

THE RELIABILITY OF THE SENSORY ENVIRONMENT AND PARTICIPATION

QUESTIONNAIRE – TEACHER VERSION

A DISSERTATION

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

IN THE GRADUATE SCHOOL OF THE

TEXAS WOMAN'S UNIVERSITY

SCHOOL OF OCCUPATIONAL THERAPY

COLLEGE OF HEALTH SCIENCES

BY

AIMEE PILLER, MOT

DALLAS, TEXAS

DECEMBER 2016

## DEDICATION

For my parents who have provided me love and support throughout my life.

## ACKNOWLEDGMENTS

First and foremost, I want to thank God Almighty who allows provisions for His children to achieve their dreams. I want to acknowledge my husband who supported me through the long process of pursuing my PhD and changed the trajectory of his dream so I could fulfill mine. I could not have completed this dissertation without his support. Thank you to Dr. Beth Pfeiffer, who taught me first in occupational therapy school and again took me under her wing to complete this dissertation. I would like to thank my dissertations chairs, Dr. Noralyn Pickens, who went beyond what was expected to pick me up and ensure I made it to completion, and Dr. Tina Fletcher, who saw me through from near beginning to the end. Thank you to Dr. Karen Dunlap for providing her expertise in early childhood education and serving on my committee. Thank you to all of the participants who took time out of their busy schedules because they want to support research and share their expertise. I want to acknowledge my family, staff, and friends who endured my absence during the process of this dissertation. I want to thank every person who has shaped my career as an occupational therapist. Each of you plays a special role in the completion of this dissertation and I am forever grateful for the influence you had on my life and my career. Finally, I want to thank my clients who I have had the privilege to serve over the years. You have taught me more than anyone and you are the reason I pursued this dissertation. I only hope that I can provide you what you have given to me.

## ABSTRACT

AIMEE PILLER

### THE RELIABILITY OF THE SENSORY ENVIRONMENT AND PARTICIPATION QUESTIONNAIRE – TEACHER VERSION

DECEMBER 2016

The purpose of this study was to explore the initial psychometric properties of the *Sensory Environment and Participation Questionnaire – Teacher Version*. The assessment is a teacher-report questionnaire focused on exploring the impact of the sensory environment of the preschool on participation of children with autism spectrum disorder (ASD). The assessment provides a valuable tool to examine participation and the environment within one instrument. The study used 103 preschool teachers who completed an online version of the *Sensory Environment and Participation Questionnaire – Teacher Version*. Twenty participants also completed the assessment a second time to gather information for test-retest reliability. Classical test theory was used to establish the unidimensionality of the instrument. An exploratory factor analysis revealed six factors that accounted for 65 % of the variance. Internal consistency for the instrument is 0.98, indicating excellent reliability. Seven items had poor factor loading and six of these items were removed from the final version of the assessment. Test-retest reliability was 0.68 for the original instrument and 0.70 for the final version of the instrument with items removed. Ease of use was also explored using quantitative measures for length of time and qualitative

content analysis to analyze narrative feedback. Length of time for assessment completion averaged from 10-20 minutes. Feedback encompassed three main themes additional response options, additional concepts to assess, and definition of terms. Feedback was used in conjunction with item and factor analysis to generate a final version of the instrument. Overall, the *Sensory Environment and Participation Questionnaire – Teacher Version* is a reliable instrument with established construct and content validity. Future testing of the final version will provide additional information to generate a complete instrument that can be used to assess the sensory environment and participation within the preschool setting with other populations. The instrument has the potential to identify barriers to participation, thus allowing the occupational therapist the opportunity to use the Person-Environment-Occupation therapy to modify aspects of the environment to increase participation.

## TABLE OF CONTENTS

	Page
DEDICATION .....	iii
ACKNOWLEDGEMENTS .....	iv
ABSTRACT .....	v
LIST OF TABLES .....	x
LIST OF FIGURES .....	xii
 Chapter	
I. INTRODUCTION .....	1
Background .....	1
Statement of the Problem .....	2
Statement of the Purpose .....	3
Research Questions .....	4
Definition of Key Terms .....	4
Participation .....	4
Environment .....	5
Context .....	5
Sensory Processing .....	6
II. REVIEW OF LITERATURE .....	7
Environment and Participation .....	8
Participation .....	9
Environment .....	11
Autism Spectrum Disorder and Participation .....	14
Autism Spectrum Disorder and Sensory Processing .....	15
Theoretical Foundations .....	20
Current Assessments of Sensory, Environment, and Participation .....	22
Summary .....	25
Development of the Measure .....	25
Phase One of Assessment Development .....	26

Components of the Measure .....	28
III. METHODOLOGY .....	30
Psychometric Properties in Assessment Development .....	30
Participants.....	32
Instruments.....	32
Procedure .....	33
Recruitment.....	33
Demographics .....	35
Data Analysis .....	35
Phase One: Exploratory Factor Analysis .....	36
Phase Two: Discrimination.....	38
Phase Three: Classical Test Statistics .....	39
Phase Four: Test-Retest Reliability .....	39
Phase Five: Ease of Use.....	40
IV. RESULTS .....	42
Demographics of Participants .....	42
Exploratory Factor Analysis .....	46
Factors.....	54
Internal Consistency.....	57
Removal of Items.....	60
Classical Test Statistics.....	61
Test-Retest Reliability .....	66
Ease of Use .....	72
V. DISCUSSION AND CONCLUSION.....	76
Psychometric Properties.....	76
Content Validity.....	76
Construct Validity.....	78
Reliability.....	81
Assessment Question Consideration.....	83
Participants.....	85
Implications for Practice .....	89
Limitations .....	94
Future Research .....	95
Conclusion .....	97
REFERENCES .....	98

## APPENDICES

A: Sensory Environment and Participation Questionnaire – Teacher Version:	
Original Version.....	115
B: Questions for Cognitive Testing .....	124
C: Demographic Form .....	127
D: Feedback Form.....	131
E: Informed Consent.....	134
F: Recruitment Script.....	137
G: Decision Table .....	139
H: Item- Statistics by Subtest.....	142
I: Inter-item Correlation Matrix .....	169
J: Final Version of Assessment.....	218
K: IRB Approval Letter .....	231



## LIST OF TABLES

Table	Page
1. Occupational Therapy Assessments of Context, Sensory Factors, and Participation .....	23
2. Location of Participants .....	43
3. Demographic Information of Participants .....	44
4. Demographic Information of Child .....	46
5. Correlations of Subtests .....	47
6. Factor Matrix .....	51
7. Items with Factors Loading Below 0.50 .....	54
8. Description of Factors.....	57
9. Internal Consistency.....	58
10. Internal Consistency after Removal of Items.....	61
11. Subtest One Item Statistics .....	62
12. Subtest Two Item Statistics.....	63
13. Subtest Three Item Statistics.....	64
14. Floor and Ceiling Scores.....	65
15. Floor and Ceiling Scores for Revised Version .....	65
16. Demographics of Participants for Test-Retest .....	66
17. Demographic Information of Child for Test-Retest.....	68
18. Intraclass Correlation Coefficient.....	69

19. Intraclass Correlation Coefficient by Item-Subtest One .....	69
20. Intraclass Correlation Coefficient by Item Subtest-Two and Three .....	71
21. Feedback Form for Ease of Use.....	72

## LIST OF FIGURES

Figures	Page
1. PEO Theory in Preschool.....	21
2. Scree Plot .....	49
3. Chart of Length of Time .....	73
4. Pre and Post Intervention using Person-Environment-Occupation Theory .....	90

## CHAPTER I

### INTRODUCTION

#### **Background**

The goal of occupational therapy services is to increase participation of clients in roles and routines across settings (American Occupational Therapy Association [AOTA], 2014). The focus on participation aligns with goals reflected in the *International Classification of Functioning* (ICF), a healthcare document authored by the World Health Organization (WHO) that classifies health domains, disability, and environmental factors (WHO, 2001). This document outlines the focus of healthcare providers on the reduction of barriers to increase participation (Noonan, Koopec, Noreau, Singer, & Dvorak, 2009; WHO, 2001). Barriers include both environmental and societal barriers that prevent or inhibit participation (Schneidert, Hurst, Miller, & Ustan, 2003). In line with this philosophy, occupational therapy practitioners facilitate participation through the reduction of barriers (AOTA, 2014). However, the occupational therapy practitioner must first identify the barriers that prevent or limit participation through the evaluation process.

