

“This just felt to me like the right thing to do”: Decision-Making Experiences of Parents of Young Children

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ABSTRACT

Parenting comes with many responsibilities, one of which is making ongoing decisions affecting a child’s health. While today’s parents have access to an abundance of parenting advice and data—both offline and online—little is known about their lived experience with these resources and how it interacts with other aspects of decision-making like intuition. Drawing on a survey of 65 parents and interviews with 12 parents of children aged 0-5 in the United States, we provide the following contributions: an analysis of parents’ experiences and needs when using different resources to make health and wellbeing decisions for their child; a definition of parents’ lived experiences with intuition throughout the decision-making process; and a discussion of tensions and opportunities for designing in this sensitive space. Our findings can inform new design directions for interactive technology-based parenting support, particularly the potential to consider intuition and make parenting information and data more socially oriented.

Author Keywords

decision-making; intuition; health; data; information; parenting; family; children

CSS CONCEPTS

Human-centered computing~Interaction Design

INTRODUCTION

When individuals become parents, they take on responsibilities for the health and wellbeing of their child and suddenly have to make ongoing decisions on behalf of their new family member. Making decisions demands a considerable amount of work that often goes unnoticed while also coping with other demands of early parenting.

Today, parents have access to more information about parenting than previous generations, ranging from traditional channels like talking to friends and families to engaging in online searches or participating in online communities. At the same time, apps and monitoring devices allow parents to

gather their own data about their family, which they might use in decision-making. While the increase of available information may help parents make more informed decisions, research shows that identifying relevant credible sources and collecting and analyzing data are time-consuming activities that require expertise [68, 81]. Parents might additionally feel pressured into making a decision which aligns with the dominant discourse and may be exposed to judgement and stigma regarding their parenting practice [72].

Facing the demands of modern work and life, parents often hope that experts, data, and science have the answer to the challenges they experience when parenting [19]. But not all parents are able to access these resources due to financial or language barriers [25], do not find resources that fit with their parenting philosophy [17], or find it easier, more comfortable and efficient to follow their intuition [11]. In fact, many parents describe relying on their “gut feelings” when it comes to parenting, and research in the clinical context indicates that parents use their intuition when making critical health decisions for their children [46].

There is an opportunity for designers and researchers of interactive technologies to explore ways of providing decision support to parents and families based on their lived experiences. To investigate parents’ decision support needs, we answer the following research questions:

RQ1: How and why do parents make health decisions on behalf of their child in everyday life?

RQ2: What opportunities are there to support parents in their decision-making about their child’s health?

We first collected insights from an online survey with 65 parents in the U.S. about their lived experiences making health decisions for their children aged 5 years and younger, including the use of different resources which we defined as any online or offline support that helped parents in their decision-making process. Parents described a wide range of decisions affecting their child’s health and were consistent in their decision-making preference across domains such as sleep and nutrition. While parents expressed a desire for scientific data—hoping for evidence and certainty—they relied heavily on their intuition and/or their partner, if available, preferring a personal connection when seeking information and advice over consulting online resources for the same purpose.

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To further explore parents' experience using their intuition in combination with other resources, we interviewed 12 parents of children aged 5 years or younger, adding a third research question to our investigation:

RQ3: How do parents perceive the role of intuition in their decision-making process?

Parents describe intuition as a decision-making resource rooted in internal awareness, reflection, and trust in one's capacity to sense the right choice. However, it can also create ambiguity, which is why most use it as one of many factors impacting their decision, primarily to guide them at the beginning and end of the decision-making process. We focused our investigation on parents of young children, as this provides us with insights on how parents navigate their relationship with their new child.

Our primary contribution is an empirical understanding of the decision-making needs of parents of young children and opportunities for design to support these needs. We draw attention to how parents use and experience different resources, particularly intuition. In light of information oversaturation, we conclude that developing skills and capacities for resources such as intuition can support parents in times of overwhelm, long-term planning, and daily life.

RELATED WORK

Parenting, Intuition, and Health Decision-Making

Decision-making has attracted considerable attention from different disciplines. Cognitive approaches to decision-making suggest a dual process model contrasting two thinking styles: rational and intuitive [30, 31, 41]. In these theories, intuition is closely associated with affect and fast processing while rational thinking is characterized as slow and deliberate [4, 96]. Researchers acknowledge limitations of intuitive expertise when based on heuristics and bias [49, 88] but also emphasized its validity when based on experience and learning, which is often referred to as educated or experience-based intuition [42, 49, 82]. Most of the research acknowledging intuition as an important expertise has focused on clinical practice (e.g., nursing [63]) or management [3]. But intuition has been increasingly discussed in connection to parenting [23, 56], suggesting that intuitive parenting benefits a child's development [14]. Research shows that support and knowledge shared with peers as well as parenting practices that promote embodied and responsive connection with the baby can facilitate intuitive mothering [26, 94]. However, parenting resources tend to emphasize empirical data (e.g., [71]) paying less attention to intuition, despite it being a known resource for parents when making a health decision for their child [11, 12, 15, 22]. This shows that further investigation of intuition, parenting, and decision-making can be fruitful.

