Classroom Communication Practices Involving one Preschool-aged Child with Complex Communication Needs

by

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Forward

This thesis was a collaborative endeavor between two James Scholars undergraduates, Stephanie Russell and Hillary Valentino, and their research team. Both students participated fully and collaboratively in all stages of the research project, from shaping the IRB form to drafting the final document. It was an admirable act of teamwork that allowed them to tackle a more comprehensive and stronger project together than either likely would have been able to accomplish on their own. The process mirrored the collaborative process of successful research teams, from project conceptualization to publication.

Literature Review

Based on social-cultural theories, communication is approached as a situated phenomenon, distributed across people, resources, and time (Gee, 2011). As such, speech is viewed as one of many critical resources (also including gesture, facial expression, eye gaze, objects/technology, etc.) that contributes to the complex landscape of social interactions. Individuals with speech-language impairments provide an opportunity to highlight the multimodal nature of communication and study the critical ways environments shape communicative success for all of us. The purpose of the present study was to utilize ethnographic methods to examine the classroom communication practices involving a preschool-age child, 'Aaron,' who had been diagnosed with autism and apraxia of speech and who used an alternative and augmentative communication (AAC) device. The remainder of this introduction is laid out to a) provide a basic overview of autism, b) introduce the concept of disability as contextually mediated, and c) highlight the critical role of one's environment, particularly in regard to access to AAC and the attitudes of others.

Overview of Autism

According to the American Speech-Language-Hearing Association, a communication disorder is "an impairment in the ability to receive, send, process, and comprehend concepts or verbal, nonverbal and graphic symbol systems. A communication disorder may be evident in the processes of hearing, language, and/or speech (1993)." By this definition autism would be commonly recognized as a communication disorder as its diagnostic criteria include impaired communication, as well as difficulty in social interaction and a tendency toward rigid and repetitive behavior (American Psychological Association, 2000). Individuals with Autism Spectrum Disorder show a wide range of communication abilities, ranging from being described

as nonverbal to having typical language development (Gray, 2008). However, almost all of individuals with autism exhibit early delays in the acquisition of spoken language, with approximately one-third reported not to develop speech as a means of communication (Bryson, 1996). An experimental group design by Wetherby et al. (2004) examining early indicators of autism spectrum disorder during the second year of life found differences in eye gaze, shared affect, gesture, prosody, and repetitive movements in comparison to children with developmental delay and those without any known developmental impairments. Children with Autism Spectrum Disorder are also reported to have deficits in symbolic or pretend play paired with relative strengths in object manipulation (Wetherby et al, 1998). Of particular interest to the present study is the potential co-occurrence of autism and apraxia of speech. Childhood apraxia of speech (CAS) is a pediatric neurological condition defined by speech difficulties due to impaired motor planning and/or programming (ASHA, 2007). Though the topic is not without controversy (see Shriberg, Paul, Black, & van Santen, 2011), there is report of uncommonly high co-occurrence of both motor apraxia and autism in the same children (Hall, 2007; Matson, Matson, & Beighley, 2011; Ming, Brimacombe, & Wagner, 2007).

Concept of Disability as Contextually Mediated

Consistent with a medical model of disability, the diagnostic criteria for autism and CAS are focused on differences in a child's neurological and behavioral functioning. In contrast however, the concept of disability can be conceptualized as a complex and dynamic interplay between a child's intrinsic qualities and his or her environment. Specifically, the World Health Organization (2002) embraces a biopsychosocial model of disability that highlights the role of context in shaping an individual's activity and participation (World Health Organization, 2002; cf. Rosenbaum and Stewart, 2004). For example, it could be difficult for a nonspeaking child to

participate in ‘show and tell,’ a common group activity in early childhood. When a child is not able to participate in meaningful classroom activity, he is disabled. However, the same child with access to AAC and an environment that is open and skilled in incorporating his AAC use within interactions, would not necessarily be disabled in this context. Together, the biopsychosocial model of disability and the social-cultural theories of communication highlight the important role of contexts, which would include classroom environments, in mediating successful social interactions.

Role of Context

Educational best practices and legal mandates dictate educating children, including those with speech-language impairments, in the least restrictive environment (National Research Council, Committee on Educational Interventions for Children with Autism, 2001). For many children this includes education within a mainstream classroom, often with various environmental supports that can range from visual schedules to a support from a one-on-one paraprofessional. For children with complex communication needs, including autism and CAS, augmentative and alternative communication (AAC) serves as an important form of support. Augmentative and Alternative Communication is typically defined as a communicative form other than speech that is utilized by individuals with speech-language impairments to express themselves. AAC can be unaided, as in the augmented use of one’s body to communicate through gesture or sign, or aided, as in the case of objects, picture boards, or computerized devices. Many current computerized devices include the capacity for speech output and are thus referred to as speech-generating devices (SGD). Traditionally AAC devices were developed according to medical models of disability as a replacement for one’s voice. However, as one would predict from a biopsychosocial model of disability, the context makes a substantial

difference in how AAC is integrated within social interaction. Although AAC has proven effective in terms of decreasing challenging behavior, enabling communication of wants and needs, and supporting speech development (Mirenda, 1997; Snell, Chen, & Hooever, 2006; Millar, Light, & Schlosser, 2006; Romski et al., 2010; Schlosser & Wendt, 2008), results are varied, and device abandonment remains a substantial reality with prevalence rates as high as 28% (Johnson, Inglebret, Jones, & Ray, 2006; Lund & Light, 2007). Integrating AAC systems within spontaneous and sustained social interactions remains a substantial challenge impacting children with speech-language impairments and their communication partners (cf. Light et al, 2002). Specifically a qualitative study by Mellman, DeThorne, and Hengst (2010) examined classroom communication practices involving three boys (ages 4, 4, and 9 years) who used speech-generating devices. Although all three children participated in rich multimodal interactions, only one of the three boys was observed using his AAC device in the classroom and with relatively limited communication functions. In addition, social interaction appeared limited across all three cases.

Although AAC is typically considered in terms of facilitating expressive language, other forms of visual support have been used to enhance comprehension, such as the use of visual schedules to ease transitions. Visual schedules provide visual representation of scheduled activities, referred to as between-activity schedules, or visuals that represent the steps of phases within an activity, referred to as within-activity schedules (Mirenda & Iacono, 2012). Children may or may not be expected to remove the visuals when each activity/step is complete. Other forms of visual support recommended for children with autism include social stories, pictoral stories created to prepare a child for a particular situation or event (Gray & Garand, 1993), and video-modeling, which creates a video representation of desired behaviors and participation

(Bellini & Akullian, 2007). In general, engaging the visual modality is considered a powerful means to enhance learning in children with autism spectrum disorders (Mirenda and Iacono, 2012).