Autism spectrum disorder (ASD) is a common developmental disability in children (Boyd, Odom, Humphreys, & Sam, 2010) and a common reason for referral to occupational therapy (Watling, Deitz, Kanny, & McLaughlin, 1999). Many children with ASD also have sensory processing differences (Smith Roley et al., 2015; Tomchek,

Huebner, & Dunn, 2014). Occupational therapy practitioners often address sensory processing differences in children with ASD from the perspective of the person in attempt to remediate sensory processing differences that impede participation (Faller, Hunt, van Hooydonk, Mallioux, & Schaaf, 2015; Lane, Smith Roley, & Champagne, 2014). However, healthcare philosophy promotes a reduction in barriers to increase participation rather than focusing on the limitations of the person (Schneidert et al., 2003). Occupational therapy practitioners use the evaluation process to identify barriers to participation (AOTA, 2014). An evaluation of participation within a specific setting is essential to the understanding of participation as a whole (Forsyth & Jarvis, 2002). Yet, the majority of assessments examine participation and the environment as separate concepts with separate assessments (Whiteneck & Dijkers, 2009). The environment and participation are indistinguishable such that the concepts should be measured together in a single assessment (Bedell, Khetani, Cousins, Coster, & Law, 2011). One barrier to participation is the sensory elements of the environment due to sensory processing differences in children with ASD (Smith Roley et al., 2015; Tomchek et al., 2014). There is a need in occupational therapy for a comprehensive reliable assessment designed to examine both the specific environment, in this case the sensory environment of the preschool, and participation of children with ASD in one assessment (Bedell et al., 2011; Forsyth & Jarvis, 2002).

### **Statement of the Problem**

Twenty percent of all practicing occupational therapists work in a school setting, making schools the number one employer of pediatric occupational therapists (AOTA,

2015a). Due to high caseloads and the push for inclusive education, the school-based occupational therapist is challenged to increase participation within the context of classroom (Chapparo & Lowe, 2012). Adaptation of the school environment to increase participation allows the occupational therapy practitioner the affordance to provide services from both a direct and consultative model. This aligns with laws that govern the implementation of services within the school setting (Individuals with Disabilities Education Improvement Act [IDEA], 2004). Evaluation allows the occupational therapy practitioner the occasion to identify barriers to participation in order to make sufficient recommendations (AOTA, 2014). There is a need for assessments to “identify factors that influence participation of children in specific settings and activities” (Bedell et al., 2011, p. 771). The development of the *Sensory Environment and Participation Questionnaire – Teacher Version* is intended to assess the sensory aspects of the preschool environment and how they impact participation of children within the preschool setting. Currently, the assessment has not been established as a reliable tool. Without reliable assessments to examine the sensory barriers and facilitators within the environment, the occupational therapy practitioner is challenged to provide effective interventions to reduce environmental barriers and improve participation.

### **Statement of the Purpose**

The purpose of this study was to establish initial psychometric properties of the *Sensory Environment and Participation Questionnaire – Teacher Version*. Specifically, this study focused on the establishment of internal consistency and test-retest reliability as well as initial utility of the assessment. The assessment is a teacher-report questionnaire

designed to examine the sensory components of the environment that support and inhibit participation within the preschool classroom.

### **Research Questions**

The research questions for this study are as follows:

1. What is the reliability of the *Sensory Environment and Participation Questionnaire – Teacher Version*?

Secondary questions include:

- a. What are the independent factors being measured by the items in the assessment?
  - b. What is the dimensionality of the assessment?
  - c. What is the test-retest reliability of the assessment?
2. What is the ease of use and burden of administration of the assessment?

### **Definition of Key Terms**

Participation, environment, context, and sensory processing are key terms in this study.

#### **Participation**

The definition of participation encompasses a process and an outcome (Law, Petrenchik, Ziviani, & King, 2006). The *Occupational Therapy Practice Framework: Domain and Process* (AOTA, 2014) defines participation as active involvement of a person to perform an occupation that is meaningful to the person. Participation occurs within a given environment and may vary based upon the environment (Ziviani & Rodger, 2006). In this study, participation is defined specifically within the preschool

environment. Participation consists of the involvement of the preschool child in the tasks established by the preschool environment to the expectations of others within that environment in order to fulfill the educational roles.

## **Environment**

Occupational therapy defines the environment as the external surroundings of a client and the place where occupations occur. It is made up of both physical and social components (AOTA, 2014) and consists of domains including the person, household, neighborhood, and community (Law et al., 1996). Environment in this study refers to the preschool setting. The preschool environment consists of several smaller environments such as the classroom, playground, and cafeteria. Both items and people make up the environment and establish expectations for occupation within the setting. The physical environment includes the physical structures, objects, and items. The social environment encompasses teachers and other professionals and students.

## **Context**

Occupational therapy defines context as the abstract features that surround the environment. While often used interchangeably, context defines influences on the environment rather than the entire environment itself. There are four contexts to consider cultural, personal, temporal, and virtual. Contexts may be internal to the person or external (AOTA, 2014). In the preschool setting, the cultural context includes the culture of surrounding society, the school, and the classroom. The personal context includes each of the student's demographic qualities including age, gender, socioeconomic status, and the like. Preschool age describes an aspect of the temporal environment based upon



the phase of life. The temporal context also includes the time of day, schedules and routines, and time of year. The virtual context includes the technology used in the preschool setting such as the use of interactive whiteboards, tablets, and the Internet.

### **Sensory Processing**

Sensory processing is defined as the organization of sensory information for use. Sensory processing encompasses seven sensory systems vestibular, proprioception, tactile, auditory, visual, olfactory, and gustatory (Ayres, 1979). Disorders of sensory integration include sensory modulation or reactivity disorders, disorders of praxis, bilateral integration and sequencing disorder, and postural disorders (Ayres, 1989). The term sensory processing and sensory integration are often used interchangeably. However, sensory processing is differentiated from sensory integration in that sensory processing refers to the processes of the nervous system to manage sensory information gathered from the seven sensory systems. Sensory integration is a part of sensory processing, along with registration, modulation, and habituation of sensory input (Bundy, Lane, & Murray, 2002). In this study, sensory processing refers to how the brain organizes and uses incoming sensory information to respond to the environment.

