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Development and Content Validity of the Participation and Sensory Environment Questionnaire

Beth Pfeiffer, PhD, OTR/L, BCP [Associate Professor],

Department of Rehabilitation Sciences, Temple University, Philadelphia, Pennsylvania

Wendy Coster, PhD, OTR/L, FAOTA [Professor and Chair],

Department of Occupational Therapy, Boston University, Boston, Massachusetts

Carole Tucker, PT, PhD, PCS, RCEP [Associate Professor], and

Department of Physical Therapy, Temple University, Philadelphia, Pennsylvania

Aimee Piller, PhD, OTR/L [Lead Therapist]

Piller Child Development, LLC, Phoenix, Arizona

Abstract

Qualitative methodology was used to develop items for a questionnaire designed to examine the perspectives of parents regarding the impact of the sensory environment on participation for children aged 3 to 5 who have autism spectrum disorders (ASD). A total of 34 parents/caregivers of children with ASD and 8 experts in ASD and/or measurement completed qualitative interviews for concept, content review, and cognitive interviewing. The result was a pool of 35 items for home/community domains for 3 scales. The outcome of this study was the development and content validation of the Participation and Sensory Environment Questionnaire (PSEQ).

Keywords

Autism; sensory; environment; participation; effort

Introduction

The ability to participate in common daily activities can have a profound impact on the everyday functioning and life of young children, as well as their families and caregivers. For people with autism spectrum disorders (ASD), participation is often limited by a lack of fit between individual person characteristics associated with symptoms of ASD (e.g., sensory processing, and speech and language skills) and environmental factors (e.g., social demands, sensory stimuli, and physical attributes). Recent research establishes the importance of

Address correspondence to: Aimee Piller, PhD, OTR/L, PO Box 50218, Phoenix, AZ 85076, Aimee.piller@PillerChildDevelopment.com.

Declaration of interest

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independence in daily activities for quality of life in young children with ASD. When compared to the severity of ASD symptoms, higher levels of independence in daily tasks is more strongly associated with better quality of life for both the child and the family (Gardiner & Iarocci, 2015). One factor identified as affecting performance in daily activities for children with ASD is the fit between the child's sensory processing patterns and the sensory environment (Hochhauser & Engel-Yeger, 2010; Reynolds, Bendixon, Lawrence, & Lane, 2011).

It is estimated that 70–96% of all children with ASD have unusual responses to sensory stimuli in the environment (Baranek, 2002; Ben-Sasson et al., 2009). The presence of abnormal reactivity to sensory stimuli is so pervasive that it is included as a core characteristic of the condition under the *Restrictive and Stereotypic Behaviors* diagnostic criteria in the updated Diagnostic and Statistical Manual of Mental Disorders 5th edition (American Psychiatric Association, 2013). Abnormal responses to sensory stimuli can range from hypersensitivity to hyposensitivity. People who demonstrate behaviors of hypersensitivity often register and react more intensely to sensory stimuli in the environment. For example, a child with hypersensitivity may become distressed by certain noise or bright lights, and subsequently avoid participating in daily activities that occur in environments that have these characteristics (e.g. shopping in a well-lit store, playing with other children). Children with hyposensitivity need more intense sensory input to register a response. For example, a child with hyposensitivity may not become dizzy after spinning or may not recognize or respond to touch from another person. Children may also exhibit sensory seeking behaviors and may seek out intense sensory experiences which affect participation. For example, a child with hyposensitivity to movement may choose to only swing repetitively, rather than to interact with other children or playground equipment. These responses to sensory stimuli in natural environments are reported to have far-reaching effects on the ability to participate in essential life activities, reducing quality of life for both the children with ASD and their families (Hochhauser & Engel-Yeger, 2010; Reynolds et al., 2011; Schaaf, Toth-Cohen, Johnson, Outten, & Benevides, 2011). Interventions that modify the environment (e.g., reducing stimuli or social expectations; changing physical structure) or those intended to modify person factors (e.g., sensory and behavioral treatments; medications) target **an** outcome of enhancing participation in daily activities. Unfortunately, there are only a few instruments that measure the impact of the environment on participation in natural environments for children with ASD within one instrument (Whiteneck & Dijkers, 2009). There are even fewer assessments that specifically measure the sensory characteristics of the environment and their impact on participation. An understanding of the impact of the sensory components of the environment on participation is essential for treatment planning and understanding the efficacy of interventions.

