Supporting Family Discussions About Digital Privacy Through Perspective-Taking: An Empirical Investigation

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***Abstract*—While 96% of U.S. teens use the internet daily, most families face challenges in discussing privacy concerns, with parents feeling unprepared and teens being hesitant to communicate. This study explored how guided family discussions, grounded in perspective-taking theory, promoted mutual understanding and enhanced digital privacy literacy. Through a qualitative study involving 13 parent-child pairs, we identified three key communication challenges: abstract discussions about privacy, reliance on absolute statements, and a decline in teen engagement. These challenges stemmed from limited privacy literacy and a lack of adaptive communication. Our perspective-taking facilitation approach addressed these issues by transforming traditional parent-led conversations into collaborative exchanges through reflective practices and helping families view privacy as a context-dependent concept. We propose design implications for educational technology to scale the support of family privacy discussions, including tools that support perspective-taking and interfaces that highlight non-binary privacy choices.**

1. Introduction

96% of U.S. teens use the internet every day, and nearly half of them are online almost constantly [1]. However, children's ability to understand and manage privacy risks has not kept pace with their use of digital technologies. Research [2], [3] indicated that while children exhibit basic privacy awareness, they often lack the knowledge and skills necessary for informed privacy decision-making.

Families play a critical role in shaping children's understanding of digital privacy. Through daily interactions and conversations, parents and children develop their perspectives on privacy decisions [4]. Nevertheless, family discussions about digital privacy face significant challenges. Without guided discussions, it is difficult for parents and children to maintain open communication about privacy concerns [5]. Prior research [6] found that most teens rarely communicate with their parents about their online experiences and related privacy issues, often due to their worries about parental reactions or control. In addition, 66% of parents do not feel adequately prepared to guide their children about digital privacy and lack the knowledge and confidence to teach digital privacy [7].

To address these challenges, our research investigated how guided family discussions, supported by perspective-taking theory, can foster mutual understanding and improve digital privacy literacy. This study focused on children aged 13 and older, as this is the age when they begin to use digital spaces for personal expression and social interaction [8], making parental guidance even more critical.

Perspective-taking theory [9] is suited to this context, as it focuses on facilitating mutual understanding of differing viewpoints and experiences, in our case, between parents and their children regarding privacy. This theory has demonstrated effectiveness in fostering mutual understanding and deeper expression of thoughts across various domains, including hard conversations [10], [11], family therapy [12], and educational psychology [13], [14].

In the context of family privacy discussions, perspective-taking offers a promising approach to bridging the understanding gap between parents and children. Perspective-taking allows children to better understand their parents' privacy concerns and protective motivations, and helps parents gain insight into their children's digital experiences and underlying reasons for their privacy attitudes. This mutual understanding may help families navigate the complexities of digital privacy together.

Based on the theory, we designed a guided approach to facilitate digital privacy discussions between parents and their children, consisting of two core modules. Firstly, we implemented perspective-taking communication techniques through structured individual reflection periods and targeted mediation strategies. Secondly, we enhanced privacy literacy by introducing a spectrum-based framework that moved beyond binary privacy choices while helping ground discussions in specific contexts that families regularly encounter.

Our user study investigated two key research questions:
RQ1: What communication issues hinder perspective-taking in family discussions about digital privacy?

RQ2: How can facilitation strategies be designed to enhance perspective-taking between parents and children?

Through a qualitative study with 13 parent-child pairs, we examined how families navigate digital privacy discussions and how facilitation strategies can promote more effective perspective-taking between parents and children.

Our observations of independent family discussions revealed several critical barriers to effective perspective-

taking. We identified three notable communication patterns that impede concrete and actionable dialogue: 1) the tendency to discuss privacy in abstract terms rather than concrete terms, 2) the reliance on absolute statements and oversimplified rules, and 3) the pattern of declining engagement from teens when their views were opposed. These patterns contributed to two recurring outcomes: limited ability to apply privacy concepts to real-life situations and superficial consensus that masked underlying disagreements. Further analysis revealed that these challenges stemmed from two underlying issues: limitations in privacy literacy (including teenagers' insufficient privacy awareness and parents' failure to recognize internal privacy boundaries) and a lack of adaptiveness in communication (particularly parents' subconscious shift into one-sided instructional modes).

Our facilitation approach achieved two key outcomes in family privacy discussions. Firstly, it enhanced privacy literacy by helping families move beyond binary privacy choices to understand privacy as a spectrum influenced by context, relationships, and situations, while also considering the needs of other family members. Secondly, it transformed traditional parent-led conversations into collaborative exchanges by incorporating structured reflection periods and encouraging children to share their digital expertise. Together, these outcomes deepened families' understanding of privacy and made their discussions concrete and actionable.

Drawing from these findings, we offer design implications for educational technology that can support family privacy discussions at scale. These include developing digital tools that scaffold perspective-taking conversations, creating interfaces that illustrate non-binary privacy decisions, and building features that bridge conceptual understanding with practical implementation. While our facilitation approach showed promise in promoting more effective family privacy discussions, we also identified limitations around translating privacy concepts into technical implementation and converting perspective-taking outcomes into practical privacy management strategies.

In summary, our research provides a detailed analysis of the communication patterns and underlying issues that hinder effective perspective-taking in family privacy discussions. Moreover, it offers empirically evaluated facilitation strategies that foster mutual participation, context-specific discussions, and actionable privacy decisions between parents and children. These findings extend current research on family privacy dynamics while offering concrete approaches for supporting more effective perspective-taking in family privacy discussions.

2. Related Work

To ground our research in perspective-taking-based family privacy discussions, we examined three key areas of related work: 1) the current state and challenges of family privacy, 2) approaches to family-based privacy education, and 3) perspective-taking communication theory and its potential in facilitating family conversations.

2.1. Challenges in Family Privacy

Prior research has identified several key challenges in how families approach digital privacy. A fundamental challenge is parents' preparedness and knowledge gaps. Auxier et al. [7] found that many parents feel inadequately equipped to guide their children about digital privacy, often lacking sufficient knowledge about cybersecurity implications. Wisniewski et al. [6] noted that most parents underestimate their children's online risk experiences, leading to misaligned guidance. This misalignment extends to permission-seeking processes, where Moser et al. [15] revealed that children expect more consultation than parents typically provide. These challenges are particularly significant given Humbert et al.'s [16] concept of interdependent privacy, where one family member's privacy decisions can significantly impact others. Similarly, research by Zeng et al. [17] and McReynolds et al. [18] highlighted that families adopting technologies such as smart home devices and Internet-connected toys often overlook crucial privacy implications.

Research also revealed that children's privacy understanding is more nuanced than often assumed. Zhao et al. [2] reported that children can identify certain privacy risks, particularly around information oversharing and identity protection, though they may have limited awareness of more technical risks like online tracking. Zhang-Kennedy et al. [19] similarly identified distinct privacy threat models held by children, which often differ from their parents' models. This finding aligns with broader research on mental models of privacy and security by Wash [20] and Camp [21], suggesting the need for approaches that can bridge perspectives and knowledge levels between parents and children.

Studies examining parents' information needs and teaching approaches highlight additional challenges. Petronio's communication privacy management theory [22] illustrates the complexities in family privacy boundaries and rules. Kuzminykh and Lank [23] further underscored that parents often struggle with effectively communicating privacy concepts to their children, despite being motivated to provide privacy guidance. However, these studies primarily focused on documenting problems without providing applicable solutions for helping parents.

2.2. Family-Based Privacy Education

Prior work has explored various approaches to supporting family-based privacy education. Corcoran et al. [24] conducted a study with over 1,000 parent-child dyads, demonstrating that while parental mediation can influence youth privacy attitudes, the effectiveness varies significantly based on the approach. Rule-based discussions dominate current practices, though example-based conversations are perceived as more effective by parents [5]. Other researchers have also proposed various technological approaches to address these challenges. The *Circle of Trust* mobile app [25] demonstrated that families prefer collaborative approaches over traditional parental control methods. Akter et al. [26]

found that, although collaborative monitoring tools can facilitate communication about privacy, the effective implementation of these approaches remains a challenge. A systematic review of multimedia tools for cybersecurity education by Zhang-Kennedy and Chiasson [27] revealed promising approaches using games and interactive content, including privacy-focused games [28], [29] and security training simulations [30]. Similarly, Liu et al. also proposed design guidelines to better support children's privacy learning by providing hands-on experiences and opportunities to reflect on the process [31], [32].

