Shared Understanding in Care Coordination for Children's Behavioral Health

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Care coordination involves crossing boundaries to connect services in support of the health and well-being of an individual. In this paper, we describe how care coordination depends on the ability to develop a shared understanding of care goals and progress. A distributed group of professionals and non-professional caregivers need to share information to provide consistent and holistic support across settings. We conducted fieldwork comprising of 20 interviews and 51 hours of observation across three different programs focused on children's behavioral health. From this empirical investigation of practices used by distributed care teams, we generated a conceptual framework of shared understanding in care coordination. We identified barriers to shared understanding, as well as nine practices that contribute to its development via two key mechanisms: (1) building relationships across boundaries, and (2) sharing actionable information. We conclude with design implications for enhancing the collaborative practices of members of a care team to cross boundaries despite the barriers that are common in behavioral health and other contexts requiring complex care coordination.

CCS Concepts: • **Human-centered computing → Empirical studies in collaborative and social computing**; *Ethnographic studies.*

Additional Key Words and Phrases: distributed care teams, information sharing

ACM Reference Format:
Olivia K. Richards, Adrian Choi, and Gabriela Marcu. 2021. Shared Understanding in Care Coordination for Children's Behavioral Health. *Proc. ACM Hum.-Comput. Interact.* 5, CSCW1, Article 21 (April 2021), 25 pages. https://doi.org/10.1145/3449095

1 INTRODUCTION

From a young age, a child's behavioral health is shaped within an ecosystem that includes the child's family structure, their educational environment, and the care of various health professionals. For example, parents may ask a pediatrician about behaviors that are concerning, or they may discuss their child's behaviors with teachers when those behaviors result in social challenges or disciplinary measures at school. Effective coordination whereby parents are more highly involved with their child's school has been associated with better social skills and fewer problem behaviors [8]. Children who have an unstable home life, with parents who may be unable to attend to their child's needs, will be more dependent on school staff to identify their challenges and advocate for certain types of care. Integrating care across organizational boundaries, contexts, and time complicates coordination, which requires an ongoing process of connecting individual caregivers and services

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2573-0142/2021/4-ART21 $15.00
https://doi.org/10.1145/3449095

[7, 49]. Coordination across professions has been associated with more efficient and equitable diagnoses of autism [19] and ADHD [36], so that children can receive appropriate support.

Coordination is "the process of managing dependencies among activities" [21]. Effective behavioral intervention requires coordination that brings together different perspectives to set goals, and share their knowledge and observations [22, 40]. However, geographic, organizational, and social boundaries across the ecosystem of children's behavioral health make it difficult to develop a shared understanding and maintain consistent care across contexts [29]. The difficulty of crossing these boundaries can even cause tensions and divisions that inhibit working together effectively. With services under the protection of special education laws, for example, breakdowns in coordination between a parent and their child's school can feel like a war and can lead to litigation if the parent feels that their child's needs are not being met [24].

To prevent such breakdowns, research is needed to understand how barriers impede the development of shared understanding, and what practices teams can use to overcome these barriers. When care teams are segmented by geographical, social, or organizational boundaries, informational artifacts, such as technology-mediated communication, are often used to coordinate care [48]. However, the use of these technologies can disrupt the transfer of information which would normally need to be disseminated in order to create shared understanding [33, 51]. Specifically, Vlaar et al. cite losses in "communication richness, closeness of teams, the immediacy of feedback, and the extent and rate of information transfer" [51] as particularly disruptive in creating shared understanding when communication technology is used to transfer knowledge across boundaries.

In this work, we studied care teams distributed across professions and contexts, including home caregivers, school staff, and healthcare workers. Past work has studied similar distributed care teams, focusing on the inter-professional use of electronic documents [40], and support for the primary caregiver's care coordination tasks (typically a parent) [11]. We build on this work by considering how information is shared across interdependent care teams of professionals and non-professional caregivers, so we can understand how a care team can more holistically be supported to cross boundaries as needed for care coordination. We examine how care teams share information through communication and documentation (both electronic and non-electronic) among systems that support children's health and well-being, including healthcare, education, and social work. To this end, our study focused on the following research questions:

- **RQ1**: What are barriers to the development of shared understanding in care coordination for children's behavioral health?
- **RQ2**: What practices contribute to developing a shared understanding for care coordination for children's behavioral health?
- **RQ3**: What types of information do different members of a child's care team need from one another to develop shared understanding?

We contribute an empirically derived conceptual framework describing nine practices of distributed care teams, which help them to overcome common barriers and facilitate the development of shared understanding. These practices also show how care teams shared two types of information: prescriptive and descriptive. This paper builds on research describing coordination of healthcare teams (e.g., [39, 48]), and shared understanding among distributed teams (e.g., [38, 50, 51]), by extending this research to care coordination for children's behavioral health.

2 RELATED WORK

In this section, we frame our focus around information sharing practices and shared understanding, then situate our work within the literature on children's behavioral health. Finally, we describe the process of collaborative reflection among children's care teams, which informed our analysis.

2.1 Information Sharing Practices

In this study, we focused on information sharing practices as the building blocks of care coordination. The inherent goal of information sharing is to ensure that members of a team have sufficient knowledge held in common to construct a shared mental model or shared understanding [44]. According to Sonnenwald, information sharing includes "providing information, confirming the information has been received, and confirming that the information is jointly understood" [44]. To investigate this process within distributed care teams, we adopted a social constructionist approach, as opposed to a cognitive one, to examine and describe the social, contextual, and dialogical interactions that comprise information sharing practices [41]. Previous work has examined information sharing practices with respect to technology as a communicative artifact, which includes electronic forms of cooperative documentation [53], shared calendars and repositories [48], and interactive hospital displays [52]. These studies mainly focus on technological tools and other artifacts, which we complement by describing the nature of the information that needs to be shared and the interactions through which the information is shared. There has also been significant work on patient-generated health data to explore the design of boundary negotiating artifacts so that patients and providers can negotiate boundaries in order to collaborate effectively [5, 6, 10, 28]. As we focused on children who are not collecting their own health data, and we aimed to understand the breakdowns and challenges with consistency in their care, our work has examined the flow of information across boundaries irrespective of what artifacts are used.

2.2 Shared Understanding

Shared understanding is an outcome that results from team members constructing and negotiating a shared mental model [50, 51]. Mental models are the representations of how individuals view and perceive information around them [12]. Every individual in a team has a certain perception of the world, whether it is influenced by personal characteristics (i.e., values, beliefs, and worldview), experiences, or access to information [13]. Differences in these factors create differences in mental models from one team member to the next. For example, a parent will interpret their child's cry based on how their relationship with their child shapes their worldview, while a professional will interpret a child's cry based on how their discipline has trained them to view the cause and meaning of that behavior. Therefore, the mental model of one individual is likely to differ from others in a team. In order to reach a shared understanding, individuals must share information and interpretations with each other. Information sharing can occur through verbal exchange and discussion, and can also come in the form of informational artifacts that facilitate discussion [38, 39]. By identifying similarities and differences of the information that is shared, team members co-construct a body of knowledge that they hold in common.

Care coordination often involves technology to mediate communication, since teams are inherently distributed [48]. Technologies and information artifacts are often involved the sharing of information within distributed teams as they coordinate care [48], where they become intertwined with work practices [45]. However, the use of these technologies can disrupt information transfer or reduce the quality of the information needed to create shared understanding [33, 51]. Thus, within our research context, we studied how people share information within care teams in order to construct a shared understanding of a care recipient's care and well-being.

2.3 Children's Behavioral Health

Behavioral health involves interdependent members of a care team who can provide appropriate support for behaviors that affect a child's physical health, well-being, and ability to develop interpersonal relationships. In evidence-based interventions, trained behavioral specialists typically create manual records of a child's behaviors, so they can be monitored to determine effects of the intervention [23, 26]. Effective intervention requires coordination that brings together different perspectives to set goals, and share their knowledge and observations [22, 40]. Progress on behavioral goals must be generalized to transfer across environments (e.g., home and school) through consistent reinforcement. Thus, a care team comprised of members from different environments, who work together to develop a shared understanding in order to coordinate care, can more effectively monitor and guide a child's behavioral development.