## CHAPTER II

### REVIEW OF LITERATURE

Occupational therapy practitioners are challenged to increase participation of clients within the context of each client's occupations and environment (AOTA, 2014). The lack of reliable resources available to assess the sensory aspects of the environment within the school setting inhibits the occupational therapy practitioner from addressing the environmental barriers from a sensory standpoint in order to increase participation. This review of literature will focus on four main areas. The first section describes the interdependent relationship between participation and the environment including a definition of both in general terms and then specifically as they relate to the preschool environment. The second section describes participation patterns of children with ASD, including the impact of sensory processing on participation. The third section describes current assessments of participation, sensory processing, and the environment. The information serves as the foundation for the development of the *Sensory Environment and Participation Questionnaire – Teacher Version*. The final section of the literature review describes the process of the development of the assessment by the author of this study.

## **Environment and Participation**

One in six children within the United States experiences a developmental disability (Centers for Disease Control and Prevention [CDC], n.d.). Disability is defined by the interaction between a person's health condition and the environment (Schneidert et al., 2003; WHO, 2001). In persons with disabilities, environmental and societal barriers impede participation (WHO, 2001). Limitations to participation are viewed as existing outside of the person in the form of environmental and societal barriers, including both physical and attitudinal barriers (Schneidert et al., 2003; WHO, 2001). The goal of intervention is to reduce barriers that interfere with participation (Noonan et al., 2009). The person is a partner in the treatment process to fully increase a person's level of functioning through an increase in participation (Singleton, 2001). Participation of an individual is recognized as having a direct impact on health and well-being (Schneidert et al., 2003).

Occupational therapy philosophy has long been concerned with participation. A main goal of occupational therapy is to increase participation and engagement in occupations by focusing on the reduction of barriers. Occupational therapy practitioners modify and adapt the environment to enable persons to engage and participate in chosen occupations (AOTA, 2014). The environment is viewed as having a direct impact on the person and the person has a direct impact on the environment, with both reciprocally and constantly influencing one another (AOTA, 2015c). The person and environment interact to generate an outcome of participation (Law, 2002; Law et al., 1996). Only focusing on

one aspect of this integral relationship does not allow for complete understanding of participation (Bedell et al., 2011; Schneidert et al., 2003).

## **Participation**

The concept of participation is complex. The WHO defines participation as “involvement in life situation” (WHO, 2001, p.10). Occupational therapy defines participation as active involvement of the person (Law, 2002) through engagement in occupations (AOTA, 2014). Participation is essential to health, well-being, and satisfaction. “Participation is a vital part of the human condition and experience—it leads to life satisfaction and a sense of competence and is essential for psychological, emotional, and skill development” (Law, 2002, p. 641).

Participation is a process and an outcome (Law et al., 2006). As a process, it involves engagement in activities and takes place within the environment (Law, 2002). These activities include work, play, and activities of daily living. Participation in occupations leads to adaptation and competence in chosen roles (Kielhofner, 2008). As an outcome, participation is the desire of humans (Law, 2002) to fulfill roles (Chapparo & Lowe, 2012) and is an end goal of occupational therapy (AOTA, 2014). The interaction of the person and the environment serves as the basis for participation (Ziviani & Rodger, 2006). The WHO’s (2001) definition of participation encompasses learning, task demands, communication, mobility, self-care, domestic tasks, relationships, and community and social involvement. For children, this definition includes participation in school, leisure, and recreational activities (King et al., 2003). Participation in family activities is also central to childhood (Raghavendra, 2013).

Children with disabilities have limited participation as compared to children without disabilities. These limitations can extend beyond childhood through the lifespan (King et al., 2003). Environmental factors contribute to limitations in participation patterns of children with developmental disabilities (Rosenberg, Ratzon, Jarus, & Bart, 2012). Children and youth with disabilities reported that three main factors influence participation. These factors include adult and peer understanding of their needs, quality of services, and collaboration in decision making for accommodations (Kramer, Olsen, Mermelstein, Balcells, & Lilljenquist, 2012). Qualitative data from children and youth with disabilities substantiates the importance of the societal aspects of the environment on participation. Environmental barriers and independence level both present as barriers to participation. Taiwanese children with mild disabilities displayed decreased participation in community settings as compared to home or school settings. Participation was impacted in all environments by both the child's level of disability and the specific restrictions within the environment (Hwang et al., 2015).

**Participation in the preschool environment.** The definition of participation changes based upon the environment and contextual demands (Kielhofner, 2008; Law, 2002). In the preschool environment, participation is defined by the actions of the child combined with the expectations of the environment. Expectations shift at various levels of the preschool environment (Sandberg & Erikson, 2010). Participation of preschool students consists of being a part of the group, listening, influencing, and involvement (Johansson & Sandberg, 2010) and is influenced by the response and interaction of the teacher and student within an activity (Emilson & Folkesson, 2007). Preschool teachers

identified a child's influence within the preschool environment as a main component of participation. A child's influence includes the acts of making decisions, communicating with others, and influencing aspects of the preschool day. In addition, opportunities are a key factor in the participation of preschool children (Sandberg & Erikson, 2010).

Participation and learning are closely linked (Johansson & Sandberg, 2010), indicating the fulfillment of the role of learner is essential to participation in the preschool environment. Overall, preschool teachers define participation within the preschool setting as the active performance of activities related to education, such as the use of classroom materials, performing activities with others, and engaging in learning activities to fulfill roles (Sandberg & Erikson, 2010). Roles are influenced by the desires and expectations of the student, teacher, and parent. The roles of the preschool environment encompass that of a student, friend, worker, classroom community member, and carer for self (Chapparo & Lowe, 2012). Successful participation in the preschool environment is dependent upon interactions, sense of wellbeing, communication, and completing activities (Sandberg & Erikson, 2010).

## **Environment**

Ecological models of development and behavior focus on the events of the lifespan within the natural environment and provide the basis for defining the environment. Foundational to ecological theories is the interaction of the environment with the person to affect participation in activities and tasks (Bronfenbrenner, 1994; Dunn, Brown, & McGuigan, 1994). Development of the person occurs within context and is dependent upon interactions between the person and the environment. The

environment exists at various levels, starting at the level closest to the person. This level is known as the micro-system and is immediate to the person. It involves face-to-face contact and the direct experience of the person. The meso-system involves two environments that are linked and both involve the person. The exo-system extends to include environments that are linked but do not all directly involve the person. The macro-system refers more to the cultural components that encompass the smaller environments (Bronfenbrenner, 1994). Participation in the preschool setting is dependent upon the various factors at each level of the environment, and therefore varies at each level (Sandberg & Erikson, 2010).

Occupational therapy defines the environment as being comprised of physical and social aspects and is the place in which occupation occurs (AOTA, 2014). Context is distinguished from the environment as less tangible features that surround the physical and social environment. It serves as the background to the environment (Spencer, 2003). The environment is encompassed by contexts, including cultural, personal, temporal and virtual contexts that exist at different levels (AOTA, 2014).

The environment has a continuous effect upon behavior; likewise, behavior has a simultaneous effect upon the environment. As a result, the environment may inhibit or enhance participation (Law et al., 1996). As in the ICF's definition of disability, the interaction of a health condition and environmental barriers has a direct effect on participation (Schneidert et al., 2003). In exploring parent perspectives on children with disabilities, the environment and participation were found to be indistinguishable, almost always reported together. Parents reported the context provides demands and barriers

that differ between settings. Parents further reported that participation is influenced by both personal factors and environmental factors (Bedell et al., 2011).

**School environment.** A main occupation of the child is education and learning activities (AOTA, 2015b; Chapparo & Lowe, 2012). The education of students with disabilities within the school environment is dictated by federal and state laws under the Individuals with Disabilities Education Improvement Act (IDEA). This act indicates children should be educated within the least restrictive environment, meaning the regular education setting, whenever possible (IDEA, 2004). Under IDEA, students with disabilities, including ASD, must be educated in the same environment as students without disabilities when appropriate (Yell, 2006). IDEA also addresses provision of services within the school setting. It extends beyond the implementation of special education services and outlines the importance of increasing participation of children with disabilities within the educational setting (AOTA, 2015b). Students are expected to participate fully within public education and supports should increase independence within school tasks (Yell, 2006).