More recently, the role of informal learning spaces (ILS) has emerged as another promising avenue. Liu et al. [33] argued that ILS can serve as effective channels for family-based privacy education, creating environments where families can learn about privacy together. Theoretical frameworks for privacy education have also evolved to better support family-based learning. Kumar and Byrune's *5Ds of Privacy Literacy* framework [34] offers a structured approach to privacy education, building on Nissenbaum's theory of contextual integrity [35], which emphasizes the importance of context in privacy decisions.

However, despite these advances, current approaches still lack effective methods to help children develop their own privacy decision-making capabilities. These studies suggest the need for a framework that facilitates engaging mutual privacy discussions between parents and children, moving beyond one-sided rule-setting conversations [5].

2.3. Perspective-Taking in Family Communication

Perspective-taking theory offers promising approaches for enhancing family privacy discussions. Krauss and Fussell [9] identified perspective-taking as a fundamental cognitive and social skill that enables individuals to understand others' viewpoints, beliefs, and intentions during communication. This is particularly relevant for family privacy discussions, where parents and children often have different knowledge and experiences with technology.

Recent research demonstrated how perspective-taking can improve communication across various contexts. In online spaces, Baughan et al. [11] found that design interventions helping participants understand each other's viewpoints can support more productive conversations. Their subsequent work revealed that perspective-taking elements in digital design can facilitate more consensual conversations [10]. This aligns with research on inter-generational communication showing how structured dialogue can bridge generational gaps in understanding [36].

The value of perspective-taking is especially evident in family contexts. Butauski and Horstman [12] demonstrated how perspective-taking influenced parent-child relationships during sensitive discussions. Their findings showed that when family members demonstrated understanding of each other's viewpoints, they positively impact both individual and relational well-being. Similarly, Bowman-Smith et al. [14] also showed that brief perspective-taking activities can significantly improve teens' communication choices, highlighting the potential for structured activities to enhance family discussions. Recent work on family privacy navigation by Bauwens et al. [37] further emphasized how perspective-taking can help families develop shared moral principles around privacy.

While prior work has demonstrated the benefits of perspective-taking in various contexts, there remains limited investigation into effectively implementing such activities for family privacy discussions. Recent advances in privacy interface design [38], [39] suggest promising directions for supporting family privacy decision-making, but more research is needed on designing engaging, game-like interactions that can help families explore privacy concepts together while fostering mutual understanding of each other's perspectives and needs.

3. Design of Facilitation Guidelines

We developed a framework to facilitate family discussions about digital privacy by drawing from the following three established theoretical domains:

Perspective-Taking Communication Theory [9]: Underpins our components enhancing communication adaptability.

Contextual Integrity Theory [35]: Shapes our approach to context-based discussions, acknowledging that privacy decisions are inherently context-dependent.

Privacy Literacy Framework [34]: Guides our digital privacy literacy enhancement component, establishing the technical knowledge foundation necessary for context-specific privacy discussions.

Our facilitation framework focuses on three main areas to enhance family discussions about digital privacy:

1. Communication Adaptability: The moderator structures the privacy discussion in two stages: individual reflection followed by facilitated group dialogue. Initially, participants document their independent thoughts privately. Then, a structured group discussion helps the family compare perspectives and highlight privacy's inherent complexity.

This approach aims to serve two primary purposes: first, ensuring equitable consideration of perspectives through structured turn-taking and mutual participation [9]; second, sustaining positive emotional engagement through strategic topic redirection [11].

2. Context-Based Discussion: The moderator needs to monitor discussions to guide parents and children to explore privacy through concrete scenarios rather than abstract rules. The moderator should guide proactively if discussions remain overly abstract, prompting the family to discuss shared experiences and relevant scenarios.

This approach aims to emphasize that privacy decisions are not a binary yes-or-no choice but involve complex trade-offs based on specific contexts [39]. By eliciting specific examples of contextual complexity, this approach prevents oversimplification of privacy attitudes [40] and grounds abstract concepts in real-world contexts, enabling participants to more effectively collaborate and connect with their personal experiences [34].

3. Digital Privacy Literacy: The moderator should create opportunities for teenagers to share their technical knowledge and daily experiences with digital platforms. For parents, the moderator focuses on articulating privacy concepts and encouraging them to explicitly explain their privacy-related decisions. By facilitating cross-generational knowledge sharing, both age groups can demonstrate their digital experiences and learn from each other's perspectives.

This approach aims to promote mutual learning, not learning from the moderator, to enhance digital privacy literacy across generations [36]. It strengthens digital privacy discussions by building technical understanding while helping participants recognize and appreciate each other's privacy needs and concerns [41].

Other Facilitation Factors: Our implementation depends on adaptable facilitation strategies and focuses on continuous improvement through active observation and strategy refinement. Core facilitator competencies include active listening, neutral guidance [42], and knowledge for privacy-related discussions. The moderator must also adhere to ethical mitigation guidelines, which are detailed in the research method section.

4. Research Method

To investigate the effectiveness of the facilitation guidelines design, we conducted a qualitative study with 13 parent-child dyads. Each family participated in a two-hour session combining structured perspective-taking activities with natural discussions around privacy concepts, concerns, and decision-making. Given the involvement of minor participants, we implemented additional ethical safeguards. Below, we detail our recruitment process, study design, ethical safeguards, and data collection and analysis methods.

4.1. Participant Recruitment

Our recruitment criteria specified English-speaking families with children aged 13 and older who could attend in person in a university town or two nearby towns (within a 15-minute drive) in the U.S. We recruited participants through flyers and online platforms. To limit self-selection bias from privacy-focused families, we advertised the study as being about "digital safety" rather than specifically "digital privacy," aligning with prior work [43], [44].

The children aged over 13 years were at a developmental stage conducive to discussing privacy concerns. This age range marks a critical period when children increasingly engage with online spaces for personal expression [8]. While they possess a growing awareness of privacy risks, they often prioritize immediate benefits over long-term consequences, highlighting the need for parental guidance.

Table 1 outlines the demographic details of the parents and children involved in the study. Most parents worked full-time (9 out of 13), with others employed part-time (3 out of 13) or self-employed (1 out of 13). Educational backgrounds varied, although the majority of parents held at least a bachelor's degree. The sample was primarily Caucasian (10 out of 13) and Asian (3 out of 13). Family size ranged from 2 to 11 members, with an average size of 4.38 (SD = 2.22). Among teen participants, there were seven males, five females, and one non-binary. They were in grades ranging from 7 to 11, with most in grades 9 and 10.

4.2. Study Design

We conducted a focus group study to explore how perspective-taking activities can support families in navigating privacy boundary discussions in the context of digital safety. Our study design was informed by prior research on family privacy education and perspective-taking theory.

Each family participated in a two-hour collaborative discussion session designed to facilitate perspective-taking around digital privacy and safety. The session was structured to promote family discussions while incorporating specific perspective-taking activities. This study has four main steps:

1. Digital Needs Perspective Exchange (45 minutes): Family members first individually wrote down what they believed to be the other's key digital needs and concerns. Parents and children then shared their assumptions about each other's perspectives, leading to a discussion about desired digital capabilities. Together, they identified digital functionalities related to safety, with a focus on understanding the underlying reasons behind each other's needs.

2. Digital Information Requirements (20 minutes): Family members analyzed what personal information would be required to enable their desired safety functionalities. Parents had to articulate privacy concerns from their teens' perspective, while children explained data collection needs from a parent's viewpoint. This included examining specific data types (e.g., behavioral patterns, device activities) and discussing implications through the lens of the other party.

3. Privacy Preference Mapping (15 minutes): Before sharing their own preferences, participants first categorized different types of information sharing into three categories: complete transparency (comfortable sharing anytime with each other); conditional sharing (requiring context or explanation); and private (not comfortable sharing). Families compared their preferences and explored reasons for alignment and misalignment in their privacy attitudes.

4. Privacy Boundaries Perspective Exchange (30 minutes): Families engaged in discussions about privacy boundaries, with each member actively adopting the other's perspective while discussing: preferences for information access due to safety needs; age-appropriate privacy considerations; and balance between privacy and family trust.

The session concluded with a reflection period where families discussed how their understanding of each other's privacy perspectives had evolved and potential applications of perspective-taking approaches in future privacy discussions. Throughout the session, we provided whiteboards and markers for participants to write, and we scheduled short breaks for them, especially for teenagers.