Research focused on the work of children's behavioral health care teams has primarily aimed to bolster data collection and record keeping practices, because resulting artifacts are central to the ways these teams work together. Studies in this area have described the persistence of paper-based records [26]; the persistence of non-electronic communication via alternative records, phone calls, and letters [40]; how co-located teams of practitioners work together to collect data on behaviors during their work with children [25]; and how structured interventions can be supported with automated data capture [16].

The modular and loosely-coupled nature of behavioral health organizations silos information and hinders effective communication and coordination among distributed care team members [1, 30, 35]. Representations of behavioral data are therefore important ways of sharing information, helping to keep care team members across boundaries informed about behavioral goals and progress. For example, teachers share daily behavior report cards with home caregivers [26], parents send SMS messages to teachers informing them about changes at home that affect behavior [24], and behavioral therapists plot behavioral data on paper graphs to share with distributed therapists and with parents [15]. However, challenges remain with regard to ensuring that information sharing is adequate within these teams for the development of shared understanding. Breakdowns can occur especially across boundaries [24], and information sharing practices are often tailored more to the needs of co-located team members than those across boundaries [25].

2.4 Collaborative Reflection

Collaborative reflection is a concept central to our investigation of the process that care teams engage in for complex problem-solving and coordination. Prilla et al. [37] use this term to explain an individual's process of learning at work by reflecting with others at a co-located workplace, whether or not that reflection is tied to the healthcare work at hand, for example through opportunities that enable reflection or artifacts that spark reflection. Meanwhile, research on collaborative reflection by Marcu and colleagues has focused on practices that revolve around the data that inform a care team's work [22].

Marcu et al.'s framework of collaborative reflection describes how care teams record and use data in coordinating care [22], and has also been extended to distributed care teams [24]. Using two representative loops, this framework distinguishes between the process of reflecting on data over the short-term for immediate coordination, and over the long-term for ongoing assessment and decision-making. The short-term iterative loop involves members of the care team recording new data, reflecting on the historical record, and corroborating their interpretations of progress as indicated by the data. This regular process informs the long-term iterative loop whereby the care team determines an appropriate intervention, applies the intervention consistently, evaluates effects of the intervention, and disseminates information on progress across the team. Breakdowns in this process are common, and result in a team not having enough shared understanding to maintain consistency and cohesiveness in care coordination [24].

What is not yet known, however, is how work practices contribute to breakdowns in coordination processes like collaborative reflection, or what types of work practices can activate and maintain fluid coordination. Collaborative reflection has been used to describe the breakdowns that occur, but not how to prevent those breakdowns. Our work fills a gap in the literature on collaborative reflection by noting that shared understanding is what enables this process to unfold continuously. Existing tools and practices can even contribute to these breakdowns, because they are not designed to support the iterative, unstructured, and adaptive process of collaborative reflection [23, 24]. We extend the literature on breakdowns in this process by identifying common barriers to the development of shared understanding, and the practices that helped care teams to overcome these barriers.

3 METHODS

We conducted fieldwork across care contexts related to children's behavioral development—clinic, school, and home. This approach enabled us to focus on how care coordination crosses various boundaries, and understand how shared understanding is developed across the broader ecosystem rather than focusing on the practices of any one organization. Our data collection therefore prioritized individual needs and potential outcomes for children, over structures and processes—which tend to be context-specific and may or may not be effective in providing children with the support they need. This focus enabled us to identify the practices that bring individuals together as a care team, aligned as much as possible around the needs of a child (as opposed to, for example, organizational needs).

3.1 Data Collection

Our fieldwork consisted of 51 hours of observation and 20 interviews conducted in parallel, interweaving the experiences of clinicians, educators, and home caregivers (i.e., parents or guardians). Observation provided us with context about the nature of care coordination, including how teams worked across organizational and geographic boundaries, and the types of care goals they were working toward. Meanwhile, interviews provided us with individual perspectives on interaction and engagement with other members of the care team.

3.1.1 Observation. We observed three different programs focused on children's behavioral health in the Midwestern United States. The programs were selected to represent different types of organizations and complementary systems (e.g., healthcare and education). Sites were recruited and included based on an interest in partnering on research focused on documentation practices and information sharing.

- Based in a hospital, the **Feeding Disorders Program** serves children with medical or developmental challenges that thwart proper feeding from a young age. A multidisciplinary team including behavioral psychologists, registered dietitians, and speech-language pathologists work together to deliver a structured treatment plan, which is primarily behavioral in nature. For example, a child must overcome a fear that has typically developed around the process of feeding, and then become desensitized to the feeling of a spoon in their mouth, and then learn how to move their mouth to take in and swallow the food on a spoon. The program is intensive, with treatment occurring at every meal, for three one-hour meals daily over eight weeks. In addition to seeing the children and their home caregivers frequently, the small number of staff in the program also work together closely. Treatment rooms have one-way mirrors for observation during feeding sessions, and team members are often pulled in from their nearby offices for a consultation.
- Part of a private therapy center providing services for autistic children and their families, the **Social Skills Program** is a weekly offering that brings children together to practice their social skills in a two-hour group. The ability to practice social skills with and among their peers complements traditional behavioral therapy alone with a therapist. Activities are

scheduled and facilitated much like in a classroom setting. However, each child has one-to-one support from a behavioral therapist who is focused on facilitating and guiding opportunities to practice social skills that will be most useful in everyday life. For therapeutic as well as staffing reasons, this one-to-one support is assigned on an ad hoc basis, so behavioral therapists may work with a child even though they are not formally assigned to their case, and they do not always work with the same child for each session. As a result, members of a child's care team are diverse, and not always intimately acquainted with the child's case. This makes it difficult to keep all therapists on the same page and consistent in how they work with a child.

- Made up of two self-contained special education classrooms within a regular elementary school, the **Behavior Disorder Program** provides structure and support for children with a range of diagnoses. Children are referred to this program when their behaviors inhibit learning or result in disciplinary action at school. The program is staffed by a collaborative team of special education teachers, paraprofessional educators, and a social worker. A small number of staff get to know each child well, through daily classroom interaction over the course of a school year. However, unlike the other two programs which require a parent or guardian to seek services, the decision to place a child in the Behavior Disorder Program is shared with the educational system. That is, a school district is legally required to assess a child's behavioral needs, and provide appropriate placement and support to meet those needs. Therefore, the staff coordinate with home caregivers, at the school or district level, as well as the health care system on occasion (e.g., for a referral to a psychiatric placement).

Our combined total 51 hours of observation were split across these programs as 16 hours, 4 hours, and 33 hours respectively. We spent fewer hours observing the Social Skills Program because one of the authors underwent 40 hours of training as a behavioral therapist and then worked for 9 months in this program. We do not count this engagement as part of our formal observation. Instead, this personal experience was brought to bear as we analyzed our data, just as Kientz and Abowd describe becoming a member of a care team in order to understand their information needs firsthand and inform system design [15]. During and immediately following observation, we took notes on interactions among care team members and information sharing practices.

3.1.2 Interviews. We recruited interview participants in part from the programs we observed, based on introductions from key informants, and through invitations to engage more deeply in conversations that began organically during observation. In addition, we recruited other practitioners, as well as parents, through word of mouth and snowball sampling from our other studies. Table 1 shows how interview participants were distributed across the care contexts (clinical, school, home) and characterizes their care team roles—behavioral therapist, specialist (speech language pathologist, psychologist, registered dietitian), educator, parent. Interview participants in clinical contexts cared for a broad range of children as young as 1 year, while those in school and home contexts cared for children between 6-14 years of age (elementary and middle school).

