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iCan-Play: A Practice Guideline for Assessment and Intervention of Play for Children with Severe Multiple Disabilities

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iCan-Play: A Practice Guideline for Assessment and Intervention of Play for Children with Severe Multiple Disabilities

Abstract

The nature of play in children with severe multiple disabilities (SMD) is complex, as many have significant motor and language impairments. Through the use of assistive technology (AT), children with SMD can play more independently and provide input to caregivers on their preferred play repertoire. This author-developed guideline describes an assessment and intervention to improve play in children with SMD using AT methods. The Interactive Child Activity Narrative of Play (iCan-Play) is an assessment tool used to evaluate play in children with SMD. It provides a comprehensive understanding of children's play preferences, social and environmental contexts, and frequency of play. The iCan-Play assessment results in a play profile and guides a systematic intervention aimed to address barriers and facilitators of play in children with SMD. The goal is to guide therapists on how to expand play, promote developmentally appropriate play, and assist play by creating meaningful and client-centered goals.

Comments

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Keywords

assistive technology, play, severe multiple disabilities

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Credentials Display

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iCan-Play guideline

Play is the primary occupation and a right of all children. Through play and playful engagement, children learn language, pre-academic, social, gross and fine motor, and psychosocial skills (Piaget, 1962; Ruble & McGrew, 2013). Play in its truest form can be defined as an activity through which children are given freedom, choice, and control (Sheridan et al., 2011) to express their creativity and curiosity and to participate in a self-initiated activity that allows suspension of reality, exploration, and that is fun to do (Bundy, 1997; Skard & Bundy, 2008). However, for children with severe multiple disabilities (SMD), play can be difficult because of physical and language limitations and, thus, may become a neglected or even forgotten occupation (Missiuna & Pollock, 1991; Van den Heuvel et al., 2015). By definition, play is a self-initiated process that supports a multitude of skills. The nature of play in children with SMD is different from that of typically developing children. Children with SMD are likely more dependent on their caregivers at home and school for the types of play and activities presented to them, as they have difficulty with physically accessing, retrieving, and asking for their preferred activities, resulting in play primarily through hand over hand techniques or play by watching others (Deluca et al., 2006). When children are presented with limited options of toys or activities to explore because of their functional impairments, they miss the opportunity to expand on their play development and overall development (Chantry & Dunford, 2010; Van den Heuvel et al., 2015).

Characteristics of children with SMD may include, but are not limited to, chronic medical conditions and continuous need for medical care, use of medical device(s) (tracheostomy tube, feeding tubes, wheelchair, etc.), severe physical limitations that can be combined with language deficits (Nakken & Vlaskamp, 2007), sensory or visual impairments, and cognitive impairments. Recent studies regarding play in children with complex needs have focused on using play as part of therapy to accomplish a motor or functional goal instead of improving play as a meaningful, fun occupation for the children (Lynch et al., 2018; Miller-Kuhaneck et al., 2013). Despite ongoing medical needs and physical barriers, the literature describes children with SMD as having similar leisure preferences to typically developing children. They enjoy socializing with peers and adults; they want to engage in physical play; they like reading books and watching movies; and they enjoy electronic play, such as computer and video games (Chantry & Dunford, 2010).

Children with SMD can encounter barriers in their play participation. They are at a higher risk for low and passive engagement in play activities (Parkes et al., 2010) and they lack opportunities to self-initiate and self-direct play (Pfeifer et al., 2011). Children with SMD may depend on others to pursue a play activity and participate (Beauchamp et al., 2018; Graham et al., 2014). They experience a reduced ability to self-initiate and control their environment, thus missing the true meaning of play as an occupation, which further impacts their interest in play and their self-esteem (Bundy,1997; Parham & Fazio, 2008). In addition, the contexts in which they play may be limited to school therapy sessions or play with an adult who can help them set up their play scenarios (Graham et al., 2014). Thus, the act of play becomes less spontaneous.

There is a dearth of literature on play evaluations and interventions for children with SMD. The majority of existing play assessments require children to be ambulatory, to have sufficient verbal and gross motor skills, and to have the ability to manipulate objects with their hands (Lynch et al., 2018), thus they are difficult to administer in children with SMD (Wessel & Van der Putten, 2017). Current assessments and interventions examin the relationship of play and cognition, quality of play, play habits and preferences, and developmental play stages, but they do not address the needs of children with SMD.

