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## Influence of Home Environment on Participation in Home Activities of Children with an Autism Spectrum Disorder

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# Influence of Home Environment on Participation in Home Activities of Children with an Autism Spectrum Disorder

## **Abstract**

**Background:** This study explored the key physical and social factors within the home environment that influence the participation of children with an ASD in home activities.

**Method:** Step 1 used a correlational research design to identify relationships between the home environment and participation patterns of children with ASD. Twenty-two children, ages 3 to 6 years, with a diagnosis of ASD participated. Data were collected using the Preschool Activity Card Sort (PACS), Home Observation for Measurement of the Environment Inventory (HOME), Parenting Stress Index (PSI), Social Responsiveness Scale (SRS), and Hollingshead Four Factor Index of Social Status (ISS). In Step 2, an electronic survey gathered information from 20 occupational therapists, attempting to identify their perceptions related to factors within the home environment that influence the participation of children with ASD.

**Results:** Significant correlations were found among parenting stress, the availability of learning materials, and parent responsiveness toward the child and the participation patterns of children in home activities. Themes relating to designated play areas for children at home, parents' awareness of the needs of the child, and parents' responsiveness toward their child emerged from the occupational therapists' qualitative survey data.

**Conclusion:** The results indicated that home environments do contribute to a child's ability to participate in home activities.

## **Keywords**

ASD, participation in home activities, contextual factors

## **Cover Page Footnote**

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Participation in the everyday occupations of life is a vital part of human development and lived experience. Through participation, children acquire skills and competencies, connect with others and communities, and find purpose and meaning in life (Law, 2002). Children diagnosed with an autism spectrum disorder (ASD) experience limitations in communication and social interactions, demonstrate restricted and repetitive behaviors, and may demonstrate hyper- or hypo-reactivity to sensory stimuli or unusual interests in sensory aspects of the environment (American Psychiatric Association [APA], 2013). This can influence their participation in daily activities.

### **Background**

Recent evidence suggests that parents of children with ASD report lower participation in everyday life occupations among their children. For example, families of children with ASD ranging from the ages of 6 to 17 years reported that their children were less involved in after-school or weekend clubs or other organized events; they also were less involved in community activities when compared to families of children with typically developing children (Lee, Harrington, Louie, & Newschaffer, 2008). Findings from another study by LaVesser and Berg (2011) indicated that children from the ages of 3 to 6 years with ASD participated in fewer activities than typical children. The most commonly cited reasons for low participation among children with ASD were factors associated with behaviors, such as having tantrums, not following directions, showing no interest in an

activity, and experiencing sensory issues. Family reasons, such as parents choosing not to participate in activities with the child or not assigning chores, were considered to be another factor associated with low participation among children with ASD.

The results of the LaVesser and Berg (2011) study also noted that participation in self-care activities was lower than for typically developing children because children with ASD may experience sensory and motor issues that interfere with such participation. Similarly, children with ASD participated in fewer sedentary leisure activities. Younger children with ASD may participate more in parent-child household activities (e.g., picking up toys, cleaning the room, having adult-child playtimes) and community activities, such as children's festivals and community celebrations (Little, Sideris, Ausderau, & Baranek, 2014).

Rodger and Umaibalan (2011) have investigated the difference in routines and rituals between families of children with ASD and families with typically developing children. In their study, families of children with ASD established routines that were more child-oriented, geared toward meeting the demands of their child with ASD rather than the family as a whole.

### **Factors Influencing Participation**

According to the Person-Environment-Occupation-Performance (PEOP) model (Christiansen & Baum, 2005), several factors can influence an individual's participation in meaningful activities. Person-related factors, such

as sensory processing (Brown & Dunn, 2010); cognitive skills (Zingerevich & LaVesser, 2009); and social skills (Shattuck, Orsmond, Wagner, & Cooper, 2011), can influence the involvement of children with ASD in meaningful occupations within an environment. Environmental factors, such as the physical and social environment, also have an effect on children's ability to participate in activities within the home, school, and community (Berg & LaVesser, 2006; Christiansen & Baum, 2005) and on their interaction abilities (Rodger & Ziviani, 2006).