Within the clinical context, studies have explored different aspects of parental decision-making, such as involvement in decision-making about a child's health care [1] or decision-making preferences in a high-stress environment like the pediatric intensive care unit [65]. As many parents choose to

not vaccinate despite overwhelming scientific evidence of its benefits and safety, many studies have investigated vaccine-related decision-making, drawing attention to aspects like socio-environmental (e.g., perceived social norms) and parent-specific personal factors (e.g., parental beliefs) [85]. Decision-making aids can support patients facing health treatment or screening decisions, potentially improving knowledge of the patient about the situation, reducing decision conflict and encourage the patient to be more active in decision-making without increasing anxiety [70]. In the family context, most decision tools focus on shared decision making, augmenting parent-clinician communication of adequate information about a condition, risks and benefits of the treatment, and helping parents clarify their values [84, 97]. While such decision-making aids have shown to be feasible, acceptable, and comprehensible [66], it is unclear to what extent their findings apply outside of the clinical contexts and can help families address other demands of parental decision-making, like emotional work or efforts connected to information seeking and evaluation.

Parents' Use of Health Information Online and Offline

There is a long history of research assessing information-seeking behavior and its relation to uncertainty, expertise, and decision-making [29, 55, 67, 95]. Some of these models have been used to assess parents' use of online information for health decision-making [58]. Mothers, for example, use four primary strategies when seeking information: actively asking questions, using multiple resources to cross-check, acquiring medical literature, and asking family and friends with children [59]. Searching for baby-related health information is the primary reason new mothers use online media [92]. While information-seeking behavior can positively influence health outcomes, parents also report being overwhelmed with the amount of parenting information available to them [16]. With widespread access to information and cultural emphasis on intensive parenting, parents not only put a lot of effort into acquiring information but also into assessing its credibility [74, 73], especially when information does not align [36]. As a result, parents turn to experts or extended family to provide guidance and trust [22, 45, 52]. Research has emphasized the need to better understand what affects parents' use of online information, highlighting both parental beliefs [93] and contextual factors like education (e.g., [76, 92]), socio-economic status (e.g., [21, 25]), or culture (e.g., [5, 22]). There is an opportunity to consider these and other contextual factors when designing technologies for parenting [98].

Health Technologies for Parents

Technology can support families in aspects of health. This includes research to support parents in monitoring and recording their child's health and development [53]. Other work has focused on how health technologies affect family dynamics [75] or the parent-child relationship [87]. Parents' information needs have also emerged as an important line of work, offering design recommendations for parental everyday information systems [57] and how to facilitate the sharing of

such health-related information across family members within the home and across contexts [47, 54], suggesting considerations to effectively support family reflection on health data [37]. However, little is known about how such technologies can support parents in the work connected to decision-making and the use of health information and data. Our research seeks to inform this area of work and inspire new design directions for technology-based parenting support.

METHOD

We used an online survey with 65 parents and semi-structured interviews with 12 parents to gather insights.

Survey

We developed an online survey to elicit information about how and why parents make decisions about aspects of their child's health. To get rich insight into their decision-making practices, we asked parents to share decisions from three different health domains. We constrained two of the three domains to common areas in which parents work to manage their child's health: sleep and eating/nutrition [24]. For the third decision, we asked parents to describe any health-related decision they wanted to share. The survey asked each parent about three decisions they made for any of their children's health in the past year in the domains described above. The parent first described each decision through a free-recall, open-ended response describing the content and process of the decision. For each decision, we asked a series of closed-and open-ended questions, e.g., how confident parents felt when making the decision, which resources they used, and how helpful they were (see Appendix A for full survey). For the purpose of this study we defined resources as any online or offline support parents used in their decision-making process.

Each parent also completed the validated and standardized [34, 80, 86], 17-item Parenting Sense of Competence Scale (PSOC) [48], which measures parenting frustration, anxiety, and motivation (satisfaction) as well as competence, problem-solving ability, and capability (efficacy). To investigate parents' preferences for intuition when forming and evaluating decisions, we collected data using the Types of Intuition Scale (TIntS), which is based on the theoretical view of intuition as three distinct types: holistic, inferential, and affective [79]. The final set of demographic questions drew on survey items used in surveys by the U.S. Census Bureau [89].

Interviews

Based on our survey results, we created a semi-structured interview protocol to further investigate parents' resource use in decision-making with a focus on intuition. Interviews were led by the primary researcher; a second researcher helped facilitate some of the sessions. We asked parents to describe the process of any two past or present decisions affecting their child's health: one which they perceived as easy and one which they perceived as hard. We prompted parents to share what motivated the decision, what informed the decision, and how they implemented it.



Figure 1. Parents selecting metaphor cards

We further investigated how parents perceive the role of intuition. Instead of suggesting a definition of intuition, we asked parents to come up with their own definition using the “*New Metaphors*” design toolkit [62]. This kit includes a set of 75 *Thing 1* cards, each illustrating a photograph and name of arbitrary artifacts and phenomena in the world which can help people express their personal meaning of abstract concepts. We prompted parents to think about “*Parental Intuition*”, asking them to pick 3 metaphor cards from a set of 40 we choose randomly and share why they chose them (Figure 1). Prior to this, we familiarized parents with this activity, using the same set of 40 cards to describe their experience of “*Being a parent*” and “*Making health decisions affecting their child.*” Using parents' own definitions of intuition, we asked them to reflect on the role of intuition in the decisions they shared earlier and their general decision-making process (see Appendix B for full interview).

RECRUITMENT

We collected responses from 65 parents for our survey using Amazon's Mechanical Turk (AMT), which allowed for a nationwide sample of parents more diverse than other online recruiting methods [28]. To ensure response quality, we restricted participation to workers with at least a 95% HIT acceptance rate and Masters qualification. While we expect parental decision making to vary across cultures, we limited our sample—and thus our investigation—to participants registered on AMT as living in the US. We compensated \$10 USD. Across all participants, the median survey duration was 29 minutes. For in-person interviews, we recruited 12 parents living in the urban and suburban area of Seattle through snowball sampling and posting on social media in local parenting groups. We encouraged participation of both parents in co-parenting situations, but we left it up to parents whether they were interviewed together or individually. Interviews, conducted at parents' homes, lasted approximately 90 minutes. Each parent was compensated with a \$30 USD Amazon gift card. Individuals in both samples had to be 18+ and have at least one child aged 5 or younger. The study was reviewed by our university's Institutional Review Board.

