Consent under Constraints: Negotiating Photography and Media Sharing in Institutionalized Childcare

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Abstract

Taking and sharing photos is a routine practice in childcare institutions, used to document children's learning, communicate with families, and support marketing. These practices are typically regulated through *consent forms*, the institutional mechanism for authorizing photography and media use. While prior research has examined parents' photo-taking and sharing, little is known about consent in institutional childcare, where formal policies and non-parental figures (e.g., staff and administrators) shape children's privacy in distinct ways. To investigate this, we analyzed 42 consent forms and conducted 21 semi-structured interviews with parents, educators, and administrators in U.S.-based childcare institutions. Our findings reveal that consent forms serve as procedural, one-time agreements rather than meaningful safeguards. Parents navigate consent pragmatically amidst structural precarity and power asymmetries, while staff performs the unseen labor of consent enforcement. We conclude with implications for reimagining consent and designing usable institutional mechanisms that support children's privacy and safety in practice.

CCS Concepts

• **Human-centered computing** → **Human computer interaction (HCI)**; **Empirical studies in HCI**.

Keywords

digital consent, sharenting, digital safety, privacy policies, children and families, care

1 Introduction

Taking and sharing photos of children is central to modern caregiving, serving multiple purposes such as preserving family memories [11, 24, 44], documenting developmental milestones [1, 23], and nurturing parents' social connections [5, 57]. Typically, parents are the ones taking and sharing these photos, which has naturally placed them at the center of scholarly attention. "Sharenting"—the ways parents document and share their children's lives online—has been examined by a wide body of work within Human-Computer Interaction (HCI) and Security & Privacy (S&P) research. Scholars have explored its perceived benefits [1, 40, 53], parental motivations [11, 26, 54], and the risks it poses to children's privacy and safety [2, 29, 39, 43, 54]. While less extensively studied, other family members—such as grandparents and distant relatives—also engage in capturing and sharing children's moments [33, 52, 65].

Yet parents and family members are not the only caregivers producing digital traces of children. Children in the U.S. spend substantial time in out-of-home care settings such as center-based care, preschools, schools, after-school programs, summer camps, and extracurricular activities [16, 45]. Photography in these institutional contexts is not incidental, but routine. Staff members such as teachers and coaches use photos to document learning, keep families informed, and produce promotional materials/advertise [31]. While seemingly mundane, these practices raise critical questions about children's privacy and safety in contexts where traditional family-based consent models may not apply. In these institutional settings, photography is typically governed through consent forms—legal consent mechanisms that appear nearly ubiquitous across these institutions [4, 9].

Despite their ubiquity and role in regulating children's digital traces, consent forms in childcare settings remain understudied in both HCI and S&P. Prior studies have critiqued how abstract, opaque privacy policies and consent policies may reduce meaningful choice and obscure actual practices of data use [21, 37, 60].

However, we know little about how these dynamics unfold in childcare institutions. This gap is significant given the unique vulnerabilities and power dynamics present in institutional childcare contexts [19, 38, 59]. Unlike parental sharenting, where decisions occur within family relationships, institutional photography involves multiple stakeholders with potentially conflicting interests: parents seeking to protect their children's privacy but also wanting to stay informed, institutions needing promotional content, staff managing day-to-day enforcement, and children who have little voice in these decisions.

HCI and S&P scholars have also shown how consent infrastructures—such as privacy policies, choice interfaces, or consent management systems—often fail to support meaningful agency, instead burdening users through opaque and rigid design of systems [28, 37, 42]. Extending this conversation into institutional childcare settings, we examine how consent is enacted through institutional forms and everyday socio-technical practices across various stakeholders. Understanding how consent unfolds across these relationships is crucial as photography becomes increasingly embedded in the digital infrastructure of childcare. Through this study, our goal was to examine how consent is implemented, enacted, and negotiated through consent forms in institutional settings. Specifically, we asked:

- **RQ1:** How are consent forms to regulate photography and media use in childcare institutions designed, structured, and communicated?
- **RQ2:** How do parents experience and make decisions about consent forms and institutional practices around photography and media use?
- **RQ3:** How do childcare providers and administrators implement these consent forms in practice, and what negotiations or challenges emerge as they manage everyday photographic and media activities?

To answer these questions, we adopted a two-pronged qualitative approach: analyzing 42 publicly available media consent forms and conducting 21 semi-structured interviews with parents and childcare staff across Washington, USA. Our findings reveal that consent forms act as institutional infrastructure that prioritizes institutional rights over meaningful safeguards for children—reducing nuanced privacy decisions to procedural checkboxes. Parents navigate consent pragmatically, often exhibiting a "just sign" tendency amidst—particularly the scarcity of quality childcare options—and resulting power asymmetries where parents may be reluctant to challenge institutional policies. Meanwhile, we found that care providers have to perform the unseen labor of consent enforcement, developing informal systems and relying on situational improvisation in the absence of institutional systems.

Our contributions are three-fold: (1) we provide an empirical understanding of how consent forms are used as privacy safeguards in out-of-home childcare institutions and reveal how they fall short in practice through a mixed-methods qualitative study; (2) we reframe digital consent as a contextual, ongoing process intersecting with structural precarity and power asymmetries, extending sharenting and privacy labor scholarship into institutional childcare

settings; and (3) we offer implications for designing meaningful consent mechanisms that address the realities of institutional childcare contexts.

2 Background & Related Work

We review literature on online sharenting, the contextual and relational nature of consent, and the design of privacy policies and consent interfaces. Building on this, our research seeks to extend and contribute an understanding of how childcare institutions implement, communicate, and enforce consent around photography and media release.

2.1 Online Sharenting and Non-Parent Figures

The rise of digital photography, combined with the ease of sharing these photos online, has significantly changed how individuals document and share their everyday lives. As photography becomes increasingly pervasive, concerns around privacy and surveillance have grown [12, 46, 48, 55]. Within the context of children, digital photography has become an integral part of modern parenthood. Much of the scholarship on children's digital privacy has centered on *sharenting*—the ways parents document and share their children's lives online [1, 2, 5, 54]. Parents engage in these practices to seek community support [5, 11, 17, 26, 40], archive milestones [1, 26, 40], or showcase their parental identity [1, 10, 40]. Yet, such sharing also exposes children to embarrassment, bullying, and risks like identity theft and image-based sexual abuse [39, 43, 58]. Children themselves often express discomfort with sharenting, with studies showing disagreements about permission-seeking processes [29].

While much of the existing literature on sharenting focuses on parents, the practice also extends to other caregivers. A recent article broadened the definition to include grandparents, aunts, uncles, educators, and coaches, showing that children's digital presence is shaped by a wider circle of caregivers than parents alone [3]. Recent studies have examined the role of grandparents in sharenting—also known as "grandsharenting" [32, 33, 52, 65]. Staes et al. showed how grandparents' pride-driven online sharing affirms their role yet sometimes conflicts with parents' privacy norms creating intergenerational tensions around ownership and consent [52]. Beyond grandparents, studies have also examined sharenting by teachers [13, 31]. Cino and Vandini found that parents felt a profound loss of control when educators posted classroom photos on personal social media, describing such acts as a form of boundary crossing [13]. Their analysis of parent forums further revealed that media release forms were "poorly worded" which fueled these tensions, leaving parents uncertain whether institutional consent extended to teachers' private accounts [13].

These studies move beyond parents to show how a wider ecosystem of caregivers contributes to children's digital presence. Yet institutional childcare, where photography is routine, infrastructural, and regulated by consent forms forms, remains under-examined.

2.2 Digital Privacy Policies and Consent Mechanisms

Extensive research has shown that privacy policies are hard to read, rarely read in detail, and do not support rational decision

making [9, 13, 21, 37, 60, 61]. McDonald and Cranor quantified this through the "cost of reading," showing how policies, if read, have a significant opportunity cost and shift the burden of comprehension to users rather than enabling true, informed choice [37]. More recent research has focused on the design of interfaces where consent is enacted, specifically showing how UX deceptive patterns such as pre-ticked boxes, asymmetric choice architecture, and confirm-shaming (use of guilt or shame to manipulate) nudge users towards disclosure rather than empowering meaningful choice [18, 20, 42]. However, the challenge here extends beyond readability or manipulative design.

Consent itself is fragile since its meaning is contingent on the context [41]. Information disclosed in one setting does not extend authorization for reuse in another [27, 67]. For example, a photograph shared in a specific "public" setting may still constitute a privacy violation when circulated elsewhere even if disclosure was initially authorized. This aligns with Nissenbaum's theory of contextual integrity, which frames privacy as the appropriate flow of information within specific social norms and roles [41]. Such tensions are rendered visible in instances of context collapse on social media where the convergence of unintended audiences disrupts assumptions about who the information is intended for [35, 36]. Thus, these studies show that consent is not a static agreement, but a dynamic one that is shaped by shifting contexts and relationships. In response to these, researchers have proposed alternatives that move away from static agreements. For instance, Dynamic Consent allows researchers and participants to follow-up over time in a continuously changing environment, positively impacting research [8]. In addition, Kotut and McKrickard propose TL;DR Charter, a design fiction approach that reimagines privacy policies as legible, enforceable commitments [25]. By offering covenant-based privacy profiles, the Charter makes consent agreements easier to interpret and embeds accountability through clear enforcement mechanisms [25].