Both physical and social environmental factors within the home can affect a child's development. Physical factors include the housing structure and home density, physical items in the home, the quality and characteristics of the home, the predictability of daily routines, residential mobility, and the availability of resources (Evans, 2006). The physical structure of a home can help children learn and acquire developmental skills if the environment is accessible. However, the physical environment also can impose barriers to participation; a lack of toys and materials may limit exploration, for example (Missiuna & Pollock, 1991).

A study by Freitas, Gabbard, Caçola, Montebelo, and Santos (2013) highlighted a significant positive association between family income, parental education level, socioeconomic class, and the availability of motor affordances for infants, such as physical space and play materials, within the home environment. But involvement in

daily activities for infants was not related to the socioeconomic status of a family. Instead, it depended on "parents creating situations that are conducive to motor skill development, such as spending time playing with the infants, promoting interaction with other infants/children, providing space and safety for the infants to move freely and providing access to toys" (Freitas et al., 2013, p. 325). Another study by Miquelote, Santos, Caçola, Montebelo, and Gabbard (2012) discussed the positive relationship between infant motor affordances at home and the motor and cognitive development of infants. It appears that interactions with the physical environment foster development and learning; these, in turn, influence the play and social experiences of the child (Pierce, Munier, & Myers, 2009).

Social factors within the environment include the availability and expectations of significant individuals, such as parents and caregivers, and the children's relationships with those individuals (American Occupational Therapy Association, 2008). The social environment for children involves the people with whom they build relationships in the home, school, and community. This may include family, peers, and neighbors. As children grow and develop, their social environments change. The family of a child with ASD plays a vital role in "determining the type and number of activities in which the child will be given opportunities for participation" (LaVesser & Berg, 2011, p. 34).

But family members, including the caregiver(s), siblings, and others, may experience stress related to having a child with ASD. Research studies have documented that caregivers and family members of a child with ASD often experience helplessness and feelings of inadequacy, failure, anger, shock, guilt, and frustration (Higgins, Bailey, & Pearce, 2005; Siller & Sigman, 2002). They also have reported a significantly higher child care burden than that experienced with typically developing children (Lee et al., 2008). Families with children with ASD also can experience difficulty creating and experiencing positive family occupations (DeGrace, 2004). In a study, Bagby, Dickie, and Baranek (2012) interviewed parents of six typically developing children and six children who were diagnosed with autism. They concluded that children's sensory experiences affected family occupations in the following ways: (a) what a family chose to do or not to do, (b) the amount of time the family required to prepare and plan for involvement in occupations, and (c) the extent to which experiences, meaning, and feelings were shared. Furthermore, family occupations also were influenced by the degree to which they were willing to expose their children to sensory experiences within a context, which could affect the social participation of the child within the family (Bagby et al., 2012). A recent study by Schaaf, Toth-Cohen, Johnson, Outten, and Benevides (2011) found that children with ASD who experience sensory-related behavioral problems have difficulty performing morning and bedtime routines. This

supports the idea that family routines are influenced by sensory-related behaviors in children with ASD.

### **Role of Occupational Therapy**

Occupational therapy practitioners aim to enhance the occupational performance of individuals. They are qualified to explore, identify, and address the influence of the physical, social, and cultural contexts on the daily occupations of individuals. Thus, occupational therapy practitioners must consider the home and the school contexts when designing interventions for children with autism (Brown & Dunn, 2010).

Environmental adaptations are an important occupational therapy intervention for children and adolescents with autism. For example, children with ASD may experience sensory processing differences that influence their involvement in daily activities. Occupational therapy practitioners may embed sensory inputs within a child's daily routines to modulate arousal or adapt home or school environments to promote participation (Ashburner, Rodger, Ziviani, & Hinder, 2014). Occupational therapy practitioners also can play an important role in addressing parental stress levels. For example, they can direct families to resources in the community, refer them to other health care professionals, and educate parents about their child's condition (Stokes & Holsti, 2010).

### **Purpose of Study**

The literature discusses lower participation in daily activities among children with ASD in comparison to typically developing children (LaVesser & Berg, 2011). However, there is

limited information and evidence available to describe the relationships between the physical and social environmental factors present within homes and the participation in everyday activities of children with ASD. The literature also suggests that occupational therapy practitioners should consider the context when designing interventions for children with autism, but there is limited information available regarding occupational therapy practitioners' perceptions of the effect of these environments on the participation of children.