Using a semi-structured interview protocol, we asked participants about their experiences coordinating care for children with behavioral needs, how they interact with other members of a care team, and the information they would like to be exchanged among care team members. Interviews lasted 40-60 minutes. All but two of the interviews were audio recorded and transcribed in full. Two interview participants declined audio recording, so thorough notes were taken instead. Interview data were uploaded into NVivo for analysis.

Care Context	Care Team Role (ID)	N = 20
Clinical	Behavioral Therapists (BT)	8
	Specialist (S)	4
School	Educators (E)	4
	Specialist (S)	1
Home	Parents (P)	3

Table 1. Interview Participants

3.2 Data Analysis

Interview transcripts and observation notes were analyzed through inductive thematic analysis. An initial round of coding compared interview and observation data, revealing how shared understanding is critical to care coordination. In weekly meetings, the authors discussed their interpretations and memos, and continued developing codes by comparing findings across all programs observed and individuals interviewed. We then completed the coding of interview data around the concept of shared understanding, using reflexive thematic analysis [3] in a second phase of coding. The first two authors coded all data and practiced memoing, then all authors discussed the codes in weekly meetings to generate, review, and define themes. We considered participant roles and repeatedly compared data across settings to finalize themes. We also used informal member checking on occasion, to confirm that our themes crossed contexts and aligned with individuals' experiences.

The themes that resulted from this inductive analysis became the components of our framework. Over time during weekly analysis meetings, we focused on the common barriers experienced by different types of care teams, and what practices helped them overcome these barriers to develop shared understanding. Our conceptual framework was ultimately constructed through comparisons to the literature, and discussions of how factors relating to shared understanding could be conceptualized together. We iterated on a framework that could describe the development of shared understanding via the relationships between barriers, practices, mechanisms, and types of information. The conceptual framework we present in this paper is the final of about ten iterations.

4 FINDINGS

In the settings we studied, shared understanding was important for care teams to help children make behavioral progress. What progress looked like differed depending on the behavioral intervention employed and the child's individual needs, but interventions needed to be consistently applied across care settings. For example, Kendall[1], a clinical psychologist in the Feeding Disorders Program described children's behavioral progress as *"the capability of children to take in more food without exhibiting undesired behaviors"* (S2). Although the goal in this clinic was to reduce behaviors that prevented successful feeding (i.e., gagging or pushing a spoon away), the goal across all contexts was to address undesired or harmful behaviors. In order to make progress, home caregivers and practitioners had to consistently apply behavioral interventions across home and clinical settings.

Although there were significant barriers facing teams as they worked to create and maintain a shared understanding, we found that they would share actionable information: insights presented in a way that helps the receiver make use of it in their respective care contexts. For example, some information can be actionable immediately, such as administering medication or following a feeding schedule, while other information can be actionable in the long-term, such as learning CPR skills in preparation for an unpredictable future crisis. Teams also made specific efforts to build

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[1] All names have been changed to pseudonyms.

relationships across care contexts, as the mechanics of sharing information alone were not enough to facilitate effective coordination.

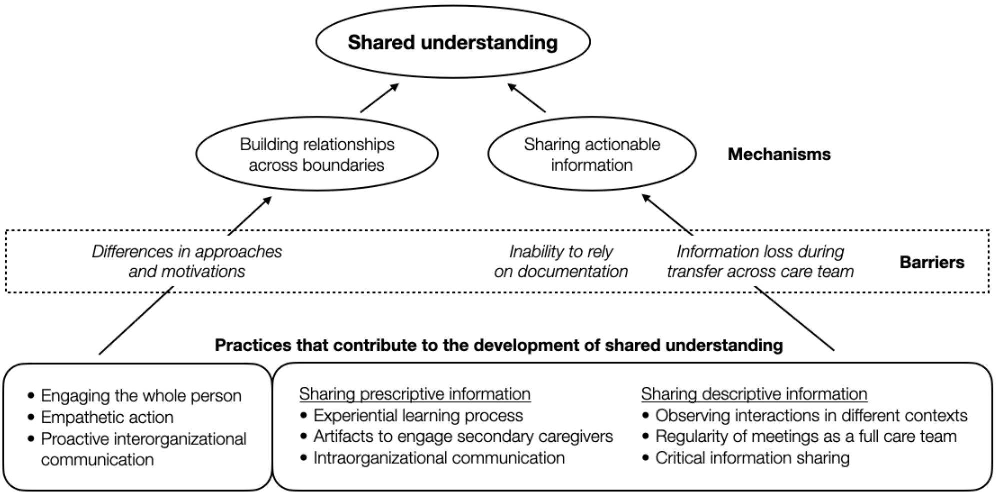

Fig. 1. Conceptual framework of shared understanding in care coordination

We generated a conceptual framework of shared understanding in care coordination, illustrated in Figure 1, which encapsulates the results of this study. We found that it was challenging for all of the care teams to develop a shared understanding, and we characterize three common barriers they faced. Some care teams had partially overcome these barriers in order to develop a higher level of shared understanding, so we examined what was unique about their practices. We identified nine practices that contribute to the development of shared understanding via two key mechanisms: (1) building relationships across boundaries, and (2) sharing actionable information.

4.1 Barriers to Shared Understanding

We delve into our conceptual framework by first describing the three key barriers care teams faced to developing a shared understanding: differences in approaches and motivations; inability to rely on documentation; and information loss during transfer across the care team.

4.1.1 Differences in Approaches and Motivations. Tensions stemmed from differences in approaches to supporting the child's needs and the unique constraints of each care context. These differences were sometimes caused by disciplinary background and training. Diane, a clinical specialist, described how one's training can make them skeptical toward another practitioner's approach:

> *"Behavior analysts don't like occupational therapists a whole lot because what they do is not scientifically based. And I'll come out and say it: it's all a bunch of fufu. But the occupational therapist said in the middle of the meeting, 'Well I know what this kid's problem is, he's getting too much applied behavior analysis'... Not everybody is on board with what you do"* (Diane, S5).

We observed many instances of interdisciplinary coordination, including behavior analysts and occupational therapists working in harmony. However, Diane's honest appraisal revealed how one's professional background could present an immediate barrier to coordination, by causing resistance to other members of a care team before they even had established a working relationship.

Differences naturally also existed between professionals and home caregivers. Sandra, an educator, explained how she sometimes saw things differently from home caregivers:

> *"Sometimes I'll get emails from parents like, "why didn't you just make them do math?" Because I can't. Because we don't live in a world where that's the kind of educational system we have. I'm not going to beat your kid until they work on math... So it's hard and especially in middle school. I'm just like, "Guys, we have to teach your kids what it feels like to get C's now, because if they don't like that, then now in middle school is a time for them to learn." We try to make that point and some parents are just not quite ready to hear that"* (Sandra, E1).

Behavioral challenges can stand in the way of learning, so individual goals must be set for behaviors (e.g., work independently for 5 minutes) and for academic skills (e.g., multiplication). Sandra worked on these goals daily with her students and set expectations as she got to know each child, but from the outside, home caregivers might have had different expectations of her teaching approach. Moreover, Sandra's approach was informed by her training as an educator, which enabled her to be more objective and pragmatic in setting realistic expectations for a child, such as average academic performance that will earn a child 'C' grades. We also found that many practitioners made reference to the educational system they work within, as Sandra did, because they were professionally constrained in ways that they felt home caregivers did not always understand.

On the other hand, home caregivers could sometimes see dynamics of the educational system that constrained coordination. Parents like Felicia were well aware of a school district's efforts to prevent being sued, and how this impacted communication:

> *"The lawyer that represents the district, his motto is: "The biggest mistake that teachers and administrators and everybody involved in your child's care throughout the public school systems make is being too honest with parents. Share as little as possible and communicate as little as possible... And then you won't open the district, yourself, and anybody else to any sort of legal recourse." It was eye opening. It was pretty sad...in a school district that from a resource standpoint... they're not lacking money"* (Felicia, P2).

