them to be wary of asking for advice on social networks? Do these concerns vary in intensity among parents from different socioeconomic status?

In our interviews, we found evidence that fear of embarrassment or being perceived in a negative way, i.e., face saving threats, was a concern for lower-SES parents, particularly in their interactions with teachers and schools. We did not find evidence of similar concerns about face saving among higher-SES parents in our interviews. Some lower-SES parents, such as Ronda and Sheri, indicated they felt or saw how teachers could be intimidating, particularly with those teaching at higher-grade levels.

I just feel like I just can't have a relationship with some of his [high school] teachers because they're different to me than the elementary teachers. [Ronda, lower-SES parent]

[Parents] get intimidated when they don't know. When the teacher's talking to them and they say certain words, they can't figure it out. [Sheri, lower-SES parent]

Interview findings inform RQ2 by indicating that lower-SES parents do have face saving concerns and that higher-SES parents did not express similar concerns. To determine how pervasive face saving threat was in parents' information searching behavior, we included four questions in our survey concerning the amount of face saving threat parents felt when seeking information from different input sources regarding their child's educational and career goals. The survey asked participants to rate how much they agreed or disagreed with seven different statements for each input source (teachers/school counselors, educational websites, offline connections, and online social networks). An example question can be seen in Figure 2.

□ How much do you agree or disagree with the following statements? If I look to educational websites for help regarding my child's educational and career goals...

1. Others would think less of me
2. Others would think me less worthy
3. Others would judge me negatively
4. Others' view of me would be more negative
5. Others would view me as inadequate
6. Others would have a poor impression of me
7. Others would view me as inferior

Figure 2. Example question regarding hypothetical face saving threat.

Note that the underlined words in Figure 2 were changed for each question based on the input source (teachers/school counselors, educational websites, offline connections, and online social networks).

A principal component factor analysis was completed four different times – one for each question for the different input sources (school counselors / teachers, educational websites, offline connections, and online social networks) – using all seven statements. We wanted to identify all possible factors that might exist for each input source, and that we were measuring only face saving threat for each input source.

For each input source, the principal component factor analysis identified a single component. The amount of variance explained for each of those single components per input source is shown in Table 5.

Input Source	% of Variance Explained by Component
Teachers / Counselors	88.58
Educational Websites	91.47
Offline Connections	92.70
Online Social Networks	95.48

Table 5. Percentage of variance explained by each component.

In each principal component factor analysis completed, there was a single Eigenvalue greater than 1, and all of the statements had a loading greater than 0.9 (in all four analyses). As a single factor (face saving) was identified for each question, the sum of the answers for all seven statements in each question was calculated and used for correlation tests.

We sought to determine if different socio-economic groups felt different face threats with different input sources. Negative correlations were found between teachers / counselors and income (Spearman’s $\rho = -0.158$, $p < 0.01$); educational websites and income (Spearman’s $\rho = -0.148$, $p < 0.01$); and offline connections and income (Spearman’s $\rho = -0.150$, $p < 0.01$). Again we used Spearman’s ρ as we have one continuous variable (face threat) and one categorical variable (income). These findings indicate that face threat is less of an issue as income increases when seeking information from teachers / counselors, educational websites, and offline connections. More affluent parents would not be embarrassed or ashamed to ask for information from teachers / school counselors or seek information from educational websites or their offline connections. We found no statistically significant correlations concerning online social networks and income. No statistical significant difference was found based on parent education with any of the input sources.

We further explored the results for parent usage of offline network connections based on reported parent income. The descriptive statistics for these values can be seen in Table 6.

Annual Income	Offline Connections		
	N	Mean	Std Dev
Low (\$10K - \$30K)	129	12.50	7.19
Lower-middle (\$30K - \$70K)	234	11.86	7.23
Upper-middle (\$70K - \$150K)	359	10.83	6.25
High (> \$150K)	128	9.11	4.10

Table 6. Descriptive statistics by income for offline face-saving questions.

Since we found a statistically significant correlation in face threat in offline connections based on income category, we sought to identify the groups that were behind the difference. We, therefore, conducted an ANOVA test using the offline connections aggregated sum as the dependent variable and income as the independent variable, grouped by income category. We found a statistically significant difference in face-saving with offline connections based on reported income level $F(3, 846) = 7.425$, $p < .0005$; partial $\eta^2 = 0.026$. (Note, a Bonferroni correction was made to account for multiple ANOVAs being run, thus in this case, we accept statistical significance at $p < 0.0167$.)

