

A New Approach to the Measurement of Adaptive Behavior: Development of the PEDI-CAT for Children and Youth with Autism Spectrum Disorders

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ABSTRACT. The use of current adaptive behavior measures in practice and research is limited by their length and need for a professional interviewer. There is a need for alternative measures that more efficiently assess adaptive behavior in children and youth with autism spectrum disorders (ASDs). The Pediatric Evaluation of Disability Inventory-Computer Adaptive Test (PEDI-CAT) is a computer-based assessment of a child's ability to perform activities required for personal self-sufficiency and engagement in the community. This study evaluated the applicability, representativeness, and comprehensiveness of the Daily Activity, Social/Cognitive, and Responsibility domains for children and youth with an ASD. Twenty professionals and 18 parents provided feedback via in-person or virtual focus groups and cognitive interviews. Items were perceived to represent relevant functional activities within each domain. Child factors and assessment characteristics influenced parents' ratings. In response to feedback, 15 items and additional directions were added to ensure the PEDI-CAT is a meaningful measure when used with this population.

KEYWORDS. Adaptive behavior, computer adaptive testing, measurement

INTRODUCTION

Adaptive behavior is the performance of daily activities required for personal and social self-sufficiency across a variety of life situations, including self-care (e.g., dressing and bathing), community mobility, home maintenance, establishing and maintaining relationships, and communicating needs and feelings (Sparrow, Cicchetti, & Balla, 2005). One concern of parents of children with autism spectrum disorders (ASD) and professionals providing services and support to these children is whether core symptoms of ASDs interfere with a child's ability to demonstrate

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age and culturally appropriate behaviors. As practitioners and researchers develop more sophisticated interventions for children and youth with an ASD, the success of these interventions will be evaluated based on the extent to which they result in meaningful improvements in performance of important activities of daily life. Therefore, there is a need for highly sensitive, reliable, and easy to administer assessments that can be used to track changes in adaptive behavior in this population.

Measuring Adaptive Behavior

Measures of adaptive behavior play an important role in both research and practice related to ASDs. Adaptive behavior assessments are utilized during diagnostic assessment, treatment planning, research, and outcome measurement. There are several well-known measures of adaptive behavior available to clinicians and researchers working with children and youth with an ASD, such as the Vineland Adaptive Behavior scales (VABS-II) Sparrow, Cicchetti, Balla, 2005) and the Scales of Independent Behavior-Revised (SIB-R) (Bruininks, Woodcock, Weatherman, & Hill, 1996). While these measures offer a valid and reliable way to document difficulty with adaptive behavior for diagnostic purposes, they have limitations. These limitations include the following: (a) the way in which the construct of adaptive behavior is conceptualized and operationalized, and (b) the requirements for administration and scoring of these measures.

The term “adaptive behavior” has been used in the field of intellectual and developmental disabilities to describe the performance of daily activities required for personal and social self-sufficiency. The best-known measures in this field were largely developed out of pragmatic experience in an effort to document areas of daily life that presented challenges for people with developmental disabilities and which are not directly predictable from IQ score alone. The lack of clear definition of the construct, or a theoretical base for defining relevant dimensions, is well recognized in the literature and discussion of this topic is ongoing (e.g., Ditterline & Oakland, 2009; Greenspan, 1999). One ramification of this unclear definition is that the items in adaptive behavior instruments often reflect a mix of behaviors believed to have clinical relevance for diagnostic purposes (e.g., making eye contact), items that capture progress toward developmental milestones (e.g., sitting without support), and items that represent culturally relevant daily life activities (e.g., getting dressed). As a result, it can be difficult to determine from these measures what is changing over time or to identify the potential mechanisms underlying that change.