In special education, breakdowns between school and home are common, and lead to high levels of litigation—past work has shown that this does affect information sharing practices in schools [24]. Therefore, while a parent may reasonably expect that their child's school will keep them informed about behavioral updates, this culture complicates what basic expectations care teams can have about information sharing. Felicia's experience also indicated that constraints were not always a result of limited resources. Instead, our findings suggested that social factors and differences, not lack of resources, acted as more significant barriers to the development of shared understanding.

4.1.2 Inability to Rely on Documentation.

Documenting behaviors and interventions was integral to the work of many of the professionals we studied. Care team members wanted documentation to meet their information needs because it was a common practice, but it often did not achieve those purposes. Katherine, a learning support teacher, provided supplemental support to children across multiple classrooms. She described her efforts to obtain documentation from teachers in order to keep apprised of each child's needs:

> *"The biggest issue I'm having this year is follow through. I don't see my kids all day long. My caseload of 14 could have all different teachers. Just getting in touch with them is difficult, but then having them fill out a form for me or reach out to me about my kid's behaviors...is really difficult. Some teachers don't have enough time to even fill it out, so they don't, so then it's not effective data...What I end up doing a lot of times is during my prep times, I go into those classrooms just to see how they're doing"* (Katherine, E3).

Without being able to rely on documentation from other care team members to stay informed, Katherine had to observe each child to carry out her work. This was especially challenging since this required her to visit various classrooms for each of her 14 students. In the Feeding Disorders Program, we saw a similar tendency to observe a child in person rather than rely on documentation to check in on their progress. However, their clinic space was much smaller than a school, and they worked with one child at a time, so it was easy to call in a team member from an adjoining room. They experienced this as less of a barrier than someone like Katherine did because they had co-located coordination to fall back on.

As expected, sharing documentation across boundaries was even more difficult. We found the boundary between home caregivers and educators to be one of the most challenging to navigate for sharing information. Many of the educators and specialists in our study mentioned having tried various methods for sharing information with home caregivers, and still not being certain that the information was received. After noticing that paper reports and notes got lost, many developed a preference for electronic forms of information sharing, which still had limitations. As explained by Erin:

> *"I would get more people checking ClassDojo, because it was just an app on the phone that just came up, which I know email can too, but it seemed like I'd send some emails, and a lot of them would be like, 'Oh, I didn't check my email, sorry,' things like that. It just wasn't always very consistent"* (Erin, E4).

Without assurance that home caregivers received information they sent, educators felt a significant barrier to developing a shared understanding of a child's behaviors and support. Information about a behavioral incident could be used by home caregivers to provide consistent feedback to the child about their behavior once they got home from school. In contrast, staff in the Feeding Disorders Program more easily developed a shared understanding because they avoided documentation in lieu of significant face-to-face coordination with home caregivers.

4.1.3 Information Loss During Transfer Across Care Team. When information was shared across a distributed care team, we found that information loss occurred most commonly due to (a) complexity of information, and/or (b) secondhand transfer of the information. We observed the greatest amount of information loss in the Feeding Disorders Program, due to the presence of both factors. Since their approaches to behavioral intervention were the most specialized and required nuanced mechanical understandings (e.g., muscles in the mouth, technique of desensitization), information sharing happened through hands-on experiential learning and modeling. In contrast, the other programs focused on basic social behaviors that could be easier to define, understand, and communicate (e.g., sharing a toy, using appropriate language). Without such an involved process of conveying the information, it would more easily be lost when two care members did not have a common frame of reference or terminology. As behavioral therapist Allison pointed out, the ability of the care team to transfer information effectively directly impacts outcomes for children—in her case, home caregivers cannot feed their child without the techniques they learn from working closely with her: *"[at home] they'll be doing this on their own. The faster they learn the techniques, the greater the chance the child is able to succeed"* (BT4). Behavioral therapists at the Feeding Disorders Program expressed the implications for transferring information to the rest of the care team: *"the caregiver's capacity to communicate with their family is critical. The whole picture really does have to do with [the] parent's emotional capacity and stress"* (Mandy, BT3).

Unlike the Feeding Disorders Program, where care team members spending an unusually large amount of time together, crossing the boundary to home caregivers in other settings only happened when they dropped off or picked up their child. Interactions between care team members at pick up and drop off are akin to patient handoffs that have been described in hospital settings during a shift change [2, 4, 14, 46]. Unlike patient handoffs in hospitals, which are intended to be a standardized process that can support critical care, practices during a drop off or pick up of a child were ad hoc opportunities for engagement rather than formalized practice. As an ad hoc practice, information sharing during handoffs was highly variable and dependent on each individual's capacity in that moment, resulting in handoffs being a key point of information loss due to secondhand transfer. In the Social Skills Program, even simple information such as notice of cancellation for a national holiday could be lost easily because one parent would receive the information and not pass it along to the other parent. This happened regardless of whether the information was shared in person during drop off/pick up, or via email, phone, or SMS. Similarly, a common issue in the Behavior Disorder Program was teachers sending paper reports or notes to home caregivers by placing them in the child's backpack and often discovering they could not have reached a parent because they were never taken out of the backpack. As we describe in the following section, we found that relationship-building was key for overcoming this barrier, and building capacity to share and transfer information across a care team.

4.2 Building Relationships Across Boundaries

The teams that were most well equipped to overcome these barriers had working relationships among even those members of their care team who belonged to different organizations, professions, and systems. When practitioners and home caregivers created a working relationship, information was shared naturally as part of regular conversation, which aided in developing appropriate interventions that were personalized to the child's needs and characteristics. In this section, we describe three practices that facilitated relationship-building across boundaries: engaging the whole person, empathetic action, and proactive interorganizational communication.

4.2.1 Engaging the Whole Person. Children need individualized care in behavioral therapy to develop new skills and work to decrease undesired behaviors. Across the programs, practitioners worked to understand each child as a whole person, rather than a set of deficits or needs. Play was an effective way to get to know a child, and informal conversation with a home caregiver helped with learning about their home life. We found that these strategies were important for relationship-building, yet they relied heavily on the amount of face time available. For example, one-on-one sessions with a child allowed more for the type of play that enabled a practitioner to get to know them, compared to the group-based activities in the Behavior Disorders Program. With regard to home caregivers, the Feeding Disorders Program was unique in that it engaged them during every session, either with more passive observation, active discussions of the process, or experiential learning. In the other programs, a practitioner only interacted with the home caregiver at pickup and drop off, which were more brief opportunities for conversation.

Synchronous engagement with both the child and home caregiver created an environment of comfort. When they were comfortable, children were more prone to naturally behaving and expressing themselves, which provided the behavioral therapists with information on a child's personality and natural tendencies. For example, one child in the Feeding Disorders Programs loved Yoda, a character from Star Wars. Haley, a behavioral therapist, described how children were often rewarded as a mechanism to promote desired behaviors:

> *"We have a treasure chest that is used to reward and motivate the children as they achieve in the clinic...We often rig the game for the child's benefit. So, if we know they happen to like Yoda, it may magically appear. After 8 weeks, you usually get it and know what they like and what would be motivating for them"* (Haley, BT2).

When practitioners playfully engaged and spent time focused on a child, they naturally learned the nuances of the child's behavior, preferences, and personality. As a result, practitioners had a greater understanding of the child and could better tailor treatment to their needs and qualities.

In watching the practitioner and their child develop a relationship, home caregivers also gained trust for and rapport with the practitioner. A parent, Abigail, explained that she was comforted by the fact that the practitioner understood her child's needs and had her child's best interest in mind. Thus, practitioners built rapport with the child over time, while also developing practitioner-caregiver synergy through this shared understanding of the child and their tendencies. Finally, we note that the practice of engaging the whole person is related to the following practice we will discuss: empathetic action. Engaging the whole person made it easier to empathize with them, and conversely, acting with empathy made someone more capable of engaging the whole person. Our framework outlines different practices to deepen our understanding of them, but these practices are intertwined in the work of care teams, and they are enacted in tandem in order for teams to build relationships across boundaries.