Specifically in childcare, media consent has shifted from assumed parental permission to formalized processes shaped by legislation. In the U.S., the Family Educational Rights and Privacy Act (FERPA) of 1974 classified photographs as "directory information," granting parents opt-out rights over their release. Since then, annual media release forms have become the routine mechanism for authorizing children's photography. However, recent studies have shown that these forms remain poorly designed and are not aligned with emerging digital risks [9, 13]. A 2024 analysis of school district media consent forms found that while most listed what PII could be shared, only a few addressed how photos circulate on social media platforms or the risks of online distribution [9]. This gap is critical as new child safety laws, such as the Kids Online Safety Act (KOSA) and the recent regulations around sharenting have begun to expand protections for children's data online. Despite these, the ecosystem around media-related consent forms within institutionalized childcare remain under-examined. Prior work has noted tensions with the design of media-related consent forms [9, 13]., yet there is little understanding of how these are designed, implemented, and interpreted in everyday practice.

3 Methods

Our study, approved by our university's ethics review board, took place between January and August 2025 in the U.S., with a focus on childcare institutions in Washington. We sought to develop an understanding of how photography and media release practices are designed, communicated, and experienced in institutionalized childcare settings. To this end, we adopted a mixed-methods qualitative approach. First, we analyzed publicly available media release consent forms to understand the language, structure, and consent mechanisms institutions use. Second, we conducted semi-structured interviews with parents and educators or administrators of these institutions to explore how these policies are interpreted and enacted in practice.

3.1 Consent Form Analysis

We began by compiling a list of out-of-home care facilities in Washington, drawing on the licensing database provided by a state-based government department focused on child and family services, and other publicly available directories. We focused on a broad range of institutionalized childcare settings, including center-based daycare, preschools, public and private schools, before- and after-school programs, extracurricular activities, summer camps, faith-based childcare, and military childcare. From this list, our team systematically searched institutional websites for publicly accessible consent documents. Forms were included if they explicitly addressed photography, other forms of media, or the sharing of children's images—whether for internal purposes, such as newsletters, or for external uses, such as promotional materials, websites, or social media. As we compiled forms, we simultaneously conducted qualitative analysis, drawing upon prior established document analysis approaches [6, 14], to identify emerging patterns in the text, structure, and design of these consent forms. We treated these forms as situated institutional artifacts that articulated each program's approach towards photo taking and sharing [6]—examining how these practices were described, how parental consent was requested, opt-out procedures, and how the surrounding text framed these decisions. We stopped collecting more forms once new forms no longer introduced unique patterns and we had secured representation across institutional categories. In total, we compiled 42 unique consent forms that discussed media. Each was freely available online without password protection or special access. In line with Bowen's view [6], these consent forms served as supplementary data sources, and further informed and sharpened our interview study design.

3.2 Semi-Structured Interviews

To complement our analysis of consent forms and understand how these policies operate in practice, we conducted semi-structured interviews with parents, staff, and administrators from out-of-home care facilities in Washington.

Participant Recruitment. Given our research goals, we recruited (1) parents of children enrolled in out-of-home care institutions and (2) educators or administrators working in such institutions. We advertised the study through university parenting listservs and Facebook

groups, obtaining permission from moderators when required. Because our study focused on Washington, all participants resided within. We, however, sought to recruit across different counties to capture variation in institutional contexts. Interested individuals completed a Qualtrics[1] survey that collected demographic information and a brief description of their experiences with photography and media release practices in childcare settings. We received a total of 149 responses. We thoroughly screened responses for eligible participants, flagging and filtering out any potentially fraudulent entries (e.g., duplicate IP addresses, verbatim open-ended responses) [30]. To ensure relevant participation, we selected only those who shared an anecdote of these practices. Eligible participants were then contacted via email to schedule interviews. We stopped conducting interviews once we reached data saturation.

Interviews. We interviewed 21 participants: 15 parents and 6 educators and/or administrators. Of the 21 participants, 16 identified as women and 5 as men. Because we did not collect institutional identifiers, we cannot determine whether parents and staff were reflecting on the same institutions. Participant demographics are summarized in Table 1 and Table 2. Interviews each lasted approximately 45 minutes and were conducted remotely over Zoom. Parent interviews focus on their experiences with media consent forms, decision-making around granting or withholding consent, institutional photography and media release practices, and perceptions of privacy and safety. Interviews with educators and administrators, on the other hand, focused on how these policies are designed and implemented in practice, communication with families, and challenges that occur in enforcement. Each participant received a $25 Amazon gift card as compensation.

Data Analysis. We collected approximately ~20 hours of audio recordings and detailed notes from 21 semi-structured interviews, which were anonymized and transcribed using Rev,[2] a secure audio transcription service. We analyzed the data using reflexive thematic analysis [7, 50], following an iterative, inductive approach. The first author coded all transcripts, and the research team met regularly to review codes, resolve disagreements, and refine the codebook collaboratively. This reflexive dialogue among researchers ensured analytic rigor and interpretive depth. We conducted multiple rounds of open coding, rigorously discussing and refining codes such as "limited granularity", "consent fatigue", "delayed reflection", and "situational improvisation." These refined codes were then clustered into overarching themes, including *consent as an institutional infrastructure*, *how parents navigate consent*, *labor of consent enforcement*, and *structural constraints and pressures*.

3.3 Limitations

We acknowledge several limitations of this work. First, we did not interview children about their privacy preferences or experiences with photography consent. Second, our sample included only six staff members, including both educators and administrators, whose insights provided depth but may not capture the full diversity of practices across different kinds of childcare institutions. Third, our consent form analysis drew from publicly available documents.

While these forms provided a meaningful window into institutional practices, they may not reflect the entire spectrum of forms or informal mechanisms in use. Finally, the study was conducted in one U.S. state, an intentional scoping choice, though we recognize that regulations and practices may vary across states and countries.

3.4 Researcher Positionality

This work stems from our interest and commitment toward designing safe and equitable technologies for childcare. All authors have a background in HCI, many in usable security and privacy, and multiple have extensive experience conducting fieldwork with diverse care providers including both parents and childcare workers. Among the five authors, two are parents with direct experience with institutionalized out-of-home care settings, and one of the authors has experience working at a care facility. The research team has a mixed perspective on sharenting—acknowledging its nuances, finding certain aspects as acceptable while raising concerns about others.

4 Findings

Our study uncovers rich insights into consent practices surrounding photography and media release in childcare institutions. We present four key findings: consent form design and institutional framing (§ 4.1), how parents navigate consent decisions (§ 4.2), the labor of consent enforcement (§ 4.3), and the structural constraints and pressures that shape these practices (§ 4.4).

4.1 Consent Form Design and Institutional Framing

While institutions present media consent forms as straightforward permission requests, we observed that the way these forms are designed, communicated, and enforced prioritizes institutional liability over parental clarity and children's safety. In this section, we examine structural characteristics of consent forms that enable such prioritization.

4.1.1 Form Design and Structure. On analyzing the 42 consent forms, we observed that there was no unifying structure among institutions. Despite serving the same purpose, the titles differed, ranging from *"Use of Image and Recording Permission Form"* to *"Photo Opt-In Form"* or *"Media Opt-Out Form."* Such inconsistencies may increase errors and misunderstandings while filling these forms. Adding to this, forms varied in their framing—some forms were opt-in, others were opt-out or had a checkbox to opt-out, others provided multiple options to select from in terms of what artifacts can be shared, and some did not let parents choose, they notified them that to participate, they must agree to this photo consent form. Overall, most forms we analyzed reduced parental consent to a simple checkbox, offering only singular or binary choices. Ad03 described reflecting on their institution's form:

> "It has our branding at the top, and then it has a paragraph that lists all of the things that [photos] would be used for... and then I do or do not consent, and then they circle one or the other... It's a very simple form like a half page document." **(Ad03)**

ID	Gender	Age	Ethnicity	Location	# Children	Ages of Children
P01	Female	45	Caucasian	Beacon Hill	2	10yo, 6yo
P02	Female	48	Caucasian	Shoreline	4	14yo, 12yo, 3yo, 1yo
P03	Female	45	Asian	Seattle	2	15yo, 13yo
P04	Female	42	Asian	Black Diamond	2	8yo, 4yo
P05	Female	38	Caucasian	Seattle	2	6yo, 2yo
P06	Female	44	Caucasian	Bothell	2	5yo, 21mo
P07	Male	37	Hispanic	South Seattle	1	5yo
P08	Female	38	Caucasian	Seattle	2	4yo, 8mo
P09	Male	39	Caucasian	South Seattle	1	22mo
P10	Female	40	Caucasian	Seattle	2	4yo, 2yo
P11	Female	37	Persian	Seattle	1	3yo
P12	Female	45	Caucasian	Maple Leaf	2	11yo, 13yo
P13	Male	41	Caucasian	Seattle	1	6yo
P14	Female	34	Asian	Snohomish	1	3yo
P15	Female	45	Latina	Seattle	2	10yo, 8yo

Table 1: Demographics of Parents

ID	Gender	Age	Ethnicity	Location	Role	Institution Type	Experience
Ad01	Male	30	Asian	Greater Seattle	Program Manager	Art Education Non-Profit	1.5 years
Ad02	Female	25	Latina	West Seattle	Program Coordinator	After School Program	3 years
Ad03	Female	28	Asian	Seattle	Administrative Assistant	Preschool	7 years
Ad04	Female	44	Caucasian	Clark County	Owner	Daycare	5 years
Ad05	Female	36	Caucasian	Seattle	Director	Daycare	8 years
Ad06	Male	40	Caucasian	Spokane	Program Manager	Preschool	2 years