Because the researchers wished to explore which factors within the home environment influence the participation of children with ASD in home activities, they decided to generate answers from two sources: (a) the parents and the home environment of children with diagnosed ASD, and (b) occupational therapy practitioners who have experience working with children with ASD. The study attempted to answer the following specific questions in two steps:

- Step 1: Is there a relationship among the participation of children with ASD in home activities, parenting stress, and the quality of the home environment?
- Step 2: What environmental factors within the home facilitate or inhibit participation of children with ASD in home activities, as perceived by occupational therapy practitioners?

It was hoped that the overall findings from Steps 1 and 2 would provide preliminary data about (a) factors within the home environment that

influence children's participation, and (b) occupational therapy practitioners' perceptions of those factors within their practice.

## **Method**

### **Study Design**

An exploratory correlational research design was used for Step 1 of this study. The purpose of a correlational study is "to explore the nature of existing relationships among variables" (Portney & Watkins, 2009, p. 281). By using this study design the researchers aimed to identify and explore any relationships among parental stress, the quality of the home environment, and children's participation in home activities. For Step 2, a survey design was used to explore occupational therapy practitioners' perspectives related to factors within the home that could influence the participation of children with ASD. The researchers chose to distribute an electronic survey using SurveyMonkey software.

### **Participants**

For Step 1, a convenience sample of 22 children diagnosed with ASD was recruited through the St. Louis Children's Hospital Autism Clinic and by professional referral or self-referral. A pediatrician or clinical psychologist had diagnosed all of the children according to DSM-IV-TR (APA, 2000) criteria. Twenty boys and two girls participated (see Table 1).

**Table 1***Description of Participating Children, N = 22*

Characteristics	Children with ASD
Age - Mean ( <i>SD</i> )	62 months ( <i>SD</i> 11.35)
Age Range	45-78 months
Gender (%)	
Male	86%
Female	14%

For Step 2, a convenience sample of 20 occupational therapists who identified their current practice area as “children and youth” participated in the electronic survey. The participating occupational therapists were not providing services to the children who participated in Step 1 of the study. Table 2 shows information related to the participants’ years of professional experience and identified practice settings.

**Table 2***Description of Participating Occupational Therapists, N = 20*

Characteristics	Occupational Therapists
Years of Experience (Mean)	14 years 8 months
Range	1-33 years
Practice Settings	
School system	11
Outpatient pediatric facility	5
Acute care	1
Early intervention	2
College/university	1

**Assessment Tools****Preschool Activity Card Sort (PACS).**

This assessment tool evaluates a child’s occupational performance and social participation (Berg & LaVesser, 2006). To establish the original PACS tool, 85 activities commonly performed by children from the ages of 3 to 6 years were identified and photographed, based on a systematic collection of children’s daily activity logs. These activities represent seven domains of function: self-care, social interaction, low-demand leisure, high-demand leisure, community mobility, education, and domestic activities. Parents are asked to respond to photographs with either “yes, my child does this activity” or “no, my child does not do this activity.” Content validity was addressed as the PACS tool was being developed. Preliminary inter-rater and test-retest reliability were reported on a separate convenience sample of 20 parents of preschoolers with or without disabilities. The correlation for test-retest reliability was .93; the correlation for inter-rater reliability was .91.

For this study, three of the PACS domain subscales were used to measure participation in home activities:

- Domestic activities (PACS D) – includes cooking, hanging up a coat, setting or clearing the table, sweeping, emptying the trash, getting mail, working in the yard, caring for a pet, cleaning, helping with laundry, and washing dishes.
- Low-demand leisure activities (PACS LL) – includes building with blocks,

playing with play-dough, playing alone, playing on the computer, cutting, doing puzzles, swinging, watching television, listening to music, coloring, and playing pretend.

- Social interaction activities (PACS SI) – includes rough housing, taking turns, looking at books, hugging, going for walks, talking on the telephone, attending birthday parties, talking with friends, playing games with children, visiting, and gathering with family members.