To address the gap in the literature regarding the assessment and intervention of play in children with SMD, an author-developed guideline to assessment and intervention has been established. The guideline uses an accessible platform for children with SMD to participate and assess the preferences, desires, and contexts of play. It also provides a treatment protocol that aims to maximize engagement in play for this population.

Theoretical Framework

The Interactive Child Activity Narrative of Play (iCan-Play) is an evaluation and intervention framework to guide clinicians who work with children with SMD. The framework combines principles from the theories of self-determination and self-efficacy (Deci & Ryan, 2002): Takata's theory of play development (Takata, 1974), Vygotsky's theory of learning and development (Vygotsky, 1978), and the Human Activity Assistive Technology (HAAT) model (Cook & Hussey, 2002) to design an accessible assessment for play (the iCan-Play assessment) and an intervention to facilitate self-initiated play in children with SMD.

Theory of Self-Determination and Self-Efficacy

The theory of self-determination (Deci & Ryan, 2002) is a framework that aims to understand contextual factors that can support or undermine a person's sense of self-initiative, volitional decisionmaking, and motivation to pursue their goals and aspirations. The framework provides useful constructs to help understand self-initiated engagement in play in children with SMD and the role of task and environment conditions in facilitating or hindering play. Specifically, the concept of autonomy support proposes the creation of social and activity conditions that encourage voluntary actions that stem from the children's interests and not from external pressures. Autonomy support further refers to children's perceptions of their communication space and social environment, as such that provides choices and options, acknowledges preferences and interests, and provides rationale when suggesting choices and alternative actions. Higher levels of autonomy encourage self-direction and autonomy, a sense of competence, and relatedness. In addition to autonomy support, the construct of self-direction "refers to being the perceived origin or source of one's own behavior" (Deci & Ryan, 2002, p. 8), in this case play. Competence is "feeling effective in one's ongoing interactions with the social environment and experiencing opportunities to play and express one's capacities" (Deci & Ryan, 2002, p. 7). Relatedness is the desire to feel connected to others in the play context and being appreciated as an equal partner in the activity (Deci & Ryan, 2002). Healthy environments that promote play offer higher levels of support as these psychological needs lead to higher levels of self-determined motivation and higher levels of self-initiated activity participation.

Self-efficacy is a main construct in Bandura's theory of social learning (Bandura, 1997). Selfefficacy in play refers to children's confidence to participate in a play activity; their perceived ability to overcome any activity and/or personal barriers; and the ability to self-organize time, effort, and possible actions around the specific play activity (Bandura, 1997). Thus, self-efficacy is very much dependent on the task and can have various levels given the task nature, structure, accessibility, and context. Outcome expectation is a second construct in Bandura's social learning theory and it refers to the predictions children can make about the positive and negative outcomes that can result from participating in play (Bandura, 1997). In the context of social learning theory, self-efficacy has a direct influence on the activity (play) and an indirect relationship to it through outcome expectations. For example, for a child with SMD their confidence in their ability to self-organize their play activity (i.e., actions, material, time and timing, effort [self-efficacy]) is highly likely to influence their level of engagement in the activity. Their ability to predict the outcomes of their activity and their success levels will further determine their confidence and future engagement with this play activity (Lyons et al., 2017).

Takata's Stages of Play Development

Takata's stages of play development is a framework that provides a developmental sequence of play that is based on activities, contexts, and observable actions. The stages of play are influenced by Piaget's stages of cognitive development. The Takata Play Taxonomy (1974) divides play into five stages in which the complexity of the activities and interactions progressively increases. The stages include:

- 1. Sensorimotor play, which involves high levels of exploration; cause-effect toys are interesting and mastered with high volumes of practice.
- 2. Symbolic play, which consists of simple constructional use of materials and objects either for what they are or repurposing them to represent actual objects in the real world (a small car represents a real car). Parallel play is indicative at this phase.
- 3. Dramatic play, which includes cooperative play with intentional use of materials as well as dramatization of reality, role-playing.
- 4. Games with rules, where children engage in rule-based games that require cooperation and have an aspect of competition; this can include board games, sports-related games, crafting projects, selection of hobbies, puzzles, etc.
- 5. Recreation play, which involves team participation and expressed action in sports, groups, or hobbies, which can include dancing, singing, music, books, tabletop games, and team sports. Although Takata's Play Taxonomy is a generalized guide to developmental stages of play, it can provide insight regarding the activities in which children with SMD are interested according to their developmental level and access to learning. Knowing the child's developmental stage can promote success and a positive experience during play activities (Parham & Fazio, 2008; Piaget, 1962).