Further statistical analysis using a Tukey’s HSD post-hoc test revealed that the mean scores for face saving in offline connections were statistically significantly different between the most high income group and the low income group ($p < 0.0005$), and between the most high income group and the lower-middle income group ($p < 0.001$), but not between the most affluent income group and the higher-middle income group ($p = 0.047$ – remembering the Bonferroni correction necessary). In general, this means that most affluent parents do not feel a need for face saving techniques when seeking input from offline connections as compared to their less affluent peers.

The national survey supported our interview findings that offline face saving concerns were greater with lower-SES parents. This brings to light that that face threat was a greater concern for low and lower-middle income parents, as compared to the high-income parents, when dealing with offline connections. However, the national survey also demonstrated that face saving was a concern for parents across all groups in all modes of interaction.

RQ3: Is there a difference in how parents from different socioeconomic backgrounds view social networking tools for attaining information about educational resources for their children?

In our interviews, lower-SES parents talked little about using online tools or social network sites to better help their children with their education. These services are of particular interest since they are playing an ever-increasing role in children and young adults’ academic and professional success.

Lower-SES parents spoke about *monitoring* (see Table 1), a pattern of parental engagement focused on checking that

their child completed their homework and received passing grades. These parents spoke to us about offline interactions with their child and their child's teachers centered on making sure that the child was on track, maintaining a desirable performance in school subjects. For example, Marie talked about a conversation she had with a teacher moments before the interview.

To make sure he's educated. I keep up with everything because I'm old-school. So, I attend all the meetings. I check the Parent Portal every day. A lot of teachers... don't put the grades in like they should. As a matter of fact, before I left, I was late getting here because I had to stop and talk with his social studies teacher... So, she was sitting in her class by herself and I asked her. She said there was something going on with her putting grades in. So, she went in and she showed me his grades. He was doing good in her class. [Marie, lower-SES parent]

Lower-SES parents mentioned concerns about their child's performance at school. Lily told us about communicating with the teachers to see what is causing the problems and how those problems might be addressed.

But sometimes when you have children not doing well in some places and they're not good in, then you say, "Okay. What didn't you understand?" So, most of the times I'll go to the teacher. [Lily, lower-SES parent]

Higher-SES parents mentioned a much broader set of resources and used them as *learning brokers* (see Table 1) for their children. They not only spoke of using online learning resources and encouraging their children to use them; but, they also talked about seeking out specific resources based on a desire for their child to pursue a specific interest. The primary way to find these resources was from their social networks. Parents, such as Ginger, were very aware of the advantage of these networks.

And there are some moms I know. They set at home every day, and they go through the private school websites and literally make notes about what activities and extracurriculars of private schools, the best ones... They'll look at that and say, "Oh, these are the things that they are doing. I wonder how I can get my child involved in these types of things." Those parents are great resources. There's one I call "the oracle." If I need to know anything about anything, I go to her. [Ginger, higher-SES parent]

Higher-SES parents such as Alex and Sasha, also actively engaged in social network sites in rather formalized ways and strategically for finding formal and informal learning opportunities for their child.

So it's kind of a network, a [online] parent network, through which I find out about a lot of things. And once you plug into something really good, like when we plugged into governor's honors or Duke TIP, you start seeing other resources that are there as well. [Alex, higher-SES parent]

Honestly, the things I've heard have usually been through word of mouth, through family members or family friends. A lot of the moms in the class, we're on a Google Group, so we'll all email each other when there's different events coming up, or when there's an educational thing that we want to bring to the school. So that's how I found out a lot of the information. [Sasha, higher-SES parent]

Not surprisingly, with access to larger amount of financial resources, we also saw a strong pattern among higher SES parents acting as *resource provider* (see Table 1) for their child, purchasing things and lending resources to help their child access to out-of-school learning opportunities to spark an intellectual interest in their child and to excel beyond school curriculum. Often times these were directly or indirectly involved with technology. For example, Amy sought to leverage her daughter's interest in crafting into an experience in creating an online shop.

My daughter loves to craft, and I'll sit down and do like a large-style crafting project. She wants to start a store that she paints her own T shirt and hats and sells them on Etsy. So I'm trying to help her set that up. [Amy, higher-SES parent]

Higher-SES parents spoke about using information technology and the free online learning resources to improve the learning opportunities and experiences of their children. Lower-SES parents typically did not mention using any of the free online education resources. Nor did lower-SES parents do research on careers and academic trajectory for their children.