Occupational therapy is outlined in IDEA as a service for children with disabilities (AOTA, 2015c, 2015d). School-based occupational therapists are challenged to provide services within the least restrictive environment and utilize strategies to increase participation within the setting of the classroom (AOTA, 2015b). Occupational therapy services within the school environment may be from a direct or consultative model (Chapparo & Lowe, 2012). Both models are an effective method of service delivery. However, consultative service delivery has the potential to impact the views of



other professionals who also work with the child in the school setting. Consultative and collaborative services lead to a change in the views and attitudes of other professionals within the school environment (Barnes & Turner, 2001; Chapparo & Lowe, 2012). Exploring the environmental barriers in the school setting lends itself to a consultative model of practice. It allows services within the school setting to be delivered in the least restrictive environment in effort to increase participation of the child with disabilities within the mainstream classroom.

A qualitative study by Piller and Pfeiffer (2016) indicated the impact of the environment on participation within the preschool setting for children with ASD. Sensory components of the environment were found to be both inhibitory and facilitatory to a child's participation based upon the unique sensory processing of the child. In addition, the various sub-environments within the preschool environment provided different sensory components. Therefore, participation varied in each of the sub-environments and classroom activities. Modifications of the environment from both a physical and temporal aspect facilitated participation within the preschool setting. The social aspect of the preschool environment was also found to be influential in the participation patterns of children with ASD. The teacher often served as the coordinator of environmental modifications that were found to influence participation (Piller & Pfeiffer, 2016).

### **Autism Spectrum Disorder and Participation**

Autism spectrum disorder (ASD) is one of the most commonly occurring developmental disabilities in children (Boyd et al., 2010) and its prevalence continues to rise (CDC, 2014). ASD is characterized by deficits in social skills, communication and

language, and repetitive or restricted behaviors that affect daily functioning. These impairments impact the participation of children with ASD in everyday activities (American Psychiatric Association [APA], 2013).

Social and language deficits impact participation in social and play activities for children of all ages with ASD limiting participation in tasks that involve peers. Children with ASD tend towards more solitary play activities and tend to avoid social and pretend or imaginative play (Reynolds, Bendixen, Lawrence, & Lane, 2011). These trends continue into adolescence for children with ASD who also tend to engage in solitary rather than social play. As a result, participation with friends or in social situations for adolescents with ASD is limited (Little, Sideris, Ausderau, & Baranek, 2014). Motor skill deficits and sensory processing differences further limit children with ASD's participation. Children with ASD demonstrate less participation in chores and jobs as compared to typically developing children (Reynolds, et al., 2011). The frequency of participation in structured activities is also limited due to deficits in social, motor, and sensory processing (Little et al., 2014). Overall, children with ASD demonstrate decreased participation in a variety of activities and tasks.

### **Autism Spectrum Disorder and Sensory Processing**

In addition to deficits in social skills, communication, and language processing (APA, 2013), children with ASD exhibit differences in sensory processing (Schaff & Mailloux, 2015; Smith Roley et al., 2014; and Tomchek et al., 2014). In fact, hypo-reactivity and hyper-reactivity to sensory input and how the person responds to the sensory features of the environment are considerations during the diagnosis of ASD

(APA, 2013). Sensory processing is impacted in children with ASD, particularly in the areas of sensory reactivity and praxis (Smith Roley et al., 2015). Children with ASD demonstrate differences in processing auditory, visual, tactile, taste, smell, and movement sensations (Tomchek et al., 2014). Sensory processing patterns in children with ASD nearly always differ from the normative population, but vary amongst children diagnosed with ASD (Fernández-Andrés, Pastor-Cerezuela, Sanz-Cervera, & Tárraga-Mínguez, 2015; Smith Roley et al., 2015; Tomchek et al., 2014). Variations are dependent up on how each child's sensory system processes information (Smith Roley et al., 2015). Sensory processing impacts performance and is considered to be unique to the individual person (AOTA, 2014). The sensory components of the environment impact participation of children with ASD. However, how and to what extent participation is impacted is based upon the unique sensory processing patterns of the child (Piller & Pfeiffer, 2016; Smith Roley et al., 2015).

Participation for children with ASD is limited by sensory processing differences (Schaaf & Mailloux, 2015). Sensory processing differences are linked with decreased daily living skills, social skills (Zachor & Ben-Itzhak, 2014), and social participation (Schaaf & Mailloux, 2015). Maladaptive behaviors in children with ASD are associated with sensory processing dysfunction (Lane, Young, Baker, Angley, 2009). As a result, participation in everyday activities, including play and academics, is limited (Schaaf & Mailloux, 2015). Further, feelings of competency in participation of home and school tasks are negatively affected in children with ASD (Reynolds et al., 2011). Sensory processing differences impact the participation of the child with ASD and the family.

The routines of the family are altered to modify activities or avoid participation in activities altogether (Schaaf, Toth-Cohen, Johnson, Outten, & Benevides, 2011). Specifically, in studies of preschool children with disabilities, participation was found to be influenced by sensory processing difficulties. Participation for preschool children with ASD is decreased within community-based activities due to a variety of components, including sensory processing difficulties. Participation is limited by both the child's choices and the family's choices to not participate in certain activities (LaVesser & Berg, 2011).

Sensory processing patterns in the areas of sensory reactivity impact participation in both home and community environments, including the school environment (Fernández-Andrés et al., 2015; Smith Roley et al., 2015). The sensory system most impacted in the classroom is the auditory system (Fernández-Andrés et al., 2015). Deficits in processing auditory information can impede performance. Poor auditory filtering in children with ASD is associated with poorer performance on academic tasks and decreased attention (Ashburner, Ziviani, & Rodger, 2008). Tactile processing also presents as a concern within the classroom environment. Difficulties with processing tactile input is linked with inattention within the school environment (Fernández-Andrés et al., 2015). Unexpected tactile input from other children nearby can be problematic for many children with ASD impacting social and peer interactions within the school environment (Ashburner et al., 2008). Research suggests that visual processing is the strongest sense for many children with ASD (Smith Roley et al., 2015). School environments are frequently laden with visual input. However, the amount of extraneous

visual input within the classroom environment may be more of a distraction to children with ASD. Children with ASD may have difficulties filtering visual input to attend to the current task (Ashburner et al., 2008). Further, children who demonstrate hypo reactivity to sensory input and sensory seeking behaviors demonstrated poorer academic performance (Ashburner et al., 2008).

Sensory reactivity is not the only aspect of sensory processing that impacts school performance. Children who exhibit difficulties with motor skills in the area of praxis also have deficits in academic performance and participation in the school environment (Fernández-Andrés et al., 2015; Smith Roley et al., 2015; Tomchek et al., 2014). Praxis is also known as motor planning. It involves the planning, initiation, carrying out, and termination of movements. Praxis is based on a person's knowledge of personal actions, the environment, objects, and the intent of the person (Bundy et al., 2002). Poor praxis patterns in children with ASD negatively influence social participation (Smith Roley et al., 2015) and impacts a child's ability to perform motor related tasks. As a result, participation in motor-based activities, such as crafts, may be limited due to sensory processing difficulties (Schaaf & Mailloux, 2015). Specifically, in preschool children with ASD, sensory processing difficulties are correlated with decreased adaptive skills and behavior difficulties (O'Donnell, Deitz, Kartin, Nalty, & Dawson, 2012). Overall, sensory features of the environment and sensory processing differences impact participation for children with ASD in the school environment.