4.2.2 Empathetic Action. We observed how, in both formal and informal interactions, practitioners engaged with home caregivers using communication skills centered on empathy. As relationships developed through open communication, home caregivers felt more comfortable to share details about their family's personal life in informal conversations which could be useful for practitioners in taking empathetic action: that is, adjusting therapeutic approaches in response to understanding challenges families were facing. Communication centered on empathy has been shown to benefit both the doctor and patient in terms of satisfaction, compliance, and treatment outcomes [20]. We observed practitioners engage in this practice by asking questions, listening actively, and observing the body language of care recipients and their caregivers. We found that empathy was especially important with new families, as there could be initial hesitation to trust practitioners due to previous negative healthcare experiences or specific styles of therapy, which confirms previous research on collaboration breakdowns [24].

To develop relationships, practitioners asked questions of home caregivers to engage in meaningful conversation including topics more generally about the child's life that were indirectly related to their work together, so that they could gauge how they were feeling about their child's care. For example, practitioners in the Feeding Disorders Program asked parents questions and directly explained each step of feeding to ensure parents felt comfortable in delivering care:

> *"We explain the 'why's' and that helps us be on the same page... whether it's about homework or how we are doing things [in the clinic] or how what we are doing generalizes to the home"* (Mandy, BT3).

Practitioners in the Social Skills Program met with home caregivers as part of a weekly one-hour check-in, and practitioners in the Behavior Disorders Program called home caregivers regularly when they did not see them in person.

Empathetic conversation contributed positively to practitioner's therapeutic work, and the care team's broader coordination and implementation efforts. In particular, when home caregivers shared challenging personal situations or negative feelings about previous experiences with care providers, practitioners would be sensitive and adjust the plan to meet those needs. As explained by Haley, a behavioral therapist,

> *"It's life. Things come up. I tend to ask parents...What does your weekend look like for you? We won't pick a hard weekend lunch meal if there's soccer and things going on with other siblings. [The Program Director] has those conversations with parents so that we meet them where they are at and so that we aren't over-shooting expectations"* (Haley, BT2).

Practitioners took contextual information into account when designing appropriate interventions for the child. They used it to set small, achievable goals for home caregivers to accomplish on their own, outside of the clinic. This avoided unrealistic expectations for home interventions (i.e., "homework"), which made goals less achievable and could be detrimental to the caregiver's confidence, mood, and attitude toward treatment. For example, Allison shared that when a home caregiver was going through a divorce, they needed to adjust their homework to be supportive of her changing circumstance (BT4). Allison knew that challenging homework (i.e., feeding a new food) could possibly go poorly and reduce morale. To support this home caregiver and child, Allison adjusted the plan so that *"the parent [will] still do homework but do a treatment that is easier for them to do like feeding a preferred food to the child"* (Allison, BT4). Practitioners knew that feeding would not be easier at home, so they adapted and *"tr[ied] to create little opportunities for them [home caregivers] to be successful and that maximizes their capacities"* (Mandy, BT3). Thus, empathetic action contributed to relationship development and helped practitioners set home caregivers up for success, while pushing a child forward in treatment.

Empathetic action was equally helpful in building relationships between home caregivers and educators, as the distance between them created few opportunities for them to empathize with one another. Admittedly, home caregivers confirmed our observation at the Behavior Disorders Program that empathetic communication happened less frequently in school contexts due to resource and time constraints. However, parents such as Abigail appreciated when educators sent messages to share successes and show their support:

> *"An intermittent message...means like 'you as a parent, I'm thinking about you. I know it's hard to raise this child. Here's something they did [well] and you can try to do that at home'...you get used to these little victories and you want a teacher who's going to celebrate those little victories with you. Because that shows that they understand your experience as a parent and they understand your child...that all this stuff doesn't come naturally and easily for your child"* (Abigail, P3).

Through educators' empathetic action, home caregivers felt acknowledged, supported and validated. In turn, care team members were more invested in establishing a shared understanding with one another. Finally, proactive communication between members across organizations contributed to the relationships necessary for distributed coordination.

4.2.3 Proactive Interorganizational Communication. Interorganizational communication describes the "structures, forms, and processes created by the exchange of messages and the co-creation of meaning" [42], and works to develop relationships across organizational boundaries. We found that consistent communication across care contexts that the child visited regularly further supported care team members shared understanding and, inevitably, the care the child received. By proactively establishing connections with the child's other professional care providers, developing a shared understanding was less challenging as the working relationship encouraged information exchange.

When communications crossed between clinics and the child's school, teams relied on emails, calls and in-person meetings. We observed in the Feeding Disorders Program that the behavioral therapists proactively communicated with each child's outside specialists to understand how their treatment plans should align to *"avoid counter-productive work"* (Mandy, BT3). Additionally, practitioners sat in on children's appointments with specialists to build a relationship across this boundary and support families in sharing accurate information.

Proactive coordination efforts occurred between dispersed clinics or between the clinic and the child's school. Jada, a behavioral therapist at the Social Skills Program, explained that once her relationship was established with

> *"The [local] school district, I can go in anytime, I can set up an observation, they'll let me come in, I can chat with the OT [occupational therapist], the speech pathologist, the teacher, 'Hey, what interventions are you using? This is what we're doing'"* (Jada, BT5).

After taking steps to develop a relationship and coordinate care before problems arise, practitioners were on the same page about a child's treatment and progress in order to provide intervention consistency across contexts. These collaborative practices to build relationships across the care team also aided their collaborative capacity to effectively share information.

4.3 Sharing Prescriptive Information

Prescriptive information serves to teach or inform so that members of the team can deliver care consistently across settings. The prescriptive information sharing process involves more knowledgeable members of the care team training others to implement an intervention effectively. For example, practitioners trained home caregivers to deliver behavioral interventions at home. Similarly, senior behavioral therapists offered feedback and practical advice to junior therapists on how to improve their delivery of care after observing their sessions. In this section, we explain three collaborative practices by which care teams shared prescriptive information: experiential learning process, artifacts for expanding caregiver support, and intraorganizational communication.

4.3.1 Experiential Learning Process. When practical, hands-on skills were required for a behavioral intervention, care team members prescribed information to each other in an experiential learning process. This process was in line with Kolb's model of experiential learning, whereby learning a skill requires an iterative process of experiencing the skill through observation (i.e., learner observes teacher, teacher verbally explains what they do and why) and actively experimenting [18] with real-time coaching (i.e., learner experiences the skill and receives feedback).

Home caregivers watched attentively as practitioners performed and explained behavioral interventions, step-by-step, and effectively prescribed information to home caregivers on how to deliver care. Jada, a behavioral therapist at the Social Skills Program, explained how they

> *"Try to teach parents first by observing the therapists. So we build rapport and instructional control with the therapist first. We never ask the parents to do anything that we have not modeled for them with success"* (Jada, BT5).

After the practitioner modeled the intervention with success, the home caregiver practiced the technique hands-on and the practitioner provided feedback. Mandy, a behavioral therapist at the Feeding Disorders Program, stressed the importance of providing feedback and pointing out desirable outcomes to home caregivers as they experimented with techniques:

> *"When we train a parent we'll say, 'Did you see how the tongue was super flat? That's how you want it to look every time.' Or if it was humped and then it was flat, we'd say 'Did you see how [it] compared to last? That's perfect' and then we would build off of that. We point out specific things to parents [as they learn]"* (Mandy, BT3).

Based on our observations, the experiential learning process opened opportunities for team members to ask follow-up questions, obtain practice with supervision, gain confidence to administer care, and learn how to prescribe intervention techniques to other team members. As information was prescribed in the phases of experiential learning, we found that care team members learned from one another and came to a shared understanding on how to administer behavioral interventions across care settings. Practitioners leveraged this process to prescribe information to caregivers that helped improve implementation fidelity of treatments at home.