### **Early Childhood Home Observation for Measurement of the Environment Inventory (HOME).**

The primary goal of the early childhood HOME assessment tool is to measure, within a naturalistic context, the quality and the quantity of stimulation and support available to a child of 3 to 6 years of age in the home environment (Caldwell & Bradley, 1984). This assessment is completed through observations of the home environment and parent interviews. It consists of 55 items that are grouped into eight different subscales and are scored in a binary manner (i.e., yes/no). Each question is given one point if a positive observation is made and no points if the behavior or attribute is not observed. The scores are added for each subscale; a total score is obtained for the HOME by summing all eight subscale scores. The total results obtained are interpreted as indicating a low, medium, or high quality of environmental stimulation. Higher total scores indicate a “more

enriched home environment, always in relation to the children’s contextual and organismic features” (Totsika & Sylva, 2004, p. 25). The internal consistency for the HOME has been reported at .93 (Caldwell & Bradley, 1984).

In this study, quality of the home environment was measured by the following four HOME subscales, as described by Totsika and Sylva (2004):

- HOME learning materials (HOME LM) – includes stimulation through toys, games, and reading materials directed toward the intellectual development of the child.
- HOME physical environment (HOME PE) – includes the safety and cleanliness of the home environment, as well as how conducive the home environment is for child development.
- HOME responsivity (HOME R) – includes the verbal interactions between the caregiver and the child.
- HOME language stimulation (HOME LS) – includes verbal communication between the child and caregiver to help language development.

### **Parenting Stress Index Long Form (PSI).**

The PSI is a 120-item self-report questionnaire that assesses parents’ perceptions of the degree of stress they personally experience in various dimensions of the parenting role (Abidin, 1995). All items are scored on a five-point Likert scale, ranging from “strongly agree” to “strongly disagree.” The PSI



assesses the level of stress in a parent's life as it relates to parental characteristics (parent domain score) and child characteristics (child domain score). The child domain score has six subscales, including distractibility/hyperactivity, adaptability, reinforces parent, demandingness, mood, and acceptability. Elevated scores in this domain may reflect child characteristics that make it difficult for parents to fulfill their parenting roles. The parent domain has six subscales, including competence, isolation, health, role restriction, depression, and spouse. Higher scores in this domain may reflect parenting stress that is associated with aspects of the parent's functioning (e.g., depressed mood) or social network (e.g., an unsupportive spouse). Test-retest reliability has been reported as adequate, and the scales have been useful in differentiating the stressors experienced by parents of sick/disabled children from normative and comparison groups (Abidin, 1995). For this study, total scores from the parent domain (PSI P) and the child domain (PSI C) were used in the analysis.

**Social Responsiveness Scale (SRS).** The SRS is a 65-item questionnaire covering the various dimensions of interpersonal behavior, communication, and repetitive/stereotypic behavior that are characteristic of ASDs (Constantino & Gruber, 2005). The items are grouped into five subscales, including social awareness, social cognition, social communication, social motivation, and social mannerisms. A Likert scale response format is used, ranging from "not true" to "almost always true," based on how often each behavior is

observed by the informant. The SRS total score is the sum of responses to all 65 questions. The total score is converted to a T-score for interpretation purposes, and T-scores above 60 are considered clinically significant. The SRS can be completed by a parent, teacher, or custodial caretaker. The total alpha reliability estimates have been reported as above .90 for both males and females, as rated by both parents and teachers in both clinical and normative samples. This indicates that the scale is appropriate for clinical use for both screening and diagnostic purposes. For this study, the total SRS score was used as an indication of ASD symptom severity.

**Hollingshead Four Factor Index of Social Status (ISS).** The ISS measures the socioeconomic status of an individual based on four domains: marital status, retired/employed status, educational attainment, and occupational prestige (Hollingshead, 1975). The individual's education is rated on a seven-point scale (from 7 = graduate/professional training through 1 = less than 7th grade). The individual's occupation is rated on a nine-point scale (from 9 = higher executive, proprietor of large business, or major professional through 1 = farm laborers, menial service workers, students, and housewives). The calculated SES score indicates one of five social strata, with 1 referring to unskilled laborers or low socioeconomic status and 5 referring to major professionals or high socioeconomic status.**rocedure**

**Step 1.** This step was prospectively reviewed and approved by the Institutional Review

Board of Washington University School of Medicine in St. Louis. Informed consent from the parents of the participating children was obtained in accordance with the institution's internal review board.