**Sensory integration treatment.** Sensory integration theory is frequently used by occupational therapists to treat sensory differences in children with ASD (Case-Smith,

Weaver, & Fristad, 2015; Watling et al., 1999). The foundation of this theory is based upon the work by Ayres (1979). The theory functions under the belief that by providing enhanced sensory experiences with active participation of the child, sensory processing is improved (Bundy et al., 2002). Sensory integration treatment is designed to impact the internal motivation of the person through activities that address play, engagement, and internal control (Case-Smith et al., 2015). The focus of the treatment is on the remediation of sensory processing deficits and in turn, participation is increased (Bundy et al., 2002). Sensory based interventions differ from sensory integration treatment. These include sensory activities that are typically directed by an adult to a child with the goal of improving regulation and behavior. Sensory based interventions are more commonly used in the school environment as compared to sensory integration (Case-Smith et al., 2015). Within the scope of occupational therapy, sensory functions are defined under the broad category of client factors (AOTA, 2014). Client factors are defined as “specific capacities, characteristics, or beliefs that reside within the person and that influence performance in occupations” (AOTA, 2014, p. s7). Under sensory integration theory, the occupational therapy practitioner focuses on restoration of sensory processing as a client factor to increase occupational performance and participation (AOTA, 2015b). While a popular evidence-based framework for treatment of children with ASD, sensory integration places its focus on the limitations of the person rather than on the reduction of environmental and societal barriers to increase participation. Further, intervention effectiveness of both sensory integration treatment and sensory based interventions is limited in the school environment. This may be due in part to the

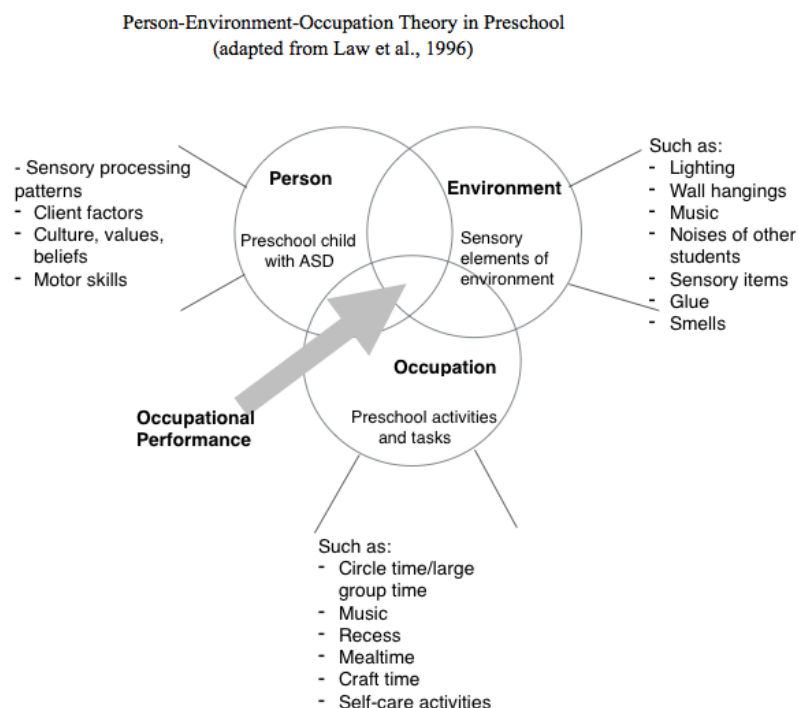
inability to maintain the efficacy of treatment due to the constraints of the school environment (Case-Smith et al., 2015). Instead of only addressing the limitations in sensory processing, interventions for children with ASD should also include a focus on contextual and environmental factors to be effective at increasing participation (AOTA, 2015d).

### **Theoretical Foundation**

The Person-Environment-Occupation (PEO) (Law et al., 1996) model serves as the foundation for the development of the *Sensory Environment and Participation Questionnaire – Teacher* version. This model supports an increase in the fit between person, environment, and occupation. The person, environment, and occupation are inter-related and continue to develop across the lifespan. The overlap of the three aspects is defined as occupational performance. The environment consists of external aspects both immediate and distant. Occupational performance happens when the person interacts with the environment through activities and tasks on a continual basis. Occupational performance improves as the fit between the person, environment, and occupation becomes more harmonious. The goal of the occupational therapist is to increase the fit, thus increasing occupational performance. In this theoretical model, the environment is seen as the easiest to manipulate to increase the fit between the person and environment and in turn increase occupational performance (Law et al., 1996).

The PEO model is an ecologically-based model and serves well as the theoretical foundation for the *Sensory Environment and Participation Questionnaire – Teacher Version*. The measure assesses the sensory aspects of the environment and the impact of

these aspects on participation. The PEO theory also aligns with the least restrictive environment aspect of IDEA by allowing for changes to be made to the environment to increase participation. The focus of the assessment is on the environmental factors that inhibit and enhance participation, in line with the theoretical framework of PEO. Because the environment and participation are so interrelated, it is essential that the two are assessed together (Bedell et al., 2011), as they are in this assessment. Under the PEO model, the information from this assessment can be used to make changes to the environment, thus increasing the occupational performance (Law et al., 1996). In this assessment, the specific environment addressed is the preschool environment. Figure 1 provides a visual representation of the PEO theory in the preschool environment.



*Figure 1.* PEO Theory in Preschool. The PEO theory applied to preschool setting.



### **Current Assessments of Sensory, Environment, and Participation**

The person consists of sensory capabilities, motor performance, and cognitive abilities (Law et al., 1996). Many of the available assessments that examine sensory components assess them from the standpoint of the person. These assessments include Sensory Integration and Praxis Test (SIPT) (Ayres, 1989), Sensory Processing Measure (SPM) (Parham, Ecker, Miller Kahaneck, Henry, & Glennon, 2007), and the Sensory Profile 2 (SP-2) (Dunn, 2014). Sensory aspects are also considered part of the physical environment that exist at all levels of the environment (AOTA, 2014). However, the SIPT, SPM, and SP-2 tend to focus on the client factor of sensory processing.

Despite the abundance of sensory components within the environment, few of assessments exist that examine these aspects and how they affect participation. Several assessments are available to examine the physical environment in the framework of rehabilitation. These are designed to examine the accessibility and safety of home and community environments (Gitlow, 2014). Specific to the school setting, the *School Function Assessment* (Coster, Deeney, Haltiwanger, & Haley, 1998) examines performance skills rather than context, but also includes a measure of participation. A recent environmental sensory assessment, the *Classroom Sensory Environment Assessment (CSEA)* provides an assessment specifically designed to examine the sensory environment in the school setting (Kuhaneck & Kelleher, 2015). The assessment examines the environment, but does not explore the impact on participation. The *Participation and Environment Measure- Children and Youth (PEM-CY)* provides a parent-report assessment to examine both participation and the environment in one

assessment. The measure assesses participation in the school, home, and community with consideration of environmental factors of each setting. It is designed for children ages 5 to 17 years (Coster et al., 2012).

