Supplemental Material S2. Codebook.

THEME 1: INTEGRATING AAC INTO LIFE: Describes the challenges/realities or supports/success stories of using AAC (unaided or aided) either within the family (at home, with family members) or outside the family (in school or community, with partners who are not family members).		
Subtheme 1.1: Integrating AAC into family life: Describes the challenges/realities and supports/success stories of how AAC fits into relationships within the immediate family (e.g., with parents, siblings, extended family) AND how AAC fits into family routines that occur at home.		
Code	**Definition**	**Example data**
Integrating AAC family supports (and success stories)	Describes the supports and success stories of using AAC in relationships within the immediate family and within family routines at home. This includes people coming into the home to care for the child (e.g., sitters, home care aides, nurses). For example: • successful use of AAC with family members • successful use of AAC within various routines at home • Use of multiple modalities (e.g., low tech symbols around home) • Supports for family functioning, such as other families, online forums, and respite care	*He [brother] learned quite early on how to use the book as a communication partner, and things like that*
Integrating AAC family challenges (and realities)	Describes the challenges and realities of using AAC in relationships within the immediate family and within family routines at home. This includes people coming into the home to care for the child (e.g., sitters, home care aides, nurses). For example: • Little use of AAC with some family members • AAC not available within all family routines at home (e.g., morning care routines, bedtime, when out of wheelchair)	*So some activities that we do, I don't incorporate AAC. For the simple fact of, if we're doing something really physical, I can't do it. On the bike, I try to do things, because she has to hold on, and she really grips it. And so I will use it just for modeling, or I'll have the taking bricks where she can say stop and go.*
Integrating AAC family description	Description of important people in family or family routines, that does not include a discussion of AAC or the barriers/supports.	

Subtheme 1.2: Integrating AAC into school and community: Describes the challenges/realities and supports/success stories of how AAC fits into relationships with individuals outside of the immediate family members (e.g., paraprofessionals, medical professionals, peers, friends, instructors, teachers), and in settings/contexts outside of the family context (e.g., school, community).		
Integrating AAC outside supports (and success stories)	Describes the supports and success stories of using AAC with individuals outside of the immediate family members (e.g., paraprofessionals, medical professionals, peers, friends, instructors, teachers), and in settings/contexts outside of the family context (e.g., school, community). This includes: • Successful use of AAC with various partners (e.g., care aides, paraprofessionals, teachers, peers) • Using multiple modalities (e.g., low tech board during swimming, unaided AAC, backup system) • Partners use interaction strategies (e.g., modelling)	*They hook the nova chat up to a big tv now that's in the classroom. They'll have conversations with him and they'll say, "where do you want to go?" The therapist will hit it, and then he'll have to respond back, so they are modeling, and he responds. And I guess that's like amazing and that's working really well.*
Integrating AAC outside challenges (and realities)	Describes the challenges and realities of using AAC with individuals outside of the immediate family members (e.g., paraprofessionals, medical professionals, peers, friends, instructors, teachers), and in settings/contexts outside of the family context (e.g., school, community). This includes: Challenges/realities related to using AAC with multiple partners such as: • Knowledge and training needed for partners • Communication partner responses and attitudes (negative, unsure of how to respond) • Wait time needed (especially hard for peers)	*You have to make a conscious effort to be patient and wait and that's hard. And imagine what it's like for children? Um and whether they're going to stick around to engage with that you know?* *But if we're in direct sunlight she can't see the screen. And you know we just go and if there's bright sun on it, she will get frustrated.*

	• Communication between school and home needed (e.g., regarding academic vocabulary) Challenges/realities related to using AAC in multiple settings/contexts, such as: • Eye gaze not available outside • Device cannot be out in the rain • AAC is not always available, especially during available during physical activates (e.g., riding bike, swimming, horse riding) • AAC not accessible out of wheelchair • Not used in community due to uneven surfaces and fear of falling	
Integrating AAC outside description	Description of relationships with individuals outside of the immediate family members and activities outside the home, without mention of AAC	

THEME 2: AAC TECHNOLOGIES: Describes the limitations or supports of existing AAC technologies, or ideas for features that would characterize ideal technologies. This does not include features of low-tech AAC systems (e.g., communication boards).

Subtheme 2.1: Limitations of existing technologies: Describes features of existing technologies that present challenges for use, either for the child in successfully using the technology, or for parents or other partners in supporting the child to use the technology.