Vygotsky's Theory of Learning and Development

It is important to provide children with SMD activities that are in their ability to access and comprehend (zone of proximal development) to encourage and advance learning of new skills (Agheana & Folostina, 2015). Vygotsky (1978) describes the zones of proximal development as a range of abilities that is everchanging in which an individual can perform with assistance before reaching mastery. Children with SMD can learn new skills if they are exposed to activities that are accessible to them with the assistance of a peer partner or adult who is more knowledgeable in the skills the activity requires (Chaiklin, 2003). In a supportive, accessible, and guiding environment, children with SMD can use repetition and practice to master new skills (Agheana & Folostina, 2015). According to Vygotsky, when children are presented with activities that are too difficult or beyond their developmental level, they are not able to learn. When presenting novel or more advance activities, the notion of "scaffolding" is very important. Through the scaffolding process, the learner is guided through a step-by-step learning process and has many opportunities to observe and practice the new skill (Chaiklin, 2003).

Human Activity Assistive Technology (HAAT) Model

The HAAT model is a framework (Cook & Hussey, 2002) commonly used in the field of Assistive Technology (AT). It places the focus on the human user (instead of the technological device) as an intrinsic enabler and operator who has underlying abilities to perform a task. It classifies AT as an extrinsic enabler, which allows humans to interact with an activity via a human-technology interface in

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specific environments. The framework emphasizes the need of ongoing evaluations of the AT device to match the individual's social and environmental context and current life situation to prevent abandonment of a device (Cook & Hussey, 2002). Factors to consider to prevent abandonment of AT in children include acceptance of disability, caregiver training, providing opportunities to use the device throughout the day, and respecting the child's and family's preferences for the device (Van Niekerk et al., 2018). The HAAT model strives to improve occupational performance and participation, maximize the potential of the person interacting with a task or the environment, and has direct applications to assessment and intervention planning (Cook & Hussey, 2002). The HAAT model describes activities as they may be related to the current life roles of the user. For children with SMD, that includes their primary occupation of play. The HAAT model emphasizes that AT is to be the means for children with SMD to engage in functional activities ranging from self-care, academics, communication, and play. The use of AT for children with SMD uses their strengths (i.e., active and purposeful movement, cognition) and maximizes their participation in their daily activities and lives (Burkhart, 2018). In addition, the HAAT model suggests that activities are context-dependent and that one adaptation or equipment may work in one context but not in another (Cook & Hussey, 2002). For example, a child with SMD may like using a gaze-based device indoors; however, when at the park, there may be too much glare that makes it difficult for them to use and they would prefer a paper-based instrument. AT can be used for evaluation and intervention planning to improve play in children with SMD, with emphasis to modify and adapt self-reported preferred play activities and maximize children's interaction with them. Active participation in the evaluation and intervention process maximizes the potential individual choices and decisions and empowers children with SMD to further expand their play experiences.

iCan-Play: An Assessment and Intervention Framework to Understand and Facilitate Play in Children with SMD

A comprehensive guide of assessment and intervention of play in children with SMD should include the use of the child's preferred AT to help them communicate their needs and answers. *Principles of Assessment*

The iCan-Play tool (see Appendix) evaluates the self-perception of frequency, desire, method, social context, and environmental context in which the play of children with SMD occurs. The iCan-Play tool empowers children with SMD through a self-perception evaluation of their play repertoire that will generate an individualized play profile for each child. Principles of autonomy support are used to design the instructions and response facilitation process. The iCan-Play tool is designed to be administered individually to school age children between 5 and 18 years of ages. It is currently undergoing validity and reliability studies. The tool can help guide therapists to determine which activities are most meaningful to the child and which activities should be part of future goals for the child. There are currently several play assessments used, most of which are observation based or require a high level of performance in gross and fine motor skills and communication skills, that are difficult for this population (Deluca et al., 2006).