Table 1 outlines common occupational therapy assessments related to sensory, the environment, and participation within pediatrics. The assessments in the table were gathered from *Asher's Occupational Therapy Assessment Tools: An Annotated Index* (Asher, 2014a). This text is published by the American Occupational Therapy Association and outlines almost 600 occupational therapy assessments. Assessments are included in the text based on practice area, standardization, and psychometric properties that meet minimum criteria (Asher, 2014b). The author of this study performed a thorough review of the assessments in the Asher (2014a) text to comprise the list outlined in Table 1. The table describes assessments in the areas of context, sensory factors, and participation as they relate to the pediatric population.

Table 1

*Occupational Therapy Assessments of Context, Sensory Factors, and Participation*

Assessments of Context		(as cited in Gitlow, 2014)		
<u>Title</u>	<u>Author</u>	<u>Population</u>	<u>Areas Assessed</u>	<u>Format</u>
Environment Rating Scales (Infant/toddler, Early childhood, Family childcare, School-aged)	Harms, Clifford, & Cryer (2005, 2006, 2007); Harms, Jacobs, & White (2014)	Birth- school aged children	Quality of setting based on the needs of the child	Observation

(continued)

<u>Title</u>	<u>Author</u>	<u>Population</u>	<u>Areas Assessed</u>	<u>Format</u>
School Setting Interview (SSI)	Hemmingsson, Egilson, Hoffman, & Kielhofner (2005)	Students with disabilities ages 10+	Identifies needs and accommodations to increased participation in school activities	Semi-structured interview
Home Observation for Measurement of Environment (HOME)	Caldwell & Bradley (2003)	Ages 0-15	Quality and quantity of stimulation within the home	Observation checklist
Assessments of Client Factors- Sensory (as cited in Haynes & Anderson, 2014)				
<u>Title</u>	<u>Author</u>	<u>Population</u>	<u>Areas Assessed</u>	<u>Format</u>
Sensory Integration and Praxis Test (SIPT)	Ayres (1989)	Ages 4-8 years, 11 months	Sensory processing and integration including praxis	Standardized performance test
Sensory Processing Measure- Preschool (SPM-P)	Parham et al., (2007)	Ages 2-5 years in home and school setting	Sensory processing, praxis, social participation	Observation rating scale
Sensory Profile-2	Dunn (2014)	Ages 0-14 in home and school setting	Sensory processing patterns that support or inhibit participation	Observation based rating scale
Assessments of Participation (as cited in Martin, 2014; Simons & Leech, 2014)				
<u>Title</u>	<u>Author</u>	<u>Population</u>	<u>Areas Assessed</u>	<u>Format</u>
School Function Assessment (SFA)	Coster, Deeney, Haltiwanger, Haley (1998)	Children in kindergarten through sixth grade	Functional performance and participation	Questionnaire
Assessment of Preschool Children's Participation	King, Law, Petrenchick, & Kertoy (2006)	Ages 2-5 years, 11 months	Participation and restriction of participation	Parent report rating scale
Children's Assessment of Participation and Enjoyment (CAPE)	King et al. (2004)	Ages 6-21	Participation, enjoyment, preferences in non-school activities	Questionnaire and rating scale

## Summary

Children with ASD demonstrate decreased participation as compared to children without disabilities (LaVesser & Berg; Reynolds et al., 2011; Schaaf & Mailloux, 2015). Sensory processing differences are linked to decreased participation of children with ASD in the preschool environment (LaVesser & Berg, 2011). The sensory aspects of the school environment present with many sensory challenges to participation for children with ASD (Ashburner et al., 2008; Fernández-Andrés et al., 2015; Smith Roley, 2015). Participation and environment are intertwined, interacting simultaneously and continuously (Bedell et al., 2011; Law et al., 1996). Yet, no psychometrically sound assessment exists to examine the impact of the sensory environment on participation in the specific environment of the preschool setting (Forsyth & Jarvis, 2002; Whiteneck & Dijkers, 2009). A reliable assessment that examines both participation and the environment is believed to be a more accurate representation of participation within “real-life contexts” (Bedell et al., 2011). It is in this framework that the author of this study co-developed the *Sensory Environment and Participation Questionnaire – Teacher Version*.

## Development of the Measure

The researcher in this study co-developed the *Sensory Environment and Participation Questionnaire – Teacher Version* in the same manner as the original home and community setting version of the assessment, known as the *Sensory Environment and Participation Questionnaire*. Via a parent-report questionnaire, this measure assesses the sensory aspects of the home and community environment on participation of preschool-

aged children with ASD in those two settings (Pfeiffer et al., 2016). The home and community version is currently in the pilot testing phase and is expected to be completed by early 2017 (Mori, Clippard, del Pilar Saa, & Pfeiffer, 2016). The school version is designed as a companion version to the home and community assessment and constitutes the assessment presented in this study. The method for development of the teacher version follows the same trajectory as the parent measure. The National Institute for Health, Patient Reported Outcome Measurement Information System (NIH PROMIS) outlines a method for the development of patient reported outcome measures (National Institute of Health [NIH], 2012). The development of the *Sensory Environment and Participation Questionnaire* and the *Sensory Environment and Participation Questionnaire – Teacher Version* followed the process outlined by NIH PROMIS.

### **Phase One of Assessment Development**

Initially, the assessment development focused on the establishment of the conceptual aspects of assessment questions. Under the PROMIS guidelines for assessment development, qualitative research provides an avenue to develop conceptually sound questions for patient-reported assessments (NIH, 2012). A qualitative study by Piller & Pfeiffer (2016) explored the perceptions of preschool teachers and occupational therapists regarding the sensory components of the environment and their impact on participation. The purpose of this study was to provide information to guide the development of the questions for the measure. The study used a semi-structured interview format to gather data. Participants included 13 preschool teachers and occupational therapists who worked with at least one preschool child with ASD in the

school setting. Data were analyzed using a qualitative descriptive approach (Sandelowski, 2000). Analysis included open coding procedure (Creswell, 2013) and was triangulated by multiple coders.

The researchers of the qualitative study examined the perspectives of the teachers and therapists in regards to the sensory environment and participation within the preschool setting. Results revealed that all seven sensory systems olfactory, gustatory, vision, auditory, tactile, proprioceptive and vestibular as being both present in the preschool environment and impacting participation. In addition, the child's response to these sensory components of the environment was found to influence participation. Three main themes emerged explaining the impact of the sensory environment on participation. Avoidance and perseveration was affected by the presences of sensory stimuli. In turn, students with ASD limited participation in certain tasks due to the sensory components. Sensory elements in the environment also proved to be a distraction thus preventing full participation within the given task. The sensory elements varied in each of the preschool sub-environments, such as classroom and playground, along with others. As a result, participation also varied in each sub environment or preschool activity. The temporal aspect of the environment in the form of routines was found to be supportive of participation, while changes in routines disrupted participation. In addition, routines were affected by the students' need for sensory input. Finally, modification to the environment and sensory supports provided facilitation to increase participation. The teacher was most often the initiator of supports and modifications indicating the importance of the social environment (Piller & Pfeiffer, 2016).

The researcher used the results of the qualitative study to develop the questions for the *Sensory Environment and Participation Questionnaire – Teacher Version* in a similar format as the home assessment. A congruent format of questions and instructions is important to ensure consistency between the home and school versions (E. Pfeiffer, personal communication, April 13, 2015). The initial version of the assessment was reviewed by two pediatric occupational therapists both with experience in assessment development. The researcher then provided the assessment to three participants that included preschool teachers and pediatric occupational therapists for cognitive testing. Cognitive testing, also known as cognitive interviewing, is used to ensure questions are interpreted as intended by the author (Streiner & Norman, 2008). Participants were asked to complete a pilot version of the assessment prior to engaging in the interview for cognitive testing. Researchers used rephrasing, probing, and double interview techniques to gather information about instructions and each question (Streiner & Norman, 2008). Technique was dependent on the nature of the portion of the assessment. Researchers performed interviews via telephone and each lasted approximately 30 minutes. All interviews followed the format of questions found in Appendix B. Researchers analyzed transcribed interviews line by line and subsequently made changes to the measure to generate a final pilot version of the measure in wording of questions and addition of questions.