One framework that potentially could be used to conceptualize adaptive behavior is the World Health Organization’s (WHO) International Classification of Functioning, Disability and Health (ICF) (World Health Organization, 2001). The ICF framework has been applied extensively to guide the development of measures of disability outcomes in the fields of medicine and rehabilitation. The ICF-CY, the version for children and youth (World Health Organization, 2008), provides a useful framework for representing the complex relationship between impairments in basic processes and participation of daily life. In the ICF framework, body functions include psychological and intellectual functions such as adaptability, attention and orientation, and range and regulation of emotion, which are typically impaired in children and youth with an ASD. Impairments in these body functions may lead to

difficulties with “Activities”; the performance of daily activities, in turn, supports the person’s participation in important life situations, such as being a student or employee. The ICF, therefore, is a framework that can be used to develop new measures to track changes in the ability of a child with an ASD to perform activities required for personal and social self-sufficiency and essential for engagement and inclusion in their communities.

In many adaptive behavior measures, the test developers operationalized adaptive behavior as independent performance, requiring that behaviors be performed without assistance. However, for children and youth with an ASD, environmental supports, such as verbal cues or the use of picture schedules, may improve performance. Basing measures of adaptive behavior on independent performance reduces their sensitivity to changes in adaptive function that are likely to occur when the environments of children and youth with an ASD are modified and supportive. The ICF recognizes that an individual’s ability to engage in an activity is influenced by features of the environment (e.g., social supports, available services, accessibility of information). Measures based on the ICF would document the capability of children and youth with an ASD to perform daily activities using whatever supports and technology they commonly use and thus provide a more accurate assessment of their everyday function.

Other limitations of existing measures of adaptive behavior are related to their administration and scoring requirements, which affect their usefulness in practice as well as in longitudinal studies. The best-known measures (e.g., VABS-II, SIB-R) require trained professionals to administer and score the assessment, which increases both research and clinical costs and can preclude their routine use. These measures are also lengthy instruments administered and scored using paper and pencil methods, increasing the burden placed on parent respondents, and, in some instances, other clinical or educational professionals involved in the assessment of adaptive behavior. Time spent gathering the information to assess a child takes away from the time needed to plan effective services and interventions. Finally, most measures of adaptive behavior adopt a norm-based approach in scoring, which compares the performance of children with an ASD to that of children with no documented delays in development. While this is an important feature of measures used for diagnostic and qualifying purposes, norm-based scores do not provide information about what a child with an ASD can do relative to all activities considered most vital for engagement in school and the community. Measures that include a criterion score would enable clinicians and researchers to detect positive change in the context of overall developmental delay.

Given these limitations in current measures of adaptive behavior, it is important for those providing services to children and youth or conducting research on ASDs to have available a measure that can assess and detect changes in daily functioning across the full range of child and youth development, is quick and easy to use, and distinguishes between the symptoms and impairments associated with ASDs and the capacity to organize skills into adaptive routines that enable participation. One such measure is the Pediatric Evaluation of Disability Inventory-Computer Adaptive Test (PEDI-CAT)¹.

¹PEDI-CAT is the full, copyrighted name of the instrument.

The PEDI-CAT ASD

Two key features of the most recent version of the PEDI, the PEDI-CAT, align the measure with the ICF. First, Social/Cognitive and Daily Activity items ask about performance of discrete activities in the context of daily life. The PEDI operationalizes the ICF concept of “activity” by assessing discrete actions. In some instances, these discrete actions may support participation in major life roles but the activities by themselves are not indicative of participation. For example, the PEDI Social/Cognitive item “Goes along with peers’ ideas for play” assesses social skills such as taking turns, which can influence a child’s participation in the life situation of friendship. However, this item does not evaluate the child’s overall engagement in friendships and other relationships (a major life situation). In this way, these PEDI items assess at the ICF level of “activity.” Second, PEDI rating scale scores reflect the effectiveness of the child’s performance, not the means of performance, in order to better capture the strengths of children with disabilities. These rating scales allow parents and other respondents to consider the environmental supports and modifications that children use to achieve activity performance. In this way, the PEDI incorporates the ICF recognition that the environment, including technology and other man-made changes to the environment, can support a child’s ability to complete activities.