Table 2: Demographics of Educators or Administrators

In this way, forms positioned consent as a binary act rather than offering parents more granular options or concrete examples of how photos might be taken and/or shared. Interestingly, some institutions, particularly those that catered to younger children, demonstrated more sophisticated consent structures, distinguishing between "internal sharing" and "external sharing." As Ad04 explained, *"internal would be for classroom purposes, for sharing with other families,"* while *"external would be anything that's public...that anybody could access."* However, such granular options are rare, as P13 said, *"They had an option, like it is allowed to take pictures for internal uses... they had that permission separate from can be used in public media and marketing documents... That internal/external granularity was really...I can only remember that for that daycare, because that stood out as an option."*

Despite the difference in structure, there were design choices found that were shared amongst the majority of consent forms. Most consent forms were in English, and the language of the forms was more formal and legal in their wording and tone. They explained what artifacts may be collected, when and where they might be collected, and what media they will be used in. Such phrasing indicated that the forms were primarily for liability sake on the part of the organization rather than clarifying implications for children or families. For example, one form stated:

> "Permission for student name, photo/image, and/or school, and/or grade, as well as images of student's recognized art or academic awards/achievements to be published on the district and/or school's website and social media platforms, as well as sent in press releases to area media and publicity outlets and publications and/or public presentation venues or displays as outlined in Section I.D. of the S-2: Administrative Procedures, Student Records, Privacy Rights, and Release of Information."

Here, the language is not only dense and legalistic, but also difficult for parents to make sense of. This also raises concerns about understanding among the adults signing these forms, especially those who learned English as a secondary language. Additionally, parents themselves noticed the formulaic nature of these forms, as P15 reflected, *"They all seem very standard and often have the same language across multiple organizations. So maybe they're all just copying each other's like basic legal liability."*

Additionally, all the forms we analyzed specified who would be able to legally sign these forms. Each form indicated that a parent or guardian must be the one to sign and date these forms. While this requirement is necessary to establish legal consent for students, it also underscores children's lack of involvement in decisions about their own photos, especially older kids who are more aware and have preferences.

4.1.2 Timing and Operational Mechanics of Consent Forms. While some institutions continued to rely on paper-based forms, others used digital forms. For example, P05 described, *"Most of the times I think I would get the digital forms to review and sometimes they'd have a paper packet available at the school that you'd actually go pick up and sign and return."* This variation in distribution method creates inconsistent experiences for parents, especially those availing multiple out-of-home care services.

Additionally, consent forms were often embedded within larger enrollment paperwork rather than being offered standalone. By bundling photo permissions alongside critical registration requirements, institutions implicitly positioned consent as inseparable from access to childcare itself. Moreover, some forms portrayed consent as a fixed decision made once during enrollment with no provisions of changing or renewing consent. P11's experience illustrated this challenge: despite repeated attempts to locate her enrollment forms, she admitted, *"Oh, there was apparently a Google enrollment form that I can't see anymore... no one ever sent me a copy of it."* Like P11, several parents could not recall what they had agreed to and noted they were never given a record of their responses. As P05 explained,

> "I don't think I've ever gotten a copy of my responses... with the paper ones where they emailed the packet, I gave them the ones that I marked and signed. So I wouldn't have a record of that and they didn't provide me with a record of digital ones either." **(P05)**

Without accessible records, parents are left to rely on memory for future decisions that may shape their children's digital presence. While some institutional forms provided provisions for opt-out or changing consent mid-term, these instructions were either typed in much smaller fonts or written at the bottom, and could be easily missed.

Lastly, some forms also specified deadlines for when they needed to be returned by, raising questions around what happens if forms are returned late, if guardians change their minds, or for how long consent remains valid. Even when such details were included, they were either buried within the legal jargon, or rarely explained clearly. Once returned, forms typically went back to a teacher, administrator, or other staff member. However, beyond an occasional instruction on who to turn the form back in to, there was little information provided to parents and guardians about how this information will be stored and enforced. A few forms included a "For Office Use Only" section, but many do not—leaving families uncertain about the temporal validity of their consent and how institutions would ensure their decisions were honored.

4.2 How Parents Navigate Consent Decisions

While consent forms frame photography permissions as straightforward yes-no, parents make these decisions through ongoing negotiations shaped by their privacy values, practical constraints, and institutional relationships. We now discuss how consent related decision-making unfolds as a relational, pragmatic, and values-driven process.

4.2.1 The "Just Sign" Tendency. Consent forms were often embedded within larger enrollment paperwork rather than being offered standalone. By bundling photo permissions alongside critical registration requirements, institutions not only demand consent preemptively, but also implicitly position media consent as inseparable from access to childcare itself. For instance, P11 shared,

> "We had been on the wait list for like 4 years before I was pregnant and we only still barely got a spot in the infant classroom because it's just there's so few spaces [...] So I think I just remember being like, I will

sign as many things as you need me to. Like, hold the spot." **(P11)**

Thus, parents provide preemptive consent, making privacy choices about unknown caregivers and practices before trust or understanding of actual institutional practices is even established. Many parents described treating photo permission as a procedural checkpoint during enrollment rather than a substantive privacy decision. This pragmatic approach reflects how families adapt to the overwhelming processes of securing childcare. As P02 said *"it's something that I feel like I've always just kind of automatically opted in... it has been kind of a no-brainer for me."* Similarly, P15 explained that consent was simply, *"part of what you have to go through if you want your kid to participate in activities."* In this way, consent becomes proceduralized within the broader enrollment process—raising questions on whether it functions as freely-given consent at all. With some parents signing as many as 15 forms per child per year (across childcare and multiple extracurricular activities or camps), the sheer volume of paperwork reinforced this "just sign" tendency, where the fatigue left families with no realistic opportunity to reflect.

At the same time, we observed that parents' perspectives were not static. Several participants described becoming more privacy-conscious over time, often after a specific event or increased awareness of digital risks, a pattern also noted in prior work [54]. This shift in perceptions prompted them to revisit their earlier photo-taking and sharing behaviors. Here, P02's case was particularly striking. She said,

> "I came across this documentary which was regarding how images, especially of kids, are used on trafficking websites, and people don't even know that...the effect of that documentary was quite strong. So the existing photographs that I had posted of her...I deleted all of that." **(P02)**

She later reflected how the research interview itself triggered a pause for reconsideration over consent forms, adding *"I'm just grateful for the conversation... having the conversation is good for me to kind of pause and be like, oh my God, what all have I agreed to."* This shows how the reflection over these consent decisions often came late—not out of neglect, but because the system left little space to pause and reflect. Alternatively, Ad04 noted that some parents who initially opted out later reversed their decision after seeing newsletters without featuring their children. He said, *"some of the parents came back and changed their consent because they did want their kids to be included."* This highlights how rushed, binary enrollment consent affords little space for parents to fully grasp the implications or align choices with their actual preferences.

In rare cases where opt-out options existed, participants felt they were often poorly designed and confusing. Many institutions required parents to complete a separate opt-out form and physically mail it to the director—an unnecessarily burdensome process. Ad02, who oversees enrollment at their institution, described a design flaw in their opt-out process. He said,

> "I think they are signing or checking that box to complete it. But it's actually to not be in it... I think that's the confusing part when it comes to like, I said, Non

native speakers where they see a box. and might be like, okay, I'm done. And now completed." **(Ad02)**

This reverses typical form conventions, where checking a box usually indicates agreement [15], leaving parents, especially those with low tech-literacy uncertain about what action they are actually taking. Parents also noted the lack of clear information on what opting out would mean. P08 said, *"It would have been nice if they included instructions or some sort of reassurance that it was acceptable to opt out, and if you did, your child wouldn't be singled out from the activity."* Therefore, opting out mechanisms within consent forms remains vague, confusing and inaccessible.

4.2.2 Privacy Values and Perceptions of Digital Risks. Parents' consent decisions were heavily shaped by their personal beliefs about online risks, digital privacy, and children's safety. We saw a wide spectrum of approaches, from strict caution to comfort with semi-private sharing. Some particularly concerned parents held firm across contexts. As P01 explained, *"I don't put pictures of my kids on the internet. I don't do Facebook pictures of my kids... so every time I get a consent form, my first instinct is to say I don't want to do that."* We found that parents' professional experience also helped shape their perceptions of digital risk. P13 reflected,

> "I work in computer security. Like, I know what can be done with those photos... I don't trust most caregivers to be technically adept enough to do that in a actually like digitally secure manner." **(P13)**

Similarly, P14 drew from her experience, saying, *"As someone who works in IT services, I know what can happen when someone has your information. And especially with AI being so big, I'm just more cognizant of making sure that facial recognition is something that we're aware of."*

On the other hand, some parents expressed comfort with photo sharing within trusted childcare networks (e.g., with other parents, staff), viewing internal sharing as an extension of the care relationship. As P06 said,

> "And I know that same picture is probably being sent to other parents... because I know that they are only being shared with the parents of the kids that are attending daycare that day. And it's such a small group of kids. It's only six children. So I'm comfortable with that." **(P06)**

Several families reported internal disagreements about photo-sharing practices, with differing privacy values among parents. P14 described this tension, *"However, my husband has a different viewpoint where he's actually pretty open with sharing photo updates and showing his face."* In such cases, the consent decisions were often deferred to the more cautious parent.