Session Procedure and Compensation: The study was conducted face-to-face in the authors' research lab on a university campus. Families received $20 in Amazon digital

TABLE 1. DEMOGRAPHIC INFORMATION: LETTER 'P' FOLLOWED BY AN ID REFERS TO THE PARENT, AND LETTER 'C' REFERS TO THE CHILD.

ID	Age	Guardian Role	Ethnicity	Work Status	Guardian Education	Family Size	Child Age	Child Gender	Grade
01	35-44	Mother	Asian	Full-time	Graduate	4	13	Male	7
02	35-44	Mother	Asian	Full-time	Graduate	4	15	Male	9
03	35-44	Mother	Caucasian	Part-time	Bachelor	5	15	Male	9
04	45-54	Mother	Caucasian	Part-time	Graduate	4	15	Female	9
05	45-54	Father	Caucasian	Full-time	Graduate	4	15	Female	10
06	35-44	Father	Caucasian	Full-time	Bachelor	6	13	Female	9
07	45-54	Mother	Caucasian	Full-time	Graduate	2	13	Female	9
08	45-54	Father	Caucasian	Self-employed	Bachelor	11	15	Female	10
09	45-54	Mother	Caucasian	Part-time	Graduate	4	15	Male	10
10	35-44	Mother	Caucasian	Full-time	College	4	15	Male	9
11	35-44	Mother	Asian	Full-time	Graduate	3	14	Male	9
12	45-54	Mother	Caucasian	Full-time	Bachelor	3	15	Female	11
13	55-64	Mother	Caucasian	Full-time	Bachelor	3	15	Non-binary	10

gift cards per hour for each participating parent and for each participating child. If participants completed the study within two hours, they were still paid for two hours.

Moderator Qualifications: The moderator had at least five years of experience conducting research involving families and privacy/security issues. The research team included members with backgrounds in family education and digital privacy research. The team regularly held meetings to debrief on session outcomes and findings.

Pilot Testing: We piloted this study with two families in advance. Feedback from these pilot sessions helped us refine our facilitation approach. For instance, we initially planned to facilitate only when the discussion stalled. However, pilot sessions revealed that even active discussions required facilitation, especially when children gave minimal responses or when discussions remained abstract. This insight prompted us to clarify specific active discussion patterns that signal ineffective perspective exchanges during the discussions.

4.3. Perspective-Taking Theory Adoption

Our research design was grounded in perspective-taking communication theory, which posits that effective communication requires speakers to consider and adapt to the knowledge and perspectives of their audience. This theoretical framework guided our study design in two key ways.

Firstly, our design leveraged natural family communication processes. Research showed that parents and children naturally engage in perspective-taking during everyday interactions [12], particularly as they negotiate changing relationships and expectations during adolescence. Our structured activities were built upon these existing family dynamics, providing a supportive framework for naturally occurring family discussions around digital privacy.

Secondly, our approach was supported by research evidence demonstrating the effectiveness of structured family discussions. Studies showed that when family members engage in perspective-taking during discussions, it enhances mutual understanding and strengthens relationships [45]. Families who demonstrated identification and interest in understanding each other's perspectives reported greater relationship satisfaction and better conflict resolution [12].

4.4. Ethical Considerations and Mitigation

In designing the perspective-taking guided family discussion activities, we carefully considered potential ethical issues regarding participants' being pressured to disclose private information during privacy-related conversations. These issues are common in research on family communication (e.g., research on parent-child conflict [46], family emotional dynamics [45], and LGBTQ youth coming-out conversations [12]), so we drew on established safeguards from prior research and recent ethical issue mitigation guidelines on perspective-taking interventions [47] to ensure that participants were not exposed to greater risk than in a typical family conversation. The University Institutional Review Board reviewed and approved this study. Our safeguards addressed three key potential issues.

4.4.1. Informed Consent. We implemented an informed consent process that addressed the unique challenges of family-based research [46]. For teens, we explicitly emphasized their right to decline participation regardless of parental consent. To ensure voluntary participation, all participants were guaranteed compensation regardless of study completion. We also explicitly outlined the roles of participants and the implications of sharing information in a family setting. We emphasized that while anonymity between family members was not possible, all research data would be protected through appropriate confidentiality measures.

4.4.2. Managing Relationship Dynamics. Throughout the activities, we implemented a mutual consent process that allowed family members to negotiate their comfort levels with different topics [10]. Recognizing that family discussions can be emotionally charged, we incorporated structured breaks and opportunities for emotion regulation [45]. The researchers used non-confrontational techniques to maintain a safe environment and assisted parents and children in

recognizing and addressing misalignment in their discussions [46]. We monitored participant comfort through verbal and non-verbal cues, maintained protocols for redirecting overly personal conversations, and ensured moderators could guide discussions toward comfortable topics when needed.

4.4.3. Post-Study Debriefing and Support. Following the activities, we conducted thorough debriefings where families received specific feedback about their communication patterns and suggestions for future privacy discussions [10]. Families were also invited to raise any concerns directly with the research team after completing the study. Recognizing the importance of ongoing family relationships [46], we provided support through open communication channels and resources for families seeking additional guidance, such as family counseling services.

4.5. Data Collection and Analysis

All the sessions were audio-recorded with participant consent, and the recordings were transcribed. Additional data sources included researcher field notes, participant-generated artifacts from workshop activities, and post-session reflection documents.

The researchers then followed Saldana's approach [48] to qualitatively code the transcripts using a constant comparative method to identify common themes across families. The coding process was iterative. Initially, two researchers independently coded three sample transcripts and then discussed and agreed on codes and themes. One researcher coded the remaining transcripts according to these agreed-upon categories. After drafting an initial report and reflecting on the findings, we repeated the coding process. In the rare cases of disagreement between coders, we discussed until a consensus was reached. One researcher then led the re-coding of the remaining transcripts, and the other researcher reviewed and discussed any consistent and inconsistent points with the lead coder. We observed data saturation [49] by the ninth session, indicating thematic saturation.

Due to the qualitative nature of this study, we do not report the exact counts of examples and themes. Instead, we use consistent terminology to indicate the relative frequencies of the themes [50], [51], as shown in Figure 1.

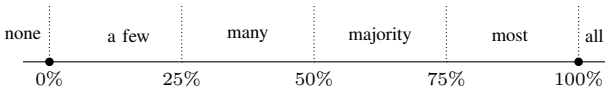

Figure 1. Terminology of Theme Frequency Descriptions

5. Findings

We found several key dynamics in how families navigate digital privacy discussions, as well as opportunities and challenges for facilitating more effective conversations. By observing parent-child interactions, we identified specific communication patterns that often impeded concrete and actionable conversations, analyzed their root causes, and evaluated the effectiveness of targeted facilitation approaches, as shown in Figure 2. Below, we organize our findings into four subsections: challenges observed in family discussions, their root causes, facilitation strategies and outcomes, and facilitation limitations. These findings illuminate the complexity of family privacy discussions and potential pathways to support parents and teenagers in having more constructive conversations about digital privacy. The codebook of the observed challenges and facilitation outcomes is presented in Table 3; facilitation signals along with prompting strategies are presented in Table 4.

5.1. Observed Challenges in Independent Parent-Child Conversations

We observed three notable challenges that led to two overarching consequences: 1) difficulty applying privacy principles in real-world scenarios, and 2) superficial consensus that masked unresolved disagreements.

Abstract Discussions about Privacy: Parent-child conversations frequently remained abstract, with terms such as "privacy" or "safety" used without connection to specific, real-life situations. This abstraction limited mutual understanding, hindering both parties from clearly articulating and appreciating each other's underlying concerns.

Reliance on Absolute Statements: Participants often relied heavily on absolute language (e.g., "always," "never") or oversimplified guidelines about information sharing. Such language created misleading impressions that privacy decisions are a binary choice and misaligned with the different considerations that families actually faced.

Decline in Teen Engagement: Teenagers' active participation diminished, particularly when their viewpoints differed or were challenged by their parents. This reduced engagement usually showed as brief, noncommittal responses (e.g., "yeah," "okay"), indicating decreased interest in continuing the current discussion topic.

We detail the challenges below, along with how each challenge contributes to the larger issues and underscores the need for external facilitation.