Items in the PEDI-CAT Daily Activities and Social/Cognitive domains are rated using a four-point Likert scale measuring the extent to which a child has difficulty performing each activity: “Unable,” “Hard,” “A little hard,” and “Easy.” A separate five-point Responsibility rating scale measures the shift of responsibility from parents, to shared responsibility, to the young adult taking all responsibility. The ratings for the Responsibility items do not require the young person to perform each life task independently, but rather consider the extent to which the young person is able to seek assistance as needed and direct others in order to accomplish tasks that enable independent living.

The PEDI-CAT item difficulty estimates were obtained using a large nationally representative sample that included 108 children and youth who received educational services related to ASDs (Haley et al., 2010). Some items were dropped from the initial PEDI-CAT item pool (Dumas et al., 2010) due to excessive variability across respondents (Haley et al., 2010). However, some of these items represent skills and tasks that may pose unique challenges for children with an ASD secondary to impairment-related symptoms and behaviors, such as “Accepts changes in routine without losing temper and crying.” These items represent skills that are often addressed in interventions with children with an ASD, and therefore may need to be included in a comprehensive and meaningful assessment of adaptive functioning. Therefore, additional validation of these items is required with this specific population. Further research is also needed to determine whether current PEDI-CAT items are applicable to children and youth with an ASD and whether characteristics of ASDs make it difficult for parents to select the most appropriate rating category.

The PEDI-CAT is administered as a computer adaptive test (CAT). A CAT provides a means of directing items to the child’s approximate level of proficiency so that time is not wasted administering items that are either too easy or too hard (Wainer et al., 2000). A particularly valuable feature of CAT applications is that

specialized items developed for target populations can be added to the computer program (Coster, Haley, Ni, Dumas, & Fragala-Pinkham, 2008; Dumas et al., in press; Haley, Raczek, Coster, Dumas, & Fragala-Pinkham, 2005). Thus, a specialized PEDI-CAT application could be developed to measure the adaptive behavior of children and youth with an ASD in an efficient and convenient manner. Maintaining a link between the item pool of the original PEDI-CAT and a new ASD application would enable clinicians and researchers to obtain a criterion score unique to children with an ASD as well as a norm-referenced measure of function. This would allow researchers to compare the performance of children with an ASD over time to other populations, including children with other disabilities and children without disabilities.

In this paper we describe the process used to examine content validity of the PEDI-CAT for children with an ASD. The purpose of this study was to evaluate the applicability, representativeness, and comprehensiveness of the PEDI-CAT for children and youth with an ASD, and to understand the factors that influence parents' decisions when rating their child on PEDI-CAT items. This is the first phase of a larger validation project to develop a more comprehensive, functional, and strength-based measure of adaptive behavior for children and youth with an ASD.

METHODS

A series of iterative qualitative methods were used to evaluate the PEDI-CAT domains. Qualitative methods enable researchers to gather detailed and in-depth information of others' perceptions regarding a specific topic (Patton, 2002). In this study, a pragmatic approach (Morgan, 2007) was used to select methods that would most efficiently elicit data regarding the adaptation of the PEDI-CAT to children and youth with an ASD.

Participants

A total of 20 professionals (17 females) with 0.9–27 years of experience working with children with an ASD (Mean = 9.4 years, SD = 7.8 years) participated in focus groups. Professionals represented the disciplines of occupational therapy ($n = 7$), speech-language pathology ($n = 5$), psychology ($n = 4$), special education ($n = 2$), social work ($n = 1$), and physical therapy ($n = 1$). Professionals had experience working with children across the broad age range captured by the PEDI-CAT: children 3–5 years ($n = 14$), elementary and middle school-aged children ($n = 18$), and high school/transition-aged children ($n = 16$).

A total of 18 parents participated across focus groups and cognitive interviews. Two parents had more than one child with an ASD, and one parent participated in both the on-line focus group and a cognitive interview (Table 1). Parents represented a total of 21 children and youth with an ASD, who ranged in age from 3 years, 8 months to 17 years, 11 months (Mean = 9 years, 8.5 months, SD = 45.3 months). Most children communicated using sentences ($n = 14$); others used gestures, single words, or other methods ($n = 6$).