Because of the highly individualized nature of accessibility in children with SMD, the iCan-Play assessment tool is criterion referenced ipsative and non-standardized. It uses the children's communication strengths to answer a variety of questions related to their current play behavior and preferences. It measures the areas of activity preferences, frequency of the activities, play desires, social context, environmental context, and preferred method of play (physical or electronic play). In addition,

the iCan-Play assessment divides activities based on sensorimotor phase, symbolic phase, dramatic/constructive play phase, games with rules, and recreation phase. The iCan-Play tool is designed to be administered individually and can be completed throughout multiple sessions, depending on the child's needs.

For the iCan-Play to be administered correctly and successfully there two steps that clinicians need to follow. The first step is to identify the child's access method. Prior to assessment, the therapist should be aware of the child's best access method for self-expression and self-initiation. An access method is a reliable way that the child can make requests; answer questions; and participate with their activities, interactions with others, and the environment. The access method can be one or multiple and it can be verbal, gestural, or physical, using any available means of intentional movement (Burkhart, 2018). Because of the complex nature of children with SMD, the child's methods of assessment should be individualized and can involve any active movement, ranging from blinking, smiling, nodding, lifting an arm, turning their head, staring, or some other motion. When evaluating a child's access method, a therapist is to use skilled observation to determine the active movements that the child uses, how the child indicates their wants and needs (i.e., making requests), or how the child initiates engagement with others. It is imperative to let the child guide the therapist through this process. Skilled observation and interaction can help the therapist build on an active movement that the child may already have been using in a functional manner. In addition, the more access methods children have, the greater opportunities they have to actively participate with activities and the environment. For example, if a child's access method is reaching to activate a switch to turn on bubbles with his or her left hand, he or she may also be using head rotation to activate another switch to make a comment and socialize with peers. Creating an access methods profile is the first important step for a true self-directed play evaluation and intervention process.

The second step is to pair the child's access method with a low, mid, or high technology assistive device to maximize self-efficacy. Despite a child's physical limitations, any small or large movements can be used and trained to activate a switch and further impact intentional interactions with an activity, others, and the environment (Burkhart, 2018). Therapists should be mindful of the types of AT being used, the amount of pressure needed to activate a device, the endurance it requires to continue using a device, as well as the mounting and positioning of the child in relation to the device itself and the activity or interaction. It is critical that the initial stages of using a device are a positive experience for the child to create a purposeful and motivating task to provide autonomy and create conditions of relatedness and self-efficacy (Beauchamp et al., 2018). Considering the various developmental and cognitive levels of children with SMD, it is important to let them have the opportunity to explore and meet them at their level.

Therapists can use the iCan-Play tool to ask a range of questions about various activities in each developmental phase followed by questions about the domains of frequency of play, play desires, play references, social context (Who do you play with?), and environmental context (Where do you play?). If the child does not indicate preference or desire of that play activity, questions regarding social and environmental context do not need to be asked. Assessment starts from the developmental level that the therapist estimates the child is at and can move toward earlier stages of play or higher levels of play. At the end of the assessment, children will be asked to rank the top five activities on which they would like to focus and learn. Based on the results, therapists will be able to identify facilitators and barriers of the child's play patterns. For example, if children only indicate that they play at school, then parents can be

trained for play activities at home. The results of the assessment can also be used to create and guide future client-centered goals.

Essential Elements of the iCan-Play Framework

The iCan-Play assessment tool was developed combining principles from the frameworks described above with the intent to support self-directed, self-initiated play in children with SMD. There are five essential elements in the iCan-Play framework: (a) It is a truly client-centered approach to the evaluation of play; (b) it provides opportunities for holistic exploration of meaningful play activities for the children; (c) it uses AT to increase active involvement, engagement, and performance of children in play; (d) it includes the child's perspectives about their caregiver, teacher, sibling, and peer interaction in the context of play; and (e) it focuses on the analysis of person-context match to optimize play performance (i.e., self-initiation, self-expression, etc.) (see Figure 1).

Figure 1





Client-Centered Approach to Evaluation of Play in Children with SMD

One of the principle tenants of the iCan-Play tool is that it is a client-centered and client-driven tool that summarizes the child's perception of their current barriers and facilitators of play. The tool encourages self-chosen play goals that the child can work toward. Because of the complex communication needs of children with SMD, they do not always have the means to express their play desires and preferences. The client-centered nature of this assessment will help guide goal-setting and intervention. Client-centered characteristics include providing access to selection and choice for children with SMD, creating an interaction that focuses on their perspective and preferences, and recording a current profile rather than a level of performance.