Overall, parents' consent decisions reflected their own privacy values and concerns. Yet these values were continuously negotiated against the practical realities of childcare access and institutional relationships, which we will discuss later in Section 4.4.

4.2.3 Trust, Compliance, and Privacy Breaches. We found that parents' consent choices were shaped less by the forms themselves and more by their trust in the institutions and caregivers, reflecting a shift toward privacy decision-making as a relational task. As P11 explained, *"I think because we have such a positive impression of the*

school, and a positive relationship with the staff, that I just trust them a lot. And so I think if there wasn't that same trusting relationship I probably would have thought about it a lot before." Additionally, relational proximity also held importance. Direct relationships with teachers and directors gave parents confidence in their decisions, making institutional reputation and staff relationships feel more meaningful than the formal language of the consent forms. P11 further added, *"But like I talk with the school directors and staff a lot... we really appreciate them. We're like, they're really great."*

At the same time, our interviews revealed instances when institutions breached parents' consent. These instances prompted significant discomfort and raised questions about the system's effectiveness. For example, P04 described a clear violation where her son's photo appeared weekly in the school district newsletter despite explicit non-consent:

> "[Name] is actually featured on the picture right above the superintendent's picture every single week on this newsletter. And the first time I saw it, I was like, oh, okay. Well that's interesting because I know I signed it that he was not supposed to be on things... it has been every single week that they send out this newsletter and [Name]'s face is right there." **(P04)**

Despite the ongoing violation, P04 chose not to escalate saying *"I wanna pick my battles with the school district right now."* Similarly, P15 experienced a breach but prioritized preserving the relationship over enforcement: *"Despite not consenting, my kids' photos were shared in the newsletter... I'm not going to put up a fight or like talk to them. They've been at this after school program for years. I really like all the teachers that they have."* These accounts illustrate the difficulty of holding institutions accountable. Even when violations were visible, parents felt constrained in challenging them.

For others, the uncertainty was even greater. Without clear verification mechanisms, parents had no way of knowing whether their consent choices were being respected at all. P13 said, *"since I'm not on Instagram, I don't know if the [institute] is actually publishing a picture of her that we didn't approve of."* P07 echoed a similar uncertainty, noting that *"if we opted out, we wouldn't know if were they were sharing her images anyways'."* These experiences show how parents have to rely on institutions to act in good faith, with no way to know if their consent is being honored and limited mechanisms to respond when violations happen.

4.2.4 Limited Negotiations. While most parents signed consent forms without comment, several sought clarification about how their children's photos might be used. Institutions were generally responsive to these questions. For instance, Ad03 explained,

> "There have been a couple families that needed clarification... I do notice sometimes with our first-time parents, they're a little more [in need of clarity]. We've had a couple of questions about, you know, you are part of a community center. Will these be used by the community center? And I always assure them, no, it's just for our program. Our consent is just for our program." **(Ad03)**

Parents who asked questions often found staff willing to explain distinctions between media use that were otherwise vague in the

forms. For instance, P03 recalled their experience seeking clarifications, *"I think we did once ask like, hey, this says, Blah blah, does that include, you know, marketing purposes, or is it just, you know... there's a very distinct difference between local website kind of thing versus literally like paid marketing purposes."*

Only one parent in our study, P09, went beyond seeking clarifications to negotiate actual changes to a consent form. When reviewing their enrollment packet, they found clauses granting "any and all rights" to photographers and allowing blanket social media use. P09 recalled,

> "We're absolutely not signing this form. We might have emailed and said, like, hey, we're not comfortable signing this. Would you mind changing it to this? We talked about it in-person, and it kind of felt at the time like there was some pressure to just sign the forms, like... hey, just sign the forms, what's the deal. The staff weren't really expecting any pushback because everyone else just comes in and signs the forms. But we found a form from another care facility online and said, hey, this looks fine, could you adopt this policy. They looked at the form I sent, amended their own form, and then had a copy for me to sign." **(P09)**

On reviewing the two forms, we observed that the institution revised the form to limit photo use to 'communication and documentation purposes,' restricted sharing to family members, and separated individual from group permissions. This stood in sharp contrast to the original broad language. P09's case shows how rare it is for parents to push for changes, yet also how persistence and concrete examples can make a difference. It also highlights how standardized forms obscure the possibility of negotiation, leaving most parents unaware such options exist.

4.3 The Labor of Consent Enforcement

We found that institutions lacked formal systems and instead relied on informal tracking, situational judgment, and improvised methods to enforce consent. We now examine these mechanisms, demonstrating how the burden of making these rigid consent systems work ultimately falls on caregivers, who often need to devise ad-hoc techniques to navigate these challenges.

4.3.1 Informal and ad-hoc systems. When asked how their institutions developed media-release forms, most administrators said they relied on pre-existing templates rather than creating them from scratch. As Ad04 explained,

> "I was just kind of pulling from other programs, looking at examples and then coming up with something that made sense for my own." **(Ad04)**

On the other hand, front-line staff typically had no involvement in the development of these media-release forms, with Ad04 adding, *"I have no involvement in what is said on the policy and how it's presented."*

When it came to tracking consent, we observed a wide range of approaches, ranging from systematic processes to improvised methods. Ad03, for example, maintained an excel sheet with two columns—children who had parental consent and those who did not—which she updated whenever new students enrolled. She explained,

> "I wanted to keep it very simple, so I have an excel sheet and 2 columns, one column students that have consented, students that have not [...] Anytime that I get a new enrollment, because we do enroll throughout the year, I'll just update that excel, and then I'll print a new list for the teachers. So I give one to each lead teacher, and then I have them communicate to other teachers." **(Ad03)**

For special events, she implemented an additional layer of review, describing how *"if the photographer takes photos that they want to use, and they know the kids (who might not have consented) are in there... she'll send me files and ask me to review any of the photos. I take the red marker, circle any kids I see, and then she knows either to crop the photos or not use it at all."*

In contrast, we found that many staff members relied heavily on memory or ad-hoc notes. Ad04, responsible for a class of 27 students, described how they eventually memorized each child's consent status, saying, *"after a couple of times I would say, like 3 weeks... I memorize that list so I wouldn't have to keep going back to it."* Smaller programs adopted even simpler methods, as Ad05 put it, *"I would just add the kiddo's name to the list of not sharing and kind of move on from there."* These approaches show how much consent management rested on personal recollection or informal notations rather than systematic, durable systems across staff members. We also observed anecdotes around lack of oversight when multiple staff were involved in taking photos. Ad02 explained,

> "They just take them and upload them, so maybe they're not aware of the students who are opt-out. And I honestly haven't checked through them since [...] sometimes there is no specific location on where to put those folders. So I just dump them in like the team folder. So whatever is on the team folder, those photos are free to use. This is shared with any team member that may not be even working on my site." **(Ad02)**

Here, even the storage process was improvised. Once photos were uploaded to shared folders, they became available for unrestricted use by any staff member regardless of their knowledge of children's consent statuses. As Ad02 further reflected, *"once uploaded, as per internal notice and my understanding... it gets used however they want in their way."*

4.3.2 Situational judgment and ethical discretion. To make consent tracking slightly easier, we observed that staff often relied on situational judgment and ethical discretion when navigating photography. Several participants described adopting conservative strategies to protect non-consenting children. For instance, Ad01 shared, *"we generally take a conservative approach where we try to take a lot from the back, take photos from other artwork. We can't take a photo of this kid, but we could always take a photo of their artwork."* Similarly, Ad06 described similar techniques, sharing,

> "We try to avoid any angles that capture the face... instead, we include from like the back of their heads.

You might not think that's important, but just like avoid anything overall from the student." **(Ad06)**

These conservative approaches were sometimes motivated by broader concerns around vulnerable populations. Ad01 reflected, *"some of these kids may be undocumented, and... not having their faces in photos is pretty important. We don't want to put any kids in jeopardy."* Here, "undocumented" refers to children without legal immigration status in the U.S., for whom public visibility can pose serious risks. To avoid such risks, a common retraction strategy in sharenting literature has been the use of emojis to cover faces, but parents in our study emphasized the limitations of this approach. For example, parents raised concerns around children being explicitly de-identified post-sharing. P02 pointed out that face-covering can unintentionally draw attention to the child, explaining,

> "I think that's interesting too though, because that kind of makes it obvious who it is too, right? If there's like one student that's missing, you can, if you're interested, you could probably like figure out, and that's another kind of pressure, right? Like, well, why didn't they [the parent] let their kid be in the pictures?" **(P02)**

Another de-identification strategy used was pixelating. However, P13, who was from a technical background, argued that, *"Pixelating can be depixelated way too easily these days. Covering up is safer, and if they were going to use a strategy like that, I would hope that was clear in that consent policy... even if it said like, if you don't consent, we may use, you know, a non-identifying photo of your child."* Here, we see that there is a need for greater transparency around the use of retraction mechanisms in consent forms.