Code	Definition	Example
AAC limitation access	Describes access limitations, including inefficient (slow) rate of communication or effortful access that causes frustration for the child and/or partners. This could be due to: • the child's motor skills, • slow pace of scanning (partner assisted or auditory), • eye gaze access challenges	*I mean it is exhausting for him to use the AAC, he would use it more if it wasn't so much work for him to get that arm up and get it directionally on the exact button.*
AAC limitation reliability	Describes technologies as unreliable due to: • glitches, • having short battery life, • limited storage, • hardware issues	*They can be prone to you know crashing or not working or whatever —and that's really bad when that happens. That's really frustrating for him…So that sort of reliance on it, that can be an issue I think.*

AAC limitation lack of fit	Describes a mismatch between the needs and skills of the child (e.g., motor, cognitive, vision) and the design of the system. This could be due to: • poor organization, • too many symbols, • child not being able to perform operational functions, • visual complexity, • changes in organization upon addition of vocabulary, • trade-offs (e.g., adding vocab increases demands of use).	*The extra actions and descriptions are alphabetized. "Actions A-Z" and like if you know if you wanna look for throw and you don't know that throw begins with a "T" how are you ever gonna find that? You're not, and so you're just gonna have to say something else. That's the big letdown about that.*
AAC limitation physical design	Describes how the size, weight, or position of the device presents challenges such as: • interfering with the social channel (i.e., partners) • blocking things the child is trying to look at (e.g., TV). • challenges with mounting (e.g., large/heavy mounts, challenging to mount due to weight of device, expensive and limited options for mounting) • being breakable/fragile	*Then also just the blocking of his face. Cause if I'm having a conversation with you, you can see me and I can see you and we can make eye contact but for him sometimes if the person is talking I'll notice he's looking at them and then his eyes are out of the field because he wants, he's very aware of how people are social so he'll look at the speaker and then he can't (voice cracks), you know, so that's hard*
AAC limitation vocabulary	Describes vocabulary available on the device as limited for the child (e.g., lack of academic vocabulary, lack of interest related vocabulary such as toys)	*There's a lot of specific vocabulary—and he doesn't need to have everything, but he needs enough to be able to participate*
AAC limitation programming	Describes challenges in modifying technologies. For example: • adding vocabulary is not intuitive or slow, • no options to program offline, • changes on one page do not carry across pages, • additional technology needed for programming offline	*I mean it's not… it's not intuitive. You definitely have to learn how to do it. And, there are a lot of keys involved.*
AAC limitation appeal	Describes technologies as unappealing, making children uninterested in using them. This includes voices that are not age	*I mean I think it's hard for her to get excited about using it.*

	appropriate or symbols that are not motivating.	
AAC limitation other	Describes other limitations not included above such as: variability between devices	
Subtheme 2.2: Supports of existing technologies: Describes features of existing technologies support use by the child, or use by partners who are supporting the child to use the technology.		
Code	**Definition**	**Example data**
AAC support programming	Describes characteristics of the technology that facilitate programming, that is, adding vocabulary and making changes. This includes: • ability to easily add vocabulary on the fly, • the system recommends vocabulary, • search feature, • capability to program offline, and • changes made to one page that carry across pages.	*If the words aren't in there, it recommends you can actually add some of the words that don't already show up.*
AAC support vocabulary	Describes the vocabulary on the technology as a support for communication about: • likes, interests, important people, • pain, • things not available in the immediate environment, • core vocabulary.	*A couple times he's been screaming pissed off mad at me and I can't figure out what he wants. And I'll get his talker out. He'll want something, you know, out in the garage, that there's no way he would be able to tell me that he wants to go on his bike or something.*
AAC support multiple functions and features	Describes how the AAC technology supports multiple functions such as: • environmental control, • internet use, • access to a camera, • social media, etc. Also describes the features of the technology that promote use such as: • prediction (to increase efficiency), • access to multiple languages, and • access to various software programs (e.g., document readers, literacy software, etc.).	*The Tobii is programmed to control the TV remote so that he can access television himself and change the channel and record what he wants.*

AAC support physical design	Describes the physical design of the technology as a support for use by child and partners. This includes: • portable or light • mounting	*Yep. It's just like one of those rigid mounts and then it's a quick release mount 2, a QRM2. It kind of just, you pull that thing back and you snap it in there and it just snaps in. (Inc.. 10:12) and it's flexible. It works pretty good*
AAC support fit with child	Describes how the technology is well matched to the child's needs in terms of the vocabulary available, selection technique, organization of vocabulary, etc. Also, describes fit with the child's motor skills (e.g., via use of keyguard)	*It has pretty much everything that he needs is on that setup—the 42. I mean the layout of the device is pretty good, I feel. It was pretty well thought out. I don't know that you could do that any differently. Um, I think it is as good as it's gonna be for what he needs*
AAC support other	Describes an AAC technology support not encompassed in the codes above.	