Holistic Exploration of Meaningful Play Activities

Because of the physical limitations of children with SMD, they are often exposed to a narrow range of activities that they can perform independently that may hinder their growth. Hence, finding the appropriate toys and activities for them can be challenging for parents, caregivers, and therapists

iCan-Play guideline

(Graham et al., 2014). Most of the time what is appropriate or chosen is the toy or game that seems accessible but not necessarily desired. The iCan-Play tool takes children through the exploration of a variety of play activities on the iCan-Play assessment; children can experience and reflect on various activities they would like to try. This process may expand what they thought they can do during play, create new interests on a potentially wider range of tasks, and it can help optimize children's occupational engagement and performance in play (Dean et al., 2019). The focus on exploration of meaningful play is the child's level of engagement either through doing, watching, or commenting, thus, expanding on the child's play options and possibilities.

Holistic exploration of play entails exploration of the different methods of play. During the evaluation process children experience options of physical play, adapted play, and electronic play. Physical play is typical play, where children directly engage with their preferred objects using their body. Adapted play is interacting with preferred objects using adaptations (e.g., a switch to activate bubbles, a built-up handle to color, modified joysticks); adapted play expands children's possibilities of using their sensory motor skills and increases exploration and variability of actions and activities. Electronic play also increases the variability of play contexts and experiences that may not be available to children in real life (e.g., going on a rollercoaster, going skiing, pretending to be a shark to catch fish). Electronic play occurs on a screen where the child can engage with the games through the child's access method to increase independence. Electronic play also allows for different developmental stages of play. This process of holistic exploration provides what self-determination theory proposes as faciliatory to autonomy (Deci & Ryan, 2002). Offering choices that are possible, fully understood, and rationalized by the children empowers them to understand what they actually want to do.

Using Assistive Technology to Increase Active Involvement, Engagement, and Performance

This essential element is crucial to the assessment and intervention of play in children with SMD. The iCan-Play assessment tool will address active involvement through adapting the format of the assessment to meet the child's communication needs, such as gazed-based devices, switch use, and direct touch selection. Through active involvement, it can facilitate a sense of empowerment, and for children, assure them that their opinions are valued (Deci & Ryan, 2002) and increase their quality of life (Lyons et al., 2017).

The AT approach is crucial for this practice model as it increases the independence of children with SMD and allows them to express desires, wants, and needs (Lyons et al., 2017). The majority of children with SMD use or will use a form of AT in their lifetime to either help them communicate or to access their environment and access their education or vocational needs (Cook & Hussey, 2002; Parkes et al., 2010). The use of AT in this practice model primarily focuses on augmentative and alternative communication (AAC) devices that will allow children to answer questions about their play repertoire. Without the use of AT, adults can misinterpret or answer for the child, thus, making the activity less meaningful and not client-centered for the child. The iCan-Play tool is adapted to meet various needs and is compatible with eye-gaze capabilities, auditory scanning, use of switch-scanning, and read aloud prompts and animated visuals. Children must have a degree of competence when using their preferred AAC devices to reliably answer assessment questions. Through the use of AT, children with SMD have been seen to have more self-initiated interactions with objects, tasks, and peers (Wessel & Van der Putten, 2017), which will also provide the opportunity for children with SMD to actively engage in the evaluation process.

Caregiver, Teacher, Sibling, and Peer Interaction

Assessing the social interactions of children with SMD is important because their caregivers, teachers, siblings, and peers can assist with the success of play interactions and activities. This essential element focuses on reflection about the individual's (caregiver/teacher/sibling/peer) own perceptions, beliefs, and biases of play in children with SMD and how it will affect the play opportunities and activities to which the children with SMD are exposed. In a study by Graham et al. (2014), some parents believed that children primarily engaged in play in therapy, and some believed that children with SMD played only by observing and commenting while watching typically developing children play (Graham et al., 2014). When we assess caregiver capacity and role, therapists can help understand biases and misconceptions about what constitutes play and how to promote play in a variety of social and physical contexts, which may expand the individual's perceptions about their child's ability to play and to increase engagement in meaningful activities. Training the child's caregivers, therapists, teachers, and peers about the child's wait time, types of cues (verbal, tactile, visual), and ways to provide adaptations is crucial for promoting more successful opportunities and active participation during play. Furthermore, if the child identifies that they play frequently with adults, perhaps arranging time with peers or siblings would be an option to expand the child's social context of play.