TABLE 1. Parent Demographics (N = 18)

Parent Demographics (N = 18)	n
Gender of Parent	
Mother	17
Father	1
Ethnicity of Parent	
Caucasian	15
African-American	1
Asian-Pacific Islander	1
Other	1
Child's Typical Communication Style	
Gestures	3
Single words	2
Sentences of 4–5 words or more	14
Other	3
Living Environment	
Rural	1
Suburban	14
Urban	3
State of Residence	
Massachusetts	13
Montana	1
Arizona	1
Michigan	1
New York	1
Virginia	1

Procedures and Analysis

Ethical approval was received for all procedures. Parents and professionals were recruited through professional contacts and local organizations providing services to children with an ASD. One in-person focus group (Krueger & Casey, 2000) was conducted with two parents of children with an ASD to pilot focus group materials, and three in-person focus groups were conducted with teams of professionals providing services in a variety of contexts: a hospital outpatient rehabilitation center, a day school for children with an ASD, and an integrated psychological and rehabilitative community clinic. At the beginning of the focus group, consent was obtained and ground rules were established. Participants reviewed PEDI-CAT items in the Daily Activities, Social/Cognitive, and Responsibility domains grouped by the developmental stage at which each activity would be typically performed. The first author facilitated all in-person focus groups, and at least one other member of the research team was present to record field notes. Focus groups lasted for 90 min and were audiotaped. Focus group responses to each presented PEDI item were transcribed and entered to a common spreadsheet for comparison across focus groups. The research team reviewed these responses for commonalities to identify themes, new items, and existing items needing clarification. Issues that were identified across multiple groups were considered most relevant. The team reached consensus by referring to the ICF framework and the PEDI's operationalization of the concept of activity; this ensured that all items were developed with reference to a consistent construct. In addition, the team considered whether the activity had a clear value in the context of everyday life.

Next, an asynchronous on-line focus group was conducted with 13 parents of children with an ASD over 26 days using an on-line discussion board. On-line focus groups are appropriate for participants who may be hard to reach due to time limitations, such as parents of children with an ASD, and enable researchers to bring together participants who otherwise would not have the opportunity to interact due to geographical constraints (Cher Ping & Seng Chee, 2001; Moloney, Dietrich, Strickland, & Myerburg, 2003; Oringderff, 2004; Turney & Pocknee, 2005). In addition, the quality of online responses may be enhanced as participants have the opportunity to reflect on and expand upon their responses (Cher Ping & Seng Chee, 2001; Turney & Pocknee, 2005).

Parents received access to a password-protected website using WikiSpaces (Tangient LLC, 2010). Parents downloaded the PEDI-CAT Social/Cognitive and Responsibility items, rating scales, and directions. As few comments were generated during in-person focus groups regarding the Daily Activities items, this domain was not included in this review. Parents were asked how well each set of items captured achievements important for children with an ASD and if unique characteristics of their child made it difficult to rate items. Parents were asked to visit the website on two different occasions and to post a response to at least two different discussion threads or comments posted by other parents. The discussion threads were monitored daily by the first author, who posted follow-up questions or probes in response to parent comments. The first and third author conducted a content analysis of online responses within each discussion thread. Responses were categorized into child and assessment factors that influenced parents' decisions when rating their child using the PEDI-CAT. The full team reviewed content areas, and this information was used to further revise the items and directions.

The revised PEDI-CAT items were then reviewed by four parents in individual cognitive interviews, three web-based and one in-person. The items were uploaded to a private, web-based Adobe Acrobat Connect Pro (Adobe Systems Incorporated, 2010) meeting room for the three web-based interviews. During cognitive interviews, parents were asked to think aloud when selecting ratings for each item in order to understand how they made their rating decisions (Sirken et al., 1999). This interview technique helped to reveal discrepancies between the intended meaning and the parents' interpretation. Responses to each presented PEDI item were again transcribed to a spreadsheet and systematically compared across cognitive interviews to identify any further revisions needed and triangulate identified themes. Parents also evaluated the ease of use of several rating scale presentations using a scale of 1–10, where “10” was “really easy to select the rating that best described my child.” Ratings were compared to identify the presentation option that was consistently rated the highest across interviews.