Despite recommended practice, visual supports, including AAC, are not always easy to integrate in everyday interactions. Most of the work on barriers has focused on AAC, and although results are varied, attitudes both toward the device itself as well as the device user, emerge as a frequent theme (Lund & Light, 2007). For example, in a study conducted by Lund and Light (2007), seven young men who used AAC and their families were interviewed regarding their communication intervention and factors that contributed to their communication abilities; one common factor that was seen across the interviews was attitude barriers. For example, many of the participants expressed encountering negative attitudes from different professionals regarding their AAC and towards the participants themselves. One mother in the study even stated that she "had one teacher that openly said he didn't want him [Carson] in his class" (p.327).

These biases towards children with disabilities have not only been seen through adult communicative partners, but also through peers. Multiple studies have researched attitudes of children towards their peers who use an AAC device. Girls have been shown to have more positive attitudes towards these students than boys (Beck and Dennis, 1996). Furthermore, younger children have been shown to be more receptive to peers with AAC devices than older children (Beck, Fritz, et al., 2000). Finally, children unfamiliar with their peers with an AAC device have been shown to be more accepting of peers who use longer messages on their devices (i.e. two to four word phrases) rather than shorter messages (i.e. one-word phrases) (Beck, Kingsbury, et al., 2000).

Given the distributed nature of communication interaction, presumed competence by one's communication partner, whether adult or peer, is particularly critical. By presumed competence we are referring to one's willingness to assign communicative meaning and relevance to the behavior of another (Sless, 1985). The importance of presumed competence is highlighted when one views communication as a basic human quality, with breathing as the only qualification (Mirenda, 1993).

Different strategies can be employed by teachers, parents, and peers in order to improve attitudes and biases towards AAC users. This point was exhibited through a study completed by Favazza and Odom, in which forty-six kindergarten children without disabilities were placed into playgroups of no contact, low contact, or high-contact with children with disabilities. These children were then administered the Acceptance Scale for Kindergartners (ASK) test in order to gauge their acceptance and non-acceptance of people with disabilities. The study showed that while there was a low level of acceptance across groups before intervention, post-intervention those children with higher contact with individuals with disabilities improved their acceptance ratings by the greatest degree (Favazza & Odom, 1997). In a focus-group study completed by Soto et al., those core members of students' educational teams, including parents, teachers, and speech language pathologists, identified "ownership by the general education teacher of the focus student," as an indicator of success for the students with AAC devices (65). According to the study, the students are more likely to flourish with their devices when the teacher takes pride in their accomplishments, adapts the curriculum, and creates opportunities for the students' participation.

The current case study used ethnographic methods to examine the communication practices involving a preschool-age child, 'Aaron,' diagnosed with autism and apraxia of speech who utilized augmentative and alternative communication in his classroom. This study aimed to identify key challenges and supports within the preschool classroom for this primary participant.

Methods

This descriptive case study was designed to explore the communicative practices of teachers, clinicians, and children within a preschool classroom environment that was newly focused on integrating children with identified special needs. More specifically, we aimed to describe the patterns of interaction across participants, with a particular focus on key challenges and supports for communicative competence and social interaction. Ethnographic and case study research methodologies were used to collect and analyze the data.

Research Collaborators/Background Information/Gaining Access

The research team consisted of two associate professors in Speech and Hearing Science (Laura DeThorne and Julie Hengst) with expertise in language disorders and AAC, a speech-language pathologist with over 20 years of clinical experience in the use of AAC to support communicative practices (Tracy Gunderson), and four undergraduate students in Speech and Hearing Science (Alison Kobel, Alison Dey, Stephanie Russell, & Hillary Valentino), the latter two pursuing an undergraduate honors thesis as James Scholar students. The family of the primary participant was initially in contact with Dr. DeThorne regarding a treatment study she was conducting. Although their son, referred to here as Aaron, was not eligible for that particular study, Dr. DeThorne remained in contact with the family and included Aaron in a playgroup she was piloting. When Aaron transitioned to a new preschool, referred to here as Campus Early Elementary, the family expressed an interest in whatever supports Dr. DeThorne might be able to

provide within Aaron's new classroom setting. This transition coincided with Dr. DeThorne's growing interest in case study design, her increased collaboration with Dr. Hengst, and the need for a suitable research project for Stephanie and Hillary, thereby creating a promising opportunity to provide some support to Aaron within his new preschool while studying the patterns of communication interactions within his classroom environment.

Classroom Setting

Campus Early Elementary School was housed on a university campus and operated under the auspices of the College of Education. Based on personal communication with the school's director, Campus Early Elementary was originally housed in Special Education and focused on "gifted education," but recently shifted away from an explicit focus on giftedness in order to be viewed as more inclusive of all children. This shift coincided with the recently attained new director, referred to here as Sara, who was making a concerted effort to include children with identified special needs. The Campus Early Elementary preschool classroom has a rich history of using the Project Approach to education and draws from Reggio Emilia in designing spaces where children are engaged in creative, challenging, and worthy curricula. Based the school's website, its philosophy is based on the principles of respect, responsibility, and community through exploration and discovery based on the children's interests.

The school housed two classrooms, one for preschool-age children (3-5 yrs. of age) and one for kindergarten/first grade students. Both classrooms included a head teacher, 2 assistant teachers, and pre-service teachers. With the lights typically off, a plethora of interesting artifacts filled the classroom reminding students of past projects. The preschool classroom consisted of 25 total students distributed into three working groups. Each working group was assigned a teacher (head or assistant) to lead daily small group activities.

Case Participants

This study included one primary participant, Aaron, as well as 23 secondary participants. Although a second primary participant, Michael, was originally selected as an age- and gender-match to Aaron, his extended absences from the classroom made it difficult to conduct dedicated observations. Consequently, whatever data was collected on Michael has been collapsed with the other classroom peers and considered as an additional secondary participant.

Primary participant. The interactions surrounding Aaron, a 5 year-old boy who was diagnosed with developmental apraxia of speech and Autism Spectrum Disorder, served as the primary focus of this case study**.** According to the interview with Aaron's father, referred to here as Roger, Aaron had access to his device for a couple of years prior to the initiation of our study, and had begun to use it heavily the last year or year and a half. Roger's description of Aaron's early speech-language development noted that Aaron started developing "pretty normally" up until sometime after he was one-year old, at which point he started to notice "some regression and losing some of the sounds…." Roger noted Aaron's tendency to sing even after his speech regressed.