Lastly, despite these efforts, caregivers and parents reflected on the practical challenges of managing individual consent within children's group activities. Ad02 explained, *"if there was like a group photo, we will pull the student aside just to make sure that they're just completely not in that setting."* Parents also recognized the tension this created between privacy protection and participation, as P08 said, *"we want to make sure that he can participate in the activities that his class is doing. We don't want him to be pulled aside or singled out."* Thus, in practice, these situations show how difficult it is to fully honor individual consent in communal childcare settings, where photos are meant to capture shared experiences, and children themselves often have a limited say or agency around media-related consent.

4.3.3 Administrative and communication challenges. While larger institutions sometimes provided educators with tablets to take photos, personal devices were still widely used. We found that reliance on personal devices created additional challenges around retention and safety. As Ad02 admitted, *"there is nothing around employees having to delete those memories off their personal devices... I have random pictures and photos from my time here 2 years ago that I haven't deleted just because I forgot or something."* Field trips further complicated this, as P05 said,

> "I've chaperoned every field trip so far and have been one of these photo takers... I always go back though after I email them out and delete pictures of other kids because that feels irresponsible. But yeah, there's no

saying that... people are using their personal devices to take and share the pictures." **(P05)**

This shows how difficult it is to ensure consistent consent practices once photos leave institutional oversight. We also observed challenges extending beyond staff control, as parents sometimes shared photos despite institutional guidance. P05 described how teachers reminded families that *"these are for you to enjoy... and these pictures are not to be shared outside of this listserv."* Still, P12 shared, *"sometimes parents will share photos of other kids in the public schools to their closed family Facebook page. And that includes our faces."*

Finally, the logistics of distributing and tracking consent itself was a significant administrative burden. Additionally, we observed that consent ambiguity also arose when children failed to return paper-based consent forms. Ad01 shared,

> "...there are times when students don't bring back the forms, especially younger kids... in that case we generally lean to the side of being a little bit more conservative where we don't want to show their picture. We recognize... it could be dangerous for some of these kids to be in photographs." **(Ad01)**

Here, Ad01 was referring to undocumented and foster kids. He further described a fragmented chain of responsibility in distributing consent information, with teaching artists, program managers, and himself each handling different pieces of photography and consent enforcement. Our parent participants also noted gaps in record-keeping. Overall, these administrative and communication challenges strained already fragile consent systems, leaving staff and parents to perform the unseen labor of navigating gaps and inconsistencies in these systems.

4.4 Structural Constraints and Pressures

Our study revealed that consent practices were shaped not only by institutional processes but also by broader structural forces. We will now examine how systemic pressures like childcare scarcity, financial precarity, and the need to maintain relationships with providers often override individual privacy preferences.

4.4.1 Precarity of institutionalized childcare. We found that the scarcity of affordable, high-quality childcare significantly shaped how parents approached consent. Many participants described long waitlists and high costs that left them feeling unable to push back on privacy concerns. For instance, P05 explained,

> "...getting childcare in the city of Seattle is bananas you could be on a wait list for three years... [company]'s infant care is over $4,000 a month now... then when we finally got an offer... you get the paperwork and you're like, I'll literally sign my whole life away if you want me to." **(P05)**

P11 described a similar sense of desperation, recalling, *"We had been on the wait list for four years [...]and we only barely got a spot because there are so few spaces. I kept emailing every month—'do you have a space?'—and they always said no. Then two months before my son was to start, they said a spot had opened a month early. I immediately offered to pay for the extra month just to hold it, and remember thinking, I will sign as many things as you need."*

Additionally, parents receiving financial assistance felt particularly obligated to provide consent. For instance, P01, whose childcare was subsidized explained,

> "Everything is subsidized and I'm so, so, so grateful for it that I just try really hard not to be annoying... I know that by signing the release, I might give them the opportunity to capture an image that is useful for them... I feel like that's the least I can do right now since they're giving me a huge discount." **(P01)**

Here, we see how gratitude towards the institution further complicate the consent dynamics. Interestingly, P01 also contrasted this with her behavior when paying the full tuition. She reflected, *"When we were paying premium, I was more strict and tried to control what went out. I still said yes but paid closer attention. Now, when I see pictures of my kids on the wall, I'm like—I'm not paying full tuition, so it's fine."* This aligns with prior work showing how the ability to monitor or restrict data use is tied to financial resources—making privacy feel like something you can afford more when paying more [34, 64].

Moreover, we observed that parents often prioritized maintaining positive relationships with caregivers over asserting their privacy preferences. As P15 said, *"the childcare situation is desperate... and as a parent you sometimes have to go against your better instinct and sign them up."* P02 described a similar hesitation, recalling how a teacher once recorded her son in distress and shared the video with them. She said, *"I was just like, this is awful... but it's such a hard line as a parent, right? Because you don't want to turn your childcare providers against you. You want to be collaborative and friendly, because you hope the nicer you are, the nicer they'll treat your children."* Therefore, we see how structural precarity and power asymmetries within childcare institutions constrained parents' ability to freely consent or challenge photography practices.

4.4.2 Institutional priorities and marketing needs. Institutions depended on children's photos not simply for communication but also as an important resource to sustain their programs and advertise their facilities and care. Interestingly, photos became part of how centers secured funding, promoted their work, and demonstrated representation to prospective families. Educators and administrators described how visual content was requested by marketing teams and external stakeholders, as Ad03 said,

> "We also have a marketing team that always asks, hey, can we include this in our newsletter and that newsletter? I don't have control... it goes out to a very big community." **(Ad03)**

She noted that this pressure came from the organization's broader structure, adding, *"the organization I work for... they have a large social media presence. And so families don't always want to be a part of that. So I do an additional consent... because it's outside of the program."* Photography was also tied to important institutional functions such as fundraising and outreach. Ad01 listed these uses, saying, *"it might be social media, it might be the annual report, funding stuff, general outreach, etc. Sometimes they send out mailers, for example."*

Parents were also aware of these goals and acknowledged the role their children's photos played in institutional representation.

For instance, P01 said, *"I know that by signing the release, I might give them the opportunity to capture an image that is useful for them... my kids are okay looking and, you know, they're charming and they're outgoing and they do ham it up."* At the same time, parents also felt conflicted with the line between representation and commodification, as P05 shared,

> "If we toured a school and didn't see kids who looked like ours or teachers who looked like our families, we'd be more hesitant to choose it. The struggle is whether that visibility is representation or commodification. I don't want my child on a brochure just to signal diversity, but we also see the value of other families recognizing themselves. It's a constant tug and pull... what's tokenization, what's representation, and is there a greater societal benefit in being visible?" **(P05)**

Therefore, we see how institutions relied on children's photos for funding and visibility, while parents grappled with tensions between representation, tokenization, and social obligation towards prospective families.

4.4.3 Normalization of photography and social pressure. We found that photography was so embedded in the daily routine of childcare that it normalized documentation as an expected attribute of participation. Parents described how media consent often felt a prerequisite for kids to participate in group activities. Others noted how even for children, this was such a normalized phenomenon. P04 shared,

> "My kids to this day... just think, oh, everybody has a phone and everybody's taking pictures of everything. And I think that's just kind of a part of them. So I don't think that they've ever noticed it." **(P04)**

Besides this, we found that parents experienced a sense of peer pressure to consent to photo sharing, especially for group activities. For instance, creating annual photobooks was a common practice in institutions. P12 noted the excitement around these, sharing, *"you don't want to be the one parent that's like, actually, I don't want to do this."* P02 also reflected on the broader social awkwardness of parenting communities, describing how,

> "...suddenly you have to kind of be friends with these people who you wouldn't necessarily be friends with... you're just trying to be kind to each other and feel each other out. So yeah, you have to kind of watch out for each other. You don't wanna bar each other from seeing their own kids." **(P02)**

Here, we see how the everyday social dynamics among parents further constrain the space to push back, turning consent into an act of sustaining relationships than protecting privacy.

5 Discussion

Our findings show that media consent forms in childcare do little to safeguard children's privacy. Instead, they operate as instruments of liability, reducing complex digital data practices to one-time binary signatures that transfer risk to families. Parents often approach these forms pragmatically, "just signing" amidst childcare scarcity and power asymmetries within institutions. At the same time, staff

shoulder the unseen labor of consent enforcement—devising informal and ad-hoc systems in absence of institutional support. In this section, we take these findings as starting point to discuss what media consent in childcare truly protects, surface the tensions in enforcing institutional consent, and re-imagine institutional consent that moves beyond liability to affirmation.

5.1 What Does Consent (Not) Protect?

Professional care relationships rest on intimate trust—parents must believe that providers will nurture, protect, and understand their children. Alongside this trust in basic caregiving tasks such as feeding, comforting, and teaching, parents must also now extend this trust to institutions for the visual documentation of these same activities. Our study shows how photography disrupts this trust in ways that everyday care activities do not. Digital capture changes something—it transforms the nature of care itself, converting private, intimate exchanges into institutional assets for circulation and display.

We argue that this tension stems from multiple fundamental mismatches between care relationships and digital data systems. Care is temporal and bounded—children outgrow daycares, move between schools, and eventually leave institutional care entirely. The activities of care (e.g., feeding, play, field trips) exist as discrete moments with clear end points. Digital documentation, however, renders these interactions into persistent artifacts that circulate through unpredictable digital environments. A photo of a child playing with blocks becomes institutional property that not only persists but circulates across opaque digital environments—from classrooms and internal newsletters to public websites. Parents cannot anticipate where these images might appear, who may access them, or how they might be reused years later.