RESULTS

Feedback on PEDI-CAT Directions and Items

Parents and professionals identified several new activities that they believed were essential aspects of everyday functioning for children and youth with an ASD. Four and six new items were added to the Social/Cognitive and Responsibility domains,

TABLE 2. New ASD Items Added to the PEDI-CAT

PEDI-CAT Domain	Item Stem	Decision	
Social/Cognitive	Lets others know that he/she is in pain or does not feel well.	New item	
	Respects others' personal space during interactions.	New item	
	Goes along with peers' ideas for play.	New item	
	Tells others when she/he does not understand what they are saying, and asks for clarification.	New item	
	Turns head toward familiar people in response to voice, sight, or touch.	Restored item previously dropped from PEDI-CAT.	
	Engages in simple social games with another person (such as tickling, making faces, peek-a-boo).	Restored item previously dropped from PEDI-CAT.	
	Handles stimulating situations such as a shopping mall or party for 1–2 hr without losing control	Restored item previously dropped from PEDI-CAT.	
	Accepts changes in routine without losing temper and crying.	Restored item previously dropped from PEDI-CAT.	
	Responsibility	Staying near parents or other caregiver when not given permission to go off on his/her own.	New item
		Keeping oneself and surrounding area neat when eating.	New item
Keeping track of personal belongings throughout the day.		New item	
Recognizing and responding appropriately if others try to take advantage of him/her.		New item	
Maintaining the security of his/her home.		New item	
Keeping track of and completing homework assignments.		New item	
Washing hands after using the bathroom.		Restored item previously dropped from PEDI-CAT.	

respectively (Table 2) In addition, respondents identified important content addressed by four Social/Cognitive items and one Responsibility item that had previously been dropped from the PEDI-CAT. These items were added back into the ASD item pool for further testing.

Some existing items were considered essential activities for everyday functioning, but were unclear or difficult to answer due to the unique features of children with an ASD. In order to clarify the meaning of these items for this unique population and maintain congruence with the original PEDI-CAT, item-specific directions were added in lieu of revising the item stem (Social/Cognitive = 15; Responsibility = 2). The item-specific directions clarify the meaning of the item by (a) further defining tasks or behaviors described in the item, (b) clarifying the specific contexts in which that item would apply, or (c) specifying the methods that a child may use to complete that activity. For example, the item-specific directions were added to several items in the Social/Cognitive domain to ensure consistency in parent responses: “When responding to these items, consider your child’s performance using

TABLE 3. PEDI-ASD CAT Daily Activities and Social/Cognitive Rating Scales and Directions

Daily Activities and Social/Cognitive Rating Scale Categories	
Unable	Child can not do, doesn't know how, or is too young.
Hard	Child does with <u>a lot</u> of help, extra time, or effort.
A little hard	Child does with <u>a little</u> help, extra time, or effort.
Easy	Child does with <u>no</u> help, extra time, or effort, or child's skills are past this level.
I don't know	
Daily Activities and Social/Cognitive additional rating scale directions	
Help includes physical assistance, verbal prompts, and other types of cues.	
If your child only <u>occasionally</u> does an activity because it is difficult, select "hard."	
If your child does an activity <u>some</u> of the time because it is difficult, select "a little hard."	
If your child does an activity <u>most</u> of the time, select "easy."	

their primary mode of communication. This could include augmentative communication devices (AAC), sign language, or use of the Picture Exchange Communication System (PECS).” Based on feedback from parents and professionals, expanded directions were also created for the introductory screen to each scale. These directions introduced the rating categories for each scale and explained how to select the best rating. Finally, additional directions were added to the Social/Cognitive and Daily Activity rating scales (Table 3) using a format based on parents’ rated preference for screen layout.