Alternatively, educators walked a fine line between their roles, yet prescribed strategies and actionable steps when engaged home caregivers asked for them. Marcus, a parent, explained that communicating things *"directly with the teachers is probably the most effective if there are questions about particular things"* (P1). However, if home caregivers did not seek prescriptive information, opportunities for experiential learning experiences may only present themselves in the child's mandatory IEP meeting(s) or not at all.

4.3.2 Artifacts to Engage Secondary Caregivers.

At times, prescriptive information could not be communicated face-to-face due to various physical, organizational, and knowledge boundaries or resource constraints. In these instances, practitioners would utilize informational artifacts (e.g., paper protocols or intervention instructions) to disseminate prescriptive information and support the continuity of interventions across contexts.

Practitioners across the clinics sent individualized protocols home to describe the child's tailored interventions. These informational artifacts engaged secondary caregivers and extended instructional capabilities to home caregivers who did not engage in the experiential learning process. The artifacts served as a tool for home caregivers to use when disseminating actionable knowledge regarding how to perform a child's behavioral interventions. Allison, a behavioral therapist at the Feeding Disorders Program, explained how

> *"The support system around the parent may not understand the child's issue which can be problematic and unhelpful for the parent and the child. For example, with one of the patients I see, the patient's Mom understands what the feeding disorder is and what to do...but the grandmother likes to spoil the child and reinforce bad behaviors"* (Allison, BT4).

Thus, it was critical for primary home caregivers to have artifacts to share with other home caregivers as they transferred prescriptive information, and worked to build a shared understanding of how to deliver interventions.

Lastly, when the flow of prescriptive information was cut off (i.e., breaks from school and/or therapy), artifacts became particularly important for intervention continuity. A parent, Abigail, expressed her need for resources on how to keep up with her child's specialized therapy and education plans during breaks. *"I need some training on how to do all this at home. I may not have an ABA therapist coming to my home and I don't have a teacher giving me advice"* (P3). As such, the use of artifacts could help fill these informational needs.

4.3.3 Intraorganizational Communication.

We found that practitioners within the same care context would often communicate with each other in order to improve the care delivered to a child. Intraorganizational communication created opportunities for practitioners to learn from one another to create a shared understanding of the child's treatment.

Within the Feeding Disorders Program, junior practitioners would ask questions and receive feedback regarding treatment from more senior practitioners, who had an established wealth of knowledge and care experience. In turn, junior practitioners would learn from their seniors, accumulating new knowledge and reflecting on it to determine appropriate next steps for future treatments.

This practice was similarly reflected in the Social Skills Program, where one psychologist monitored sessions, answered questions, and provided in-the-moment support. Kayla, the clinical director of the Social Skills Program, shared how she had conversations with behavioral therapists if they shared *"an immediate concern like 'I was injured because such and such behavior happened.' I would tell them how to best, guard against that"* (S4). These teaching moments were crucial for the behavioral therapists to learn how to be safe while also staying focused on a child's treatment. Jada, a behavioral therapist at the Social Skills Program, shared how video-recording treatment sessions was especially effective when:

> *"Every therapist has seen something different...it definitely helps...for therapists to be able to break it down and be like, 'Oh, I didn't realize I was doing this every time [the child] did that'...So it kind of helps the therapist...But it's also helping with treatment"* (Jada, BT5).

By watching recorded treatment sessions together, individual behavioral therapists were able to reflect on their care and improve their work practice, and the care team was able to discuss and learn from one another to create a shared understanding of how to administer interventions.

4.4 Sharing Descriptive Information

As we have outlined, prescriptive information is practical knowledge that one team member can teach another, so that it can be applied directly in delivering an intervention. In contrast, descriptive information is more contextual or holistic knowledge about the milieu in which an intervention may be applied. For example, a practitioner who only sees a child in the context of their workplace will likely benefit from learning more about the child's experiences and behaviors within the other contexts in their life. To share descriptive information, intentional effort is required on the part of each team member, and this type of information sharing often requires a working relationship. Because descriptive information involves contextual knowledge that cannot be easily captured through data and shared, we found that sharing descriptive information required team members to meet in person and employ collaborative practices with the intention of understanding the child's experiences and care across settings. Descriptive information sharing ideally involves one-on-one and group communication, as well as opportunities for team members to welcome each other into their respective settings for observation and learning.

In this section, we explain three practices by which we saw care teams share descriptive information that facilitated the development of shared understanding: observing interactions in different contexts, regularity of meetings as a full care team, and critical information sharing.

4.4.1 Observing Interactions in Different Contexts. Practitioners across programs discussed a common hurdle with applying behavioral interventions: behaviors they observed within one context was not always the same in other contexts. Often, for example, progress within a controlled clinical context would not immediately transfer to everyday contexts. Practitioners would hear from home caregivers that they did not see progress in their child, but such reports did not match demonstrated progress within the clinic. In addition, home caregivers were presented with challenges when new behaviors arose outside of the clinic. Lindsey explained that home caregivers could be unsure how to respond when this happened, or how they should try to communicate the behavior to the practitioners:

> *"Sometimes the home caregivers notice a behavior and email about it in concern. But we usually can't do something until the next day. Oftentimes, we have to see the behavior in order to know what to do"* (Lindsey, BT1).

Practitioners therefore found that an effective collaborative practice was to observe a child in a more natural setting in their daily lives, such as their home, school, or even a less controlled environment like a grocery store. The information obtained by practitioners this way was descriptively rich and actionable in tailoring interventions. Moreover, this information could not be easily replicated through records or reports from home caregivers trying to convey their child's behavior.

Any member of a care team could observe the child's behavior in a new context, to improve their shared understanding and strengthen future collaboration. For example, a teacher invited a child's behavioral therapist into the classroom to observe the child's behaviors. In the Feeding Disorders Program, it was a common practice for home caregivers to observe their child's behavior in the clinical context, because they would take part in sessions and see how their child was responding to different feeding techniques, which they would be required to replicate. As a result, we found that this amount of observation led to high levels of shared understanding.

However, observation in different contexts was not always easy because it could mean a deviation from their typical routine with the child. Observation could also require an invitation from a team member who was willing to have others enter their space. When leaving controlled environments to go on outings in more natural settings, this could require additional planning and preparation:

> *"It can take a long time to get there...building that rapport and instructional control at home and then going out into the community...you really want to make sure that client, when you say 'stop', is going to stop if you're practicing crossing the street"* (Jada, B6).

The collaborative practice of observation across contexts involved a commitment from both parties to leave the relative comforts of their routine interactions, and help ensure the child is ready for the change, to enter a context where they could gain new descriptive information about the child's behavior in everyday life.

4.4.2 Regularity of Meetings as a Full Care Team. Within a program, meeting regularly as a full, interdisciplinary care team enabled them *"to ensure that there's integrity in the services that are being provided... to ensure that everyone's running things as similarly as possible"* (Jada, BT5). Meetings were particularly important as opportunities to check-in on goals, share observations, ask questions of each other, address concerns, and otherwise exchange descriptive information about how a child's behaviors and needs changed over time. Because different people worked with the child in each of the child's care contexts, in-person meetings created opportunities for individuals to share their unique perspectives and observations of the child so that everyone on the care team could come to a shared understanding of a child's behavior across contexts. Following meetings, each person could adjust the child's interventions with this additional descriptive information in mind.

Care teams that supported children in the Social Skills Program formally met for one hour in-person for bi-weekly meetings, and *"the amount of involvement from parents ranges from literally absolutely zero to parents who are sitting in on every session, wanting to know everything that's happening"* (Jada, BT5). In these meetings, home caregivers and practitioners discussed recent behavioral challenges, gains, and progress. They exchanged descriptive information about the child and addressed their approaches to supporting the child. Behavioral therapists used these meetings to ensure all team members were up to date on progress. Jada (P5) felt that regular meetings were important for working together toward behavioral goals:

> *"We have successful instances of great communication on a weekly basis at team meetings. When we're getting to express like, 'Wow, they finally learned how to do this or this new skill.' I mean, one of my clients said, 'Ball!'...This girl is nonverbal and we get to see kids do things for the very first time"* (Jada, BT5).