Analysis of Person-Context Match to Optimize Play Performance

Play should occur in many aspects of the child's social and environmental context (Dean et al., 2019). Children should have the option to choose who they want to play with, whether it is alone or with a sibling, same-aged peer, therapist, teacher, parents, or caregivers (Wessel & Van der Putten, 2017). Children with SMD interact with more adults than same-aged peers because they require setup assistance for play or because an adult understands the intricacies of how that child plays. The iCan-Play assessment will address children's social and environmental context by asking children with whom they frequently play and where they play for certain activities. Keeping in mind that the person and context are important elements to optimize play performance either as barriers or facilitators of play, one must remember that the goal is to have a balance where the child can comfortably play in many different environments. Most caregivers are aware that children with SMD have difficulty accessing many different contexts, whether it is physical, cultural, or social barriers. Therefore, the person-context match must be evaluated because each child has different interests and each context has various factors that can or cannot be adapted to meet the child's needs. It is best to observe children with SMD in a familiar environment and with the people with whom they are most comfortable to see their true abilities. When assessing in the natural environment, the goal is to assess the child's level of engagement and selfinitiated play, and being in a natural context will help the child feel more comfortable. In addition, some children with SMD have difficulty with generalization of the skill and transfer of knowledge to new environments. If the child is still working on a means of communication using a designated AAC device, they may not be comfortable using it in a new setting. Performance cannot be understood in isolation from the child's natural context, and assessment in the natural context can provide numerous benefits, especially for children with SMD, to meet their medical, physical, social, and cultural needs (Darrah et al., 2011).

Principles of Intervention

Therapists can use the individualized iCan-Play profile that is created during the assessment process to create an intervention plan for the child. The iCan-Play profile presents children's perceptions of their current play desires and goals, their current frequency of play activity, and their social and

iCan-Play guideline

environmental context of play. The iCan-Play profile addresses discrepancies in contexts and activities that should be changed and can serve as a guide to caregivers, teachers, and therapists on how to engage children in meaningful and preferred play during their leisure time. It will also provide information and insight about children's preferences for play, whether it is physical play or electronic play.

The key principles of intervention of play in children with SMD are: partner-assisted play, children's active involvement in play "I CAN," children's development and learning through play, facilitating playfulness during play, and the context of play (see Table 1). The principles of intervention follow the theories of Takata's Play Taxonomy (1974) as it allows the user to follow a sequence of developmental play stages, the theory of self-determination as the child chooses their own activities, and the HAAT model (Cook & Hussey, 2002) to provide accessible play opportunities. In addition, based on the iCan-Play profile and depending on the level of the child, therapists can easily find activities that are developmentally appropriate for the child.

Partner-Assisted Play

Partner-assisted play involves the child's play partner, whether is it a self-chosen partner based on the assessment or an individual that is in the child's day-to-day environment (i.e., parent, paraprofessional, teacher, therapist) that assists with facilitating play activities and opportunities. Partner-assisted play can be used to support autonomy and encourage voluntary action from the child (self-determination process). A play partner who is familiar with the child can help train new people on the team or facilitate interactions with new individuals. When possible, it is important for the child to have a decision about their play partner, play preferences, and desires. Partner-assisted play should always be focused on the child's wants and needs and provide the child with options. The child should participate in the decision-making of the play activity, such as which toy to use, where they would like to put the toy, what they want to do with the toy, etc. The child's play partner should facilitate interactions between the child and another child or adult, or the child and their environment.

Children with SMD often spend more time with adults, such as paraprofessionals at school or caregivers at home, rather than with peers. However, many children with SMD relish the opportunity to be around peers to play with or observe their play. Vygotsky (1978) stated that children benefit from learning from their peers when pairing them with someone that has mastered an activity; it creates opportunities to provide scaffolding to master the activity. Moreover, providing children with a choice of a play partner can also differ between contexts. Based on the HAAT model, types of AT can differ across different contexts. In a new environment, a child with SMD may want a familiar adult to help set up toys and assistive devices or help positioning them in a way that will help them succeed. In a familiar environment, the same child may want the opportunity to explore different play opportunities with peers or by themselves.