5.1.1. Abstract Discussions about Privacy. We found that most families often discussed privacy issues in abstract terms rather than grounding their conversations in specific, real-life contexts. For example, C08 (age 15, female) remarked on the boundaries of information sharing, *"Sometimes I just think you don't need to know everything, like all the time. It's not like I'm hiding something, but not every little thing matters."* Similarly, P13 (age 55-64, mother) discussed her perceived disconnect between privacy and risk at a high level, *"I mean, just because something's private doesn't mean it's bad, you know? But if you say it's all about safety, people assume the worst."* Such abstract language was particularly noticeable when discussing parental oversight of digital activities. For instance, P03 (age 35-44,

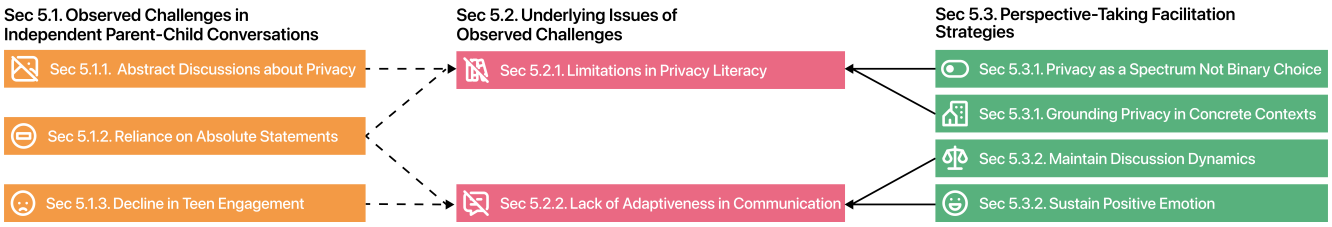

Figure 2. Overview of challenges in parent-child privacy discussions (Section 5.1), their underlying issues (Section 5.2), and addressing them with perspective-taking facilitation strategies by improving privacy literacy and communication adaptability (Section 5.3).

mother) mentioned the family's approach to phone usage, *"We were trying to figure out how to let you keep it [the phone], but safely."*

We found that these abstract discussions often prevented families from fully understanding each other's concerns, making it difficult to reach common ground. We identified two key signals indicating the need for facilitation: 1) using abstract terms such as "privacy" or "safety" without concrete examples; 2) expressing difficulty in connecting abstract principles to daily life (e.g., *"I don't know. Well, you know..."*).

When these signals appeared, the moderator asked the family to recall an actual incident so everyone could explain the concern in concrete terms. For example, when P13 repeated her general statement about privacy, the moderator prompted her to recall a situation involving an unknown caller reaching out to her child, which turned out to be about her child's guitar lessons. This recollection was intended to facilitate a concrete discussion of privacy boundaries and safety concerns.

5.1.2. Reliance on Absolute Statements. We found that parents and teenagers tended to express absolute stances without including contextual differences.

In the majority of families, parents used absolute statements such as *"always a risk"* or *"parents should always get alerts,"* which sometimes unintentionally triggered anxiety in children about future events. For instance, in the discussion between P07 (age 45-54, mother) and C07 (age 13, female):

> P07: "There's always a risk that someone could go back and say this was their record."
> C07: "That's the thing. I was diagnosed with depression and had to take meds. How do they know I'm going to be the same person at 25 as I was at 10 or 11?"
> P07: "Putting anything down is always a risk. In my experience, it's always a risk."

We found that teenagers also expressed absolute views. Teenagers' demands for privacy often appeared as simple resistance to monitoring. For example, C07 stated, *"I wouldn't like just give you my phone to scroll through all my text."*

Similarly, other teenagers told their parents they did not want their parents to *"check everything"* (C01, age 13, male) or *"see my device"* (C11, age 14, male).

In response to the resistance, their parents usually repeated their good intentions, emphasizing that they were not interested in their children's secrets but worried about child safety with statements like, *"Just to make sure you are safe"* (P01, age 35-44, mother).

These expressions create a false impression of a privacy-safety dichotomy, limiting the opportunity to understand each other's reasons behind these statements. It is worth noting that during the reflection period, all families agreed that the simplistic impression was not entirely accurate. Parents wanted to emphasize privacy in terms of external risks, and teenagers wanted to emphasize their discomfort when they do not know what their parents will find out.

We found that the use of absolute expressions and simple rules was a signal for the moderator to intervene. The moderator intervened by asking children to consider whether there are specific safety-related situations where parental monitoring is acceptable to them. For parents, the moderator encouraged them to explain whether they are addressing external risks, as the approach may be different when family members are involved. This facilitation aimed to shift the conversation from total resistance to a deeper perspective exchange about privacy attitudes.

5.1.3. Decline in Teen Engagement. We found that many teenagers' engagement gradually declined during the discussions. They shifted from active participants to passive listeners, offering only brief assent rather than sustained, in-depth contributions. This shift was observable through various disengagement signals, such as single-word confirmations like *"yeah,"* noncommittal sounds like *"hmm,"* and brief assents like *"okay," "cool."*

For example, C09 (age 15, male) initially explained his thoughts in detail, indicating that his need for privacy was not that important. However, after hearing his mother express a more cautious attitude toward sharing private information, C09's responses became minimal, consisting of repeated responses like *"yeah"* and *"hmm."*

We found that this reduction in participation often indicated that teenagers felt their perspectives were heard but not accepted or understood. Consequently, teenagers became reluctant to engage further, seeking instead to expedite the conclusion of the conversation. We identified brief, noncommittal responses as key signals of disengagement, such as single-word confirmations or disengaged vocal cues.

This decline in interactive engagement suggested that the moderator should intervene, check in with the teenager, and adjust the discussion accordingly in order to re-engage them by shifting the conversation to common ground, such as by revisiting a context-specific privacy-related scenario that the teenager is open to discussing further.

5.2. Underlying Issues of Observed Challenges

We found two underlying issues behind the challenges observed in privacy-related conversations between parents and teenagers. Firstly, limitations in privacy literacy manifested in teenagers' low awareness of data privacy implications and parents' low awareness of privacy boundaries within the family. Secondly, parents' communication styles lacked adaptability, often defaulting to a one-sided guidance model that gradually moved away from perspective-taking conversations. These issues may reduce the effectiveness of digital privacy discussions within families and highlight the need for external facilitation to guide family digital privacy discussions. Below, we elaborate on each underlying issue and its impact on parent-child discussions.

5.2.1. Limitations in Privacy Literacy. Based on the analysis of family discussions, we identified two key limitations in privacy literacy that contributed to the observed challenges: insufficient privacy awareness among teenagers and parents' failure to recognize internal privacy boundaries.

Teenagers' Insufficient Privacy Awareness: We found that many teenagers initially demonstrated a lack of awareness regarding personal data security. They often believed their data was insignificant, failing to recognize the potential risks associated with sharing personal information. For instance, C13 (age 15, non-binary) remarked, *"The bigger the company, the more shady they might be... but I don't think it's a big deal,"* indicating a limited concern about data privacy.

Parents attempted to address their children's misconceptions and illustrate the potential consequences of data misuse. For example:

> C09: "Yeah, but I don't care. It's not like they're gonna target me specifically. My data's not that important."
> P09: "It's not about being important. They don't need just your data; they need everyone's. It's the patterns that matter."

The moderator would intervene if parents failed to address the teen's indifference to privacy protection, such as statements like *"my data is not important,"* in accordance with the guidelines to enhance digital privacy literacy outlined in Section 3.

Similarly, facilitation would occur if parents taught their children correct privacy knowledge, but children declined to engage, following the guidelines to enhance communication adaptability outlined in Section 3.

Parents Missing Internal Privacy Needs: We found that a few parents made a clear distinction between internal and external boundaries when setting privacy guidelines. For example, P01 (age 35-44, mother) stated, *"Sharing your habits with family is OK, but sharing your habits with an AI is not OK."* But such boundary-setting overemphasized external risks while overlooking the privacy needs of family members. A similar sentiment was expressed by P10 (age 35-44, mother): *"I would want to respect your privacy, but if it just showed up in my email, I might read it."*

As children were often unsure but did not ask their parents about the reasons behind these privacy positions, the moderator would further explore the parents' rationale and encourage them to explain their reasoning or clarify their stance on family privacy boundaries, as it might not represent parents' true intentions.

5.2.2. Lack of Adaptiveness in Communication. We observed that parents often unconsciously shifted into a predominantly instructional mode when discussing privacy, sometimes without realizing their communication had become one-sided. This approach, while well-intentioned, typically lacked open-ended questioning that could encourage deeper reflection and engagement from teenagers.