At the time our case study began, Aaron reportedly utilized a combination of spoken words, manual signs, and AAC messages to communicate. Two weeks after our initial classroom observation, Roger, Aaron's dad, completed the MacArthur-Bates Communicative Development Inventories: Words and Gestures (MacArthur-Bates CDI; Fenson et al., 2007), a parent report measure of vocabulary, emergent grammar, social interaction, and play routines. We asked to specify on the CDI if a word was used verbally, as a sign, or via his AAC device. Roger noted on the assessment form that Aaron would *attempt* to imitate almost any sound or word presented to him. Roger also noted that he only marked words as spoken if he thought Aaron seemed more

interested or more successful in saying them; in addition he specified that he only marked words used through Aaron's AAC if he had observed it outside of therapy. In sum, Aaron's dad reported that Aaron used 50 total words (5 spoken, 3 signed, 42 on his AAC device, and 3 that are both spoken and used on his AAC device). Also from the CDI, Aaron's data reported that Aaron a) understood 82 total words, with 47 of them being both understood and produced, b) utilized four of the twelve listed communicative gestures sometimes or often (specifically reaching out and giving a toy that he is holding, pointing at an interesting object or event, extending his arm upward to signal a wish to be picked up, and shaking his head "no"), c) participated in 3 of the 6 games/routines (specifically peek-a-boo, chasing games, and singing), and 8 of the 17 actions with objects (including eating with a spoon or fork to putting on clothes), and d) imitated 6 of the 15 adult actions (including "reading" and writing with a pen, pencil, or marker).

Secondary participants. The secondary participants included Aaron's father, Roger, Sara the director of the Campus Early Elementary School, the three preschool classroom teachers, one of Aaron's paraprofessionals, and Aaron's preschool classmates, all referred to here by their selected pseudonyms. Of the three classroom teachers, Anna served as the 'head teacher,' with responsibilities that included serving as a liaison across parents, paraprofessionals, and other classroom teachers. At the time of the study, Anna was working toward a secondary degree in education. Sue and Angie were assisting teachers in the classroom, and both were also working toward secondary degrees in education. Aaron received support from 3-4 different paraprofessionals through The Autism Program, one of whom, Connie, was with him during our observations on Fridays.

The research team tried to elicit requests from all of Aaron's classmates as secondary participants, however only 17 out of the 24 children provided explicit consent (9 girls and 8 boys). Specifically in regard to Aaron's small working group, which was focused on the topic 'Bodies and Feelings,' 1 of the 3 girls and 3 of the 4 boys in that group provided consent. The other two working groups were focused on the topics 'Children at Play' and 'Homes and Families.'

Data Collection and Preparation for Analysis

Data collection used ethnographic methods in order to examine the complex interplay of variables impacting social interaction in the classroom. Data was collected in three forms: a) classroom observational field notes focused largely on the primary participant, Aaron, b) in-person interviews of all adult secondary participants, and c), one videotaped observation of a supported small group activity in the classroom. Research meetings were held weekly to manage logistics, discuss data collection, and provide ongoing data analysis.

Classroom observations. A total of 6, 60- to 90-minute classroom observations were conducted across a 42-day period by one or more research team members. All observations occurred on Friday mornings from 9:30-10:30 AM with the intent of capturing opportunities for peer interaction. Specifically, our observation time corresponded with outdoor play, the large literacy group, and small group instruction/projects (see Appendix A for a detailed class schedule). For 4 of the 6 observations, Tracy Gunderson was available to provide small group support for Aaron. In addition to being present for the small group activities, Tracy worked with Sue to develop small group activities that were likely to increase Aaron's participation by providing visual support, encouraging social interaction, and targeting relevant curricular goals. Each researcher had a personal notebook in which field notes from the classroom observations were

originally taken on-line with a focus on patterns of interactions across participants, key challenges and supports for communicative competence, and social interactions of the primary participant. The notes were then expanded with additional detail within 24-hours. The expanded notes were later typed into Microsoft Word to assist in analyses. Across investigators, the observations led to 948 lines of field notes, the majority of which were taken by student investigators, Hillary and Stephanie.

Videotaped observation of target activities. The goal was to videotape several target classroom activities during which Aaron received support from Tracy. However, only one video data collection day was recorded due to the inability to obtain consent forms from all classmates. Two investigators viewed and took notes from the 25-minute video segment 10 months after it was originally collected. Notes from the video were taken in the same way as during classroom observations with the one exception that key segments would be viewed more than once.

Interviews

A total of 6 semi-structured interviews lasting anywhere from 10-120 minutes were conducted by various members of the research team with each adult secondary participant. Questions varied depending on the role, expertise, and familiarity of the interviewer and interviewee. However, each interview was conducted in person at a location and time of the interviewee's choice. See Appendix B for sample interview questions. All interviews were either audio- or video-recorded and then transcribed according to conventions in discourse analyses (Miller, Hengst, & Wang, 2003).

Data Analysis

Procedures for coding field note and video data

Formal data analysis was initiated four months after all data were collected and focused on characterizing classroom interactions observed among teachers and children, especially those involving Aaron. Using a grounded theory approach, coding categories were based on the literature and emergent themes were identified by the research team. The researchers first completed one day of field notes together in order to establish a shared coding system. After this initial joint coding, the researchers completed coding the rest of their field notes for the first pass by themselves. Three total coding passes were made of the observational data. To begin the process, each line was force choice coded as either a comfortable or uncomfortable interaction as perceived by the researcher in reference to the observed interaction. Simultaneously, notes pertaining to one of three following primary themes were also coded: Marked Support, Transitions or Loops, and Initiations to or from the primary participant. The research team defined Marked Supports as explicit, tangible supports provided for any child in the classroom. Initiations were identified by the research team as any social initiation, intentional or otherwise, to or from Aaron; the initiation could be verbal or nonverbal. Transitions were defined by the research team as any significant explicit shift in classroom activity. Loops were defined by the research team as any pattern of pervasive repetitive behavior that was not required for the identified activity.

For the second pass of field notes, researchers a) developed a fourth primary theme, b) subcategorized two of the primary themes, and c) divided the transcripts into episodes. The fourth primary theme, Objects, was developed to capture sustained interaction with objects that did not include social interaction. The two primary themes of Marked Supports and Initiations were subdivided into secondary themes: Marked Support was divided into Facilitation of Social Interactions versus Management of Behavior; Initiations was subdivided into Initiations from

Aaron versus Initiations to Aaron accordingly. In addition, the field notes were divided into episodes based on a shift of events/observer attention. Each episode was forced choice coded as comfortable, uncomfortable, or mixed according to observer perception. Note that field note episodes are cited in terms of the first initial of the investigator, the day of observation, the episode within that day, the episode coding (comfortable, uncomfortable, or mixed), and the specific line numbers. For example, the following excerpt below demonstrates one recorded episode, with the 'H' referring to it being from Hillary's field notes, 2 referring to the second day of data collection, 5 referring to this being the fifth episode in this day's field notes from Hillary, 'Comfortable' referring to the perceived quality of the interaction, and the lines referring to the Microsoft Word line number after the field notes had been typed up. It should be noted, that the researchers have added punctuation to the field note excerpts to clarify the segmentation of thoughts for the reader.