Table 1

| | Intervention | Outcomes |
|------------------|---------------------------|--|
| Partner-Assisted | Allow the child to choose | -Autonomy |
| Play | their play partner | -Various partners |
| | Training play partners | -By training the play partners, it will allow for successful play opportunities as they will know what the child needs in different contexts |
| | | -Set-up assistance only and increased play time with peers -Use of play profile and tool kit at their convenience |

iCan-Play Intervention Postulates

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| | Provide child with options | -Autonomy | | | |
|------------------|--|--|--|--|--|
| | Focus on the child's needs | -Learn the child's reaction (wait) time | | | |
| | | -Learn the child's schedule and the time of day they are more | | | |
| | | fatigued or have difficulty participating | | | |
| | | -Meet the child at their level | | | |
| " I CAN" | Familiarize yourself with the child's access methods | -Child-led and child-directed activities will lead to meaningful participation | | | |
| | and device | nterpretation of subtle movements the child uses to communicate | | | |
| | Creativity! | -More opportunities for the child to participate | | | |
| | 5 | -Increased interactions with peers, siblings, community | | | |
| | Decrease hand over hand | -Increase independence | | | |
| | assistance | -Increase ability to have physical interaction with an item or toy | | | |
| Development and | Developmentally | -Feelings of success and mastery | | | |
| Learning through | appropriate activities | -Increased comprehension of task | | | |
| Play | | -Expansion of current skill | | | |
| Increasing | Modeling | -Allow for engagement with task and playfulness (when | | | |
| Playfulness and | | developmentally appropriate) to advance cognitive development. | | | |
| Engagement with | | This can be achieved through modeling activities of playfulness, | | | |
| Task | | using motivating activities, and reducing distractions. | | | |
| | Expression | -Allow for the child to learn what it means to engage in an activity | | | |
| | | and to express themselves through play, to be silly, use imagination, suspend reality (i.e., dress up) | | | |
| Context of | Identifying barriers | -Therapists can provide training to individuals in the child's life | | | |
| Treatment | | - Provide environmental and physical adaptations to increase | | | |
| | | independent play | | | |
| | Identifying facilitators | -Train caregivers on how to expand the child's engagement and expand on activities | | | |
| | | -Task-analysis and identify facilitators of play and generalize it to | | | |
| | | all activities to ensure success | | | |
| | | an activities to ensure success | | | |
| | Training of caregivers | -Use of play profile and tool kit for activities to do in different contexts | | | |

"I CAN": Assistive Technology Assistance for Play

The "I CAN" part of the intervention should focus on grading the activities with the use of AT and creating as many successful play opportunities as possible. The grading of activities and providing the just right challenge aligns with Vygotsky's (1978) theory of learning and development of starting with the child's abilities and scaffolding more advanced activities to further learning. When starting with a child's strength (i.e., one access method), the therapist can provide various play opportunities (different games, same access method) and repetition until they have mastered the skill. From there, the therapist can expand on a particular physical movement to incorporate various adaptations. Principles of the HAAT model place emphasis on participation and not on the device itself and on-going need for assessment is crucial to this stage of intervention (Cook & Hussey, 2002). The use of AT can be a range from low-technology adaptations, mid-technology adaptations, and high-technology adaptations. Lowtechnology adaptations are simple adaptations that do not require electronics; this can be a built-up holder, PVC pipe, or stylus. Mid-tech adaptations are items such as a switch, Powerlink, switch interface, and accessible toys; and high-tech adaptations are computers and gaze-based devices. With the help of AT and grading of activities, children with all physical abilities should be able to engage in play more actively and become an active participant in choosing their activities to interacting with materials despite their physical limitations. Thus, eliminating or decreasing the use of hand assistance during play

and increasing self-efficacy and confidence. The physical interaction and exploration between the child and a toy or an activity should be emphasized during the intervention.

Development and Learning Through Play

Takata's Play Taxonomy serves as a developmental guide through the iCan-Play assessment and the iCan-Play profile for intervention. The taxonomy guides the therapist by providing possible task modifications, grading of activities, or future activities to work toward. A crucial aspect of intervention of play in children with SMD is engaging them with developmentally appropriate activities. Results from the iCan-Play assessment will provide information about the developmental level of play that the child is in or would like to expand on further. When children are presented with activities that are not developmentally appropriate, there is a risk of disengagement from the activity. Meeting the child at his or her developmental level can have many benefits, such as increased comprehension of the activity sequence and feelings of success and mastery. The iCan-Play profile will encourage therapists to create a list of toys and games that are selected by the child or are in the same developmental level and can be accessed by the child during their leisure time.