We found that this one-sided communication pattern was prevalent across the majority of families. For instance, P04 (age 45-54, mother) shared her perspective with her daughter through a series of declarative statements:

> P04: "I don't even get on Facebook. I'm just like, you know, unless I know people personally, I don't really share information about myself or my family. Like, we're just like, well, because I don't feel like that's something I want or need."

During this exchange, C04 (15, female) remained silent, demonstrating the typical passive reception we observed in such scenarios.

During the reflection period, P04's comment revealed the underlying parental anxiety driving this approach: *"It's overwhelming as a parent... You feel like worms can just get to her in all kinds of ways."* This highlights the emotional challenge parents face in expressing their privacy concerns without inadvertently creating pressure for their child.

For the moderator, the key signals to watch for include: 1) extended parental monologues without pauses for teen input, 2) frequent use of declarative statements rather than questions, 3) absence of teen verbal participation, and 4) parents' unconscious shift from sharing perspectives to giving instructions. When these patterns emerged, the moderator would intervene to redirect the conversation toward more collaborative dialogue.

5.3. Perspective-Taking Facilitation Strategies

Our facilitation achieved two goals in family privacy discussions. First, we improved privacy literacy by moving beyond binary privacy choices to refined ones, situation-specific decision-making frameworks. Second, we implemented perspective-taking communication techniques that transformed traditionally one-way parent-child privacy conversations into collaborative exchanges, where teens were

encouraged to share their thoughts when remaining passive, and parents could incorporate their children's suggestions into privacy decision-making. These strategies promoted a deeper understanding of the complexities of privacy and more effective family discussions around privacy decisions.

5.3.1. Privacy Literacy Enhancement. Our facilitation enhanced family privacy literacy by challenging two oversimplifications in privacy discussions. Instead of treating privacy as a binary decision, we introduced a spectrum-based framework that acknowledged nuanced choices. Rather than discussing privacy in abstract terms, we helped ground the conversations in contexts that families regularly encounter.

Privacy as a Spectrum Not Binary Choice: We introduced a spectrum-based explanation for understanding privacy, moving beyond simple yes-or-no conceptualizations. Drawing from the privacy literacy framework [34], [35], this approach helped families recognize the nuanced continuum of privacy choices. The facilitation typically began with a structured introduction:

> Moderator: "This spectrum shows that sharing information isn't just about saying 'yes' or 'no.' On one side, you have complete transparency, where people are comfortable sharing information with each other anytime, anything. In the middle, there's conditional sharing, where sharing requires context or explanation. On the far end, you have privacy, where someone is not comfortable sharing any information."

Our findings revealed three significant shifts in how families conceptualized privacy. Firstly, families learned to calibrate privacy levels based on specific circumstances. For instance, Parent P03 (age 35–44, mother) then shared with her child, *"Well, sometimes, like, a friend tells me something, and they really don't want me to tell anyone else."* Through this exchange, family members came to recognize that friendship, whether among parents or children, can significantly influence their own privacy boundaries and decision-making. Secondly, rather than viewing safety and privacy as opposing forces, families learned to balance these considerations. Finally, families recognized how privacy needs vary across relationships and contexts. A realization C06 (age 13, female) summarized by saying, *"I think people have a lot of different comfort levels."*

These observations suggested an advancement in participants' expression of privacy attitudes: an acknowledgment that privacy needs may shift depending on relationship dynamics, information sensitivity, and personal preferences.

Grounding Privacy in Concrete Contexts: We implemented a context-based discussion facilitation approach to help families explore privacy through specific, real-world situations rather than abstract concepts. This approach drew from the contextual integrity framework, providing families with concrete scaffolds to examine how privacy considerations shift across different scenarios. Table 2 summarizes the context-specific strategies, which the moderator used to prompt family members to move away from abstract, one-size-fits-all views of privacy.

TABLE 2. MODERATOR FACILITATION CONTEXTS AND STRATEGIES

Family Needs & Context	Moderator Strategy
Physical Location Safety	Prompt discussion on the different location contexts
Mental Health Safety	Ask about types of mental health issues and needed data patterns
Online Safety	Prompt discussion on specific online applications and what risks to focus
Message Safety	Ask about types of messages and the different contexts
Photo Safety	Ask about types of photos and the different contexts

Before facilitation, most families spoke in broad or absolute terms. For example, *"I don't want you to read all my texts."* or *"It's just for safety."* By focusing on concrete scenarios, as shown in Table 2, our facilitation guided the family members toward more situation-specific discussions and context-dependent privacy decision-making.

For instance, P12 (45-54, mother) and C12 (15, female) initially spoke only in general terms about message monitoring. P12 mentioned "some way" to receive alerts and the content of harmful messages, such as those indicating suicidal intentions, while C12 responded minimally with agreement like "Yeah." Recognizing that the consensus was unclear, the moderator applied the "Message Safety" strategy from Table 2, prompting them to consider different scenarios to discuss more specific possibilities:

> Moderator: "What about situations where the context matters? Like, if something you said as a joke or sarcasm?"
> C12: "I feel like if it's sarcasm and the algorithm is triggered, maybe send the notification explaining it's a joke ahead of time."
> P12: "Maybe send some content before and after to show context, whether it was a joke or serious conversation."
> C12: "Yeah, like send what the other person replied with so you can see if they were joking back or if it was serious."

P12 and C12 eventually proposed adding contextual information when flagging concerning messages to parents, instead of settling on a solution that lacked clear rules on how to respond if C12's texts to friends were misunderstood.

Another example is when P09 (age 45-54, mother) and C09 (age 15, male) began with an all-or-nothing view on location sharing. The moderator prompted them to distinguish among different locations ("Physical Location Safety" in Table 2). They then jointly decided on "no location alert" when the child is in familiar locations, but to notify the parent if the child goes to unknown places or identified risky places around their neighborhood. Their discussion thus moved away from all-or-nothing monitoring solutions.

These examples demonstrate how context-based discussion facilitation helped families move from abstract or broad privacy conversations to more situation-specific, context-dependent discussions. By referencing their real-life scenar-

ios, families achieved greater clarity and alignment in their privacy attitudes and agreements.

5.3.2. Perspective-Taking Communication Facilitation. We implemented and tested the key strategies for maintaining communication dynamics and positive emotional engagement. Our approach focused on creating conversations where both parents and children actively contributed and responded through structured individual reflection periods and targeted mediation techniques. These facilitation methods helped transform traditionally parent-led conversations into collaborative exchanges while maintaining positive emotional engagement during the privacy discussions.

Maintain Discussion Dynamics: Our facilitation to address power imbalances focused on recognizing and validating children's multiple roles in privacy discussions. The activity consists of two stages:

Individual Reflection: Family members use whiteboards to record their thoughts individually to prevent premature influence on each other's perspectives.

Facilitated Joint Discussion: The moderator introduced shared whiteboard sessions where family members individually recorded their thoughts. As indicated by the moderator's transition, *"Now we can turn this whiteboard around and discuss what we wrote,"* these individual reflections became the foundation for group dialogue.

By providing this space for individual reflection before collective discussion, the initial step helped transform traditional parent-led privacy discussions into more collaborative dialogues. As C07 (age 13, female) noted, *"I think we didn't influence each other as much because we did our own things and then came back together."* Another child C04 (age 15, female) reflected on this structure as new to her: *"Usually, we just sit down and talk about it, but we never sit down and write about it."*

P06 (age 35-44, father) also recognized the value of this approach: *"I think this is the kind of discussion we want to have."* Initially, P06 spoke for the family regarding online safety and privacy protection. After the individual whiteboard reflections were shared, C06 (age 13, female) contributed by highlighting how individuals' comfort levels with sharing private information vary. P06 then naturally shifted from steering the conversation to actively responding to his child's perspectives.

Our observations and participants' feedback suggest that the structured activity effectively facilitated the desired shift toward more equitable parent-child dialogue.

During the joint discussions, the moderator employed two facilitation strategies to ensure equitable speaking opportunities for both parents and children.

The first strategy was when observing that a parent was dominating the discussion, the moderator would directly cue the quiet child by asking the child a follow-up question based on observed child behaviors.

For example, when P05 (age 45-54, father) spoke at length about a "long list" of tasks related to digitalization that could raise privacy concerns, such as scheduling, homework assistance, finances, and so on, the moderator explicitly invited C05 (age 15, female) to contribute. The moderator asked, *"So, so, [child's name], I noticed you just crossed off this homework assistant on the list, could you tell us why you..."*

C05 responded before the moderator finished his sentence, explaining that she enjoyed solving difficult problems herself and preferred not to share her homework information with a digital assistant. P05 then acknowledged C05's viewpoint, suggesting that any technology supporting homework should focus on clarification or study support rather than simply providing answers. After this exchange, C05 participated more actively with P05 during brainstorming tasks and discussions, enabling the discussion to progress more collaboratively between parent and child.