(Observational Field notes, H,2,5, Comfortable, lines 203-209)

It is Story Time.

Aaron smiles and pushes "time to go" twice.

He has his chewy and vocalizes.

He makes eye contact with me.

He is asked which activity he wants to do.

Aaron is pushing buttons on the talker.

Finally, the third pass through the field notes consisted of subcategorizing the primary theme of transitions and loops to delineate transition versus loops. Once coding of the field notes was complete, the same coding scheme was applied to notes taken from the videotaped interactions. See Appendix C for a diagram of the coding scheme.

Procedures for coding interview data

Coding was completed on data from 5 of the 6 interviews (Connie's interview file was inadvertently lost). The researchers used essentially the same categories from the field notes to code the interviews except that Objects and Initiations were not coded and a new category, Values and Goals was an added. The researchers also divided the interviews into segments based on changes in topic, which were roughly analogous to 'episodes' in the observational field notes, and identified each topic segments as comfortable or uncomfortable.

Results

Descriptives

Approximately 9 hours of classroom observation, most of which was captured by different investigators, led to 56 total field note episodes, 29 of which included Aaron and 26 that did not include Aaron. Of the field note episodes that included Aaron, 48% (14/29) were coded as comfortable, 17% (5/29) as uncomfortable, and 38% (11/29) as mixed. Of the episodes that did not include Aaron, 84% (22/26) were coded as comfortable, 12% (3/26) as uncomfortable, and 3% (1/26) as mixed. The 5 coded semi-structured interviews that were available for analyses yielded a total of 196.68 minutes (3.28 hours) and yielded 86 total topic segments: 51% (44/86) comfortable, 23% (20/86) uncomfortable, and 26% (22/86) mixed. Last, the video notes, taken by two different investigators of the same video segment, led to 18 total episodes, all of which included Aaron. Of these episodes including Aaron, 72% (13/18) were coded as comfortable, 17% (3/18) as uncomfortable, and 17% (3/18) as mixed. The remaining data analyses will be organized by coding category, highlighting general findings and providing specific supporting data.

Initiations

General findings from the category of Initiations included a) More marked initiations by Aaron to both adults and peers than one might have expected based on the profile of autism portrayed in the literature; b) Numerous rich multimodal interactions, often including objects as mediators; and c) Differences in individuals' receptivity and use of different modes of communication.

Here is an example of a rich multimodal interaction taken from an episode noted from the video notes in which Aaron nonverbally initiates an interaction with Tracy during a small group Potato Head activity that involved building Potato Heads, both with a 3D Potato Head and with 2D laminated Potato Head pictures with Velcro pieces. Of particular interest here, Tracy used an object to respond to Aaron's first initiation by handing him the Potato Head.

(Video Note, H,6,8, Comfortable, lines 51-56)

Anna comes over and initiates conversation with

Tracy.

Aaron taps Tracy's arm when she is turned towards Anna.

In apparent response and without shifting her gaze to Aaron, Tracy moves the potato head towards him.

Aaron smiles and hits his paper of Velcro images.

He looks at Tracy, but does not take the Potato Head.

Aaron looks at Tracy and smiles.

Tracy continues talking to Anna.

During the same activity, Tracy uses a piece from the paper Potato Head activity, specifically a pair of paper eyes, to mediate a successful multimodal exchange between Aaron and his peer.

(Video Notes, S,2, Comfortable, lines 50-62)

A girl grabs the eyes off of Aaron's potato and replaces it with another pair.

Tracy prompts the girl to hand Aaron the other set of eyes.

Tracy tells her to put it in his hand and so she does.

Aaron then puts the eyes on his paper.

Despite the observations of rich multimodal interactions, there was indication that both peers and adults differed in terms of how receptive they were to using different modalities to communicate with Aaron. For example, the following excerpt from an observational field note highlights two different peer perspectives captured during the class transition to snack. The female peer utilized multiple modalities to communicate, specifically verbalizing, moving close to him, and offering an object. In contrast, the boy specifies to the investigator that talking to Aaron needs to be channeled through the AAC device. Note also that the excerpt ends by another little boy bringing his chewy to Aaron, which Aaron then took.

(Observational field notes, H,3,4, Comfortable, line 493-504)

Connie uses the AAC now and tells a child to use it to say hi to Aaron.

Aaron runs to the books. He runs from the table and grabs a book from the library.

A peer (girl) goes to Aaron and says "no Aaron" and puts Mr. Potato head in front of him.

A boy tells me you have to use Aaron's talker to talk to him.

A child brings Aaron's chewy to him.

Note also in the opening of the previous excerpt that the paraprofessional, Connie, directs a peer explicitly to use Aaron's AAC device to say hello to him, which again seems to limit the available means of interacting with Aaron.

An additional field note to illustrate Connie's interaction with Aaron is taken from a period before snack time in which Aaron transitions to snack before the rest of the class, presumably because his usual visual support during story time was not available. Note that Aaron's paraprofessional, Connie, prompts him and his peers to use his AAC device, and provides Aaron with physical prompts, but provides very little direct spoken communication. In particular, toward the end of the episode, Aaron takes a cup from classmate's hand and Connie responds by taking it away from him without verbally mediating the interaction. The episode supports the position that Connie was less comfortable with supporting rich multimodal interactions.

> (Observational field notes, S,4,2, Comfortable, line 266-279)
>
> *Aaron walks back to the talker.*
>
> *He picks up the talker and walks to snack.*
>
> *Problem arises- nothing for him to track with during the story.*
>
> *Connie prompts him to use talker by pressing the button first.*
>
> *He gets a snack before all of his other classmates.*
>
> *Hand over hand to pour water.*
>
> *Grabs another girl's cup- but Connie takes it from his hand, and doesn't explain why.*
>
> *Connie teaches two girls to use the talker.*
>
> *The girls say Aaron's name but he runs away to the bookshelf.*

In contrast to this episode with Connie, the head teacher, Anna, appeared very flexible in negotiating multimodal interactions. In support of this point, the following is an excerpt from Anna's interview transcript in which she describes an interaction with Aaron that incorporated touch, gesture, eye gaze and spoken words.