### **Components of the Measure**

The measure utilizes a five-option ordinal scale for responses for each of the subtests. The assessment consists of three subtests. The first examines the extent to

which the response to sensory input affects the student's participation in a particular preschool classroom activity. The activity serves as the overarching category, and the tasks of each activity are rated based on the impact of the child's response to sensory input on participation in the particular task. Activities include circle time, table time, snack or lunch time, classroom routines, free play/recess time, craft/art time, self-care, sensory table, and movement/music time. The next section of the measure encompasses a set of preschool activities and examines the amount of support provided to the child for the child to participate in each activity. The final section examines the amount of modifications to the environment that are provided to allow participation in the same set of tasks as in subtest two. The same set of five ordinal responses is provided for each section. The response are as follows: "none," "a little," "some," "a lot," "too much to participate." The assessment is designed to provide a teacher-reported outcome of the sensory environment's influence on participation within the preschool setting.



## CHAPTER III

### METHODOLOGY

This study establishes initial psychometric properties of *Sensory Environment and Participation Questionnaire – Teacher Version*. The researcher used classical test theory (CTT) to establish the reliability of the instrument. Namely, the study establishes internal consistency and test-retest reliability. In addition, the researcher gathered information regarding the ease of use and burden of administration of the instrument.

#### **Psychometric Properties in Assessment Development**

The development of an assessment is important, but the assessment has minimal use if it does not have sound psychometric properties. Reliability is defined as “the extent to which a measurement is consistent and free from error” (Portney & Watkins, 2009, p. 77). Internal consistency provides information as to the degree that items measure the same characteristic and not another trait. Test-retest reliability examines the ability of the instrument to gain similar results on repeated administrations. Reliability is established when multiple trials produce similar scores (Portney & Watkins, 2009).

Classical test theory (CTT) is a common theory used in assessment development and is useful in determining reliability for self-report measures (DeVillis, 2006). It provides an item analysis in order to indicate a score closest to the true score and to determine the item and scale properties are met (Kline, 2005; Portney & Watkins, 2009). Under this theory, the score obtained from the assessment consists of a true score with some error (McDowell, 2006). CTT is used to provide information as to how errors in

measurement impact scores (Allen & Yen, 1979/2002) and determine reliability of the items within the assessment (DeVillis, 2006). Errors in scores are contributed to random errors and would therefore, be the same in any situation (DeVillis, 2006; Portney & Watkins, 2009).

In order for CTT to accurately determine measurement errors, assumptions must be met. First is tau equivalence, or the assumption that all items are equal and measure the same trait (Tavakol & Dennick, 2011). The second assumption is that all items are parallel meaning they have equal error variance (DeVillis, 2006). Correlations between items are also considered. The more parallel the items, the better the items are considered to be in structure because they are more closely correlated to the true score; known as discrimination. Exploratory factor analysis (EFA) provides a means of determining the dimensionality of the measure by providing a method to determine the characteristics of test items that are similar and different to the characteristics of other items (DeVillis, 2006). It also provides construct validity to the measure (McDowell, 2006). Factor analysis elucidates similarities in items (DeVillis, 2006) and determines latent factors from observed variables (Osborne, 2014). Internal consistency is a common method to establish unidimensionality of an items in an assessment (Portney & Watkins, 2009), an assumption of CTT. Cronbach's alpha is typically used to establish internal consistency for measures using ordinal scales by examining the correlations between the items on the measure. It provides a method to determine the correlation of each item to other items within the section (Portney & Watkins, 2009).

## **Participants**

Participant inclusion criteria include preschool teachers who were currently working with at least one child between the ages of 3 years, 0 months to 5 years 11 months old and diagnosed with ASD or displayed behaviors consistent with a diagnosis of ASD within a preschool setting. Diagnosis of ASD was based upon report of the participant. Participant settings of preschools included public, charter, private, and home-based preschools. Exclusion criteria include participants who do not speak or read English and who do not have access to the Internet.

## **Instruments**

The study consisted of three instruments. First, participants completed a demographic form to create a profile of the participants and identify any patterns that may influence responses. The demographic form included community type, state of residence/practice, level of education, age, race/ethnicity, occupation, years in profession, and current number of children worked with that have been diagnosed with ASD. The form also provided participants the opportunity to report information about the student including age, gender, race, and how the diagnosis of ASD was known to the person completing the assessment. Appendix C displays the demographic form. Next, participants completed an electronic version of the *Sensory Environment and Participation Questionnaire – Teacher Version*. Electronic format allowed for ease of the data collection process. The full assessment can be found in Appendix A. Finally, the participants completed a feedback form in the form of an ease of use survey. The structure of the feedback form included didactic questions with an open-ended response

box. The questions focused on particular aspects of the measure including wording of questions, complexity, and manageability of the measure. The feedback form explored the participants' understanding and perceptions of the measure including the ease of use of the measure. It mirrors the same feedback form used in the pilot study for the home and community version of this assessment. A sample feedback form is found in Appendix D.

### **Procedure**

Texas Woman's University provided Institutional Review Board (IRB) approval. The researcher uploaded the assessment to PsychData survey software to provide the means for the forms to be accessed and completed electronically. The three instruments were available to participants through an Internet link in the body of the email or through a link in the text of social media postings. Instructions on how to complete each instrument were included with the questionnaire in PsychData. Prior to the initiation of the questionnaires, participants completed three questions to determine eligibility and provided informed consent. Participants then completed the demographic form followed by the *Sensory Environment and Participation Questionnaire – Teacher Version*. Lastly, participants completed the feedback form for ease of use. The questionnaires took on average 10–20 minutes to complete, and up to, but not more than 30 minutes to complete. All data for each of the questionnaires were stored in PsychData until data analysis.

### **Recruitment**

Participants were recruited on a volunteer basis via purposive and snowball sampling (Patton, 2015). The target number for the study was 100 participants in order to

determine initial psychometric properties (Gorsuch, 1983). The researcher primarily utilized three main sources via the Internet for recruitment of participants. The first source was social media postings on *Facebook* and *Twitter*. The social media post included a brief description of the study, an option to contact the researcher regarding the study, and a link to the assessment with further information and instructions about the study and questionnaires. The second main method of recruitment occurred via postings on early childhood websites. Again, a brief, one or two sentence overview was provided with a link to the questionnaires. One blog, *Growing in Pre-K* ([www.growinginprek.com](http://www.growinginprek.com)), provided the information for recruitment in a blog post and The National Association of Special Education Teachers posted the recruitment information on their main webpage and included it in an email sent out to their subscribers. The third main method of recruitment took place via email. Emails were gathered via various sites that provided electronic mailing lists such as *Autism Speaks* ([www.autismspeaks.org](http://www.autismspeaks.org)) and *Private School Review* ([www.privateschoolreview.com](http://www.privateschoolreview.com)). The email recruitment script can be found in Appendix F. The researcher also used word of mouth to recruit participants. Interested participants contacted via word of mouth were sent an email with more information and a link to the online questionnaires in PyschData.