The second strategy involved encouraging teenagers to act in the role of a digital expert, inviting them to explain app usage and privacy protection functions to their parents.

For instance, when P03 (age 35-44, mother) expressed concerns about social media contacts potentially threatening her child's digital safety, her child, C03 (age 15, male), initially remained quiet. Noticing this situation, the moderator directly invited C03 to share his perspective on his mother's concerns. C03 then explained how digital safety features on social media platforms function:

> C03: "Like if there's a link your friend sent you, maybe it has a virus. It [the social media] can figure that out and not let you go on it. If it was really bad, it could just block it or ask if you want to report it."

After hearing C03's explanation, P03 acknowledged her child's superior online knowledge, telling the moderator that her child *"actually he knows more about that stuff than me..."* Later in the discussion, when considering how parental control technologies should respond if a safety issue arose, C03 proactively suggested a compromise that balanced parental oversight with his autonomy: *"Maybe it can give me two days to tell my parents myself before it automatically reports them or something."* Throughout this exchange, C03 proposed specific privacy strategies that were previously unknown to P03.

This shift in expertise recognition led to family privacy decisions that considered both parental concerns and children's digital experiences, ultimately helping establish mutually agreeable privacy expectations.

Sustain Positive Emotional Engagement: Our observations revealed how emotional dynamics could shift during privacy discussions, potentially leading to disengagement. For instance, C09 (age 15, male) initially engaged actively in privacy discussions, but became minimally responsive with multiple 'yeah' and 'hmm' responses after his mother expressed stronger privacy concerns. To re-engage C09, the moderator intervened by asking, *"Would you feel differently if you could control what specific data is collected or how it's used?"* This led to a more nuanced discussion:

> C09: "Yeah, that could help, but it's not realistic to do that every single time."

P09: "But if you have the option to do that before your data is handed over, would it work?"
C09: "Yeah, that would work. But I don't think everyone would use it all the time. Still, it's a good option to have."

Another example is how parents' absolute statements about privacy risks could unintentionally trigger anxiety in children. This was mentioned earlier about the discussion between P07 (age 45-54, mother) and C07 (age 13, female). P07 stressed that any information shared could always be traced back, which made C07, who had a history of depression, worry about future job prospects. The moderator noticed that P07's repeated warnings of "always a risk" amplified C07's sense of uncertainty. Thus, the moderator facilitated this shift in the following exchange:

Moderator: "Here the goal is to remind you that this information about your data is your own, and you have the right to decide how it's shared."
P07: "You should know it's your right to limit that when you feel uncomfortable."
Moderator: "Yeah, everyone has different comfort levels with sharing information."
C07: "Depends on the info, like I wouldn't mind sharing basic stuff, but more personal things, not so much."
P07: "Same here, but I think it depends on timing and the situation too."

This shift lowered tension and re-centered the discussion on mutual understanding, supporting an exchange that accounted for parental concerns and child autonomy.

In summary, we developed three facilitation strategies to help parents sustain positive emotional engagement:

- *Shifting the Tone of Conversation:* Move away from normative language such as "should" or "must," toward empowering statements emphasizing choice and autonomy, such as "can" or "have the right to..."
  Example: Instead of saying, "You must tell your parents," reframe the message as, "This is your information, and how would you decide to share it with your parents?"
- *Encouraging Thinking in Context:* Replace an absolute statement with a situational approach.
  Example: Instead of saying, "There is always a risk," reflect the context, like, "In this situation, the risk is..."
- *Valuing Personal Preferences:* Emphasize individual differences rather than applying universal standards.
  Example: Instead of asserting, "Everyone does this," acknowledge personal variation by stating, "Everyone has different comfort levels with sharing information."

5.4. Facilitation Limitations

A limitation emerged around the translation of privacy concepts into technical implementation. While some families understood privacy concepts, they wanted to learn more about technical implementation details. For instance, C03 (age 15, male) wanted to understand mechanisms for alerting parents about children's risks without exposing raw data, but the moderator's verbal descriptions remained too difficult to digest, without tangible examples to demonstrate how such systems would work in practice.

There were also challenges in translating perspective-taking outcomes into practical privacy management. While the moderator facilitated shared understanding of privacy perspectives among family members, there is a gap in the practice of such understanding. For example, P06 (age 35-44, father) wanted *"practical guidance on actual settings and controls."* This reflects a limitation of our current facilitation methods. While it promoted perspective-taking, it was not designed to provide technical instruction. This limitation highlighted that families want to align their desired privacy practices with digital tools and settings available to them.

6. Discussion

Our findings reveal important insights into how families navigate privacy discussions and highlight opportunities for facilitating more effective perspective-taking in these conversations. Through our analysis of family interactions and facilitated discussions, we identified both significant barriers to perspective-taking and promising strategies for overcoming them. These results extend the current understanding of family privacy communication while suggesting practical approaches for improving privacy education and tool design.

The following subsections explore three key contributions. Firstly, we examine the barriers that often prevent effective perspective-taking in family privacy discussions, including communication patterns and underlying issues that create these obstacles. Secondly, we discuss how structured facilitation strategies can help families overcome these barriers and engage in more context-specific and actionable privacy discussions. Finally, we consider the implications of our findings for family-based privacy education and technology design, especially how to support collaborative learning and decision-making around privacy issues.

6.1. Understanding Barriers to Perspective-Taking in Family Privacy Discussions

Our findings address **RQ1** by revealing several critical barriers that hinder effective perspective-taking in family privacy discussions. The identified communication patterns, including abstract discussions, absolute expressions, and declining engagement, represent significant obstacles that need to be systematically addressed. While previous research has identified power imbalances as barriers in family communication [26], our work extends this understanding by revealing how specific communication patterns interact with underlying issues to impede perspective-taking.

The discovery of two fundamental underlying issues, privacy literacy limitations and lack of communication adaptability, provides crucial context for understanding these barriers. Parents' tendency to shift into a one-sided instructional mode and children's insufficient privacy awareness create a

challenging dynamic that can prevent contextually grounded perspective-taking. This finding echoes previous work on parents' inadequacy feelings [7], demonstrating how the underlying issues are reflected in their communication patterns.

Our observation of superficial consensus and limited real-life applicability as consequences of these barriers highlights the need for targeted interventions. While prior work has emphasized the importance of authentic family communication [6], our findings reveal how communication patterns and underlying issues can lead to seemingly productive but ultimately superficial discussions that fail to promote perspective-taking communication.

6.2. Designing Effective Facilitation Strategies

Our findings answer **RQ2** by demonstrating how structured facilitation approaches can effectively promote perspective-taking. Our two-stage facilitation approach (i.e., individual reflection and facilitated joint discussion) offers a promising step forward in addressing previously identified barriers to family discussions.

Our strategies for enhancing privacy literacy, particularly the shift from a binary-based to a spectrum-based view of privacy and the use of context-aware discussions, illustrate how facilitation helps translate abstract privacy concepts into context-specific and actionable insights for parents and children. This approach extends previous research on contextual integrity [34], [35] by providing concrete mechanisms to foster shared understanding through perspective-taking.

Our findings suggest that structured facilitation helps maintain equitable speaking opportunities, providing a practical solution for addressing power imbalances. The individual reflection period, followed by joint discussion, demonstrates how such design can create protected spaces for developing ideas while ensuring mutual participation. This approach addresses the power dynamic challenges identified in previous research [26] and offers specific strategies for practical implementation.

The emergence of children's multiple roles, including digital natives and active privacy negotiators, in facilitated discussions challenges traditional approaches to privacy education. This finding echoes recent research on children's privacy understanding [19], [33] by highlighting how facilitation can effectively leverage children's technological expertise and privacy awareness in family discussions.

6.3. Comparative Research Insights on Mental Models and Societal Perspectives

Family discussions about privacy resemble conflict resolution scenarios, especially when uneven power dynamics are present. However, in privacy conversations, parents and children share a mutual goal: protecting children's privacy and safety. Consistent with previous conflict resolution research [52], [53], [54], our findings indicate that perspective-taking enables parents to understand children's desire for autonomy, while children gain appreciation for their parents' protective intentions. Although both groups recognize the importance of responsible internet use, parental authority may occasionally overshadow children's perspectives, restricting mutual understanding and collaborative decision-making. Adopting a conflict resolution perspective sheds light on how structured facilitation methods can mitigate power imbalances by encouraging clear self-expression from both parties. This approach, in turn, promotes collaboration toward achieving shared family objectives.