(Anna's Interview transcript, lines 538-556)

"oh today he was had left group and was on the couch {...} So one of the things is like we you know doing the presses [squeezes arm] {...} so he put his legs on my stomach {...} you know that's the first thing he did and I kind of lean on him I push on him and he like [smiles and shakes head]{...} it's he smiles and laughs and then I stop and he takes my hands and puts them right back on his legs so he's telling ya know he's showing us {...} okay that's what I want{...} of course were incorporating language into that and were like oh I'm touching your legs and we smush your legs and then just really fast [snaps] that was brief interaction maybe that was thirty seconds {...} he was communicating by leaving group that he wasn't ready to be at group {...} we just had a really concise very successful interaction that lasted less than a minute and it was fluid right."

Anna's receptivity to different modes of communication creates an environment where she presumes competence. In other words, she expects Aaron to be able to communicate and believes in her own ability to communicate with him. In her mind, Aaron's speech-language impairment does not translate into inability to communicate.

(Anna's Interview transcript, lines 535-559)

"{...} I'm the kind of person that assumes that people are brilliant- like all people. And that ya know just because somebody isn't able to verbalize (right)

doesn't mean like- I was filling out these forms and I was like wanting to shred them and it was saying things like does the child relate to others emotions and I'm like well I don't really know that .1. I really don't know .1. I mean obviously he's not able to tell us .1. I see that ya know my friend is sad .1 and I'm able to- respond appropriately {…} at least what we presume is appropriate for that age level. But that doesn't mean he's not having that understanding {…} so for me to presume that he doesn't have that understanding I think that's very disrespectful of him as a person."

This next excerpt, also taken from Anna'a interview transcript, again illustrates her willingness to presume competence from Aaron's nonverbal communication, eye gaze in this particular example.

(Anna's Interview transcript, lines 370-378)

"and then he looks at you with his eyes and{…} he's totally like connecting with you {…} it is not- there's nothing {…} else going on there he is connecting with you when he is looking into your eyes {…} but once again I just assume that he is just totally brilliant and we just need to figure out how to- which I think he really is {…} I really believe that (yeah) but how do we help other people understand that {…} and not to just assume um {…} something else and also how to, how to help him exhibit those {…} ya know his strengths."

Objects

General findings from the category of Objects included a) repeated interactions with select objects and b) a co-occurrence between Objects and Loops. By definition, the Objects code category excluded social interaction, so they offer a glimpse of the object interactions that

did not tend to co-occur with social interaction. As such the objects that were coded by any investigator in the observational field notes included leaves (1/6 days), basketball base (1/6 days), woodchips (2/6 days), playground structure (2/6 days), trike (2/6 days), water (3/6 days), toothbrush (2/6 days), and a swing (1/5 interview). Within the interview transcripts, both the water (Anna, line 523) and the swing (Roger, line 132) were mentioned as things that Aaron liked to do. It may seem unusual that Aaron's AAC device did not emerge in this category; however this category only included Aaron's interaction with objects that were not within the context of social interaction. The following observational field note excerpt, taken during outdoor play, exemplifies Aaron interacting with three of the coded objects within the context of a loop.

> (Observational Field notes, H,1,1, Uncomfortable, line 13-26)
>
> *Aaron is in the corner of the playground, alone, looking around and wandering on own.*
>
> *A girl and another peer come check what is going on.*
>
> *They linger for about 20 seconds before going to a different activity.*
>
> *Aaron plays on the basketball base and then runs to the leaves on the ground against the school building wall.*
>
> *He is not playing or doing the other activities kids are engaging in.*
>
> *Aaron goes back to the basketball base.*
>
> *He picks up leaves to crumble, and he slightly flaps his hand.*

In regard to the overlap between the Objects and Loops, there were 8 total non-redundant Objects in the observational field notes (non-redundant meaning the same object coded by more than one investigator was only counted once), 6 of which were coded at some point as being used

within a coded Loop. Below is an excerpt taken from an observational field note when Aaron is at outdoor play interacting with objects on the playground within a loop of nearing the basketball hoop base, picking up woodchips, and climbing onto large plastic tubs with water in them.

(Observational field notes, Mixed, H,1,2, lines 31-48)

Dr. DeThorne is sitting with him on the ground. She is playing and trying to "catch" the other kids. Aaron does not visibly react to this excitement.

Aaron makes small vocalizations. The girls playing with Dr. DeThorne play with excitement and react by engaging in play, yell as they run away, and laugh as they escape.

Aaron looks to Dr. DeThorne before going to the basketball base.

He goes back to play in the wood chips.

He has a pattern of going to the basketball base, wood chips, and climbing on the water box.

Dr. DeThorne sits on the base to break his pattern and he turns to climb on the playground structure.

He did not get angry or upset by this.

Now, peers are playing on the basketball base where Aaron was.

Marked supports

We observed four general findings in regard to Marked Support. First, the researchers observed a multitude of objects that were used as Marked Supports for Aaron: a cube chair (observed 2/6 days), blown up pictures from a book (2/6 days), a chewy key (4/6 days), a therapy ball (1/6 days), a Velcro schedule (1/6 days), laminated sheets (2/6 days), props such as a large toothbrush, a Mr. Potato Head toy (2/6 days), and his AAC device (3/6 days). It's worth noting

here that Aaron's AAC device was not present (2/6 days) because it was under repair. Second, many of the same supports were used with other children as well as Aaron (e.g., chewy key, therapy ball), particularly within large group activities. Third, the head teacher, Anna, did not seem to make a distinction between supports for Aaron and supports for the other children. Fourth, although many supports were used fluidly in the classroom, the AAC device sometimes appeared as a barrier to interaction. The following excerpt from the observational field notes references both the chewy toy and the talker within the context of playing with the Potato Head.

(Observational field note, S,4,3, Mixed, lines 283-297)

Tracy has a girl join her and invite Aaron to play with them.

Aaron carries box to the playroom.

Girl brings Aaron's chew toy to Connie.

2 other children playing with the potato head but do not interact with Aaron.

Aaron runs away- Connie grabs him but he gets away.

She brings him his talker and uses hand over hand and leads him back to the room.

Aaron vocalizes while playing with the potato head- Tracy imitates him and he stops.

Vocalizations turn into singing "doo doo da doo."

Tracy prompts one of the girls to give home a choice of hats for Mr. Potato Head, she stands in front of him and holds them out.

In addition to being noted in the observational field notes, Aaron's use of the cube chair came up in the interview provided by the head teacher, Anna.