Instead lower-SES parents talked about encouraging their children to do what made them happy and to stay in school but did not talk about helping to find information about how to reach those goals. Emily highlights the sentiments of many of these parents.

I let my kids know how I feel about going to school, but I don't think personally that college is for everyone. You have to decide. I don't want to make you go to college and you're stuck with loans. It has to be something you want to do, but you've got to do something. You've got to get out and work, military or school. It's got to be one of them. It's up to you. [Emily, lower-SES parent]

In contrast, a pattern emerged among higher-SES parents where they helped their child strategically think about their future. John encouraged his children to think beyond their grades and about other ways to stand out to college admissions.

You have to plan ahead. You have to know not just about meeting the deadlines; your child has to be competitive to be able to get accepted into a lot of the programs. [John, higher-SES parent]

Parents with lower-SES similarly participated in online networking in successful ways, such as Mona's efforts looking for a job.

I have my job websites linked up to my Facebook and they'll link jobs to me that they're not linking to my email or they're not posting. [Mona, lower-SES parent]

However, they did not talk about participating in online social networks for parenting help or about finding educational resources for their children, even though the nature of these two tasks (i.e., 'finding information about available job positions', vs. 'finding information about educational resources') is very similar.

RQ3 asked if there is a difference in how parents from different socioeconomic backgrounds viewed social networking tools for attaining information about educational resources for their children. We found evidence that lower-SES parents used offline connections with teachers as their primary source for information and focused their efforts on educational information tied to school performance. With higher-SES parents, we found evidence they used a variety of online and offline social networks to attain information about formal and informal learning opportunities for their children.

These interviews also demonstrated that parents took on different roles, such as lower SES-parents *monitoring* and higher SES parents acting as *learning brokers*. These different roles impacted the type and ways parents sought information, i.e. lower-SES parents checked with teachers about grades and higher-SES parents sought information about multiple factors that impacted a child's acceptance into schools or educational programs. However, it is important to note that lower-SES parents talked about their use of social networking sites for purposes other than seeking out educational resources, such as job seeking. Demonstrating that lower-SES parents are competent with and open to using social networking sites for information seeking.

To help establish if these patterns were more generalizable, in the national survey, we asked participants about the amount of information they had sought concerning their child's educational and career goals. For each possible input source, the participant answered on a five point Likert scale from 1 = sought very little to 5 = sought a great deal. In analyzing the responses to this question, we found a negative correlation between the actual reported use of online social networks for information and parental income (Spearman's $\rho = -0.114$, $p < 0.01$). This indicates that higher levels of parental income report less usage of online social networks as an information source.

This contradicts our interview findings, where higher-SES parents talked about more online information seeking and lower-SES parents primarily talked about seeking information from teachers. However, it may be that higher income parents seek more information sources for educational resources, such as educational websites, family members, and neighbors, and use online social networks less. This is a question that needs further investigation.

We were also concerned that lower-SES parents talked less about information resources other than teachers because they did not trust the credibility of other resources. To address this and to further inform RQ3, we asked two questions in the survey concerning the outcome expectancy of various sources of information. The first question referred to the quality of information, and the second referred to the impact of information from different sources. Analysis of the answers to these questions identified no statistically significant correlations between income and answers.

The survey demonstrates that lower-SES parents reported more usage of online social networks for locating educational information. However, our interviews indicated that lower-SES parents rarely used online or offline social networks when seeking educational resources. This suggests that they may be looking for educational resources less often, or it may suggest that the interviews with lower-SES parents were not representational of the national survey lower-income parents. Previous research suggests the strong and weak social network ties of lower SES may also contribute to this contradiction. While all groups have homogenous networks within their strong ties, previous research indicates that lower-SES parents have less diverse social networks and not as likely exposed to the diversity of information resources available [11,38]. Thus, while the survey we conducted indicates low-SES use online resources, they may lack awareness of the wider range of educational resources online because of a focus on strong ties that are homogenous.

Indeed, the lower-SES parents interviewed expressed deep interest and concern with their child's education with the best resources available to them: teachers and taking on *monitoring* roles regarding their children's formal education. In contrast, the higher-SES parents told us about complex information seeking practices and online social networks to improve their child's learning experiences, frequently with a focus on out-of-school learning.

DISCUSSION

The findings indicate that perceived technical skill, concerns with face saving, and ways that parents access information about educational resources differ across socioeconomic status families. Background information supports that technical skill and face saving can impact online interactions. Background information also provides us with insights about how strong and weak ties can impact information-seeking practices, and indicates that online social networks may be a method for increasing heterogeneous social networks and providing diverse information.