Subtheme 2.3: Ideal technologies: Parents describe features of ideal technologies such as reliability, appeal, programming, efficiency, improved physical design, or others.

Code	Definition	Example data
AAC ideal reliable	Parents describe an ideal technology as being: • having adequate storage, • working smoothly.	
AAC ideal appealing	Describes the technology as appealing/easy for the child to use, for example by having better voices or better representations.	*I wish that there were better icons. And a better selection of different icons.*
AAC ideal programming	Describes an ideal technology as easy to program, manage vocabulary off of the device, edit across pages, etc.	*it would be nice to be able to—be able to download like a folder for American history that was pre-built.*
AAC ideal efficient	Described an ideal technology as quicker and easier to use/access. This includes features such as: • sentence prediction, • brain-computer interface, and • facial recognition software.	*But it would be really neat if he could use brain waves because there's always going to be a motor component to eye gaze, and he has a very severe motor impairment.*
AAC ideal physical design	Describes the physical design of an ideal technology as being: • lighter, • smaller, • wearable, • easier to mount	*I'd like it to be lighter and a bit smaller if possible and the attachment system and mounting— that could all be much improved I think*

	• durable	
AAC ideal other	Described other features of ideal technologies not described above.	

THEME 3: CHILD NEEDS AND SKILLS: Describes the developmental, communication, or psychosocial needs and skills of the child.

Subtheme 3.1: Developmental needs and skills: Describes the motor, cognitive, sensory-perceptual, or psychosocial skills and needs of the child.

Code	Definition	Example data
Child developmental motor	Describes the child's fine or gross motor skills including: • ambulation, • finger isolation, • use of a wheelchair to achieve mobility, • motor control • spasticity.	*We're just getting to the point where she can isolate her pointer finger. And so we do a lot of activities with that because that's how she's going to be able to progress to more squares.*
Child developmental cognition	Describes the child's cognitive skills including: • attention, • memory, and/or • intelligence	*He is such a bright person. The school district assessed him and he is definitely age- appropriate cognitively*
Child developmental sensory-perception	Describes the child's vision or hearing including: • vision loss/limitations • cortical visual impairment. • hearing loss • hearing aids	*Some of the issues that we didn't realize we were going to have was the vision issue. So the CVI… so she wasn't totally blind. They called her technically blind at one point.*
Child developmental psychosocial	Describes the child's attitude, motivation, self-advocacy, or personality, including: • the child's feelings about communication or another task that are charged with emotion. (attitude) • the child's drive to communicate or complete other tasks (motivation) • how the child makes his/her needs know to others (self-advocacy) • the child's demeanor, such as being witty, funny, likes to make people laugh (personality)	*And he'll tug on my arm and point to the talker and, that's how I'll know he wants me to add the characters from this movie or he wants to be able to talk about this TV show.*

Subtheme 3.2: Communication needs and skills: Describes the child's operational, linguistic, social, or operational skills.		
Code	**Definition**	**Example data**
Child communication operational	Describes the child using skills that are required to use technically operate the AAC system. This includes: • turning on/off device • changing languages or volume • navigating between pages/displays • use of selection technique (e.g., eye gaze) • use of other programs and communication tools (e.g., email, internet, camera, social media)	*It has groups, so he can hit groups and then he's had to learn, like, the farm animals are under this button.*
Child communication linguistic	Describes the child's receptive and expressive language skills in the native language of community and in language code of AAC system. This includes: • combining symbols on the AAC technology (syntax) • Using vocabulary concepts on the AAC system (semantics) • Comprehension of spoken language • Literacy (writing, typing, reading)	*He's able to whip out four to six words without any trouble.* *But her spelling, because she's never been able to sound out her phonics, her spelling is not great.* *She's fully aware of what's going on and understands just as much as anyone else her age would*
Child communication social	Describes the child's pragmatics (skills in initiating, maintaining, and terminating interactions) and interpersonal skills. This includes: • Conversational skills (e.g., taking turns, asking questions, initiating topics) • Using a variety of communicative functions (e.g., requesting, commenting, etc.)	*And he's actually come a long way, he knows that if he starts with, "Hi, what's up?" then that tells people a lot about you. Like oh ok, you communicate age appropriately and that sort of thing*
Child communication strategic	Describes the child using compensatory strategies to maximize the effectiveness and efficiency of their communication. This includes: • Using multiple modalities (e.g., unaided first because faster) • Using telegraphic utterances to increase rate	*If he wants to say something, you know, 90% of the time, he's going to try first with a gesture or his voice. Because it's the fastest way, and we understand him for a lot of basic things.*