Analysis

For qualitative analysis, we followed Braun and Clark's [13] framework for thematic analysis. Initially, the primary researcher read through all open-ended survey responses repeatedly to get familiarized with the data, creating a preliminary codebook through inductive analysis according to the research questions. To validate the codebook, both first

and second author coded 20 survey responses independently using these codes, meeting to discuss inconsistencies until consensus was reached and to add or refine codes. The rest of the survey responses were divided between both researchers who wrote memos to abstract higher-level themes. The primary researcher then read through all interview transcripts, iterating on the survey codebook (see Appendix C) and analyzed 5 interviews. Using the same codebook, the remaining 3 transcripts were analyzed by a third researcher who helped conducting interviews. The primary researcher reviewed all transcripts and wrote memos, refining themes through affinity mapping [43] across both survey and interview data. Discussions were conducted with all authors at every stage to further ensure validity.

For quantitative analysis, we analyzed all 195 decision points, which required the duplication of demographic variables and scale values (PSOC, Types of Intuition Scale) as repeated measures. We mostly focused on resource use in relation to parents' overall decision-making preferences. As the majority of our data was ordinal, we used Spearman correlations to investigate relationships between variables.

RESULTS

Participants in our survey (PS#) were distributed across 26 different U.S. states, with California, Florida, and Illinois having the highest rate of participation; this is roughly consistent with the latest census data on the geographic distribution of the U.S [90]. When asked about their parenting situation in an open-ended question, 83% of parents described their child living in a household with two partnered adults, the remaining 17% self-identified as single parents, 64% of whom were single mothers. Women, those with a B.A. or B.S. degree, those in living arrangements with two parents, white Americans, and people who were mixed race were overrepresented in our sample (Table 1).

Participants in our interview (PI#) were distributed across 7 households: 5 parent dyads, one single mother, and one parent whose partner was not able to participate. We improved some aspects of diversity in our sample compared to survey participants but overrepresented those with an M.A. or M.S. degree, in living arrangements with two parents, Asian Americans, and people who were mixed race (Table 1). We refer to parents who identified as women as mothers and parents who identified as men as fathers. When asked about their preference, the parent who self-identified as non-binary stated that "mother feels right 80% of the time," and so we refer to them as mother. We first provide an overview of *decisions parents make for their children* followed by quantitative insights of parents' *use of resources and decision-making preferences*. We supplement these findings with rich, qualitative results organized around different themes relating to parents' *experience in using different resources* for the decision-making process.

Parental Decisions Affecting the Child

Across both survey and interview studies, parents shared a variety of decisions they make for their children. These

Parent	Survey (n = 65)	Interviews (n = 12)
Gender identity	38 women (58%), 27 men (42%)	6 women (50%), 5 men (42%), 1 non-binary (8%)
Age	Mean (sd) = 35 (5) range = 26-46	Mean (sd) = 35 (5) range = 31-40
Ethnicity & racial group	White (84.6%), Black (12.7%), Asian (7.7%), Hispanic (7.7%), Native Hawaiian (1.5%)	White (58.3%), Black (8.3%), Asian (41.7%), Hispanic (8.3%)
Education	High School (12.3%), Some College (21.5%), College Degree (49.2%), Some Grad. School (6.2%), Grad. School (9.2%), Adv. Degree (1.5%)	Some College (8.3%), College Degree (33.3%), Some Grad. School (8.3%), Grad. Degree (41.6%), Adv. Degree (8.3%)
Employment	Full-time (69.2%), Self-employed (12.3%), Part-time (9.2%), Unemployed or unable to work (7.7%), Prefer not to answer (1.5%)	Full-time (66.7%), Part-time (8.3%), Unemployed (25%)
Household income*	<\$25K (3.1%), \$25-49.9K (30.8%), \$50-99.9K (49.2%), \$100-149.9K (7.7%), \$150-199.9K (6.2%), >\$200 (3.1%)	\$25-49.9K (14.3%), \$50-99.9K (28.6%), \$100-149.9K (28.6%), \$150-199.9K (14.3%), >\$200 (14.3%)
Living situation (per household)	Suburb near a city (41.5%), Urban City (36.9%), Rural Area (15.4%), Small Town not Near a City (6.2%)	Suburb near a city (71.4%), Urban City (28.6%)
Number of children (per household)	One (38.5%), Two (32.3%), Three (21.5%), Four (6.2%), Five (1.5%)	One (57.1%), Two (28.6%), Four (14.2%)

Table 1. Participant demographics. *Two interview dyads disagreed in their reported household income brackets, we placed their income bracket in between their two estimates.

decisions differ greatly in their *content* (e.g., co-sleeping or sleep training, establishing eating rules, vaccination or medical treatments), *triggers* (e.g., changing needs of the child due to growth and development, psychological breaking points of the parents), *motivations and purpose of the decision* (e.g., expressing parenting values), *temporality* (e.g., urgency, "in the moment" needs, long-term views) and *context* (e.g., living arrangements and working situations). For example, PS32, a mother of three, shared:

I decided to bedshare with my baby. I have had success with my other two children bed sharing. I tried to co-sleep with my child in a bassinet right next to the bed. Then I tried to co-sleep with my child in a vibrating chair. Overall, both methods resulted in my child crying for what felt like hours and in waking up almost every hour. Eventually, we decided to let him sleep in the bed with us in a safe way (no blankets on him, no pillows, on a tight/firm sheet), or at least as safely as possible. We also use an owlet monitor to watch his oxygen saturation.