The International Classification of Functioning – Child and Youth version (World Health Organization, 2007) identifies five aspects of the environment that can influence a child's participation. These include products and technology, the natural and built environment, support and relationships, attitudes, values and belief, and services, systems and policies (Law, Petrenchik, King, & Hurley, 2007). Although the sensory environment falls under the natural environment, the construct is not adequately addressed in any of the currently

available pediatric environmental instruments. Five main assessments were identified in the research on environment and participation in children with disabilities. The Home Observation for Measurement of the Environment (Caldwell & Bradley, 2003); Participation and Environment Measure for Children and Youth (PEM-CY) (Coster, et al., 2011); the European Child Environment Questionnaire (Colver et al., 2011); the Environmental Restrictions Questionnaire (Rosenberg, Ratzon, Jarus & Bart, 2010); and the Craig Hospital Inventory of Environmental Factors Parent-Child Version (McCauley et al., 2012) were all reviewed; however, none of these instruments specifically targeted the sensory environment. Additionally, there are well-developed parent report measures including the Sensory Profile (Dunn, 1999; Dunn 2002) and the Sensory Processing Measure (Parham & Ecker, 2007) that assess a child's responses to sensory stimuli. These instruments do not address how the responses to sensory stimuli affect participation in daily activities within natural environments. Of the assessments reviewed, only the PEM-CY (Coster, et al., 2011) considered the sensory environment in the natural setting. Even then, the PEM-CY has only one question that assesses the sensory environmental factors, which affect the global construct of participation, but is not related to individual daily activities. The proposed instrument in this study seeks to examine specifically the impact of the sensory environment on participation of children with ASD within the home and community settings.

Children with ASD have characteristics that may influence their ability to complete standardized tests in a reliable and valid manner, such as difficulties with auditory processing, decreased communication skills, and sensory issues influencing their ability to attend to relevant evaluation tasks. Therefore, a parent report measure is considered an important first step in obtaining information to guide the intervention process as well as to determine outcomes, especially within natural environments. Additionally, for young children with ASD, participation in daily activities occurs most commonly within the context of family activities and relationships occurring in the home and community (Dunst et al., 2002; Swanson, Raab, & Dunst, 2011). Participation is transactional in nature, involving both the child and the family, with families prioritizing and supporting the areas of the child's participation. Because of this important parent role, as well as the unique needs of children with ASD, it is essential to obtain the perspective of the caregivers to understand participation in daily life activities.

The goal of this study was to develop a pool of items for an instrument that assesses parent perspectives concerning the impact of the sensory environment on participation in daily activities for their young children with ASD. The instrument is intended to be domain-specific as contrasted with disease specific, meaning that it intends to measure a core self-reported health concept (Magasi et al., 2012) as compared with the specific characteristics of the ASD condition. In other words, the assessment is designed to assess the impact of ASD, rather than the attributes of ASD. In this initial stage of development, the focus was to establish content validity, an essential step in the development of parent reported instruments. In order to establish content validity, the development process was directed by guidelines from Patient Reported Outcome Measurement Information System (PROMIS) (National Institute of Health [NIH], 2012). Under these guidelines, qualitative interviews provide a fundamental first step in establishing a sound instrument (NIH, 2012). In addition, qualitative methodology was used to develop and modify items for the assessment to

establish content validity (Leidy & Vernon, 2008; Magasi et al., 2012). The outcome of this study was the development of a draft instrument titled the *Participation and Sensory Environment Questionnaire*.

Methods

Researchers used qualitative methodology to develop and evaluate content. This method was chosen to ensure that constructs capture relevant and important outcomes for the target population of children with ASD and their families. Specifically, this was accomplished through three major data gathering steps. First, the parent and caregiver perspectives were obtained through semi-structured interviews, which would make the major concepts operational and refine the conceptual framework for the tool. Second, content experts developed and reviewed an initial set of items for the tool. Finally, cognitive interviews were completed with parents and caregivers to determine whether items were interpreted in the same manner intended by the developers. IRB approval was obtained from the university of the first author prior to implementation of the study. Informed consent was obtained from all participants.