Our findings suggest that parental apprehension about photography is less about trusting educators and more about anxieties over digital infrastructures and data use. Current consent forms do little to address these concerns because they remain rooted in pre-internet liability frameworks. Media consent practices in the United States trace back to the 1974 Family Educational Rights and Privacy Act (FERPA), which categorized photos as "directory information// that schools could release unless parents explicitly opted out. These opt-out models embody a "no means no" approach to privacy [49], leaving families to shoulder the burden of resisting disclosure. Yet saying no is rarely simple—it is shaped by structural pressures that make refusal laborious, costly, or uncomfortable [49, 66]. Beyond FERPA, the institutions in our study also operated within state-level jurisdictions that required early-childhood programs to obtain parental permission before photographing or videotaping children [63], as well as publicity laws that distinguish between promotional and non-promotional use of photos [62]. Together, these regulations establish that parental consent is required, but offer little clarity on how that consent should be communicated, structured, and enforced. The nuance embedded within these laws—such as the distinction between promotional and non-promotional use— is not enough in a digital ecosystem where boundaries between public and private spheres are blurred by institutional websites,

parent portals, and social media platforms. Even within FERPA itself, whether a photo counts as personally identifiable information is heavily dependent on the context.

Moreover, as the internet and social media reshaped how images persist and circulate, consent forms retained their liability-focused framing, borrowing from domains like field trips or sunscreen application where risks are bounded and finite. Today's forms collapse heterogeneous uses—internal documentation, family communication, advertising, external marketing—into blunt categories, leaving families little space to articulate nuanced preferences. Once signed at enrollment, often before trust is established, these permissions persist indefinitely with limited or laborious mechanisms for revision, renewal, or deletion.

This prompts us to ask: *what are media consent forms in childcare really designed to protect? Are they meant to safeguard children against overexposure and misuse, reassuring families, or primarily protecting institutions from legal liability?* These shortcomings mirror long-standing critiques of notice-and-choice in S&P, where lengthy, hard-to-read, complex policies only create an illusion of protection [51]. We encourage future research to take this mismatch as a starting point, asking how consent might be re-imagined for the digital documentation of care. *What would it mean to design consent management systems that acknowledge the temporal boundaries of care while addressing the persistence of digital traces? How could more ephemeral media sharing systems be designed for institutionalized childcare settings? How might consent allow parents to freely express their evolving preferences over their child's digital presence?*

5.2 Tensions in Institutional Consent

Answering the question posed above—how to reimagine consent in this context—is non-trivial due to the challenges that typically arise when enforcing consent in childcare institutions. Rather than viewing these as problems with straightforward solutions, we examine them as fundamental design tensions that surface competing values and structural constraints within current systems [56].

Simplicity vs. granularity. Parents sought nuanced control over their children's images, distinguishing between classroom documentation, family communication, and external marketing. However, institutional consent forms routinely collapsed this complexity into blanket categories. Our interviews revealed that even modest granularity—such as separating internal from external sharing— required complex tracking systems and constant staff vigilance. While some institutions found workable solutions, these were highly contingent on the size of the institution. This reveals an inherent tension—meaningful, nuanced parental control comes at the significant cost of institutional burden. This raises key questions: how could childcare institutions design consent systems that provide meaningful parental agency while acknowledging operational constraints? What role might technology play in reducing the privacy labor associated with granular consent? How might we address the systemic misalignment between diverse family privacy needs and institutional capacities?

Individual privacy vs. collective documentation. Honoring opt-out preferences often meant excluding children from group photos, classroom displays, and event-related documentation. Staff described

pulling children aside, while parents worried about their children being visibly singled out. Some families who initially declined consent later reversed their decisions after seeing their children absent from shared experiences. This reflects broader challenges in collaborative privacy [46, 47], where individual preferences conflict with the inherently social nature of institutional caregiving. Current consent systems also lead to disproportionate visibility. Children whose parents consent are well represented in institutional memory, while others are systematically excluded. However, prioritizing collective inclusion violates families' privacy preferences. This tension prompts: how might institutions document collective experiences while respecting individual privacy boundaries? Could alternative approaches like group consent or privacy-preserving documentation methods enable participation without individual identification?

Professional boundaries vs. personal devices. The widespread use of personal devices for photography created boundary violations and retention challenges that consent forms could not address. Teachers often kept photos on their phones indefinitely, while volunteers used personal cameras without understanding consent preferences, turning institutional documentation into private possessions beyond oversight. This unveils a tension between consent forms designed for institutional control and the realities of everyday photo-taking. Dedicated institutional devices (e.g., iPads) could mitigate risks but introduce costs, reduce the spontaneity of captured moments, and create new workplace tensions around screen-use. On the flip side, allowing personal devices is operationally feasible but risks retention and ownership issues. This prompts us to ask: how can institutions enable authentic documentation while ensuring data protection? Could institutional apps on personal devices featuring automatic deletion manage retention, or are blurred personal-professional boundaries an inevitable component of childcare that rigid technologies cannot (and should not) contain?

Parental control vs. children's agency. Only 1 of the 42 consent forms we analyzed explicitly addressed children, asking parents to ensure their child was "aware" of the consent decision. In most cases, media consent frameworks excluded children entirely, treating them as passive subjects of parental choices. Yet children directly experienced the consequences—being pulled aside during group photos, seeing their faces obscured in shared images, or watching peers celebrated in newsletters while they remained invisible. Such moments create visible markers of difference that children would notice and sometimes question. This reveals a fundamental tension around how parents' privacy preferences can inadvertently isolate them from peer experiences and institutional belonging. To that we ask: how might institutions uphold parental authority while also acknowledging children's growing desire for social inclusion in photography? How can we design privacy-preserving approaches that reduce rather than highlight exclusion?

5.3 Towards Affirmative Media Consent in Institutionalized Childcare

The tensions we surfaced above illustrate why institutional consent is challenging to enact. Parental agency collides with staff privacy labor, individual privacy with collective belonging, and parental

authority with children's emerging interests. These are not tensions with simple fixes but frictions that reveal the shortcomings of liability-driven, procedural consent. We argue that these frictions should not be seen as barriers, but as a starting point for reimagining consent in institutionalized childcare. We now draw inspiration from Im et al.'s work on *affirmative consent* in digital platforms [22]. Affirmative consent reframes consent as enthusiastic, ongoing, and revocable rather than a static, one-time agreement. While it does not erase the tensions we identify, it offers a normative benchmark for shifting institutional practices away from compliance and towards trust-building, and opens up design opportunities for HCI to support these practices through socio-technical tools than paperwork alone.

The principles of affirmative consent suggest several directions for institutionalized childcare. First, consent must be *voluntary*. Parents should not feel pressured to sign because childcare is scarce or fear that refusal will disadvantage their child. For instance, institutions can reduce these pressures by explicitly assuring families that opting out will not affect participation, and by offering other alternatives such as selective framing or child-authored artifacts that document participation without direct photographs. Second, consent must also be *informed and specific*. Current media release forms collapse diverse uses into blanket categories, leaving families with little space to express nuanced preferences. Institutions should distinguish between different use cases such as offline documentation, online sharing with families, social media, and external marketing. For instance, providing concrete examples of how images may be used in each case could help parents make more informed choices. We recognize that such specificity is laborious and requires additional resources and coordination from institutions. Yet this kind of granularity is necessary if institutions are to move beyond procedural, pragmatic consent to enthusiastic consent. To this extent, digital interventions could be designed to scaffold such granular preference-setting. For instance, interactive consent dashboards that allow parents to preview, reflect, and annotate through specific categories of media use.

Additionally, consent must be *revocable*. Families' privacy preferences shift as trust develops, children grow older, and circumstances change in unpredictable ways. Yet institutional practices assume the opposite—with preemptive consent requests at the time of enrollment. We argue that mechanisms such as annual renewal, alongside straightforward ways to revise consent mid-year would make consent more flexible and align with evolving privacy preferences. These renewal forms could also be designed in ways that help parents reflect and go over their children's media use by the institutions that year. This could build trust, and help them put more thoughts to the renewal process. Lastly, consent must also be *unburdensome* for both families and staff. Our findings show that enforcement labor often falls on educators, who are expected to remember individual privacy preferences. Simple interventions—for example, noting consent status through subtle indicators as stitch-on clothing items, or overlays in photo-taking apps displaying consent status of children, could reduce this cognitive load. Future research could explore more such techniques and design solutions that might work in this context.

6 Conclusion

Through analysis of 42 consent forms and 21 semi-structured interviews with parents and childcare staff, we examined how photography and media consent operates in institutionalized childcare settings. Our findings reveal that consent forms function as procedural infrastructures designed to protect institutions rather than provide meaningful safeguards for the family. Parents navigate consent pragmatically amid childcare scarcity and power asymmetries, often defaulting to a "just sign" tendency when there's little room to express nuanced privacy preferences. Staff, meanwhile, perform the invisible labor of consent enforcement, developing ad hoc solutions and relying on situational improvisation in the absence of institutional support.

We call for re-imagining photography consent in institutional childcare—moving beyond liability-focused compliance toward trust-building practices that acknowledge the everyday realities of caregiving. This work makes three contributions: (1) we provide an empirical understanding of how consent forms operate as privacy safeguards in childcare institutions and why they fall short in practice; (2) we reframe digital consent as a contextual, ongoing process shaped by structural precarity and power asymmetries, extending scholarship on sharenting and privacy labor into institutional childcare settings; and (3) we identify key tensions in institutional consent, and offer recommendations for designing meaningful consent mechanisms in institutionalized care settings. We hope this work sparks broader conversations around children's digital safety and privacy in institutional care settings.