The first author completed the child assessments in the home with parents present. At that time, one or both parents were interviewed using the PACS tool to identify activities in which the child participated. Following a 45-minute observation period in the home, the HOME tool was completed. The parents were asked to fill out a demographic questionnaire, the SRS, and the PSI. If they were unable to complete these tools during the home visit, the parents were provided with a self-addressed, stamped envelope in which to return the questionnaires. Each home visit lasted for approximately 60 to 90 minutes.

**Step 2.** This step was approved by the Institutional Review Board of Governors State University in Illinois. Data were gathered from occupational therapists via a self-administered online survey using SurveyMonkey software. The invitation to participate in the survey, which was distributed by e-mail in May 2013, included an explicit request for consent and a hyperlink to the electronic survey. A subsequent e-mail was sent two weeks later and then again four weeks later to maximize response rates.

Before implementation, the electronic survey was pilot tested for face validity by the researcher. The survey included five closed-ended questions that asked the participants to identify their

current level of practice, current practice area/s, current practice settings, and number of years of experience working with children with disabilities. The survey also included five open-ended questions, which asked the participants to describe factors related to children with ASD:

- Social factors within the home environment that facilitate the children's participation in home activities
- Physical factors within the home environment that facilitate the children's participation in home activities
- Social factors within the home environment that inhibit the children's participation in home activities
- Physical factors within the home environment that inhibit the children's participation in home activities
- How occupational therapists gather information related to the home environment of children with ASD

### **Data Analysis**

**Step 1.** Data for Step 1 of the study were analyzed using IBM SPSS software version 19. The range of scores and standard deviations for the SRS T-scores, PSI domains, HOME subscales, and PACS subscales were calculated. To investigate bivariate relationships among parenting stress, quality of the home environment, and the participation patterns of children with ASD in home activities, one-tailed Spearman rank coefficient analyses were used.

**Step 2.** Data analysis for Step 2 of the study involved exporting the data from SurveyMonkey into an Excel spreadsheet, and then into a Word document. Initially, 36 participants began the survey, with 20 fully completing it. Only the completed surveys were included and analyzed. Responses to the open-ended questions in the survey were analyzed using the qualitative analytical process by Miles and Huberman (1994), as discussed by Carpenter and Suto (2008). The process involved three phases: (a) data reduction, (b) coding or indexing, and (c) conclusion drawing and verification. The data reduction phase required the researchers to go through the transcripts and highlight chunks of data that appeared to provide insights about the research question. In the data display phase, the researchers assigned code words to highlighted data fragments and then organized the data into specific categories. During the conclusion drawing and verification phase, the researchers developed a number of overarching themes.

### **Step 1 Results**

The SRS T-scores for the study children ranged from 47 to 119, with a mean of 77.63. This indicates that the participating children, on average, demonstrated severe impairment in everyday social interactions. The total score on the HOME for the children ranged from 46 to 55, which is indicative

of high-quality environmental stimulation within the home. The total stress score for the parents who participated in the study ranged from 214 to 373. Scores above 260 are considered to be clinically significant (Abidin, 1995).

The mean of the PSI child domain subscale was 136.46, and the mean of the PSI parent domain subscale was 134.25. Thus, approximately one half (54.2%) of the parents who participated in the study were experiencing clinically significant levels of stress.

According to the ISS scale, all of the participating families belonged to high socioeconomic status. The parents' educational backgrounds ranged from high school through college graduate.

### **Relationship Between Parental Stress and Participation**

The relationship between parenting stress and the participation of children with ASD was analyzed for the 22 participating children. There were significant inverse correlations between the PSI child domain and PACS low-demand leisure scores ( $R = -.44$ ;  $p = .02$ ) and between the PSI child domain and PACS domestic scores ( $R = -.39$ ;  $p = .03$ ). This suggests that, as parent-perceived child-related stress increased, participation in low-demand leisure activities as well as domestic activities decreased (see Table 3).

**Table 3**

*Correlations Between PSI Subscales and PACS Subscales, N = 22*

	PSI C	PSI P
PACS LL	-.44*	-.15
PACS SI	-.29	.14
PACS D	-.39*	.07

*Note.* \*Correlation is significant at  $p < .05$  level (one-tailed). PSI C = PSI child domain; PSI P = PSI parent domain; PACS LL = PACS low-demand leisure; PACS SI = PACS social interaction; PACS D = PACS domestic.