Sometimes meetings included such celebrations of more significant progress toward goals, but more often they were updates on the efforts of the care team to help a child make incremental progress. In the special education setting, full care team meetings were less frequent in part because dropping off a child at school typically involved less interaction between practitioners and home caregivers than bringing them to a clinical or therapy context. Sometimes meetings at school took place only because school practitioners were legally mandated to meet with home caregivers, and therefore these meetings focused on behavioral goals set annually, rather than smaller and more incremental goals. When these meetings at school did take place, the exchange of descriptive information was usually highly valued, just as in the other programs:

> *"Everybody that works with that student will be there, and then they'll each have their own blurb to say about the student...how they're doing, what we're noticing...I would just say what I was noticing in the classroom"* (Erin, E4).

For programs where it was more challenging to meet as a full care team, it was more challenging to develop shared understanding. We therefore found that regularly of full team meetings were an important practice for shared understanding. The Feeding Disorders Program was unique in that its small and tight-knit structure allowed for a significant amount of face-to-face time between different configurations of team members. We found that these teams had frequent ad-hoc information exchange, and holding regular meetings more formally became less necessary. Even home caregivers spent time observing their child's sessions, and having in depth conversations with their practitioners. However, secondary home caregivers (e.g., another parent or a grandparent) were likely to be involved in the child's feeding at home, but have less engagement with the practitioners than the home caregiver who most often was responsible for taking the child to sessions. It was difficult for these secondary caregivers to participate in the exchange of descriptive information without visiting the clinic in person.

4.4.3 Critical Information Sharing. Practitioners in the Social Skills and Behavior Disorders Programs discussed a challenge with achieving shared understanding across settings: consistent care requires up-to-date information on behavioral interventions and a child's behaviors. Practitioners need up-to-date behavioral information to inform their work. For example, one behavioral therapist, Jada, explained that *"If I don't know that every time you get close to him, he's going to punch you in the face, that's going to be really unfortunate when you get punched in the face, which has happened...many times"* (BT5). Other behavioral therapist echoed Jada's experience. Thus, when details about a child's behavior are shared in advance, practitioners have adequate time to prepare for how to respond and can be more consistent in the care they provide. Additionally, home caregivers use reports from practitioners to reflect and act upon this information by reinforcing appropriate behaviors at home. For example, Abigail shared how her child responded best to *"consistent use of language and approaches across context and settings"* (P3).

In the clinical setting, home caregivers informed practitioner(s) of descriptive, must-know details about the child during drop-off (e.g., times of last potty break or meal, quality of sleep), which could inform their work. For example, as a home caregiver dropped off their child at the Social Skills Program, they reported: *"hey, he didn't sleep again... he's been awake since 2:00 AM"* (Jada, BT5). With a more holistic understanding of how the child might be feeling, Jada responded by adjusting her expectations for how the child might behave, and discussing sleep strategies with the child's home caregiver. Without critical information on changes to behavioral interventions such as toilet training, practitioners are forced to *"make an educated guess"* (BT8) about the child's intervention. Moreover, descriptive information can enhance shared understanding across the care team and improve the quality of care, both in the clinic, and at home.

In educational settings, handoffs were not always a face-to-face encounter between practitioners and home caregivers. When critical information needed to be shared, synchronous and asynchronous communication methods (e.g., formal meeting, phone call, text, or email) were used based on the nature of information being shared. Some home caregivers prefered structured behavioral conversations as they seemed more meaningful. Abigail, a parent, shared that her child had a teacher who shared a structured social story at pick up to describe her child's behaviors and then:

> *"They'd say, "But here's what we think it was caused by and here's what we're going to do about it". And that is what you want to hear as a parent. You don't want to hear, "[Your child] is getting really pushy with other kids", because then I feel like oh you think he's aggressive? You think he's bad?... they had a problem solving attitude"* (Abigail, P3).

The teacher's social story conveyed actionable information and helped Abigail develop an understanding of her child's behavior. When home caregivers receive descriptive information about their child's behavior, they are able to reflect and act. Erin, an educator, observed that some home caregivers did reflect and act upon this information: *"parents that do will usually let me know. A lot of times, they'll say like, 'We talked about it. It shouldn't happen again, but if it does, please let me know'"* (E4). Whereas, Abigail reflected on the information shared at pick up as meaningful because it had *"some format...that is detailed, informative, constructive and lacks the kind of negative affect and judgment that sometimes comes through with an unstructured text message"* (P3). Instead of feeling judged or belittled, Abigail felt empowered to act on this information by recreating the scenario at home, and *"he might have that same reaction and I can use the same words that are in his school social story to help him...at home"* (P3). The practice of critical information sharing enhances shared understanding, aides care consistency, and promotes positive outcomes for children.

5 DISCUSSION

Our conceptual framework fills a gap in the literature on collaborative reflection that outlines the process by which care teams iteratively work together toward treatment goals, but does not specify the factors that enable this process to unfold continuously from one stage to the next. We found that distributed care teams need to develop shared understanding in order to move between the stages of collaborative reflection (i.e., determining an appropriate intervention, applying the intervention consistently, evaluating effects of the intervention, and disseminating information on progress). We extend the literature on breakdowns in the process of collaborative reflection by isolating common barriers to the development of shared understanding, and identifying the practices that helped care teams to overcome these breakdowns. Our motivation for developing this framework of shared understanding was twofold. First, we observed that some care teams overcame barriers to move more fluidly through the stages of collaborative reflection than others. Second, our fieldwork enabled us to compare and contrast practices across various contexts in the ecosystem of children's behavioral health (hospital, private therapy provider, school).

Improving our knowledge of how distributed care teams develop shared understanding has important implications for design. With our conceptual framework, we have described the development of shared understanding via two mechanisms: (1) building relationships across boundaries, and (2) sharing actionable information. The relationship-building practices we observed were nuanced interactions that we believe would be difficult to replicate or enhance using technologies. We argue that design efforts should not focus on addressing these aspects directly, but that designers should have an understanding and appreciation for these practices so that technologies do not unintentionally impede them. (For example, in what ways might the addition of technologies make it more difficult for team members to engage the whole person as practices are structured and people are quantified; or, how might technology-mediated coordination reduce opportunities for empathetic action?) On the other hand, we find that there are numerous design opportunities for sharing actionable information, based on the practices we identified among care teams.

Prior work has stated the general need for more detailed or contextual information in care coordination, for example, to improve team members' awareness of behaviors across contexts. We build on this literature by describing two categories of information—prescriptive and descriptive—and identifying the practices that care teams used to share these kinds of information. Moreover, our focus on the development of shared understanding enabled us to highlight information sharing practices that contribute to the collective work of the team across organizational and contextual boundaries. That is, rather than explaining the work practices of a particular kind of organization, or the information needs of informal caregivers in the home, we describe the practices that enable distributed care coordination involving a diverse team of professionals and non-professional caregivers. In what follows, we discuss the two kinds of information that helped care teams develop shared understanding, and how information sharing tools can be designed to overcome common barriers and support practices that meet these information needs.

5.1 Designing for Prescriptive Information Sharing

Our study uncovered the importance of sharing prescriptive information across a distributed care team in order to maintain consistency of care. Prescriptive information is that which teaches another member of the team how to implement an intervention effectively. Often, this involves a professional sharing their expertise with a non-professional, but prescriptive information can also be shared from more senior professional to a junior professional, or from one professional to another who has a different area of expertise.

Prescriptive information sharing in the form of experiential learning was limited to in-person engagement and minimal use of artifacts in the form of paper protocols. People process information and learn in a variety of ways, and our findings suggest that expanding to more modes of instruction could help with diverse capabilities, preferences, and needs that may be found within a care team. Some of the practitioners used the common psychological concept of "meeting them where they're at" to describe their approach to sharing information with home caregivers. That is, practitioners would gauge the capacity of caregivers in their home life, understand in what ways they most wanted to help the child, and what interventions they were most comfortable implementing, so they could share prescriptive information that would be most actionable for them. Design efforts might therefore be used to explore what it would mean for technology to support the process of "meeting them where they're at." We note that this is different from tailoring an intervention to a child's needs, as the focus would instead be on helping a care team member to navigate the learning process of another team member, as they work together to support the child's needs.