Some original PEDI-CAT item stems required revisions to ensure clarity of meaning and consistency of interpretation; three Social/Cognitive and one Responsibility item were revised. All Daily Activity items were reported to be easy to rate and considered relevant activities for adaptive functioning within that domain.

Factors that Influence Parents’ Rating Decisions

Child and assessment factors influenced parents’ decisions when rating their children using the PEDI-CAT. Child factors included variability of performance; unique strengths; and the child’s capacity to execute the steps of an activity rather than understanding the meaning and purpose underlying those steps.

Parents noted great variability in their child’s performance of an activity across contexts and people. Parents explained the following:

My son is able to easily follow directions from a familiar person but will frequently need prompting to respond to or follow directions from someone he doesn't know well. (Parent #3)

I know that my children can be very inconsistent in their abilities on any given day for multiple reasons, such as sensory issues. (Parent #14)

Professionals also described variability of performance as a unique consequence of ASD-related symptoms, and cited the importance of demonstrating behaviors “in multiple environments with multiple people” (Professional Focus Group 2). This variability made it difficult for some parents to quantify their child’s ability using one rating. As one parent explained the following:

He can “manage bowel and bladder through the day” when we are at home or school. But my rating drops significantly if we are in a novel setting such as a store, friend’s home, park, etc. So would I average my response from the “child full responsibility” rating down to “adult/child share responsibility”? (Parent #8)

The introductory screen and rating scale “help” icon now include specific guidance regarding performance variability to help parents make consistent rating decisions.

Even if children had difficulty performing specific tasks, parents highlighted their children’s strengths and accomplishments when rating PEDI-CAT items. Parents took opportunities to celebrate achievements and gains in their child’s adaptive behavior. One parent shared, “For kids with autism, [it’s] a big step when they are able to look at another person and just say ‘Hello’ ” (Parent #11). Other parents noted that the unique characteristics associated with ASD often led to very unique and specialized abilities. One parent explained how her son “is becoming a very good cook- because of his hyper-focus” (Parent #17). Even when evaluating their child’s current challenges, parents were sure to acknowledge their child’s unique strengths and abilities.

Parents also differentiated between their child’s ability to “execute” an activity and his or her understanding of the importance or meaning of the activity. Parents reported that their children with an ASD could follow rules or steps of a task but often did not grasp the underlying reason. This was especially common for safety-related skills and communication skills. For example, parents explained as follows:

My son knows he has to look both ways for car, but when you ask him why, he say[s] it is because it’s a rule (Parent #6).

Even when children did not understand the reason underlying specific activities, parents rated their child higher when he or she could execute the required steps.

Several assessment factors influenced parents’ rating decisions. When completing the assessment, parents preferred less text and more white space on the computer screen (e.g., easy to read formatting that is not crowded). The need for assessments to be intuitive and easy to use was stressed by a parent who explained, “Parents of kids with ASD have to fill out way too many surveys and too much paperwork in general. I prefer to dive right into a survey and skip the directions” (Parent #4). Other parents noted that optional “help” buttons would provide needed information without crowding the screen, and appreciated bolded or underlined text that called attention to important concepts or words.

Parents’ responses also reflected an awareness of the subjective decisions required when making rating decisions. The process of translating personal observations and knowledge of their child’s performance to a rating category, which may be a process familiar to trained professionals, was a challenge for some parents. For example, one parent explained why she had difficulty selecting the most appropriate level of difficulty on the PEDI-CAT: “I don’t know if something is ‘hard’...for my son to do, as he does not express emotional content about his actions” (Parent #8). Parents also recognized that an evaluation of their child’s performance was relative to the child’s past abilities as well as their interpretation of the child’s behavior and actions. For example,

If a kid made exciting progress with some item over the years the parent might want to put that the kid needs only a little help now, but to a new person walking into the room it might appear like a lot of help is needed. It's all relative! (Parent #5)

The expanded directions were added to the ASD application to encourage parents to systematically consider all relevant and available knowledge of their child's abilities when making rating decisions to ensure their evaluation is as objective as possible.