Our research also expands on previous studies examining children's initial mental models of privacy [55], [56], [57], [58], which are often context-independent and focused primarily on rule-following. For instance, Kumar et al. [55] noted that younger children commonly view privacy as obeying parental instructions, such as not sharing passwords, without considering the context. Our study extends this understanding by demonstrating how structured perspective-taking activities encourage children to think beyond basic assumptions, such as believing their personal data has little value. Through guided discussions, children began to approach privacy decisions more thoughtfully, recognizing privacy as dependent on context and potential risks.

Additionally, some teenagers initially showed indifference toward protecting their personal data, a stance similar to that observed in marginalized or low-income groups who perceive limited benefits from safeguarding privacy [59]. Such attitudes often arise from feelings of powerlessness or seeing little immediate advantage in privacy protection. Through facilitated discussions, they reconsidered how their data might be misused, helping them recognize the personal and collective importance of privacy.

Overall, our findings demonstrate how perspective-taking designs can adjust family power dynamics and enhance teenagers' mental model of privacy. We showed how shared family privacy goals can be hindered by existing power dynamics and oversimplified expressions about privacy. Encouraging teenagers to consider the perspectives of others and the potential consequences of their actions can foster a shift toward a more contextual and critical privacy awareness, aligning with broader societal views.

6.4. Advancing Family-Based Privacy Education

Our findings contribute to an ongoing dialogue about family-based privacy education, building upon valuable insights from prior research. Previous work has highlighted important challenges, including parents' feelings of inadequacy in guiding digital privacy [7] and children's reluctance to communicate about online experiences [6]. Recent work by Liu et al. [33] proposed three important design goals for family-based privacy education: family-centered learning, cultivating privacy literacy, and resolving conflicts and tensions. Our study explored potential approaches to addressing these challenges and working toward these goals through structured perspective-taking activities.

6.4.1. Family-Centered Learning. We explored family-centered learning through structured facilitation informed

by perspective-taking communication practices [9]. Our approach followed the goal of "enhancing the experiences of family groups rather than focusing solely on the needs of children" proposed by Liu et al. [33], aligning with insights from previous studies [37], [60]. Specifically, we found that incorporating individual reflection periods followed by joint discussions created environments where parents and children could effectively learn from one another.

These interactions revealed mutual benefits when family members exchanged their knowledge and experiences related to privacy. Guided discussions appeared to facilitate inter-generational dialogue, allowing children to express their views openly and providing parents with valuable insights into their children's digital experiences and privacy concerns. Such an exchange may have strengthened their collective understanding of digital privacy.

6.4.2. Cultivation of Privacy Literacy. In relation to the cultivation of privacy literacy, our findings resonate with research emphasizing the contextual nature of privacy [35] and the importance of building privacy literacy rather than just following rules [34]. Consistent with Liu et al.'s assertion that "the promotion of privacy literacy is a key objective" [33], our design specifically targets this goal. The perspective-taking activities we examined suggest three ways to support privacy literacy development:

- Encouraging exploration of privacy as a spectrum, rather than as a binary choice;
- Connecting abstract privacy principles to concrete, everyday contexts;
- Facilitating continuous dialogue about privacy boundaries to foster critical thinking.

6.4.3. Resolving Conflicts and Tensions. Our observations also align with previous research on resolving conflicts and tensions during family privacy discussions [61]. Specifically, the spectrum-based discussions helped families move beyond binary conflicts (e.g., privacy versus safety) identified by a prior study [37], supporting calls for "a safe and flexible environment" [33] to address privacy-related conflicts.

6.4.4. Other Aspects. Additionally, we observed children taking on various roles during discussions as a digital native and an active privacy negotiator. These observations resonate with previous reports highlighting children's nuanced understanding of privacy [19], [33].

These findings suggest potential directions for family-centered privacy education that complement existing approaches. While traditional rule-based approaches have their place [5], the combination of structured facilitation and perspective-taking activities appears promising for supporting family-centered learning, developing privacy literacy, and addressing conflicts. Future work could explore how educational technology might help implement and scale these approaches.

6.5. Educational Technology Design Implications

While many educational tools exist, few help family members practice perspective-taking during privacy discussions [27]. Based on our findings, we propose four design implications for educational technology to facilitate family privacy discussions and privacy education at scale.

6.5.1. Perspective-Taking Scaffolding. Our research highlights the importance of technologies that scaffold perspective-taking conversations within families. While existing tools focus on individual learning [30] or rule-based instruction [62], our findings underscore the value of supporting collaborative family privacy discussions and privacy education. This is consistent with prior work [20], [21], which emphasized that effective educational tools should help learners develop mental models of privacy rather than simply instructing them on privacy rules.

Future tools may integrate interactive visualizations, such as those in privacy comics [19] and security infographics [63], to facilitate joint exploration of privacy concepts. Game-based elements, like those in *A Day in the Life of Jos* [28], can create natural teachable moments. Additionally, structured prompts and activities that encourage perspective-sharing, akin to those used in effective tabletop games [29], can foster context-specific dialogue. Finally, features that support collaborative decision-making about privacy settings would empower families to navigate privacy management together.

6.5.2. Non-Binary Privacy Decision Illustration. Traditional privacy interfaces in educational contexts often rely on simple binary (yes/no) choices. Our research, however, indicates that families can develop more nuanced mental models of privacy through perspective-taking communication. To capture this complexity, we need interface designs for privacy education to move beyond binary toggles.

Visual designs could present privacy decisions along a spectrum or provide multiple nuanced options to create a richer and more flexible family communication experience. This approach aligns with research emphasizing the use of visual metaphors to improve the accessibility of privacy concepts [19]. For example, *Security Cartoons* [64] depict privacy as a continuum; they illustrate how small, everyday decisions (e.g., sharing WiFi bandwidth) can escalate into more significant threats (e.g., exposure to malware). By presenting privacy trade-offs through familiar scenarios and metaphors, these cartoons help readers appreciate the graduated nature of privacy risks and recognize that decisions are rarely an all-or-nothing proposition. Building on this concept, we propose privacy interfaces that illustrate privacy risks as situational and continuous rather than binary.

Extending our call for non-binary privacy interfaces, we propose designing spectrum-based privacy prompts in informal privacy literacy learning settings (e.g., museum exhibits). Rather than limiting users to "allow" or "block" options, a three-choice system (i.e., "allow," "depends," and "block") can encourage families to reflect on and discuss

trade-offs depending on different situations. For instance, an exhibit could ask whether visitors prefer to share a souvenir photo taken in the museum on a public screen or keep it private. Instead of presenting just a yes/no button, providing these three choices could encourage families to engage in non-binary, context-dependent discussions about their privacy decisions.

6.5.3. Bridging Conceptual Understanding and Daily Practices. To bridge the gap between abstract privacy concepts and their technical implementation, interactive multimedia tools [27] can provide clear and actionable guidance. Instead of relying on verbal explanations, interactive simulations can demonstrate privacy mechanisms in action. For example, a visual demonstration might show how parental alerts work while preserving children's privacy, addressing the technical understanding needs mentioned by participants like C03 (age 15, male). Animations and step-by-step guides can further simplify complex privacy mechanisms.

Hands-on tutorials can also help families move from understanding to practical application to meet the needs of participants like P06 (age 35-44, father). These tutorials may guide users through privacy settings on popular platforms, offering clear instructions and opportunities to experiment with different configurations in a controlled environment.

6.5.4. Balancing Technology and Human Expertise in Scalable Family Facilitation. While our findings demonstrate the effectiveness of human facilitation in promoting perspective-taking and context-specific privacy discussions, scaling such approach presents unique challenges.

Educational technology can provide consistent scaffolding and guidance, but they may struggle to replicate the nuanced and adaptive facilitation that human moderators can provide in responding to family dynamics in real-time. Therefore, future work needs to consider how to balance automated support with opportunities for human guidance, perhaps through hybrid approaches that combine AI-assisted facilitation with periodic human expert involvement. This could include developing generative-AI systems that recognize key discussion patterns and provide appropriate interventions while maintaining mechanisms for human oversight and personalized support. Understanding this design balance will be crucial for developing practical and scalable facilitation that maintain the quality of perspective-taking support while reaching a broader range of families.