(Anna's Interview Transcript, lines 305-312)

"so turn taking and extending his amount of time at choices {…} because he tends to kind of flip around so he'll like hit multiple places but not really {…} engage so the goal is to get him to engage for longer periods of time {…} so one of the things we started to do I was at parent teacher conferences and I was like hey why don't we just move the cube chair {…} around {…} duh so things like that I can't believe I didn't think of that months ago but that really did help"

As previously noted, the use of Marked Supports for children other than Aaron was observed during large group circle time in particular. The following observational field note excerpt depicts the use of props in conjunction with the telling of a poem at large group time.

(Observational field notes, S,2,3, Comfortable, lines 122-127)

Gather on a carpet for circle time.

They listen quietly to Anna sing a song.

Talk about their special places.

Anna teaches them a new poem.

She uses props (hat, boots, coat) to assist in the telling of the poem.

The below excerpt from the observational field notes taken during large group time exemplifies another use of props, in this case a large toothbrush that was coded as marked support.

(Observational field notes, S,1,4, Comfortable, lines 54-63)

The group sings along to a song.

Song gives direction (toes are for tapping…).

Aid tries to engage Aaron by moving him with the song.

Aaron doesn't join but he watches.

Aaron is given a pretend toothbrush to play with, with the other kids.

He holds the toothbrush and begins to sing vowel sounds.

Dr. DeThorne uses hand over hand to help Aaron sign "more" for more music.

During "teeth are for brushing" part of the song, he picks up the brush and his aid helps him pretend to use it.

The head teacher, Anna, speaks to her use of visual supports and highlights their utility to the class as a whole in the following excerpt from her interview transcript.

(Anna's Interview Transcript, lines 428-430)

"I've been like rethinking vis- some of the visual supports like so for example like we have um like a picture of pencils where the pencils go (yeah) and those things I really like (yeah) that helps all of the children"

The researchers also observed instances in the classroom in which AAC facilitated Aaron's participation in the classroom. In this particular instance, the head teacher, Anna, prompted him with a question in regard to the song she was singing. Aaron offered up a different song on his device, which she then incorporated into the next activity.

(Observational field notes, L,6,1, Comfortable, lines 31-37)

Turning to singing a song, the Head Teacher, Anna,

Invites Aaron to give input on the '5 Little Children Song'

she is leading. He offers 'Puff the Magic Dragon' and

'singing' with his device. Anna incorporated the word

'singing' into her song and then sang Puff the Magic

Dragon as the next song.

Anna also talks specifically about how use of the AAC device could be seen as a barrier to interaction. Specifically in the below excerpt from her interview transcript, Anna mentions how integrating Aaron's AAC would have disrupted an ongoing interaction.

(Anna's Interview Transcript, lines 552-559)

"…now here's something that I'm bad about for sure {…} is that {…} I didn't have him say on his talker I want a break {…} that one of the goals is that he uses his talker more but {…} sometimes I feel like the talker is like another thing right so were having a comm- were interacting and communicating {…} we just had a really concise very successful interaction that lasted less than a minute and it was fluid right {…} he was able to take my hands I say oh you want me to touch your legs he doesn't have anything like that on his talker {…} I mean like legs. Touch {…} . Hand. {…} so that for me I would have to go get the talker interrupt the interaction that was already occurring"

Also related to the AAC device as a burden, Aaron's Dad, Roger, mentioned the issue of who should be expected to carry Aaron's AAC device and alludes to having to carry the device as a potential barrier to its use.

(Roger's Interview Transcript, lines 98-101)

"he does carry around his talker {…} not as much as he should I mean they're always- the ABA girls I mean the ABA consultants are always telling us you know make sure have him carry that and don't do it for him {…}you know encourage him to you know independently um {…} use it but um yeah"

Transitions/Loops

In regard to transitions, the primary finding was that Transitions were coded as comfortable more often than both uncomfortable and mixed combined with 27 non-redundant Transitions being coded as comfortable, 11 as uncomfortable, and 3 as mixed. In addition, transitions usually did not include any coded Marked Supports besides the AAC device.

This excerpt from an observational field note depicts an uncomfortable transition in which the paraprofessional, Connie, wants to switch Aaron's attention to a different activity, but does not complete her thought.

(Observational field notes, H,2,5, Uncomfortable, lines 216-218)

Aaron presses "play" "play dough" 4 times in a row.

Connie pushes "time to" and then does not push anything else.

Another coded Transition involved the use of the AAC device, but was coded as a comfortable interaction. In this interaction, one of the researchers, Hillary, was serving as Aaron's aid for the day. She used the AAC device in order to direct Aaron towards a new activity, cleaning Mr. Potato Head.

(Video observation notes, S,5,5, Comfortable, lines 75-82)

Hillary asks Aaron if he wants to wash Mr. Potato head with water and he doesn't react, then she uses his talker.

Aaron looks at her after this.

She asks him to put the hand in the jar and he does.

The coded transitions did not include any coded marked supports besides the AAC device, except for a Velcro schedule that was only observed on one occasion. The AAC device was observed during both comfortable and uncomfortable transitions. The first excerpt from the observational field notes depicts an uncomfortable transition. In this transition the

paraprofessional, Connie, wants to switch Aaron's attention to a different activity, but does not complete her thought.

In regard to Loops, this particular code emerged too infrequently to draw substantial findings. Only four different loops were coded in the researchers' field notes. In addition, Loops emerged once in the interview with Sara, the school's director. Despite such limited data, it was notable that Aaron's loops often involved physical activity and objects but rarely included spoken language or attempts by Aaron at social interaction. In addition the director and investigators expressed uncertainty regarding when and how to interrupt Aaron's loops.

This first excerpt depicting a coded Loop is taken from an observational field note during recess on the playground. Note the representative physical activity and object interaction as well as the absence of social interaction and spoken language.

> (Observational field notes, S,1,1, Mixed, lines 17-21)
>
> *Aaron climbed on the basketball hoops and then threw woodchips.*
>
> *He starts to smile while on the hoop and then runs to the boxes with water in them.*
>
> *He doesn't open the boxes.*
>
> *Begins a loop of running between the hoop and boxes.*

As we reflected on Aaron's behavior coded as 'loops,' we looked for analogous data on other children. Data in this regard was relatively limited given our explicit focus on Aaron when taking observational field notes. However, the following example stood out. Specifically, one peer was gathering litter from around the playground, showing her discoveries to the adults, and then placing it in the garbage can. Although this series of behaviors was analogous to Aaron's loops in terms of repeated physical activity and interaction with objects, the activity was

verbally-mediated during her interaction with adults as the work of being a "garbage detective." The specific field note entry is presented here:

> (Observational field notes, S,2,1, lines, Comfortable, lines 106-109)
>
> *One talks to the teachers for a while but then decides to join her classmates.*
>
> *She talks to us about her "litter mission."*
>
> *Another girl tries to join her and she helps her to learn what to do.*
>
> *This girl likes to help and be with adults.*

There was discussion across investigators regarding how Aaron's loops should be considered and when 'intervention' during loops was warranted. The complexity of our discussions was also reflected in the interview transcript by Sara, the school director, when the issue was raised in relation to a loop that one of the investigators observed when she was in the classroom outside of data collection time. In particular, Aaron was observed squirting a water bottle, systematically pointing to each seedling in a planter, and jumping on a pile of pillows. This series of actions was repeated a number of times. In the below excerpt, the investigator asks Sara her opinion in how such situations should be handled.