To avoid second-hand information loss, promote consistency of care, and expand caregivers' potential to administer behavioral interventions at home, technological supports for care coordination should be designed to promote the exchange of prescriptive information through:

- direct engagement between practitioners and all home caregivers, and
- synchronous and asynchronous learning opportunities for home caregivers.

An opportunity that we identified for supporting practices of sharing prescriptive information was engaging all caregivers in the home. Secondary home caregivers, who don't interact with practitioners as often, lack the opportunity to engage in experiential learning and communicate directly with professional care team members. Care teams therefore made use of information artifacts to prevent information loss during second-hand transfer of information. We build on work recommending technological supports for coordination between home caregivers (e.g., [47]) by noting the importance of direct information sharing from practitioners to multiple home caregivers. In the context of children's behavioral health, the role of caregivers requires more prescribed and tailored interventions. For example, home caregivers noted that they could not search for information on their own, and needed information about the child's specific interventions prescribed directly from practitioners.

Practitioners could share asynchronous and synchronous learning opportunities through live remote experiential learning sessions, or pre-recorded skill-based instructional videos on how to administer treatment, annotating each step as they would in person. These opportunities could supplement in-person learning as a memory aid, and also expand secondary caregivers' potential to administer behavioral interventions at home. Recorded videos available to all home caregivers may reduce some of the burden on the child's primary caregiver to transfer prescriptive information across the care team. Videos could also be useful resources for practitioners, whether during training, or more broadly in intraorganizational communication and feedback, similar to how behavioral videos recorded using Abaris were used for feedback purposes and intervention decision-making purposes by the care team [17]. Thus, online video resources have the potential to support prescriptive information sharing across the care team and benefit the delivery of care across contexts.

5.2 Designing for Descriptive Information Sharing

In contrast to prescriptive information, which teaches a care team member how to apply a behavioral intervention, descriptive information helps them understand the a child and their behaviors more holistically, and understand the context in which interventions are applied. We found that home caregivers crave more descriptive information to reflect and support their child based on what goes on in settings outside the home, and practitioners equally need descriptive information to understand a child's behaviors across contexts in order to tailor interventions. Care team members obtain richer behavioral information when they observe behaviors in context, compared to receiving second-hand information. Although we emphasize the value of time spent engaging the care recipient and care team in person with regularity, design can support rich descriptive information sharing in between opportunities to meet. Technological supports for care coordination could be designed to promote the exchange of descriptive information through:

- parent-led behavioral data capture and exchange,
- guided conversations to ensure information exchange at handoffs of care, and
- team-wide updates on behavioral developments.

Observing behavior to obtain descriptive information can be costly or even intrusive [31], yet practitioners in our study emphasized that they must witness behaviors first-hand in order to make recommendations on interventions. Technology could allow for everyday information capture and exchange to enhance shared understanding of a child's behavior across contexts. Researchers have designed tools to support embedded behavioral data capture and access. For example, Naturalistic Observation Diagnostic Assessment (NODA) provides home caregivers with a guided process to capture behavioral occurrences in the home for autism spectrum disorder diagnoses [32, 43]. Similar technologies could be designed for promoting descriptive information sharing over time, in support of a child's behavioral development. Using our framework, the design would make room for building relationships across boundaries, as opposed to facilitating only the exchange of data and documentation. To support the development of shared understanding among the child's entire care team over time, the design would then incorporate features in line with multiple of the practices in our framework, such as facilitating regular team meetings, and enabling more fluid information sharing in between these meetings by allowing for observation and critical information sharing.

Descriptive information sharing was also particularly important when home caregivers would drop off or pick up a child, as this was an opportunity to engage with practitioners in person. Members of a care team would use conversations during handoffs as opportunities to quickly debrief about behaviors they observed, or just engage in small talk which could help them learn more about one another's care contexts. We liken the information sharing in these interactions to that of patient handoffs that have been described in hospital settings during a shift change [2, 4, 14, 46]. The amount of standardization in handoffs varies, and there is debate as to the amount of structure that aids communication [34]. In the distributed behavioral health contexts we studied, handoffs were highly unstructured with very few artifacts used. Our findings suggest that light structure could promote consistency across contexts, and as has been shown in hospital settings, would have the potential to foster "empathy, equity, and common ground" [9]. For example, prior to drop off, all home caregivers could be notified to submit critical information such as the time of the child's last meal or bathroom trip, or whether the child slept well. Such prompted information requests could decrease pressure at handoffs by requesting descriptive information from all home caregivers. Collaborative tools could also provide space for care team members to share updates about behavioral developments as they occur across settings, and alert care team members to significant developments that require changes in how they approach care in order to maintain consistency.

5.3 Limitations and Future Work

The programs observed in this study may not be representative of all behavioral health care teams, or transfer to other types of contexts. Our observations were usually in the morning, and did not account as much for afternoon sessions or otherwise represent all time periods of the work day. We also did not include children as participants in our study, as many programs served young children, and children are not often involved in care coordination. If current practice of care teams does not actively engage the perspective of children or others in their care, we recommend creative approaches to research and design in order to elicit their participation.

We found minimal to no evidence of the child's agency or contribution to shared understanding, though this is more likely to occur when the child is older. For example, students are invited to attend their IEP meetings with this invitation being legally mandated once they are 14 years old. However, Martin et al. [27] suggest that there must be sufficient time spent with children in helping them understand the meeting and purpose of the IEP for their participation to avoid harm and confusion, as children do not always have a complete understanding of their own care plan. Thus, our conceptual framework could be assessed, and potentially extended, based on practices that the care team uses to build a relationship and exchange actionable information with the care recipient. We did see evidence of relationship-building with children, as this is important for developing an understanding of the individual's needs and tailoring interventions appropriately. Chung et al. [6] found that patients share self-generated data with practitioners and expect actionable feedback for their individualized health plans. Similarly, care team members could share actionable information with the care recipient such as feedback on their behavior or self-generated data from reflection tools such as diaries.

Future work is needed to conduct follow-on studies that continue to validate and iterate on this framework. We plan to apply our framework in the design and deployment of technologies, to support the strengths of individuals and teams in facilitating shared understanding amongst a broader set of stakeholders. Participatory design workshops with care teams would also enable exploration of opportunities for design that promotes shared understanding across boundaries, while meeting the diverse needs of all care team members.

6 CONCLUSION

Many CSCW studies have focused on teams of collocated professionals, or non-professional home caregivers. We contribute to the literature that considers all of these individuals as part of the same distributed care teams. We have presented a conceptual framework of the development of shared understanding in care coordination, showing pathways for supporting members of a care team to cross boundaries. Our framework is drawn from the experiences of caregivers across contexts (i.e., clinic, school, and home) who use a variety of collaborative practices to coordinate care. It was challenging for all of the care teams to develop a shared understanding, and we described three common barriers they all faced. Some care teams were able to overcome these barriers to develop shared understanding, and we examined what made their processes different from others. We uncovered nine practices that enable the development of shared understanding via two key mechanisms: (1) building relationships across boundaries, and (2) sharing actionable information.

This study improves our understanding of distributed coordination across care teams, and describes how information sharing tools could be designed to bolster specific practices and reduce the impact of barriers.

ACKNOWLEDGMENTS

Thank you to the participants who contributed their time and experiences to this work, and our community partners for welcoming us into their workplaces. We'd also like to thank our reviewers for their insightful feedback, as well as our colleagues who provided feedback on drafts of this paper: Allison Spiller, Andrea Grimes Parker, Angela Schöpke Gonzalez, Carol Scott, Kayla Guerrero, and Mark Ackerman. This material is based upon work supported by the National Science Foundation under Grant No. IIS 1816319.

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