While all decisions affected the child, in some cases they were expressions of parental needs, such as not allowing the child to co-sleep to preserve parents' privacy.

Use of Resources & Decision-Making Preferences

Through our survey, we gained a broad understanding of the resources parents use when making decisions affecting their child. Across all 195 decisions parents described, they used on average a combination of 9 out of the 15 resources we

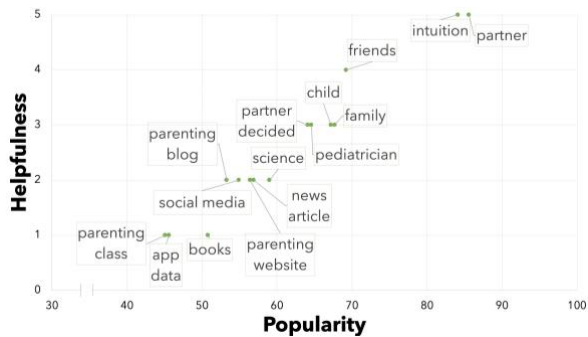


Figure 2. Popularity (in %) and median helpfulness (0 = not at all helpful to 5 = very helpful) of resources used by parents across all decisions (n = 195).

asked about. Overall, parents preferred resources that provided a personal connection: talking with their partner, if available, was the most popular and helpful resource (Figure 2). They also described turning to their social environment, particularly their close and extended family. Others, particularly sole decision makers, described turning to online communities. When seeking information through means other than talking directly with another person, parents preferred consulting scientific articles. For survey data, we used a within-subject comparison with a Spearman correlation analysis of the number of resources used for making decisions about eating compared to sleeping. Individual parents were consistent in how many resources they used across domains ($r = .83, p < .001$). This indicates source-use is related to parents' personal decision-making preference, consistent with how parents described actively rejecting additional information resources and data because they did not want anyone to influence their decision (PS42, father) or it did not align with their parenting philosophy (PS4, father).

We next share a more nuanced understanding of parents' experiences using different resources organized around five overarching themes: *parents' collaborative experience*, their use of *information and external expertise*, their *experience with intuition*, *intuition as part of the decision-making process* and *factors affecting parents' decision-making experience*.

Parents' Collaborative Experience

Parental Dynamics and Communication

Talking to their partner, when possible, was the most popular and helpful resource and sometimes sufficient: *"Talking to my child and my partner were the only things I needed to do as far as this was concerned."* (PS26, father). Co-parents communicated a strong desire to agree with their partner about the decision. However, this created challenges when parents expressed different attitudes or conflicting opinions, as shared by this couple when deciding whether to continue potty training their 2-year old son. While the mother (PI2) was on the side of *"Let's not fight the battle. It'll work itself out,"* her partner's opinion (PI3) was that *"we're in charge."* PI2 later shared that the need to sustain marital harmony was what affected her decision the most. This was echoed by her partner (PI3) describing discomfort about their disagreement.

Navigating these conversations can be challenging and can culminate in a breakdown of communication between parents. PI6, a father of two, shared that he never communicated his decision to not wake his children after returning from his work shift, even though it resulted in him not seeing his children for multiple days. When asked what would have helped him through the decision-making process, the father said, *"I know what it is, talking to [my wife]."*

Awareness and Distribution of Work

Making decisions affecting their child's health required parents not only to communicate about their different attitudes and opinions, but also about the work necessary at every stage, including researching, weighing options, and implementation. While some parents feel content with how this work is distributed, others describe an imbalance, which was sometimes based on assumptions but also preferences. Parents, for example, mention that one parent likes doing all the research or has a more "analytical" personality. However, other parents simply lacked the support. For PI4, a single mother of a 2-year old boy, this work was particularly burdensome because the daycare situation in her hometown required her to put her son on waitlists of 15 places, only hearing back from two. This meant gathering information about availability, costs, her own and her ex-husband's availability and visiting multiple daycares. Even after the mother moved, she did not want to adjust her son's daycare, so as to not disrupt his social environment; she also did not want to do the whole daycare research process again. One couple further shared how their different opinions on a decision were shaped by the amount of work required of them for implementing the decision and the necessity of being aware of this distribution when making a joint decision.

Information and External Expertise

In our interviews, parents described motivations and experiences seeking information from external resources, such as internet forums, medical experts, and their social networks.

The Importance of Being Well-Informed

Parents engage in extensive information-seeking behavior when making a decision affecting their child's health, independent of what might prompt the decision. Parents value the importance and necessity of being well-informed and following scientific guidelines, which is partly motivated by the abundance of information today's parents have available at the click of a finger. Based on the mentality of *"the collective knows more than the individual,"* parents describe the internet as an *"anonymous insurance"* (PI3) but also an opportunity to adjust their preconceived notions. PI9 shared their decision whether to circumcise their newborn boy, initially leaning towards going with *"what you're supposed to do."* After looking into it, she changed her mind: *"What I didn't realize was, there was actually no benefit. [...] And then I talked to my OB, and then we talked to his pediatrician, and they both said. It's personal preference."* However, parents also mentioned having to assess the credibility of information obtained online, as PS48, a father of a 18-months-old, described: *"I don't like to just blindly*

follow advice I read online, I'd rather leave something as serious as my child's health up to the professionals." Parents seek to align their decisions with professional recommendations. They describe external expertise and information as a form of guidance when making a decision, especially when they feel uncertain about their parenting and are looking for validation for their decision trajectory. However, parents might not always have access to medical expertise through regular visits to the doctor. While obtaining detailed information about their child's health was valued by parents, PS39, a father of a 3-year-old, questioned the appropriate method to use: *"I wish I had a sleep monitor that could more accurately track sleep patterns. I'm on the fence about this because I'm not sure if I want her to have a wearable."* While this can increase confidence, we also observed a tension around expectations to *"know everything,"* leaving parents questioning their parenting skills, especially when they are first-time parents.