> (Sara's interview transcript, lines 391-401)
>
> *"and well I guess it – maybe it does depend on the{...}, example {...} but I don't know {...} I guess if I was in the room {...} I'd grab Olivia and say let's go water some plants with Aaron {...} but I don't know if that would change it {...} is that okay if he does that for ten minutes {...} I don't know I mean maybe that was part of the way he is doing his own choice {...} which is to be by the plants {...} if that was part of what a choice could be {...} see and now I'm back to I'm questioning my answer because I don't know"*

Discussion

Highlight primary findings

In sum, the present case study aimed to illustrate classroom communicative practices involving Aaron, a preschool-age child with complex communication needs. Analyses across all data sources led to four primary coding categories: Marked Supports, Transitions/Loops, Initiations, and Objects. Many of the Marked Supports observed or noted were nonverbal, and many of the same supports were used with other children in the same classroom. Transitions/Loops were observed without social interaction, often including objects, and staff were uncertain regarding when and how to interrupt Aaron's loops. In regard to Initiations, Aaron had initiated multiple initiations with both adults and peers, many of which were noted during multimodal interactions including verbal and nonverbal communication; differences emerged across individuals in terms of how flexible and comfortable they were within multimodal interactions. Finally, Objects provided evidence for Aaron's preferred objects, many of which were double coded within Loops. For the remainder of the discussion, the two emergent themes of multimodality and presumed competence will be reviewed with implications for inclusive practices.

Implications

One emergent theme across coding categories that offers particular implications for clinical and educational practices includes the power of being able to see and interpret Aaron's behavior through a lens of typical variation, even if extreme at times. This theme emerged in relation to similar supports used across children in the classroom, the observation of loops across children, and the power of multimodal interactions that can include but are not dependent upon any particular object, including AAC. Given our particular interest in AAC, we will focus here

on our observation that acknowledging and supporting multimodality was key in successful interactions with Aaron and consistent with the concept of presumed competence.

Although certain individuals seemed predisposed to channel communication to Aaron through his AAC device, many successful interactions were mediated by other modes of communication. A powerful example is captured in the field note episode where Connie is instructing children to use Aaron's AAC device to say 'hi' to him, while two children in the same episode naturally find ways to successfully interact with Aaron by handing him objects—the Potato Head in one case and the chew toy in the other (H,3,4, line 493-504). The point is not to say that the AAC device is not an important communication support; in fact, we observed instances in which it was. The point instead is that supporting successful social interactions for children with speech-language impairments requires acknowledging and helping others see that communication is naturally multimodal for all of us (cf. DeThorne, Hengst, Fisher, & King, in press). Consequently, requiring a child or his/her partners to communicate via a particular modality, be it speech or AAC, is unwarranted and actually places additional restrictions on the child with speech-language impairment and his/her communication partners.

In terms of implications, adults and peers may need to be prompted to employ and interpret nonverbal communication strategies. Wolfberg et al. (2008) alludes to a similar idea when she recommends coaching peers and interpreting behaviors that might be perceived as unusual. As a successful example, recall the video note excerpt during which a peer is 'trading' Potato Head pieces with Aaron. It is not until Tracy explicitly instructs her to put the piece in Aaron's hand that we have a notable interaction between Aaron and his peer (S,5,5, lines 75-82). Explicit strategies for getting a child's attention, such as placing oneself in the child's field of

vision or placing objects in the child's hand, may need to be taught to maximize successful interactions.

Acknowledging the multimodality of communication also allows individuals to recognize strengths and presume competence in individuals with speech-language impairments. This powerful perspective was particularly apparent in Anna, the head teacher, who frequently scaffolded Aaron's nonverbal behaviors as meaningful and interactive (i.e., prolepsis). In the examples provided in the Results, Anna interprets Aaron's eye gaze, his touch, his emotions, his facial expressions, and his use of the talker as meaningful, which thereby helps empower the two of them to have a successful interaction (Anna's interview transcript, lines 370-378). Anna's tendency to presume competence was also noted across her interview transcript (lines 171-179). She explicitly states, *"{…} I'm the kind of person that assumes that people are brilliant- like all people." and goes on to say, "{…} so for me to presume that he doesn't have that understanding I think that's very disrespectful of him as a person."* In sum, acknowledging the multimodality of communication allows us to see and capitalize on the potential strengths of individuals with speech-language impairments and gives us the flexibility to employ whatever modalities are available in the moment to make the interaction successful. Or as captured so poignantly by Anna, the head teacher, in her interview transcript, "the challenges that I encountered really are how to serve the child {…} and having people that are responsive to the child as opposed to responsive to the disability" (Anna's interview transcript, lines 102-105).

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Appendix A

Campus Elementary School

PreK Typical Daily Schedule

8:20-8:50 Arrival and Choices (sign in, coat hooks and inside shoes, bathroom, wash hands, survey question, choices)
8:50-9:15 Welcome Meeting (large group) and Project Discussion
9:15-9:45 Outdoor Play
9:45-10:10 Literacy Group Meeting (large group)
10:10-10:30 Small Group Instruction or Project Groups
10:30-11:20 Choice Time/ Snack
11:20-11:40 Music and Movement
11:40-12:00 Dismissal and Outdoor Play
12:00-2:30 Extended Preschool
12:00-12:25 Lunch
12:25-12:45 Outdoor Play
12:45-1:00 Read Aloud on Sleeping Bags
1:00-1:30 Quiet Play/ Rest on Sleeping Bags
1:30-2:15 3rd Choice/ Activity Time
2:15-2:30 Gentle Music Time

Appendix B

Semi-structured interview (with secondary participants)

Goal: to gain information about the communicative practices at the clinical site in general, and specifically the roles and patterns of participation of the primary participant.

· Tell me about {the given participant}

· Give me an example of {the given participant's} typical day.

· How does {the given participant} communicate with you and others? Give me an example.

· Who are {the given participant's} most frequent communication partners? Give me an example of one of their recent interactions.