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References

[1] Tawfiq Ammari, Priya Kumar, Cliff Lampe, and Sarita Schoenebeck. 2015. Managing Children's Online Identities: How Parents Decide what to Disclose about their Children Online. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems (CHI '15)*. Association for Computing Machinery, New York, NY, USA, 1895–1904. doi:10.1145/2702123.2702325

[2] Mary Jean Amon, Nika Kartvelishvili, Bennett I. Bertenthal, Kurt Hugenberg, and Apu Kapadia. 2022. Sharenting and Children's Privacy in the United States: Parenting Style, Practices, and Perspectives on Sharing Young Children's Photos on Social Media. *Proceedings of the ACM on Human-Computer Interaction* 6, CSCW1 (March 2022), 1–30. doi:10.1145/3512963

[3] Jill Anderson. 2019. The Pitfalls of Online Oversharing. Accessed: 2025-Feb-10. URL: https://www.gse.harvard.edu/ideas/edcast/19/12/pitfalls-online-oversharing.

[4] Claire Bessant. 2024. School social media use and its impact upon children's rights to privacy and autonomy. *Computers and Education Open* 6 (2024), 100185. https://doi.org/10.1016/j.caeo.2024.100185

[5] Alicia Blum-Ross and Sonia Livingstone. 2017. "Sharenting," parent blogging, and the boundaries of the digital self. *Popular Communication* 15, 2 (April 2017), 110–125. doi:10.1080/15405702.2016.1223300

[6] Glenn A Bowen. 2009. Document analysis as a qualitative research method. *Qualitative research journal* 9, 2 (2009), 27–40.

[7] Virginia Braun and Victoria Clarke. 2019. Reflecting on reflexive thematic analysis. *Qualitative research in sport, exercise and health* 11, 4 (2019), 589–597. https://doi.org/10.1080/2159676X.2019.1628806

[8] Isabelle Budin-Ljøsne, Harriet JA Teare, Jane Kaye, Stephan Beck, Heidi Beate Bentzen, Luciana Caenazzo, Clive Collett, Flavio D'Abramo, Heike Felzmann, Teresa Finlay, et al. 2017. Dynamic consent: a potential solution to some of the challenges of modern biomedical research. *BMC medical ethics* 18, 1 (2017), 4. https://doi.org/10.1186/s12910-016-0162-9

[9] Macy A Burchfield, Joshua M Rosenberg, and Sondra M Stegenga. 2025. Informed or outdated consent? An investigation into the media release policies of school districts in the United States. *Journal of Research on Technology in Education* 57, 4 (2025), 766–783. https://doi.org/10.1080/15391523.2024.2313614

[10] Mario Campana, Astrid Van den Bossche, and Bryoney Miller. 2020. # dadtribe: Performing sharenting labour to commercialise involved fatherhood. *Journal of Macromarketing* 40, 4 (2020), 475–491. https://doi.org/10.1177/0276146720933334

[11] Charlotte Chalklen and Heather Anderson. 2017. Mothering on Facebook: Exploring the privacy/openness paradox. *Social Media+ Society* 3, 2 (2017). https://doi.org/10.1177/2056305117707187

[12] Eun Kyoung Choe, Sunny Consolvo, Jaeyeon Jung, Beverly Harrison, and Julie A Kientz. 2011. Living in a glass house: a survey of private moments in the home. In *Proceedings of the 13th international conference on Ubiquitous computing*. 41–44. https://doi.org/10.1145/2030112.2030118

[13] Davide Cino and Chiara Dalledonne Vandini. 2020. "Why Does a Teacher Feel the Need to Post My Kid?": Parents and Teachers Constructing Morally Acceptable Boundaries of Children's Social Media Presence. *International Journal of Communication* 14, 0 (Feb. 2020), 20. https://ijoc.org/index.php/ijoc/article/view/12493

[14] Sarah L Dalglish, Hina Khalid, and Shannon A McMahon. 2020. Document analysis in health policy research: the READ approach. *Health policy and planning* 35, 10 (2020), 1424–1431.

[15] Yvonne de Man, Yvonne Wieland-Jorna, Bart Torensma, Koos de Wit, Anneke L Francke, Mariska G Oosterveld-Vlug, and Robert A Verheij. 2023. Opt-in and opt-out consent procedures for the reuse of routinely recorded health data in scientific research and their consequences for consent rate and consent bias: Systematic review. *Journal of medical Internet research* 25 (2023), e42131. https://doi.org/10.2196/42131

[16] National Center for Education Statistics. 2019. Early Childhood Program Participation: 2019. https://nces.ed.gov/use-work/resource-library/report/first-look-ed-tab/early-childhood-program-participation-2019?pubid=2020075REV

[17] Alexa K. Fox and Mariea Grubbs Hoy. 2019. Smart Devices, Smart Decisions? Implications of Parents' Sharenting for Children's Online Privacy: An Investigation of Mothers. *Journal of Public Policy & Marketing* 38, 4 (Oct. 2019), 414–432. doi:10.1177/0743915619858290

[18] Colin M. Gray, Yubo Kou, Bryan Battles, Joseph Hoggatt, and Austin L. Toombs. 2018. The Dark (Patterns) Side of UX Design. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (Montreal QC, Canada) *(CHI '18)*. Association for Computing Machinery, New York, NY, USA, 1–14. doi:10.1145/3173574.3174108

[19] Meghna Gupta, Arpita Bhattacharya, and Julie Kientz. 2025. "Being a nanny isn't just caregiving": An Analysis of How Nannies Seek Support in Online Communities like r/Nanny. In *Proceedings of the 4th Annual Symposium on Human-Computer Interaction for Work*. 1–15. https://doi.org/10.1145/3729176.3729181

[20] Hana Habib and Lorrie Faith Cranor. 2022. Evaluating the usability of privacy choice mechanisms. In *Eighteenth Symposium on Usable Privacy and Security (SOUPS 2022)*. 273–289. https://www.usenix.org/conference/soups2022/presentation/habib

[21] Duha Ibdah, Nada Lachtar, Satya Meenakshi Raparthi, and Anys Bacha. 2021. "Why should I read the privacy policy, I just need the service": A study on attitudes and perceptions toward privacy policies. *IEEE access* 9 (2021), 166465–166487. https://doi.org/10.1109/ACCESS.2021.3130086

[22] Jane Im, Jill Dimond, Melody Berton, Una Lee, Katherine Mustelier, Mark S Ackerman, and Eric Gilbert. 2021. Yes: Affirmative consent as a theoretical framework for understanding and imagining social platforms. In *Proceedings of the 2021 CHI conference on human factors in computing systems*. 1–18. https://doi.org/10.1145/3411764.3445778

[23] Julie A. Kientz, Rosa I. Arriaga, and Gregory D. Abowd. 2009. Baby steps: evaluation of a system to support record-keeping for parents of young children. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Boston, MA, USA) *(CHI '09)*. Association for Computing Machinery, New York, NY, USA, 1713–1722. doi:10.1145/1518701.1518965

[24] Julie A Kientz, Rosa I Arriaga, Marshini Chetty, Gillian R Hayes, Jahmeilah Richardson, Shwetak N Patel, and Gregory D Abowd. 2007. Grow and know: understanding record-keeping needs for tracking the development of young children. In *Proceedings of the SIGCHI conference on Human factors in computing*

systems. 1351–1360. https://doi.org/10.1145/1240624.1240830

[25] Lindah Kotut and D Scott McCrickard. 2022. The TL; DR charter: Speculatively demystifying privacy policy documents and terms agreements. *Proceedings of the ACM on Human-Computer Interaction* 6, GROUP (2022), 1–14. https://doi.org/10.1145/3492842

[26] Priya Kumar and Sarita Schoenebeck. 2015. The Modern Day Baby Book: Enacting Good Mothering and Stewarding Privacy on Facebook *(CSCW '15)*. Association for Computing Machinery, New York, NY, USA, 1302–1312. doi:10.1145/2675133.2675149

[27] Priya C. Kumar, Michael Zimmer, and Jessica Vitak. 2024. A Roadmap for Applying the Contextual Integrity Framework in Qualitative Privacy Research. *Proc. ACM Hum.-Comput. Interact.* 8, CSCW1, Article 219 (April 2024), 29 pages. doi:10.1145/3653710

[28] Kalle Kusk and Midas Nouwens. 2025. How Website Owners Use Consent Management Platforms: An Interview Study. In *Proceedings of the Extended Abstracts of the CHI Conference on Human Factors in Computing Systems*. 1–7.

[29] Fortesa Latifi. March 2023. Influencer Parents and The Kids Who Had Their Childhood Made Into Content. Accessed: 2025-Feb-10. URL: https://www.teenvogue.com/story/influencer-parents-children-social-media-impact.