In Search for Real-World Advice

While parents value scientific knowledge or professional recommendations, they sometimes feel it does not match their context (e.g., guideline assuming family constellations or child age) or experience. PI5, a mother of two, described how she wanted to follow what 90% of other parents suggested in a Facebook group, but her own experience matched that of the other 10%. Many parents wanted to hear other parents' *"real world advice"* (PS52, mother), and they often followed advice from friends or extended family who have children, since they *"have researched and used different methods for [their] kids, so they were best able to tell [...] what methods would result in the best overall [outcome]"* (PS12, father). Sometimes this evidence based on others' experience can be a pivotal moment for parents, especially when they feel dissatisfied with professional recommendations. Being dissatisfied with their hospital experience, PI8 and PI9 decided to deliver their first-born, and the rest of their 4 children, in a birthing center - a decision they made after watching documentaries about childbirth in the U.S.. This shows how people's lived experience can be powerful and have an impact on people's decisions, especially if the decision is emotionally charged.

Overwhelmed by Information, or Not Having Enough

Parents described different tensions in their experiences seeking information. PI11, a first-time mother, described *"getting bombarded by all of this information"* when seeking information about whether to breastfeed her newborn. This becomes particularly challenging when dealing with emotionally charged information, which leaves it up to the parent to *"filter"* it or potentially exposes them to judgement:

When I tried to look anything up online, it was very overwhelming how much 'breast is best' information is out there and really shoved in your face and how intensely women feel about it. So it wasn't so much that I knew I wanted to breastfeed or I knew I wanted to pump or I knew I wanted to do formula. It was more that I really knew that I wanted to not

feel so much pressure. And try and make the decision independent of it. (PI11, mother)

Other parents described challenges with finding appropriate resources because resources either would not reflect their experience (e.g., *"most parenting guides would have assumed that children would be weaned off of bottles by such a late age."* PS35, father) or because of pre-existing bias towards their personal preference, as PI12, a father of a 3-month old, described: *"A lot of these issues are still tethered to literature. They're not as written about, talked about and so there's a lot of biased information on breastfeeding and it's hard to get well-rounded information."* When asked about what would have helped, parents shared ideas around making information more accessible and transferable to their own situation, suggesting a more nuanced design of an information resource, for example for co-sleeping:

Yeah, if there was a giant chart of definitely okay, probably okay, maybe okay, not okay, definitely not okay, and everything in the world was divided into those categories, sure, that'd be great. [...] So here's how to co-sleep sleep safely. (PI11)

However, parents repeatedly mentioned the need for aggregated information. When asked about helpful resources, PI10, a father of two, proposed the idea of a centralized information system for finding and filtering information on afterschool programs for their daughter, a process which currently requires a lot of work and time.

Parents' Experience with Intuition

Intuition was one of the main resources parents indicated using and valuing. In our interviews, we thus further explored parents' definitions of parental intuition in relation to decisions affecting their child. Reflecting on different metaphors, parents described intuition as a decision-making resource rooted in internal awareness (*"knots and joints"*), reflection on past experiences (*"traces of previous messages"*), and trust in one's capacity to sense the right choice for their child's wellbeing (*"a safe harbor"*). For some parents, intuition provides guidance, in the form of initial awareness (*"what looms out of the mist"*) as well as final decision-making power (*"a signpost"*). However, it can have strong, non-linear qualities that are emphasized by ambiguity, creativity and uniqueness (*"splashes of paint"*).

Different Levels of Comfort with Using Intuition

Parents had varying levels of comfort with using intuition in their decision-making. Some parents describe a certain ambivalence and skepticism towards intuition, not wanting to solely base their decision on it, even though they recognize that their intuition might be strong or reliable. However, parents differed in how comfortable they were with such ambiguity. Some parents saw intuition as a strength, one parent even described it as a sixth sense, and wished they would be able to rely on it more. Some parents even saw intuition as representative of their overall parenting approach while others only felt comfortable if their intuition was externally validated. PI4 reflected on her pregnancy and how parents asked her which books she is reading, responding she would do it *"the intuitive way."*

Intuition Comes with Experience or Expertise

Parents generally agreed comfort with intuition comes with experience, such as by looking back on positive outcomes that resulted from trusting their intuition, or through experience from their own personal upbringings and older child(ren). When talking about their parental intuition, parents described it as a way to access their past parenting experience, which makes it harder for first-time parents to trust their intuition. PI3, whose son was born prematurely, reflects on how nurses use their intuition:

You think about a nurse in a NICU ward, they don't look up everything. They have so much past experience to build upon. Their intuition becomes so much more reliable. So I would say intuition gets stronger as you have more and more parenting experience.

Intuition Alongside Other Perspectives

Our interviews offered perspective on how parents perceive intuition in communication with each other. Parents described differing from each other in how they approach decisions (e.g., *"I'm very analytical, and so I want facts, [...] I don't really trust my gut."* PI9). PI3 shared discussing how to approach decisions with his wife: *"If you know my wife, she needs to have facts [...] Without hard facts, if it was just my intuition, I wouldn't have been able to have this discussion."* Further, parents used their intuition to navigate their communication with their partner, e.g., knowing the right time to address a decision. But parents also expressed awareness of and trust in the intuition of others. For example, PS32, a single mother who lived with her parents, listed her mother's intuition as a resource for her decision-making.