Increasing Playfulness

Playfulness is engagement and it is motivational. When modeling playful interactions, we create and instill values of autonomy (deviation from typical object use) and competence (as in pretend play, there are not any rules) (Deci & Ryan, 2002) in children who have difficulty expressing themselves through verbal means. Allowing the child to explore and deviate from the intended play activity will allow the child to be playful. Playfulness is part of play and will encourage pretend play opportunities (Lynch et al., 2018). Modeling examples of being playful will help increase the child's understanding of what it means to be playful and how to do it. Children have better self-efficacy and confidence in their skills when they feel that they are in control, which allows them to actively engage in tasks with greater ease (Bandura, 1997). Developmental play stages that allow many playfulness opportunities are especially seen in the symbolic and dramatic play stage. The iCan-Play profile will help therapists generate a play kit based on the child's results, and it will provide suggested activities and toys and examples for therapists, caregivers, and teachers on how to deviate from an activity to increase playfulness.

Context of Treatment

The results from the iCan-Play profile assessment will also highlight the child's perception about the social and environmental context of play. If the child answers that outdoor play mostly occurs at school, the therapists should investigate why that is happening and how to bridge the gap to ensure that play opportunities are occurring in all contexts. In addition, the context of play can also serve as an intervention to generalize already mastered play skills. Generalization of play skills can occur in a different physical, social, or temporal context. All children should have the opportunity to play, whether it is at school, home, in the community, or at the hospital. The therapist or caregivers should adapt his or her recommendation based on the child's physical or medical conditions. The context of play aligns with one of the main tenants of the HAAT model where the environment is always changing, whereas the human-technology interface can adapt. Thus, the context of treatment is crucial to evaluate and assess to ensure successful activities and technology to support it.

Conclusion

Focusing on the active participation and the needs of children with SMD during play activities is of the utmost importance. They should have the opportunity to communicate with

individuals around them on what they want to play, with whom they want to play, and where they want to play. By incorporating the use of AT in the evaluation and intervention process, the children will have more autonomy in choosing and expanding on their play options. The iCan-Play evaluation tool that will assess the play repertoire of children with SMD, ranging from their play desires to the social and environmental contexts. The iCan-Play assessment is an accessible platform that will let children with SMD answer questions using their AAC device. This client-centered approach will help guide goalsetting and meaningful interventions for children with SMD. The iCan-Play tool will generate a play profile that will provide information on facilitators and barriers of play for the child. The essential elements provide therapists with directions on how to evaluate and treat play in children with SMD. The iCan-Play guideline for practice provides therapists with a hands-on and direct treatment approach on how to incorporate meaningful activities and play at school, home, and in their communities. The interventions encourage therapists to use their expertise in task-analysis to maximize play opportunities in a variety of contexts. The iCan-Play tool encapsulates the root of the occupational therapy profession of building on client's strengths (active movement and use of AT), using a client-centered approach (allowing clients to choose meaningful activities), and believing that all children have the right to engage in their primary occupation of play.

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Appendix I-Can Play Questionnaire

| Activity | Do you like this activity? | Frequency Do you do this often? | do you want do this more? ⊑ ☺ | Social Context: Whodoyoudothis with? | Environmental Context: Where do you do this activity? |
|---|----------------------------------|---------------------------------------|-------------------------------------|--|---|
| | | | | Choose all that apply | Choose all that apply |
| Sensorimotor Play | | | | Alone (1) With Friends (2) With Adults (3) | Home (1) School (2) Community (3) |
| Flipping through pages of a book - Physical (use picture books with | | | | | |
| preferred themes) Electronic (electronic picture books that have a 3 to 6 page sequence) | | — © | | | |
| Environmental / Object Interaction Using senses to anticipate something to happen using cause-effect toys Visual Physical (i.e., toys with lights) Electronic (i.e games on activation shows big patterns/faces/colors; fireworks) | | □ © □ ⊗ | ☐ © ☐ © | | |
| Auditory Physical (musical instruments) Electronic (on activation it will make a loud/funny noise) | | □ ⊗ □ ⊗ | — 8 — 8 | | |