Participants

For inclusion in the study, parents and caregivers had to have children between the ages of 2 to 7 years with a diagnosis of ASD based on criteria from the DSM-IV (Autistic Disorder, Pervasive Development Disorder – Not Otherwise Specific [PDD-NOS], and Asperger Disorder) or the updated DSM-V (Autism Spectrum Disorder). The diagnosis of ASD was confirmed by parent report. We modeled this after studies conducted for the Centers for Disease Control and Prevention's National Center for Health Statistics in children with ASD (Blumberg et al., 2013) that used parental report as the primary inclusion for diagnosis. Research has identified that a parent reported diagnosis is highly reliable in the diagnosis of ASD (Daniels et al., 2012). Diagnoses were confirmed through parent, medical or school reports. Participants were recruited through support groups and agencies that provide services to children with ASD and social media groups targeting families of children with ASD. Interested participants who met the inclusion criteria provided informed consent and demographic information. A total of 34 participants were included in the study. Table 1 provides demographic details of the participants.

Parent/Caregiver interviews

The aim of phase one was to identify key concepts for question development. Semi-structured interviews were completed either by phone or in person at a place convenient for the participant. Guided open-ended questions, along with specific probes, were used to structure the interviews to obtain key experiences (concepts) of the sensory aspects of the environment that affect participation in daily activities from the parent and caregiver perspective. Questions also targeted language used to describe the quality and quantity of these experiences. This information provided guidance for the development of scaling for the tool.

All interviews were digitally recorded and transcribed, and the transcriptions were crosschecked with the recording to ensure accuracy. A content analysis of the transcripts was completed to identify the key concepts related to the sensory environment and the impact on specific daily activities. Text analysis was performed using NVivo, a text management software program (QSR International, 2010) provided initial categories for analysis. Words, phrases and quotes from the interviews were then placed into these categories. Data analysis was continuous and the use of descriptive categories guided the analysis of interviews to identify new content and to add to current categories. The descriptive categories included: 1) daily activity or participation area; 2) sensory environment characteristics; 3) descriptors of experience; and 4) qualifiers to describe experience. Two or more researchers analyzed each transcript to ensure the reliability of the analysis. Data saturation was established by examining concepts from each sequential participant to ensure that no new content and categories emerged and that content was adequately reflected to guide the development of items. Researchers examined the number of participants who identified a concept and the frequency with which concepts were mentioned across participants.

Item generation

Results from the parent/caregiver interviews directed item generation. Items were developed to assess three main concepts identified by the participants: 1) the parental or caregiver effort required to support participation in the activity; 2) the perceived importance of participating in the activity; and 3) the impact of the sensory features of the environment or activity on participation. The following criteria were used to develop each item: a) item included participation in a daily activity identified as relevant and common by the parents and caregivers for their children with ASD in either the home or community environment, b) each item assessed participation in one daily activity, c) item and response options reflected language typically used by parents and caregivers to describe participation experiences, and d) response options represented the range of participation in daily activities of the targeted group.

Content expert review and cognitive interviews

The second phase of the study included three content experts who reviewed items after development. All three were doctoral-level researchers who had specialized training in measurement and experience in research related to ASD. Content experts reviewed items for structure, concept communicated, and wording. Following review by the content experts, an advisory committee of eight experts also reviewed the initial draft of the items. The advisory committee included a group of parents who have children with ASD ($n = 5$) and experts in the areas of ASD and measurement ($n = 3$). The committee reviewed the initial items and provided feedback on the interpretability, scaling, language, and concept understanding through a structured feedback form.

In the final phase of the study, five parents of children with ASD completed cognitive interviews. The purpose of the cognitive interviews was to document the parents' decision making process while completing the measure (Willis, 2005) with the intent of identifying problem areas (e.g., confusion or misunderstanding) when answering the questions. Cognitive interviewing provides a method to determine whether questions were interpreted

as intended (Streiner & Norman, 2008) and provides content validity for a patient-report questionnaire (McDowell, 2006). For cognitive interviews the participants were asked to complete the pilot measure and then participate in an interview to identify the decision making process during completion of each item. The primary researcher facilitated individual cognitive interviews using a protocol with questions examining interpretation of each item, ease of use, and understanding of the language used in the instructions and response scale of the pilot version of the assessment. Interviews were recorded and transcribed for further review by the research team. Items were modified based on the results.