Perception of Technical Skill

Perception of one's skill can be as important as technical means to access information technology or social network sites [2]. This difference becomes particularly important when we are considering the services that directly impact

one's educational, economic, and social status. For instance, research on young adults' Internet use shows that there is a positive relationship between one's education and self-reported technical skills and the number of capital-enhancing sites he or she visits and research on gender and perceived skills show that females underestimate their skill level [18].

But how can technology be the solution for people who perceive they have low technical skills? More intuitive designs and simpler interactions are certainly one way to address this issue. But it is also important to note that many times, it is simply the notion of technology that scares people away [14]. In our previous study with parents in marginalized communities, we found that many parents are more capable with technology than they believe. There are often identity barriers associated with the use of technology in general, and social networking platforms in particular among these parents [10]. So while the level of technical abilities demonstrated by the lower-SES parent participants was clearly beyond the skill level needed for using social networking services, such as Facebook, these parents did not necessarily recognize that ability. However, once they are encouraged to try these tools in the context of activities closely related to their interests and everyday lives, the perceived technical barrier fades and parents found using these tools easy, enjoyable, and consider them valuable in getting connected with other parents [10].

Concerns with Face Saving

Previous research suggests that other cultural factors, that may have correlation to SES, can impact when and how face threat is experienced [40]. This study demonstrates how this can impact the information seeking practices of lower income parents and further suggests that a greater awareness of face saving threat in the design of interfaces and social network sites used for finding informal learning resources could reduce face saving threat to parents.

This might mean designing to navigate around face saving threats, or to offer face saving alternatives for activities that might cause fear of embarrassment. For example, rather than offering tips to a first generation college student and their parents, which may place them in a defensive position, designers could choose to provide narratives about what it is like to be a first generation college student that any parent might read. Similarly, as an alternative to talking to teachers, who may be intimidating to some parents, anonymous online resources that take into account reading levels and previous knowledge and may reduce face saving threat.

Ways of Accessing Information

Parents who have a strong relationship with their child's teachers is considered a positive sign for educational attainment [20]. However, lower-SES parents relying on teachers as the primary resource for information on informal learning, which could be limiting to their child's educational opportunities. We were initially concerned that

lower-SES parents were relying on teachers because they did not trust other information resources. Yet, the findings in this study indicate that credibility and trust are not particular barriers to lower-SES parents using social network sites to gather information about learning resources. Instead, the findings suggest that social network sites may have potential, if their design is attentiveness to diverse skill levels and face saving threat that social networks might cause. The greater challenge lies in increasing awareness among lower-SES parents that these resources exist and they are capable of accessing them.

In the domain of education, there are opportunities to build upon existing institutions that could increase awareness and use. One resource is K-12 schools and Parent Teacher Associations. If school-sponsored online information resources are designed correctly, they could help equalize the use of the online and out-of-school learning opportunities across socioeconomic divides. One method would be to provide motivation and access points to look for out-of-school learning, not just skill building for academics. This would address our finding that lower-SES parents were focused on finding resources to improve academic achievement rather than out-of-school learning. A second method would be to offer parent-led initiatives and anonymity to parents rather than teacher-to-parent contact as the only communication. This would address the finding that parents have concerns with face saving, and that lower-SES parents have concerns with face saving in front of teachers. Other organizations are also positioned to influence parents on a national scale. Testing services, such as our partner ACT, have a diverse national reach and have potential to provide parent networks that are more diverse to lower-SES parents, improving their network of weak ties. In addition, the national scale could provide anonymity to parents and have an easier time attracting partnerships with informal learning providers. This would again address findings that parents have concerns with face saving.

CONCLUSION

It is important to stress that all participants showed enthusiasm and care for their child's education, placing their child's success in education among their top priorities. However, we observe differences in use of both offline and online educational resources across different socioeconomics. Through participants' stories, we observed all of the parenting roles in each of the three rounds of interviews. We are not suggesting there is one way that parent's act in one group versus another, or that there is one correct way to parents. Nevertheless, our analysis shows some patterns in the parent roles that corresponded to SES and ways that design of online resources may increase some families' engagement with learning resources.

ACKNOWLEDGEMENTS

This work was supported by ACT. We thank the parents for their time, Emily Holland, Miguel Encarnacao, Jason Yip, and June Ahn for their help and support.

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