### Relationship Between Home Environment and Participation

A second analysis of correlation was conducted to examine the relationship between the home environment and the participation of the 22 children with ASD. A significant positive relationship was found between PACS low-demand leisure and HOME learning materials ( $R = .37; p = .04$ ) (see Table 4). This means as the amount and quality of learning materials found in the home increased, the number of low-leisure activities in which the child participated also increased.

A significant positive relationship was found between PACS social interaction and HOME responsivity ( $R = .38; p = .04$ ), as well as PACS social interaction and HOME learning materials ( $R = .37; p = .04$ ). This means that high parent responsiveness toward the child and an increased availability of learning materials found in the home (e.g., toys that teach colors, sizes, and shapes; toys that permit free expression; books and puzzles) increased participation in social interaction activities among children with ASD (see Table 4).

**Table 4**

*Correlations Between HOME Subscales and PACS Subscales, N = 22*

	HOME LM	HOME LS	HOME PE	HOME R
PACS LL	.37*	.01	.31	.20
PACS SI	.37*	.22	.19	.38*
PACS D	.12	.11	.30	-.06

*Note.* \*Correlation is significant at  $p < .05$  level (one-tailed). HOME LM = HOME learning materials; HOME LS = HOME language stimulation; HOME PE = HOME physical environment; HOME R = HOME responsivity; PACS LL = PACS low-demand leisure; PACS SI = PACS social interaction; PACS D = PACS domestic.

### Step 2 Results

For Step 2, the following four themes were identified from the 20 occupational therapists who fully completed the electronic survey.

#### Play Area Within the Home

A number of the participants indicated that an organized, designated play area for a child within the home is crucial for the child’s development of motor, sensory, cognitive, and social skills. Play areas need to include developmentally (i.e., age) appropriate toys and learning materials that can enhance the development of motor, sensory, and social skills in the child. Therapists shared examples for supporting children with ASD, such as “covering the toy chests or bins to minimize the distractions present within the play area and labeling the toy bins.” The participants stressed the importance of embedding sensory inputs within the daily routines of children based on their sensory needs. For example, having sensory equipment, such as a trampoline and/or weighted blankets,

available in the home environment helps children modulate their arousal.

In addition, the participants emphasized that disorganized and unstructured play areas for children and/or a lack of resources at home (e.g., toys, books, play equipment, and games) can inhibit the participation of children with ASD within the home environment. The participants also indicated that no or limited opportunities for children to explore new activities and games at home may inhibit the development of skills that are required to participate in occupations within the home environment.

### **Parent or Caregiver Responsiveness**

A few survey participants reported that some parents or caregivers do not encourage their child to participate in daily routines because they think that “the child cannot do it.” The participants indicated that parental expectations about setting routines with the child (such as bedtime or mealtime routines) are an important factor that can influence participation within the home. The participants also indicated that parents or caregivers should practice certain communication and social skills or behaviors with their child at home, such as taking turns or sharing while playing games; this provides an opportunity for the child to generalize those behaviors in other contexts.

### **Parent or Caregiver Awareness of the Child’s Needs**

Another important theme was the parent or caregiver’s level of understanding and knowledge related to the ASD diagnosis and its influence on

the child’s participation. Occupational therapy practitioners indicated that families that had awareness about the diagnosis, as well as the sensory processing needs of the child, could develop strategies to meet those sensory needs in the home environment. Survey responses described strategies used by families that included “parents involving their child in sensory motor play experiences” and “parents or siblings modeling behaviors to the child during play activities within the home.” One of the participants stated that the “availability of resources at home and educating the parents or caregivers was equivalent to providing access to the child with ASD.”

### **Assessment of the Home Environment**

Nearly all (95%) of the participating occupational therapists mentioned that there is a need to gather information related to the home environment of a child with ASD during an occupational therapy evaluation process. The participants were asked to identify strategies they use to gather information related to the home environment of the child. All of them stated that, during the interview process with parent or caregivers, they asked questions related to the home environment. Some examples included the following. “Describe your child’s favorite toys.” “What works best at home to have your child participate?” “Who does your child spend time with?”