Additionally, many parents described perceiving their intuition in conflict with recommendations provided by experts or trusted sources they accessed online or in person. One father described how his now 2-year old son was having a choking incident when they started to transition to solids.

So he's two months premature and we started feeding him solids essentially when the literature felt that he could eat solids. And my intuition was, he wasn't ready, but we did it anyway because the doctor said to do it. [...] And my intuition would have said, if we had waited, like a month, everything would have been just normal because he was two months early. (PI3)

He later reiterated that parents are experts when it comes to knowing their child, and intuition seems to be a way for parents to access and express this expertise. Sometimes, this would lead parents to shift from relying on one set of experts to finding a more niche community of parents or experts to validate their intuition:

[Our son] had an earache and we called the nurse. And they were, "Oh no, it's perfectly fine." But our intuition was, "No, this is not right." And then we actually texted a picture to someone who's a nurse practitioner and she was, "Yeah, you probably have an ear infection, you need to see a doctor. (PI9)

Other parents also shared how intuition represents what might be best for the mental and physical health of their whole family. For example, reflecting on their decision between pumping and formula, PI12, father of a 3-month old, mentioned: *"So like our intuition is that we need sleep and*

this [pumping] is going to be extremely disruptive. [...] But the literature got you into feeling that you would be a bad parent if you didn't try it." When asked about what would help him feel better about the decision, he mentioned wanting more reinforcement from external "authorities" to go with what feels right since every family is different:

Reinforcing that it's okay for people to make decisions based on what they feel is right, because there's a lot of literature on this is what you should do, not like, here's the smorgasbord of options, and whichever one is right for you and your baby is probably the one that's right for you and your baby.

Intuition as Part of the Decision-Making Process

Parents perceive intuition in many different roles throughout the decision-making process. Through our survey, we gained insight into parents' decision-making preferences as measured by the Types of Intuition Scale [79] and how they relate to their use of resources. Parents who preferred to make decisions based on feelings (affective intuition) or through integrating diverse informal cues (holistic intuition) used more resources ($r = .33, p < .01$ and $r = .19, p < .01$ respectively; Spearman's correlation). This is consistent with the interview participants sharing that intuition helps them navigate a large amount of resources or reflect on diverse information they gathered to make sure it "feels right." On the other hand, parents who relied on previously analytical processes that have become automatic (inferential intuition) used fewer resources ($r = -.10, p = .147$). A Spearman correlation showed that parents with this decision-making style perceived themselves as more competent in their parenting skills ($r = .48, p < .001$), which was not the case for parents scoring higher on the holistic and affective subscale. Parents' confidence in their decision did not depend on their general decision-making style, nor the number of resources they used. However, parents who perceived themselves as more competent used fewer resources when making a decision (Spearman correlation: $r = -.23, p < .01$). This may indicate that while using more resources might not help parents feel more certain when making their decision, parents use certain resources to compensate for a potential lack of competence [40]. In the interviews, parents emphasized that while intuition was part of their decision, they rarely used it as the only resource, since it feels too unsafe or risky. Intuition was predominantly used at the beginning and end of the decision-making process, together with researching information and conversing with personal connections like partner, extended family or friends.

Intuition as a Jump-off Point or Trigger

Parents described intuition as being *"the first thing that you have before getting any facts, or even before doing research"* (PI9). Intuition can provide parents with an initial sense of what they might be doing, directing further information-seeking or conversations with their social environment. However, intuition can equally be a trigger or *"kind of alarm"* (PI9) that initiates the need to decide on a certain action.

Intuition as the Final Decision-Maker

Parents described using their intuition once they have done some research but still need to make a final decision. Intuition allows them to reflect on the whole situation and information and come to a conclusion. This is particularly prevalent when parents must choose among alternatives they deem “equally good”:

You have multiple options that seem equally good, using intuition is kind of the decision factor, and trusting yourself that you are going to make a good decision maybe without all the inform... It's not always without all the information, but it's needing to make the additional weight on one or the other, without having a resource that can tell you, oh yeah, you should do this or that. (PI12, father of a 3-month old)

Some parents describe intuition as the final “leap of faith” (PI2) required if outside information does not provide a clear answer. One mother, PS30, further described how she relied on her intuition to make an internally consistent decision about whether to bedshare with her 4-month old child despite discouragement from healthcare providers and information found on parenting blogs and websites:

At the end of the day, it is more important for me to make sure my child is sleeping as safely as I can, and that I have enough energy to care for all three of my children the next day, so I relied on my intuition to make the final decision.

Using Intuition or Not Depends on the Context

Parents made a distinction in how comfortable they feel going off of their intuition based on the quality and the stakes of the decision. For example, parents feel less confident using intuition when they are dealing with a medical decision or a particularly consequential decision, as PI2, mother of a 2-year old, described:

Intuition is more useful in aspects that are less specified by outside people. So his health decisions, intuition hardly goes into it at all. Follow the guidebook. If there's multiple ways of going about it, intuition helps.

However, for decisions where parents had past experience, intuition can be a way to anticipate what might work for them and their child; this provides a feeling of control. Since most parents connected intuition with a sense of uncertainty and ambiguity, they also wanted to experience some form of reassurance when trying an option, especially if they do not know what the outcome will be, or to know that it is okay to iterate and not have to be perfect the first time.