Results

Demographics and clinical characteristics

Thirty-three parents and one caregiver ranging in age from 20–59 participated in parent/caregiver interviews. Of the 33 participants, 5 also provided feedback during the item generation phase and 5 other participants participated in cognitive interviews from the initial concept interview group. The mean age of the children was 4.5 years ($SD = 1.42$). Additional demographic information for both participants and their children are provided in Table 1.

Key concepts and saturation

Saturation was obtained for all the key concepts identified in the interviews with no new key concepts identified after the eighth parent/caregiver interview. Key concepts included: 1) types of daily activities; 2) sensory impact on participation; 3) parental effort; 4) perceived meaningfulness or importance of participating in the daily activities; 5) and strategies to support participation. These are further explained in Table 3.

For this study, researchers defined daily activities as those tasks that commonly occur in the life of the child. Participation was described as the child's involvement in an activity, but it did not require the child to independently complete the activity. For example, a child may or may not have the skills to complete the activity by him/herself but can still participate (e.g. putting arms out to help with a dressing task). Participants identified principal types of activities of daily living in which their children participated in the home and community environment. Many of the activities that were identified initially were encompassed under a broader theme resulting in the final 14 home and 21 community activities of daily living (e.g., vacations to different places; the separate components of dressing). By the 26th interview, there were no new daily activities identified in either the home or community environments, thus indicating data saturation for this concept. A list of the daily activities and the number and percent of participants who identified each specific activity type is provided in Table 2.

The most frequent concepts mentioned in the parent/caregiver interviews were the daily activities. The next most frequently mentioned concept was the sensory impact on participation in daily activities. Participants described the sensory environment as either a barrier or facilitator to participation. The participants also described the two most common

responses to the sensory factors as sensory seeking and sensory hypersensitivity. Seventy-four percent of parents described the concept of sensory seeking as a barrier to participation and 97% identified the concept of sensory hypersensitivity as a barrier to participation. One hundred percent of the parents and caregivers described at least some aspect of the sensory environment as a facilitator to participation for certain activities. Fifty percent of parents described the concept of sensory seeking as a facilitator to participation and 41% identified the concept of sensory hypersensitivity as a facilitator to participation.

Parental and caregiver effort to support the child's participation in daily activities was identified in all 34 of the interviews. Other words commonly used to describe the concept of effort included "enable," "hard," "difficult," "work," "challenge," "strenuous," and "struggle." Participants frequently reported the concept of meaningfulness or importance of the daily activity when discussing effort. The concept of meaningfulness was identified in 10 out of 34 interviews and the concept of importance in 8 out of 34 interviews when also describing their efforts in supporting participation. The other words used to describe the concept of "meaningful" were "significant," "impact," and "special." Participants often described the concept of "important" in reference to daily activities as "stuff we have to do." Participants stated that effort was used to support participation when activities were identified as meaningful or important (28 out of 34 interviews) and they were less likely to support participation for those activities that were not deemed as meaningful or important (22 out of 34 interviews/frequencies). The types of daily living activities reported as meaningful varied among participants. Those daily living activities deemed essential such as eating, grooming tasks, dressing, and toileting were identified across all participants as important. Participant responses varied regarding activities they deemed as "important".

Participants in the parent/caregiver interviews identified the final key concept as strategies to support participation. Strategies were frequently described as ways to reduce effort and increase success in participation and were mentioned in 33 out of the 34 interviews. Parents and caregivers identified two primary categories of strategies and six specific strategies. The first primary strategy identified was to modify the sensory aspects of the environment (e.g., removing the sensory factor or stimulus; increasing certain types of sensory stimuli). This accounted for 3 of the strategies. Such a strategy was identified by 32 of 34 participants. The second primary type of strategy, which encompassed the remaining 3 strategies was to reduce behavioral responses associated with the sensory factors (e.g., preparation, setting a routine, and increasing the child's perception of control). This strategy was identified by 30 of the 34 participants across all daily activities.

Item development and scaling

The draft instrument included two domains, participation in daily activities in the home and participation in the community. Based on findings from the parent/caregiver interviews, items were generated for three subdomains: 1) the impact of the sensory environment on participation in daily activities; 2) the amount of parent or caregiver effort required to support participation; and 3) the perceived meaningfulness or importance of the daily activity. A question was also generated to identify the types of strategies used to support participation for each type of daily activity in the home and community domains.