6.5.5. In Summary. These design implications extend beyond traditional approaches to privacy education technology. While monitoring tools and parental controls remain important [25], our research suggests that equal attention should be paid to technologies that help families develop shared understandings and collaborative approaches to privacy management. The goal is not just to enforce privacy rules but to help families build the knowledge and skills to navigate privacy decisions together.

6.6. Study Limitations

Our study has several limitations that should be considered when interpreting the results.

Firstly, our sample of participants was relatively homogeneous in terms of socioeconomic status and education level, with most parents having at least a bachelor's degree and working full-time. This limits the ability to generalize our findings to families from different socioeconomic backgrounds, which may face different challenges in managing digital privacy.

Secondly, our study focused on a specific age range (13-15 years) and included primarily Caucasian and Asian families. This limitation, though common in similar studies [65], [66], also restricts the generalizability of our results. Additionally, our sample size of 13 parent-child dyads, while sufficient to gain qualitative insights, may not represent the full range of family privacy communication patterns.

Finally, the structured nature of our two-hour laboratory sessions, while conducive to controlled observations, may not fully reflect how families naturally discuss privacy issues in their daily lives. The presence of researchers and recording devices may have influenced participant behavior, potentially leading to more socially desirable responses.

6.7. Future Work

In the future, we aim to explore how perspective-taking facilitation can be scaled through the development of educational technology. This includes creating interactive tools, such as multimedia platforms, educational games, and generative-AI systems, to guide families in privacy discussions without the need for constant human expert involvement. These tools will be designed to provide structured support, helping families practice perspective-taking and improve their privacy management skills. A key focus will be on evaluating the effectiveness of these technologies in fostering sustainable privacy practices across diverse family contexts.

Additionally, we plan to conduct longitudinal studies to assess the long-term impact of these approaches. By examining how families adapt their privacy communication strategies over time, we hope to gain insights into the factors that sustain effective privacy management as family dynamics evolve. This research may also help refine educational tools to ensure they meet the needs of families with varying structures, cultural backgrounds, and developmental stages.

7. Conclusion

Our study introduces a structured facilitation approach designed to support family discussions about digital privacy by leveraging perspective-taking activities. Building on prior research that mainly highlighted communication challenges, we conducted a qualitative study involving 13 parent-child dyads. We identified three major communication barriers: abstract discussions about privacy, oversimplified absolute statements, and declining teen engagement. These barriers

emphasize the need for enhanced privacy literacy, adaptive communication strategies, and external support for families.

Our key contribution lies in designing structured facilitation techniques grounded in perspective-taking theory. These techniques helped families move beyond abstract concepts toward context-dependent discussions. Additionally, our approach supported teenagers in contributing their digital expertise, fostering collaborative conversations that incorporate more contextual and individual perspectives. We also suggest design implications for educational technology aimed at scaling up facilitation, including game-like scaffolds for turn-taking, prompts for spectrum-based privacy decision-making, and context-based interactive visualizations.

While our study showed promise in facilitating more collaborative and effective family discussions about digital privacy, we recognize that our facilitation methods were applied in a controlled environment. Future research should explore how these strategies translate into everyday interactions within diverse family contexts.

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Appendix A.
Codebook and Facilitation Guidelines

TABLE 3: THE CODEBOOK

Themes	Codes	Quotations/Observations
Observed Challenges in Independent Parent–Child Conversations	Abstract Discussions about Privacy	- C08: "Sometimes I just think you don't need to know everything..." - P03: "We were trying to figure out how to let you keep it [the phone], but safely." (No specific scenario followed up.)
	Reliance on Absolute Statements	- C07: "I wouldn't like just give you my phone to scroll through all my text." - P07: "Putting anything down is always a risk. In my experience, it's always a risk."
	Decline in Teen Engagement	- P01 responded, "Yes, just to make sure you are safe," which was met with silence from C01. - C09 initially offered detailed views, but after hearing P09's strong cautionary attitude, turned to repeated minimal "yeah" or "hmm."
Underlying Issues of Observed Challenges	Teenagers' Insufficient Privacy Awareness	- C09: "They are not gonna target me specifically. My data is not that important." - C13: "The bigger the company, the more shady... but I don't think it's a big deal."
	Parents Missing Internal Privacy Needs	- P01: "Sharing your habits with family is OK, but not with an AI." - P10: "I'd want to respect your privacy, but if it showed up in my email, I might read it."
	Lack of Adaptiveness in Communication	- P04 focused mainly on describing her own cautious online practices, while C04 remained mostly silent. In reflecting afterward, P04 acknowledged feeling anxious (*"It's overwhelming as a parent... worms can just get to her in all kinds of ways"*), which she felt complicated her ability to fully adapt her communication style.
Facilitation Effectiveness Outcomes	Ground Privacy in Concrete Contexts	- In a facilitated discussion on message monitoring, P12 suggested to C12, *"Maybe send some content before and after to show context, whether it was a joke or serious conversation."*
	Transition from Binary to Spectrum-Based Privacy Attitudes	- In a facilitated discussion on privacy choices, C06 observed, *"I think people have a lot of different comfort levels."*
	Maintain Discussion Dynamics	- During a family exchange on access logs, the moderator prompted C08 to share her view, leading her to say, *"If I'm buying a birthday gift for Dad, I don't really want him seeing my searches..."*
	Sustain Positive Emotional Engagement	- After sensing C09's withdrawal in response to parental caution, the moderator asked about selectively controlling data, prompting C09's response, *"Yeah, that would work. But I don't think everyone would use it all the time. Still, it's a good option to have."*

TABLE 4: FACILITATION SIGNALS AND STRATEGIES TO OVERCOME CHALLENGES

Challenges	Facilitation Signals	Facilitation Strategies	Suggested Facilitation
Limitations in Privacy Literacy	- Overly broad references to "privacy" or "safety" with few real-life examples - Frequent use of absolute "always" or "never" and binary all-or-nothing rules - Teens showing low concern for private data breach - Parents focusing on external privacy threats while missing internal boundaries	Ground Privacy in Concrete Contexts	- Prompt families to connect privacy concepts to specific daily scenarios - Encourage discussion of both external and internal privacy boundaries - Give real-world news that reports on the consequences of data misuse
		Transition from Binary to Spectrum-Based Privacy Attitudes	- Introduce a spectrum of data sharing decisions rather than a yes-or-no choice - Ask how privacy attitudes vary by scenario (e.g., routine vs. sensitive information) - Emphasize the importance of adjusting privacy decisions based on context
Lack of Adaptiveness in Communication	- Parents subconsciously shifting to an instructional mode - Parents using absolute statements about privacy risks - Teens mostly passive or silent ("yeah," "hmm") - Teen anxiety or disengagement (minimal response)	Maintain Discussion Dynamics	- Provide time for individual reflection before group discussion - Invite teens to explain apps and digital privacy features - Use direct prompts to hear from quiet teens
		Sustain Positive Emotional Engagement	- Reframe "must" and "should" to more empowering language (e.g., "You can decide...") - Ask teens if they feel dismissed or anxious, and acknowledge differing comfort levels regarding privacy decisions - Revisit a not contentious scenario if teens become inactive

Appendix B.
Meta-Review

The following meta-review was prepared by the program committee for the 2025 IEEE Symposium on Security and Privacy (S&P) as part of the review process as detailed in the call for papers.

B.1. Summary

In this paper, the authors present on the results of a structured activity promoting perspective-taking in privacy discussions with 13 parent-child dyads. They identify key communication challenges and address these challenges through scaffolded, moderated conversations between parents and children, to help families treat privacy as a spectrum and something that is context-dependent.

B.2. Scientific Contributions

- Creates a New Tool to Enable Future Science
- Addresses a Long-Known Issue
- Provides a Valuable Step Forward in an Established Field
- Establishes a New Research Direction

B.3. Reasons for Acceptance

1) Key contribution: a novel approach for family privacy discussions, providing a foundation for educational approaches using perspective-taking. This paper moves beyond identifying communication challenges by providing structured, theoretically grounded methods to improve digital privacy literacy within families.
2) Concretization of privacy conceptions: This paper effectively translates abstract privacy concepts into concrete, real-world scenarios, making the discussions more actionable and building on contemporary communication research.
3) Methodology: well-designed and well-executed.

B.4. Noteworthy Concerns

Limited participant diversity: the population studied is limited to educated White and Asian families.