Sometimes Intuition is All I Have

Context also plays a role in terms of allowing parents access to different resources. Parents mention that sometimes they feel intuition is the only thing they can base their decision on because they experience a lack of social support, time or information. This was particularly true for a PI4, a single mother who shared not having the opportunity to discuss decisions with a partner, so she had to rely more on herself and her intuition. Out of necessity, parents may also rely on intuition as a timely resource for “in the moment” decisions and as creative inspiration for improvised solutions.

Factors Affecting Parents' Decision-Making Experience

When asked about how parents experience making decisions affecting their child's health using the metaphor cards, different themes emerged: Parents reflected on the need for guidance (“a signpost”) which can be provided by external resources (“following tracks”). At the same time, parents acknowledged how despite there being a recommended way, they need to stay flexible in consideration of constraints or individual needs (“fitting things around each other”). Therefore, parents describe their experience as “a balancing act” but also see it as a step-by-step, long-term process (“steps”) requiring iteration. Central to parents' decisions was their desire to ensure their child's healthy and safe development (“plant growth,” “horizon”).

Pressure of Time: Temporality and Persistence

Parents shared different temporal perspectives when it came to making decisions affecting their child. While some decisions were made as part of the bigger picture and a long-term trajectory, other decisions were more “in the moment.” Parents described decisions as stressful when worrying about not adhering to the right timeline (e.g., “[Am I] doing something wrong because a lot of kids I know have been trained by two, two and a half. And he had just turned three.” PI5) or missing a critical window of development, as PI1 shared when talking about her decision on therapy options for her son's eating difficulty: “He is not eating and it's such a critical development age.” Temporality further emerged in that parents described having to stay persistence since the decision process can take a long time, which might require them to make the decision repeatedly because the process is ongoing (e.g., sleep training) or because they have to defend their decision in front of others in their social environment.

Things Change: The Need to Adapt

Parents also struggled with predicting the outcome of their decision, which often requires them to try different options and stay flexible and adaptable. PI11 shared that she wishes for more scaffolded support for parents to think through different decisions and alternatives.

Dealing with Societal Pressure and Expectations

Participants often described needing to navigate societal expectations when making a decision affecting their child. This was particularly challenging when parents' opinions were not in line with the dominant discourse, creating feelings of being pressured into a decision. When parents made decisions they perceive as opposed to the dominant discourse, it affected how they saw themselves as parents and could make them feel unable to share their experience which a community of parents: “In a way, it makes me feel like, am I a bad parent? I give him apple juice, I let them have candy once in a while. [...] I just feel like I don't want to tell people that for fear that I'm a bad mom or something” (PI5, mother of two). However, sometimes parents also felt this pressure from within their family, describing intergenerational conflict and expectations directed at them from their own parents: “My mom is a marriage and family therapist and former LCSW.

And so I kind of have her breathing down my neck” (PI1, mother of a 5-year old). One father, PI12, described how some of these expectations are transported through marketing, describing the cover of a breast pump displaying a woman in a business outfit pumping while being on the phone.

Regulating Emotions

Parenting is an emotional experience, as outlined by parents when asked to describe their parenting experience. When making a decision, parents often describe having to regulate emotions which arise in the context of a decision. This is particularly challenging if parents have to make a decision in the moment, which allows them less time to reflect and plan. When asked what parents would find helpful when making decisions, PI5 suggested an “emotional shield”: *“I just always have wished that there could just be something that removes all that anxiety from my brain [...].or just block out what anyone thinks.”* PI2, a father of a 2-year old, further expressed frustrations with how products or technologies *“capitalize on parents’ fears that something might be wrong with [your] kid”* when talking about opportunities for supporting parental decision-making.

Socioeconomic Status and Cultural Background

Parents’ socio-cultural background greatly influenced the quality and content of decisions. For example, families who need to share a room with their children make different decisions about their child’s sleep than parents who have access to more space. We also observed other aspects like cultural background (e.g., immigration background, faith) affecting how parents experience their decision-making process. In that context, parents might experience additional pressure when continuing a difficult decision because it is rooted in a particular set of values and worldviews they want to preserve, even when “easier” solutions might be possible.

DISCUSSION

Parental decision-making is a complex task influenced by many different inter- and intra-personal as well as external aspects. Decisions parents face also vary considerably in their content, trigger, context and purpose, making it challenging for designers of decision aid tools to fully support parents across decisions. Below, we discuss design opportunities for interactive technologies to support parents in their unique needs based on their lived experience.

Supporting Access to “Real World” Experience

When asking for advice, parents in our study preferred sources like their partner, friends, and family, who represented personal connections and could share real world experience. This may be because close connections, such as friends, are better able to tailor advice [2] or offer emotional support [69]. Families might also be able to provide culturally relevant information and advice, something that is important to culturally diverse parents [22, 98]. However, not all parents are in a co-parenting situation, have support from family members, or have local access to friends with culturally relevant parenting experience. Some of the interview participants emphasized how they experienced a

sense of relief when sharing their decision-making stories with us. Research within HCI shows that social media groups can offer parents an important support structure to meet their emotional information needs (e.g., [7, 78]), but parents might face judgement if their own experience does not align with the dominant discourse. While social media can facilitate access to information and social support, it rarely builds lasting connections between parents [6]. However, our findings also show that parents vary in their engagement in online communities, ranging from actively exchanging information and advice with other parents to passively reading through what others do, which previous research described as a function of how fast online people need information or how personalized they want it to be [69]. Parents further describe challenges finding advice that fits their circumstances, especially when their lives differed from what resource authors assume, a challenge consistent with previous research in family informatics [75]. While parents value access to information and data, they are equally interested in other parents’ stories. Our results suggest potential approaches for designers and researchers when creating parental decision support:

- Facilitate longitudinal relationships to other parents—or grandparents—that can help build trust and support parents who lack local and family support by drawing, for example, on opportunities to increase social participation online [77];
- Consider the role of extended family in parental decision-making tools to emphasize the support they can offer, mitigate potential conflict when opinions do not align, or explore the potential to expand support structures to extended family members (e.g., [38]);
- Explore ways to supplement scientific data with personal narratives that can be a powerful tool to support decisions [44], help reflect on controversial issues [61], or even counteract misinformation [83, 27]. Research in personal informatics has further explored the potential of using social media platforms like Instagram to share and view insights into what others do [18];
- Consider elements of storytelling in the design of parenting technologies as they can effectively convey health information (e.g., [39]), help technology become more socially oriented [51] and help parents get a more nuanced perspective on parenting by providing context (e.g., even parenting experts do not always follow all of the best practices with their own children [50]).

Supporting Intuition in Balance with External Expertise

Parents in our study heavily relied on their intuition when making a health decision for their child. They describe intuition as a resource originating within themselves, based on reflection on past experiences with their child or their own upbringing but often have trouble trusting it. As a result, they seek validation from sources of expertise (e.g., pediatrician, social circle) as it aligns with their desire for certainty and evidence offered by scientific results and data-driven approaches. Previous research shows that parents internalize scientific knowledge to justify their parenting practice and

hold themselves accountable [32]. At the same time, the increasing scientization of knowledge can be exclusionary to groups in our society who perceive and create knowledge in a less scientific way [21]. Our findings suggest that parents prefer to combine both intuition and external expertise but often struggle when intuition contradicts best practices or others' opinions, especially their partner's and family's. Given that intuition can be a valuable resource for parents in times of constraint (lack of time, support, or information) and can help them make internally consistent decisions when confronted with several alternatives, we suggest that the HCI community should explore the following design directions:

- Support parents in forming and trusting their intuition when managing their child's health, which is an open area of investigation for technology researchers and designers;
- Explore ways to design for intuition by including it in research methods and as elements of technology design;
- Encourage parents in combining and balancing analytical and intuitive decision-making, which has shown to lead to better outcomes in the clinical context [91];
- Support parents in balancing their priorities against what science or experts say is optimal or help them figure out if it is worth—or necessary—to go against their intuition;
- Support parents in communicating their intuition about a decision to other caregivers involved in the decision-making, like family or medical professionals.

Supporting Parents in Their Decision-Making Work

Managing a child's health and making decisions requires parents to engage in a considerable amount of work. Parents do not just invest a lot of time and effort into making an informed decision based on scientific evidence, their parental beliefs and values, social norms and their friend's and family's experience—they often see themselves experimenting with different opportunities or adjusting a course of action. While they can plan for some of these decisions, others come up unexpectedly—something that might exacerbate emotional demands parents face, like dealing with conflicting emotions or negotiating values and parenting philosophy with their social environment. Parents further report feeling overwhelmed and a need to filter through emotionally charged or biased information. To address these challenges, we suggest exploring the following approaches to support the work of parental decision-making:

- Consider elements of reflective design [9, 10, 33] and critical thinking [20] that can help parents make sense of the abundance of information available to them instead of trying to make parental decision-making more efficient and productive;
- Support parents in prioritizing possible actions according to their values, context (e.g., parenting, working, and living situation), and emotional needs, creating internally consistent decisions and decreasing feeling overwhelmed;
- Address challenges related to the iterative process of experimenting with different approaches by scaffolding alternatives, allowing flexibility and providing parents with

personalized strategies. Strategies like self-experimentation are effective for individual behavior change [60], but it is unclear how this translates to the space of parenting;

- Consider mixed-media support (including paper and other non-digital tools), as many parents feel ambivalent about how much they want technology to be part of their parenting practices or how much electronic data they want about their children. Paper-based interventions and mixed-media can support self-tracking [8], but the coordination needs of parenting introduce additional challenges;
- Consider the distribution of work required for a decision through acknowledging preferences but avoiding assumptions on who is taking over different tasks;
- Address the temporary aspect of decisions, supporting parents both in the moment (e.g., persistence in sleep training) and the work required for long-term planning.

While research has explored how technology can facilitate parents' access to information, emotional support, or coordination resources [6, 7, 47, 51, 53, 58, 87], parents may also benefit from designs that better support them in doing the actual work or adjust their expectations on what it means to be a "good parent." Our results suggest that support needs depend on parents' contextual factors, e.g., single parents might need more support managing the breadth of work, while partnered individuals need help coordinating the work. Technologies that support the different aspects we identified can better support parents in making, communicating, coordinating, enacting, and evaluating decisions. However, technologies designed to support or reduce the work of parenting should also aim to limit their user burden so that they do not inadvertently create more work [64].

Limitations

Future research should expand investigation into parents living in different countries to capture the cross-cultural comparison of parental decision-making and include a more diverse set of parents, since our sample overrepresents heteronormative couples in two-parent living arrangements.

CONCLUSION

Parents in our study described a variety of decisions they make about their child and were consistent in their decision-making style across domains. Parents predominantly relied on their partner or listened to their own intuition but rarely used just one resource alone when making a decision. Scientific results were popular amongst parents, but they also found them to be inconclusive or incomplete. Parents repeatedly sought evidence and certainty to support their beliefs or to gain confirmation for a decision. Our findings further draw attention to parents' perceived role of intuition in decision-making and feelings of stigma and burden related to information-seeking. Placing the concept of decision-making in the sensitive space of family health management reveals unique needs in supporting parents that make a ripe area for future design and research exploration.

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