There were 14 questions for each of the 3 subdomains corresponding to the activities of daily living in the home and 21 questions corresponding to the daily activities for each of the 3 subdomains in the community. The rating scale for measuring parental effort to support participation *and* the impact of the sensory environment on participation ranged numerically from 1 (none) to 5 (too much to participate) with labels used to describe each number in the rating scale (2 – a little; 3 – some; 4 – a lot). A 5-point Likert scale was chosen as it provides enough points of discrimination without having too many response options, which was judged appropriate based on the demographic characteristics of the participants. For the final subdomain measuring the importance of the daily activities, a numerical scale in a Likert format of 1 (not important/essential), 2 (moderately important/essential) and 3 (very important/essential) was used based on quantitative language provided in the parent/caregiver interviews.

An additional section was developed to rank common strategies as follows: 1 (used the most often) to 6 (used the least often) based on how often the strategy was used to support participation in specific daily activities. This was initially developed for each of the daily activities in both the home and community domains. This section went through significant revisions after the cognitive interviews and content expert review, as discussed below.

Item revisions following cognitive interviews and content expert review

A total of five participants were recruited for the cognitive interview portion of the study. Additionally, eight content experts consisting of parents and measurement experts reviewed initial items and provided feedback on the interpretability, scaling, language, and concept understanding through a structured feedback form. Data were gathered through the cognitive interviews and content expert review. Thus, the following changes were made to instructions and items:

1. Changes to instructions. Parents and caregivers reported that certain parts of the instructions needed clarification. To address concerns identified, definitions were added to the instructions in the introductory section defining sensory hypersensitivity and hyposensitivity. Additionally, instructions were modified to clarify that parental effort was the primary construct measured when answering questions about the child's participation. Wording was added to the initial instructions and the words "parental effort" were bolded in the actual question. Finally, definitions for each of the strategies were provided in the actual question as participants reported that it was challenging for them to remember this from the introductory instructions.
2. Modification of the subdomain section. The most significant change in the pilot measure was in the section on strategy use. All the participants who completed the cognitive interviews, and 5 of the content expert reviewers (3 parents and 2 measurement experts) identified this subdomain as burdensome and difficult to understand. Based on feedback provided, this section was revised to include a single item for each of the two main domains of home and community when compared with each of the daily activities, as participants reported that this

section was redundant and that strategies were more environmentally dependent (e.g., home and community) than task specific.

There was no change in the number of items in the instrument. An additional sub question, however, was added to each domain ranking the types of strategy used to support participation. Item examples for the Participation and Sensory Environment Questionnaire (PSEQ) home domain are provided in Table 4 and for the community domain in Table 5.

Discussion and implications

Research has demonstrated that sensory factors, considered a core characteristic of ASD, affect overall participation for individuals with ASD (Reynolds et al., 2011; Schaaf et al., 2011). In order to provide client-centered intervention for best practice and to document outcomes deemed important for children with ASD and their families, it is important to understand how much effort is required to support participation, as well as the impact of the sensory environment on the child's participation in daily activities. As daily activities occur in the natural environment, a parent and caregiver report measure provides insight into the everyday experiences of children and families with ASD that can help guide targeted interventions and be used to measure meaningful outcomes.

The primary goal of this study was to develop a sound parent report measure that assesses the impact of the sensory environment on participation in daily activities. Our findings identified that the sensory environment, as well as the perceived meaningfulness or importance of the daily activity, influenced participation. The PSEQ provides a more extensive look at the impact on the sensory environment of specific daily activities in both home and community settings. The study revealed specific daily activities that participants identified. These activities aligned with occupations outlined by the *Occupational Therapy Practice Framework: Domain & Process (OTPF), Third Edition* (American Occupational Therapy Association, 2014). The daily activities that serve as the basis for the questions in the PSEQ are encompassed within the *OTPF* as occupations and include activities of daily living, instrumental activities of daily living, rest and sleep, play participation, and social participation. Further, parental effort to support participation was deemed the key concept in enabling participation for young children with ASD. These concepts are not fully represented in other instruments (Bradley & Caldwell, 1984; Colver, et al., 2011; Coster, et al., 2011; Rosenberg et al., 2010; McCauley et al., 2012).