[30] Jennifer Lawlor, Carl Thomas, Andrew T Guhin, Kendra Kenyon, Matthew D Lerner, Ucas Consortium, and Amy Drahota. 2021. Suspicious and fraudulent online survey participation: Introducing the REAL framework. *Methodological Innovations* 14, 3 (2021), 20597991211050467. https://doi.org/10.1177/20597991211050467

[31] Hanna Lewandowska. 2024. Sharenting–Between Promoting an Educational Institution and Protecting the Image of Students. *Scientific Reports of Fire University* 2, 90 (2024), 31–42. https://doi.org/10.5604/01.3001.0054.5183

[32] Kate Stone Lombardi. March 2022. The Problem With Grandparents Posting Photos of Their Grandkids Online. Accessed: 2025-Feb-10. URL: https://www.goodhousekeeping.com/life/parenting/a39354905/grandsharenting-grandkids-photos-online-privacy/.

[33] Kate Stone Lombardi. November 2019. Grandsharenting: When Grandparents Get Carried Away on Facebook. Accessed: 2025-Feb-10. URL: https://www.wsj.com/articles/grandsharenting-when-grandparents-get-carried-away-on-facebook-11574764204.

[34] Mary Madden. 2017. Privacy, security, and digital inequality. (2017).

[35] Alice E. Marwick and danah boyd. 2011. I tweet honestly, I tweet passionately: Twitter users, context collapse, and the imagined audience. *New Media & Society* 13, 1 (Feb. 2011), 114–133. doi:10.1177/1461444810365313 Publisher: SAGE Publications.

[36] Alice E Marwick and Danah Boyd. 2014. Networked privacy: How teenagers negotiate context in social media. *New media & society* 16, 7 (2014), 1051–1067. https://doi.org/10.1177/1461444814543995

[37] Aleecia M McDonald and Lorrie Faith Cranor. 2008. The cost of reading privacy policies. *Isjlp* 4 (2008), 543.

[38] Wendy Hobbins McGrath. 2007. Ambivalent partners: Power, trust, and partnership in relationships between mothers and teachers in a full-time child care center. *Teachers College Record* 109, 6 (2007), 1401–1422. https://doi.org/10.1177/016146810710900601

[39] Tehila Minkus, Kelvin Liu, and Keith W. Ross. 2015. Children Seen But Not Heard: When Parents Compromise Children's Online Privacy *(WWW '15)*. International World Wide Web Conferences Steering Committee, Republic and Canton of Geneva, CHE, 776–786. doi:10.1145/2736277.2741124

[40] Meredith Ringel Morris. 2014. Social networking site use by mothers of young children *(CSCW '14)*. Association for Computing Machinery, New York, NY, USA, 1272–1282. doi:10.1145/2531602.2531603

[41] Helen Nissenbaum. 2004. Privacy as Contextual Integrity. *Washington Law Review* 79 (2004).

[42] Midas Nouwens, Ilaria Liccardi, Michael Veale, David Karger, and Lalana Kagal. 2020. Dark patterns after the GDPR: Scraping consent pop-ups and demonstrating their influence. In *Proceedings of the 2020 CHI conference on human factors in computing systems*. 1–13. https://doi.org/10.1145/3313831.3376321

[43] Gaëlle Ouvrein and Karen Verswijvel. 2019. Sharenting: Parental adoration or public humiliation? A focus group study on adolescents' experiences with sharenting against the background of their own impression management. *Children and Youth Services Review* 99 (April 2019), 319–327. doi:10.1016/j.childyouth.2019.02.011

[44] Ju-Mi Park and Yoo young Jeon. 2024. The relationship between fathers' online involvement and parental satisfaction. *korean Jouranl of Early Childhood Education* (2024).

[45] Rapid. 205. Many families with infants and toddlers struggle to consistently access child care. https://rapidsurveyproject.com/article/many-families-with-infants-and-toddlers-struggle-to-consistently-access-child-care/

[46] Yasmeen Rashidi, Tousif Ahmed, Felicia Patel, Emily Fath, Apu Kapadia, Christena Nippert-Eng, and Norman Makoto Su. 2018. "You don't want to be the next meme": College Students' Workarounds to Manage Privacy in the Era of Pervasive Photography. In *Fourteenth Symposium on Usable Privacy and Security (SOUPS 2018)*. 143–157. https://www.usenix.org/conference/soups2018/presentation/rashidi

[47] Yasmeen Rashidi, Apu Kapadia, Christena Nippert-Eng, and Norman Makoto Su. 2020. "It's easier than causing confrontation": Sanctioning Strategies to Maintain Social Norms and Privacy on Social Media. *Proceedings of the ACM on Human-Computer Interaction* 4, CSCW1 (May 2020), 1–25. doi:10.1145/3392827

[48] Samarth Singhal, Carman Neustaedter, Thecla Schiphorst, Anthony Tang, Abhisekh Patra, and Rui Pan. 2016. You are Being Watched: Bystanders' Perspective on the Use of Camera Devices in Public Spaces. In *Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems* (San Jose, California, USA) *(CHI EA '16)*. Association for Computing Machinery, New York, NY, USA, 3197–3203. doi:10.1145/2851581.2892522

[49] Robert H Sloan and Richard Warner. 2014. Beyond notice and choice: Privacy, norms, and consent. *J. High Tech. L.* 14 (2014), 370. https://dx.doi.org/10.2139/ssrn.2239099

[50] Jonathan A Smith. 2024. Qualitative psychology: A practical guide to research methods. (2024).

[51] Daniel J Solove. 2022. The limitations of privacy rights. *Notre Dame L. Rev.* 98 (2022), 975.

[52] Luna Staes, Michel Walrave, and Lara Hallam. 2023. Grandsharenting: How grandparents in Belgium negotiate the sharing of personal information related to their grandchildren and engage in privacy management strategies on facebook. *Journal of Children and Media* 17, 2 (2023), 192–218. https://doi.org/10.1080/17482798.2023.2177318

[53] Stacey B Steinberg. 2016. Sharenting: Children's privacy in the age of social media. *Emory Lj* 66 (2016), 839. https://scholarlycommons.law.emory.edu/elj/vol66/iss4/2

[54] Sophie Stephenson, Christopher Nathaniel Page, Miranda Wei, Apu Kapadia, and Franziska Roesner. 2024. Sharenting on TikTok: Exploring Parental Sharing Behaviors and the Discourse Around Children's Online Privacy. In *Proceedings of the CHI Conference on Human Factors in Computing Systems*. 1–17. https://doi.org/10.1145/3613904.3642447

[55] Jose M Such, Joel Porter, Sören Preibusch, and Adam Joinson. 2017. Photo privacy conflicts in social media: A large-scale empirical study. In *Proceedings of the 2017 CHI conference on human factors in computing systems*. 3821–3832. https://dl.acm.org/doi/10.1145/3025453.3025668

[56] Deborah Tatar. 2007. The design tensions framework. *Human–Computer Interaction* 22, 4 (2007), 413–451. https://doi.org/10.1080/07370020701638814

[57] Austin L. Toombs, Kellie Morrissey, Emma Simpson, Colin M. Gray, John Vines, and Madeline Balaam. 2018. Supporting the Complex Social Lives of New Parents. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems* (Montreal QC, Canada) *(CHI '18)*. Association for Computing Machinery, New York, NY, USA, 1–13. doi:10.1145/3173574.3173994

[58] Jennifer Valentino-DeVries and Michael H. Keller. 2024. A Marketplace of Girl Influencers Managed by Moms and Stalked by Men. *The New York Times* (2024). https://www.nytimes.com/2024/02/22/us/instagram-child-influencers.html Investigative article.

[59] Carol Vincent and Stephen J Ball. 2001. A market in love? Choosing pre-school childcare. *British Educational Research Journal* 27, 5 (2001), 633–651. https://doi.org/10.1080/01411920120095799

[60] Kim-Phuong L Vu, Vanessa Chambers, Fredrick P Garcia, Beth Creekmur, John Sulaitis, Deborah Nelson, Russell Pierce, and Robert W Proctor. 2007. How users read and comprehend privacy policies. In *Symposium on Human Interface and the Management of Information*. Springer, 802–811. doi:10.1007/978-3-540-73354-6_88

[61] Isabel Wagner. 2023. Privacy Policies across the Ages: Content of Privacy Policies 1996–2021. *ACM Trans. Priv. Secur.* 26, 3, Article 32 (May 2023), 32 pages. doi:10.1145/3590152

[62] Washington State Legislature. 2024. Revised Code of Washington 63.60: Personality Rights. https://app.leg.wa.gov/rcw/default.aspx?cite=63.60. Accessed July 2024.

[63] Washington State Legislature. 2024. Washington Administrative Code 110-300: Early Learning Program Licensing. https://app.leg.wa.gov/wac/default.aspx?cite=110-300. Accessed July 2024.

[64] Liam Williams. 2021. Pricing Privacy and Valuing Data Collection: The Commidification of Privacy and the Impact on Low-Income Groups. *Indiana Journal of Law and Social Equality* 9, 2 (2021), 7.

[65] Nama Winston. November 2019. Grandsharenting: The problem when grandparents go rogue on social media. Accessed: 2025-Feb-10. URL: https://www.mamamia.com.au/grandsharenting/.

[66] Richmond Y Wong and Deirdre K Mulligan. 2019. Bringing design to the privacy table: Broadening "design" in "privacy by design" through the lens of HCI. In *Proceedings of the 2019 CHI conference on human factors in computing systems*. 1–17. https://doi.org/10.1145/3290605.3300492

[67] Michael Zimmer. 2020. "But the data is already public": on the ethics of research in Facebook. In *The ethics of information technologies*. Routledge, 229–241. https://doi.org/10.1007/s10676-010-9227-5