DISCUSSION

Parents and professionals found item content from the three PEDI-CAT domains relevant for children and youth with an ASD across the developmental continuum. The addition of new items to the Social/Cognitive and Responsibility domains ensures that the PEDI-CAT is a comprehensive assessment applicable for children and youth with an ASD. The new Responsibility items assess a child's ability to meet more basic responsibilities such as monitoring one's personal space, belongings, and personal safety that provide the foundation to take on more adult responsibilities. These new items enable clinicians and researchers to measure more accurately the responsibility of children with an ASD who are younger or whose capacity for these activities is developing at a slower pace. The new Social/Cognitive items assess activities that require communication or self-regulation, which may be difficult for some children with an ASD to master secondary to symptom-related impairments, such as accepting changes in routine or telling others when he/she does not understand.

Findings also highlight the importance of providing straightforward and succinct instructions to guide parents' rating decisions. For example, the parents in this study were familiar with assessments that require children to execute tasks independently. As the PEDI-CAT assesses a child's ability to complete activities with supports such as augmentative communication devices or social scripts, it was important to remind parents throughout the assessment that performance without environmental supports was not a requirement for the highest rating. Expanded scale directions, "FAQs," and item-specific directions were added to the PEDI-CAT ASD application to provide such clarification.

Assessment developers should consider the unique features of the respondent group that may make existing items or rating scales difficult to interpret. In this study, parents indicated that the variability of their children's performance, secondary to ASD-related symptoms, sometimes made it difficult to identify the most appropriate rating. To help parents translate the variability of their child's behavior to the PEDI-CAT difficulty rating scale, we added rating scale directions that specify the relationship between frequency of performance and level of ability. An FAQ section provides parents with additional guidance such as "When choosing a response for each item, consider how your child performs each task in a situation or context that is familiar and provides support to him/her." For parents who perceive the process of matching their child's performance to a rating category to be more subjective than objective, incorporating additional instructions into the

assessment helps ensure the consistency of responses and increases the reliability of the PEDI-CAT when completed by parents of children with an ASD.

Seeking feedback from parents revealed important information about the assessment process that may not have been discovered if input was sought only from professionals. Parents of children with an ASD fill out many assessments and therefore preferred intuitive and uncomplicated assessment formats that could be completed quickly and easily. In addition, parents felt the process of completing an assessment was an opportunity to identify and share their child's strengths in addition to their needs. A tool such as the PEDI-CAT is uniquely suited to meet parents' requests. The PEDI-CAT is strengths-based, recognizing that children and youth may perform activities successfully in alternative ways or with environmental supports. Further, when using a CAT, parents only answer questions targeted to their child's ability level rather than age. Parents are not exposed to large sets of items representing activities that their child is not yet able to perform, maintaining a strengths-based approach to assessment. Another benefit of the computer format is reduced visual clutter, as the CAT application displays one item at a time, and features such as "pop up" boxes make directions readily available to respondents seeking clarification.

Limitations

The convenience-sampling approach used in this study does not enable us to generalize findings with confidence to all parents and professionals. Parents and professionals who chose to participate in this study may have had a unique interest in the measurement of adaptive behavior and provided feedback in favor of the PEDI-CAT. Further, parents in this study were primarily Caucasian, middle-income parents of children under 13 years of age, so findings may not be representative of parents from other cultural, socio-economic backgrounds, or with teenagers or young adults in transition age. However, the online methods enabled us to gather data from parents from several regions of the United States, which would not have been possible using a traditional focus group approach. Further validation of the PEDI-CAT ASD adaptation will be obtained through a large field study.

CONCLUSION

Findings support that the PEDI-CAT Daily Activities, Social/Cognitive, and Responsibility domains assess activities that enable the personal and social self-sufficiency and community participation of children and youth with an ASD. The PEDI-CAT ASD application is a strength-based approach to measurement that provides a meaningful and comprehensive measure of children's ability to perform activities required for personal and social self-sufficiency.

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