A unique concept measured by the PSEQ is parent effort to support participation. Other instruments have measured concepts of parent support and parental stress, which are related, but clearly different concepts. Parent support is often conceptualized as the amount of social support available to the parents of children with ASD when compared with support provided to the child. Both the Multidimensional Scale for Social Support (Zimet, Dahlem, Zimet & Parley 1988) and the Family Support Scale (Dunst, Jenkins, Trivette 1984) were used to measure social supports in research involving parents with ASD. The Autism Parenting Stress Index (Silva & Schalock, 2012), a widely-used measure, assesses the impact of the core and co-morbid conditions of ASD on parental stress. The Aggravation in Parenting Scale was derived from the Parent Stress Index to measure the level of frustration and stress related to caring for their children. It is used with parents of children with ASD (Schieve, et

al. 2011). In contrast, the key concept of parental effort in the PSEQ refers to the amount of effort or work required to support the child who is participating in daily activities. Rather than focusing on the emotional impact on parents, it focuses on what the parents are actually doing to enable their children to participate. This is an active process requiring perceived work effort.

Similar to other instruments measuring participation, the PSEQ includes content assessing the meaningfulness and importance of specific daily activities. The PEM-CY (Coster et al., 2011) and the Canadian Occupational Performance Measure (Law et al., 2014) are two examples of instruments that include some method of considering how meaningful or important the area of participation is to the respondent. An interesting consideration for the current instrument is the relationship between parent effort and choice in supporting participation for their children. Participants qualitatively described as putting more effort into daily activities that were perceived as important or meaningful, but this relationship warrants further quantitative examination. This type of information has the potential to provide insight on where to enhance family support structures.

The process used to develop and establish content validity of the PSEQ followed guidelines recommended by leading measurement experts and PROMIS (Magasi et al., 2011). These guidelines emphasize the importance of stakeholder involvement in the instrument development process. This study included parents and caregivers of children with ASD during interviews to identify key concepts as well as to test items of the initial draft during expert review and cognitive testing. Cognitive interviewing ensured that the targeted population for the instrument could understand the instructions, items and scaling options. Parent and caregiver input was supplemented with measurement experts and literature review.

Possible limitations of this study include a small sample, although it was consistent with the qualitative phase reported in other studies of instrument development. Additionally, saturation was obtained indicating that sample size was adequate to identify all key concepts. This study was implemented to develop an initial item pool and to establish content validity. Additional research examining psychometric properties of the instrument is necessary to determine the final item pool and to establish other aspects of validity and reliability prior to use in research and practice. Although still in development, the PSEQ demonstrates potential to assess unique constructs not assessed in available instruments, including parental effort in supporting participation and the impact of the sensory environmental on participation in daily activities for young children with ASD.

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Table 1.Participant demographics ($N = 34$)

<u>Demographics of Parents and Caregivers ($N = 34$)</u>		<u>n</u>
Gender and Relationship		
Mother		33
Male Guardian		1
Age		
20 – 29 years		2
30 – 39 years		19
40 – 49 years		11
50 – 59 years		2
Ethnicity		
African-American		2
Caucasian		29
Hispanic		1
Other		2
Living Environment		
Rural/Small Town		10
Suburban		19
Urban		5
Country of Residence		
Canada		3
United States		31
State of Residence		
Alaska		2
Indiana		1
Pennsylvania		27
New Jersey		1
<u>Demographics of the Children of the Participants</u>		<u>n</u>
Gender		
Female		6
Male		28
Ethnicity		
African-American		3
Caucasian		24
Hispanic		1
Other		6
Classroom Setting		
Regular Education		10
Both Regular and Special Education		3
Special Education		11
Not Attending School		7

Other	3
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Table 2.