	• Using "sounds like" strategies (e.g., "brown knees" for brownies) • Dealing with communication breakdowns	*Well she didn't have the word brownies on her device. So she used the color brown and then the body part knees*

THEME 4: PARENT RESPONSIBILITIES AND PRIORITIES: Describes the parents' roles related to supporting their child and his/her communication, as well as their goals and priorities for their child.
Subtheme 4.1 Parent roles: Describes the parents' role in supporting their child, that includes: advocacy, leadership, educating, preparing for the future, performing device related roles, using various partner interaction strategies, and everyday parenting responsibilities.

Code	Definition	Example data
Parent role leadership	Parents describe playing a big role in supporting their child and their child's communication. This could involve: • managing multiple responsibilities, • taking the lead on organizing services, etc. • being an expert on the child and his/her needs (e.g., interpreting nonverbal communication.	*I think I have a big role and I actually sometimes have to remind myself to have less of a role because you know I was the one who did the research and found the device*
Parent role advocacy	Parents describe their role as being "pushy" or demanding by: • standing up for their child's needs and • making their child's needs known to other communication partners	*We were fighting for a long time to try and get the school district to do what we wanted*
Parent role educating	Describes the parents' role of educating: • themselves on AAC (e.g., reading, researching), • educating others (e.g., showing care aides how to setup device) and • educating society.	*I went in and kind of trained them [school professionals] how to use it and what worked at home.*
Parent role preparing (for future)	Describes parents as supporting the independence/autonomy of their child and reinforcing the value of communication.	*I'm his mom and I know where I want him to be as an adult and I feel like, it's kind of my responsibility to get him there.*
Parent role device (related)	Describes specific technology related roles such as: • programming and adding vocabulary, • technical upkeep (e.g., finding software to use, running updates), • providing access to AAC, and	*It's always me that gets to do all the tech stuff with it. So when she wants vocabulary added or if we need to reprogram something or check out some new software for her to paint with or play music with, or anything like that.*

	• supporting the child's navigation on the device	
Parent role interaction (strategies)	Describes the use of various partner interaction strategies to support the child's communication including: • modeling/aided input, • prompting, • providing wait time, • contingent responding, • providing choices, • asking questions	*As soon as the talker goes on if we want to encourage him, if he's not jumping right into saying something, we start with like an open-ended phrase. So, my husband will say, "Dad is…"*
Parent role parenting	Describes caregiving responsibilities related to everyday care such as: • feeding, • dressing, • toileting, etc.	*Another aspect of our day that really consumes our time is, since she's on blenderized diet, it takes me 15 minutes to give water…And then 45 minutes later, so everything is cleared, then I can feed her.*
Parent role other	Describes other roles not described above.	

Subtheme 4.2: Parent goals: Describes the goals and priorities parents identify for their children including linguistic, social, fluency, independence, inclusion, motor, and other goals.

Code	Definition	Example
Parent goal linguistic	Parents describe goal for the child to improve his/her morphosyntax, semantics, or literacy skills. This could include: • use of a wider range of vocabulary concepts, • formation of more complex or longer sentences, or • various literacy skills (writing, typing, reading, distinction between written and spoken communication)	*Literacy is something that I would like to see her achieve because I think it would be a great gift to her and it's you know so very enjoyable.*
Parent goal social	Parents describe goal for child to improve his/her pragmatics (skills in initiating, maintaining, and terminating interactions) and interpersonal skills. This could include: • social communication with peers, • looking at partners, • conversational skills, • having a greater number and variety of partners	*I would like to see him being able to respond to conversation with some kind of wit or some kind of, other than, "that's funny" because he says that a lot".*

Parent goal fluent (communication)	Parents describe a goal for their child's communication to be faster and more efficient.	*I think the next thing which we're working on with speech and language therapy and experts that support them are faster— programs to make it faster.*
Parent goal independence	Parents describe a goal for their child to achieve greater autonomy. This could be by using environmental controls on device and/or using AAC across various settings.	*I can foresee him being able to be more independent if he can use his communication device to control the lights in his house or the locks on the doors. I think that would be really great for him*
Parent goal inclusion	Parents describe a goal for their child to be included, for example, in: • a mainstream school, • with typically developing peers, • in society, • by a variety of partners	*We feel really strongly about inclusion, and being around typical children. And so to me it's really important for him to stay with, you know, the peers that we live near and that his brother is friends with*
Parent goal motor	Parents describe a goal related to motor skills (e.g., being able to help more with mobility such as standing and transferring)	*Right now he's really heavy. So my big things for him—I need him to either stand or help more with transfers—like he's just really getting heavy, so we've been kind of working on having him help a little bit with that.*
Parent goal other	Parents describe a goal not encompassed in the codes above.	