### **Discussion**

Although occupational therapy practice models like the PEOP (Christiansen & Baum, 2005)

highlight the effect of person and environmental factors on participation, there is limited evidence about the influence of environmental factors on participation in a child with ASD. Previous studies have indicated that participation among children with ASD is lower in home and community activities (LaVesser & Berg, 2011; Little et al., 2014).

The current study recognizes the influence of environmental factors present within the home on participation patterns of children with ASD. Findings from this study suggest that increased parental responsiveness toward the child and the availability of learning materials within the home increases children's participation within the home environment. This study also suggests that increased parental stress due to child factors can decrease the participation of children within the home environment.

The results from both Steps 1 and 2 indicate that the availability of toys and adequate learning materials is essential for enhancing a child's participation in the home environment. The responses from the occupational therapist survey emphasized that having a designated, organized play area with age-appropriate toys that provide sensory experiences based on the child's sensory processing needs is important for a child's development. As highlighted in the literature, children with ASD may have sensory processing differences that influence their involvement in daily activities. Therefore, embedding sensory inputs into a child's daily routines to modulate arousal or

adapt home environments may promote participation (Ashburner et al., 2014).

Findings from a recent study suggest that parents of children with ASD may not choose to participate in activities with the child or parents may not assign chores to the child (LaVesser & Berg, 2011). But results from the present study suggest that a child's participation in the home can be influenced by parental responsiveness. This can be demonstrated by a parent conversing with and responding verbally to the child and by a parent responding and helping the child demonstrate achievement. It also is vital that parents of children with ASD provide opportunities to the child to participate in activities within the home environment.

Parents of children with ASD can experience high levels of stress (Higgins et al., 2005; Siller & Sigman, 2002) and, according to the present study, parental stress can influence a child's participation within the home environment. Occupational therapy practitioners can play an important role by referring parents to community resources and educating them about their child's condition and its effect on participation.

The results of this study also support the idea that occupational therapists need to focus on identifying the key contextual factors that affect the participation of children within the home. Identifying these factors can lead to designing interventions that can generate better outcomes.

Finally, this study showed that it is important to evaluate the home environment of

children with ASD, but limited assessment tools exist to measure the environmental complexity present within the home environment. There is a need to develop more sophisticated tools to measure the influences in the home environment on the participation of children with ASD.

### **Limitations and Future Directions**

Several limitations restrict the interpretation of these study findings. It is possible that the small sample size of children with ASD prevented the identification of other relationships that contribute to their participation in home activities. The children belonged to middle class families. All of the children were classified as having enriched home environments, based on the HOME scores. Future studies should include families of low socioeconomic status.

There are other potential physical and social contextual factors that were not assessed in this study. These include physical environment factors, such as lighting, cleanliness, room temperature, odors, noise, and the organization of items in the home. Also, a complete assessment of the child's play environment would have included the availability of equipment that provides sensory stimulation to the child, the organization of play materials, and the types of home modifications done to facilitate the child's participation in home activities.

While the HOME is a well-known assessment tool that is easy to administer and has good psychometric properties, it uses a binary scale. This deprived the examiner of access to more subtle

information needed to make informed judgments about the home environment. Another potential issue is that information on the HOME was collected following only one visit to a child's home. This might not represent a child's full life experience.

Another limitation might be the number of years of professional experience accrued by the occupational therapy practitioners who participated in the survey. The therapists who had fewer years of experience working with families of children with ASD may have had limited understanding of the influence of environmental factors on a child's participation.

Despite its limitations, this study provides a beginning characterization of the environmental factors that influence the participation of children with ASD in home activities. This information can further inform occupational therapists about potential home environment factors that can facilitate or hinder the participation of children in their activities of daily living.

### **Conclusion**

The results of this study suggest that increased quality in the cognitive, learning, social, and emotional environment of the child, as well as the amount of parenting stress experienced due to the child's characteristics, influences the participation of children with ASD in everyday activities in the home. In addition, this study supports the need to develop more sophisticated assessment tools to measure the quality of the home environment of children with ASD. The potential

exists to improve the quality of life of children with ASD by addressing the environmental factors that influence participation.



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