Summary of daily activities in the home and community

Daily Activities in the Home (n of Participants Reporting Daily Activity, % of 34 participants)	Daily Activities in the Community (n of Participants Reporting Daily Activity, % of 34 participants)
Eating (33/34, 97%)	Play at the Playground/Park or Indoor Play Place (28/34, 82%)
Staying asleep or sleeping through the night (27/34, 79%)	Shopping in stores or malls (24/34, 71%)
Dressing (26/34, 77%)	Eating at a Restaurant (23/34, 68%)
Play with objects/toys (25/34, 71%)	Going on vacation (19/34, 56%)
Bathing excluding washing hair (21/34, 62%)	Play with Other Children Outside of Home and School (16/34, 47%)
Falling asleep (19/34, 56%)	Community Events (i.e. fairs, concerts, fireworks, parade) (11/34, 32%)
Tooth brushing (17/34, 50%)	Parties for Another Child in the Community or at Another Home (10/34, 29%)
Hair care/washing hair (17/34, 50%)	Library Activities (i.e. choosing a book at the library, attending reading times) (9/34, 27%)
Toileting including diaper changes or going to the bathroom on the toilet (16/34, 47%)	Swimming (8/34, 24%)
Putting on socks and shoes (14/34, 41%)	Religious Service, Event, or Education (i.e. church, synagogue, mosque) (8/34, 24%)
Mealtime with family (12/34, 35%)	Doctor appointments/procedures (7/34, 21%)
Play with siblings or other children in the home (10/34, 29%)	Amusement park/Water park (6/34, 18%)
Putting on coat (8/34, 24%)	Dental appointments/procedures (5/34, 15%)
Cutting fingernails and/or toenails (5/34, 15%)	Sporting Event of Another (i.e. professional game, siblings events) (5/34, 15%)
	Sporting Event of the Child (i.e. gymnastics, soccer, t-ball) (5/34, 15%)
	Family parties at another's home (4/34, 12%)
	Meals at family or friend's home (3/34, 9%)
	Movies/Theatre (3/34, 9%)
	Using a public bathroom (2/34, 6%)
	Travel on Public Transportation (2/34, 6%)

Table 3.

Summary of key concepts

Key Concepts	Number of Participants Reporting Key Concept (% of 34 participants)
Sensory impact on participation	34/34 (100%)
Parental effort	34/34 (100%)
Perceived meaningfulness or importance of participating in the daily activity	28/34 (82%)
Strategies to support participation	33/34 (97%)
Adapt the sensory responses to the environment	32/34 (94%)
Reduce behavioral responses associated with the sensory factors	30/34 (88%)

Table 4.

Examples of home domain items

How much does your child's responses (hypersensitivity and/or sensory seeking) to the sensory features of the environment or activity impact on participation?					
Daily Activities	None (1)	A little (2)	Some (3)	A lot (4)	Too Much to Participate (5)
Dressing (excluding shoes, socks, and coat)					
Cutting Fingernails and/or Toenails					
Mealtime with Family					
How much effort is it for YOU to help your child participate in this activity? (Your child may or may not have the skills necessary to complete the activity by his or herself, but can still participate.)					
Daily Activities	None (1)	A little (2)	Some (3)	A lot (4)	Too Much to Participate (5)
Dressing (excluding shoes, socks, and coat)					
Cutting Fingernails and/or Toenails					
Mealtime with Family					
How important is it for your child to participate in this activity?					
Daily Activity	Not Important/Essential (1)	Moderately or Somewhat Important/ Essential (2)		Very Important/Essential (3)	
Dressing (excluding shoes, socks, and coat)					
Cutting Fingernails and/or Toenails					
Mealtime with Family					

Table 5.

Examples of community domain items

How much does your child's responses (hypersensitivity and/or sensory seeking) to the sensory features of the environment or activity impact on participation?					
	None (1)	A little (2)	Some (3)	A lot (4)	Too Much to Participate (5)
Eating at a Restaurant					
Doctor Appointments and Procedures					
Play at the Playground/ Park or Indoor Play Place					
How much effort is it for YOU to help your child participate in this activity? (Your child may or may not have the skills necessary to complete the activity by his or herself, but can still participate.)					
Daily Activities	None (1)	A little (2)	Some (3)	A lot (4)	Too Much to Participate (5)
Eating at a Restaurant					
Doctor Appointments and Procedures					
Play at the Playground/ Park or Indoor Play Place					
How important is it for your child to participate in this activity?					
Daily Activities	Not Important/Essential (1)	Moderately or Somewhat Important/ Essential (2)		Very Important/Essential (3)	
Eating at a Restaurant					
Doctor Appointments and Procedures					
Play at the Playground/ Park or Indoor Play Place					