· What activities does {the given participant} enjoy?

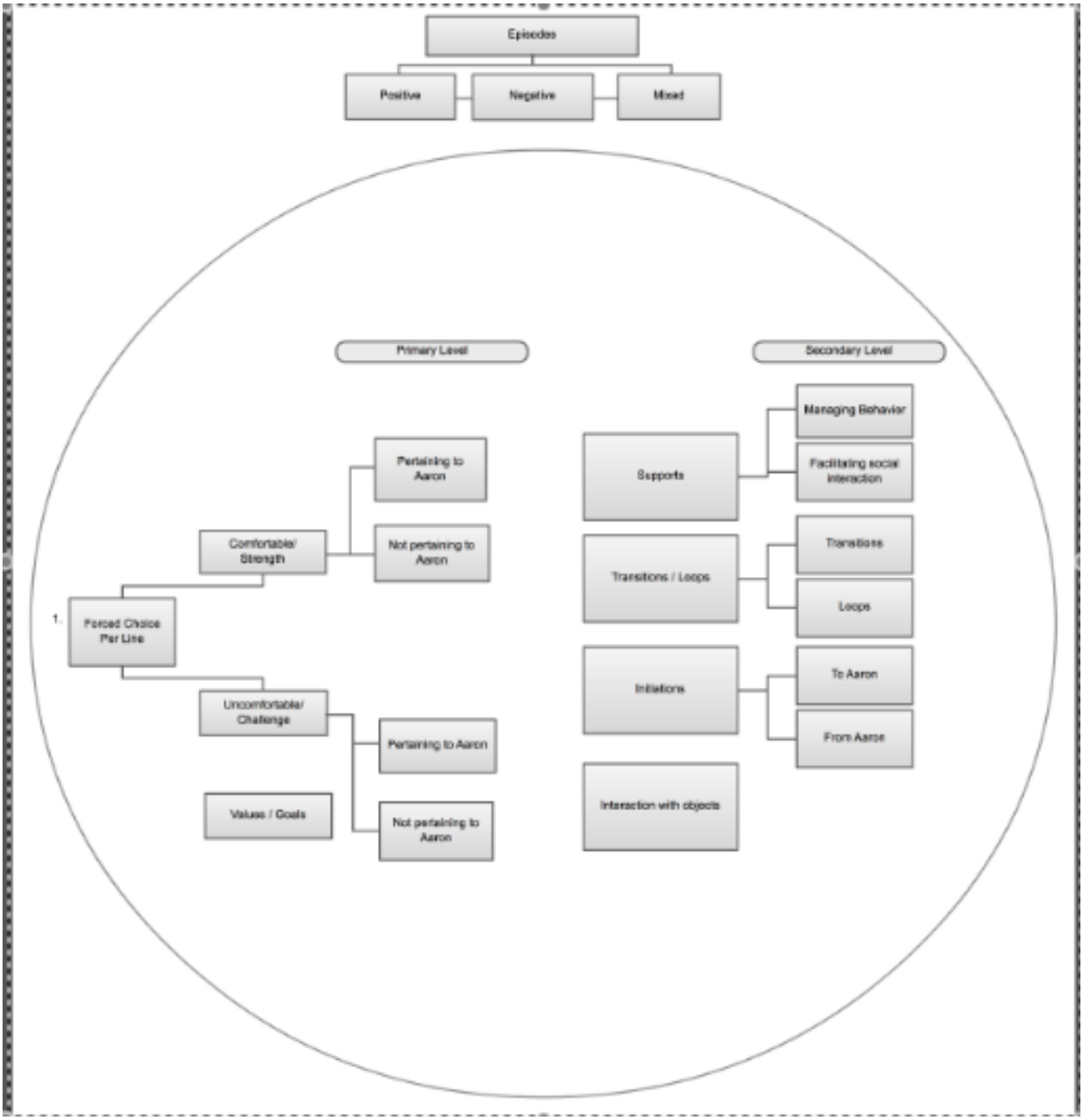
· What do you consider to the {the given participant's} strengths?

· What are your current goals for {the given participant}?

· Is there anything else you'd like me to know about {the given participant}?

· Collect copies of artifacts about the ongoing program (e.g., data sheets).

Appendix C


Episodes
Positive
Negative
Mixed
Primary Level
Secondary Level
1.
Forced Choice Per Line
Comfortable/ Strength
Pertaining to Aaron
Not pertaining to Aaron
Uncomfortable/ Challenge
Pertaining to Aaron
Values / Goals
Not pertaining to Aaron
Supports
Managing Behavior
Facilitating social interaction
Transitions / Loops
Transitions
Loops
Initiations
To Aaron
From Aaron
Interaction with objects

Appendix D

Relevant Transcription Conventions

Main Dialogue: exact word-by-word transcription

Pauses: transcribed with the number of passing seconds (i.e. ...3... or ..2..)
Relevant movement: transcribed in brackets (i.e. [shrugs shoulders])
Interjections: transcribed in parentheses when the person that is not currently speaking interjects (i.e. I went to the store (yeah).)
Main speaker: the first initial of the name who was speaking was used to identify the speaker

A: Thank you
H: You're welcome

Appendix E

The first pass coding categories:

Episodes

Identified as any shift in attention or change in activity during field note observations

Comfortable

Comfortable initial reaction of the researcher relevant to the observation

Uncomfortable

Uncomfortable initial reaction of the researcher relevant to the observation

The second pass coding categories:

Supports

Managing social interaction: Any support provided by the aid, teacher, or primary speech-language pathologist that facilitated peer interactions, group participation, and overall inclusion within the classroom.

Managing behaviors: Any support provided by the aid, teacher, or primary speech-language pathologist that ultimately encouraged specific behaviors.

Initiations

To Aaron: Any initiation, intentional or otherwise, that was directed to Aaron.

From Aaron: Any initiation, intentional or otherwise, that was directed from Aaron.

Transition & Loops

Transitions: Any action requiring a major change in classroom activity.

Loops: Any action that persisted and persevered that prohibits a transition to a different activity

Objects

Interaction with an inanimate object occurring without social interaction

Appendix F

Campus Early Elementary Preschool Working Groups

1. Children at play - Anna
   -girls 6, 4 with consent
   -boys 4, 3 with consent
   Total 10, with consent 7
2. Bodies/feelings - sue / Aaron
   -girls 3, 1 with consent
   -boys 5, 4 with consent (including Aaron)
   Total 8, with consent 5
3. Homes and families - Angie
   -girls 5 ,4 with consent
   -boys 2, 2 with consent
   Total 7, with consent 6

Total children: 25, 18 with consent total