THEME 5: AAC PROCESS AND DECISION MAKING: Describes the process of acquiring and learning technologies, collaborating with professionals, and the changes that occur over time. It also includes the feelings and emotional responses of parents to this process.
Subtheme 5.1: Device selection/acquisition and customization: Describes the process of acquiring and customizing the device, as well as trialing various low-tech and unaided communication modes and determining the most appropriate ones. Also describes the process of learning technologies for parents (families) and their children.

Code	Definition	Example data
Process selection and learning	Describes the process of acquiring the AAC technology and customizing it. This also includes the process of trialing various low-tech and unaided methods of communication. Specific examples/descriptions included are: • trailing different devices and selection techniques, • AAC assessment, • funding,	*We bought the device, we haven't even, you know, gone through any sort of AAC trialing with the school.*

	• time for acquisition, • cost of technology, • parents taking a leadership role in device acquisition (i.e., purchasing device) • changing the number of symbols Describes the process of learning technologies and various forms of AAC for children and their families. This includes a description of: • the child's history of AAC use (e.g., when started using AAC); • cost of learning (e.g., steep learning curve); • trial and error (e.g., "learning as we go"); • lack of training for parents/families; • independent exploration for the child • having a separate tablet for "fun" for the child	*I didn't really know what I was doing, I was trying to figure it out on my own for a while, probably about a year.*
Subtheme 5.2: Feelings and emotional responses: Describes the feelings and emotional responses of parents and family members throughout the process of supporting their child to use AAC.	
Process feelings	Describes feelings and emotional responses of parents including: • accepting diagnosis and lack of speech/communication • feelings about the future (e.g., hopeful, unsure) • managing competing demands of parenthood and AAC	*You know, we can handle her struggling to eat, we can handle the mobility issues, but its's the speech-or-in any form. You know we would take any kind of form.*
Subtheme 5.3: Changes over time: Describes transitions, progress or technology changes that occur over time for the child and parents.	
Process transitions	Describes transitions, for example: • starting a new school • new therapists/professionals • new AAC system	*We're going to have to start over. It's a whole new group of professionals all new people, we have to make our case again for what we want.*
Process progress	Describes progress of the child or parents over time. This could include:	*His MLU has grown pretty tremendously in the past year and a half it's up from one to maybe 3, 4.*

	• improved communication skills for the child • fewer behavioral issues • more use of device in community by parents • etc.	*Amazing. and he's starting to use core a lot more frequently.*
Process technology changes	Describes changes in technologies over time, for example: • new software released • more vocabulary available • different voices released • etc.	*The devices have already changed so much since she was two. I can't imagine that by the time she is an adult, they won't be … you know things that – things I can't even think of or something astounding.*

Subtheme 5.4: Collaboration with professionals: Describes the parent-professional relationship, professional-professional relationship, or characteristics of the professionals.		
Code	**Definition**	**Example data**
Process collaboration positive	Describes positive relationships that parents have with professionals. This includes: • supportive professionals • getting professional "buy-in" • professionals are well educated and informed about AAC, OR are willing to learn • professionals help parents to set up device • professionals provide training, recommendations, information to parents • professionals provide training to school staff	*I think a lot of what she does is give me information. You know, educate me and I then can help navigate.*
Process collaboration negative	Describes negative relationships with professionals. This includes: • uneducated professionals • professional lack of time or large caseloads • professionals disinterested in learning about AAC • mistrusting professionals (don't believe what parents tell them child can do) • professionals disagree with parents about what child is capable of	*The biggest stumbling block that we have is that teachers and SLPs are not familiar with AAC. They don't know anything about or, or what they do know is wrong.*

Theme 6: Description and Uncoded: Used for comments that describe the child, but are unrelated to developmental, psychosocial, or communication. Also used for descriptions of the parent/family unrelated to roles and responsibilities. Uncoded comments include interviewer questions, participant questions, and comments unrelated to child, parent or AAC