Participant eligibility was determined through three initial questions that served as an introduction to the assessment. The three questions to determine eligibility were as follows: 1) Do you teach preschool or teach a preschool age child(ren)? 2) Do you read English? 3) Do you work with at least one student who has been diagnosed with autism spectrum disorder (ASD) or exhibits behaviors consistent of a diagnosis of ASD? A

“yes” answer to all three questions determined the participant as eligible for participation in the study. After eligibility was determined, the participant provided informed consent prior to the start of the study.

The researcher logged participants on a weekly basis using a spreadsheet. Participants were logged if they expressed interest in completing the *Sensory Environment and Participation Questionnaire – Teacher Version* a second time to gather test-retest data. Two weeks after initial completion, the researcher sent out a link to the questionnaire. Email batches for recruitment for the test-retest were initially sent out once a week and then on a daily basis as more participants completed the study.

### **Demographics**

Descriptive statistics were used to determine the demographics of participants. The researcher matched the IP addresses from the demographic questionnaire to the IP addresses on the *Sensory Environment and Participation Questionnaire – Teacher Version* to determine the participants that completed both questionnaires. Participants who completed the demographic questionnaire but did not complete the *Sensory Environment and Participation Questionnaire – Teacher Version* were excluded from the demographic information data set.

### **Data Analysis**

Data analysis consisted of both quantitative and qualitative methods. Classical test theory (CTT) provided the theoretical basis to establish reliability (Kline, 2005). Data was housed on PsychData until time for analysis. At the point of analysis, the researcher uploaded the data from the demographic questionnaire and assessment to

SPSS (IBM Corp., 2015). Data from the feedback form was uploaded into an Excel spreadsheet and then into a word processing document. Each of the instruments was analyzed via separate methods. The researcher used descriptive statistics to examine the demographics of participants and classical test statistics, various statistical analysis to analyze CTT assumptions, and content analysis method using Nvivo (2014) to analyze the ease of use narrative data.

### **Phase One: Exploratory Factor Analysis**

Exploratory factor analysis provides a manner to analyze variables in order to identify patterns and correlations without any preconceived ideas or factors. First, a sufficient sample size to perform an EFA must be determined. A sample size of 100 is considered sufficient for an initial factor analysis (Gorsuch, 1983). In this case, the researcher gathered a sample size of 103 participants. A correlation matrix of each item revealed the extent of the inter-item correlations. Principal component analysis (PCA) was used to identify items within a factor, and the method of varimax rotation was used to rotate the factors. The researcher chose this method to determine factors that were independent of one another in attempt to load the factors (Osborne, 2014). Factor loading was used to determine the correlations between individual variables and the overall factor through the use of a correlation matrix (Portney & Watkins, 2009).

Exploratory factor analysis provides a method to reveal the items that measure the same concept. Therefore, items that did not load to the intended concept were considered for removal in order to reduce the size of the assessment, and simplify the measure (Portney & Watkins, 2009). According to Comrey and Lee (1992), factors loadings are

considered as follows: 0.32 is considered poor, 0.45 is considered fair, 0.55 is considered good, 0.63 is considered very good, and 0.71 is considered excellent. Pituch and Stevens (2016) consider a coefficient of 0.40 sufficient for a cutoff to determine what items are interpreted with a give factor. However, 0.50 is better because it indicates the item accounts for 25% of the variance and is more suitable for smaller sample sizes. In this study, the researcher considered factors with a loading of less than 0.50 for removal. A decision table provided the method to log the decision process of the researcher to determine a decision to keep or remove each item with less than a 0.50 loading. Seven rules were considered in the decision table:

1. Loads  $\geq 0.40$ .
2. Rule one met and item loads with factor that encompasses concept of question.
3. If item is removed, there will be less than three items under category.
4. No negative or confusing feedback provided on feedback form regarding question.
5. Conceptually, questions could not be considered as part of another item in the same section or subtest.
6. ICC for  $\geq 0.40$  on test-retest reliability.
7. Inter-item correlation with other items under same heading or in same subtest falling between  $\geq 0.30$  and  $\geq 0.70$ .

If a question had six positive answers to the rule, the item was kept in the final version of the assessment. An answer of “yes” was considered positive on all rules except number



three, in which case a “no” was considered positive. The researcher logged all decisions regarding each item in the decision chart located in Appendix G. After a decision was made, the researcher compared the item to the item item-total statistics to ensure that the reliability would not significantly change if the particular item was deleted. If the mean and standardized coefficient alpha would not result in a large change or the corrected item-total correlation was below 0.30, the item was deleted from the final version of the assessment.

### **Phase Two: Discrimination**

Cronbach’s alpha provides a means to determine internal consistency of assessments using an ordinal scale by examining the correlation between items in a measure (Portney & Watkins, 2009). The researcher used a correlation matrix to examine the inter-item correlations for each item. Items with higher inter-item correlations are more correlated with the true score. Therefore, the item is considered a better item in construct (Devillis, 2006). However, items with higher than 0.70 may be considered somewhat redundant in concept. Inter-item correlation between 0.30 and 0.70 are desirable to establish unidimensionality (Ferketich, 1991). Item-to-total correlation indicates the relation of each item on the assessment to the total by correlating the item to the total score with that item omitted. A correlation that is too low may indicate an item is measuring a different trait, while a correlation that is too high may also indicate items of the measure are redundant. Therefore, a moderate correlation of  $\geq 0.7$  to  $> 0.9$  is desired to establish internal consistency of the measure (Portney & Watkins, 2009).

To establish internal consistency, the researcher used Cronbach's alpha to determine the entire assessment's internal consistency, the internal consistency of each subtest, and the internal consistency of items identified in each factor by the factor analysis. Correlation matrices were examined for each subtest and each factor. Items were considered as unidimensional if the inter-item correlation fell between 0.30 and 0.70. To further establish internal consistency using an item-to-total correlation, items were also compared to the entire subtest or factor as a composite score correlation if the item was removed. Items with correlations under 0.70 or over 0.90 range were considered for deletion or rewording in order to generate a manageable assessment that is unidimensional, has the fewest number of items, and fully measure the concept of the assessment.

### **Phase Three: Classical Test Statistics**

Descriptive statistics were used to examine the demographics of respondents. Frequency counts and percentages of each demographic question were calculated. Descriptive statistics were also used to determine the mean scores of items and standard deviations of each item and for each subtest. Floor and ceiling effects were determined by examining minimum and maximum scores for each item and the three subtests.

### **Phase Four: Test-retest Reliability**

Twenty participants repeated the assessment a second time to establish test-retest reliability. The researcher sent an email to participants who expressed interest in completing the assessment a second time. The email was sent out two weeks after the participants initially completed the assessment. The questionnaire for test-retest was the

same as the original, but housed as a different survey in PsychData. Participants also completed a second demographic form. To match participants, each participant created a unique identification number that included the month and day of the participant's birthday, first initial of the participant's first name, and the last four digits of the participant's phone number. The identification number in the test-rest form was matched to the identification in the original form. Data from both the original and the second questionnaire were entered into SPSS (IBM Corp., 2015). An intraclass correlation coefficient (ICC) was used to establish correlation between the two ratings. ICC is a method of testing reliability for ordinal data that encompasses both correlation and agreement (Portney & Watkins, 2009). A two-way random model and an absolute agreement type was used with a 95% confidence interval. A correlation of  $\geq .80$  is desired (Webb, Shavelson, & Haertel, 2006). The researcher considered items with poor ICC within the decision chart for removal. If the item was kept in the assessment, the researcher considered the rewording of items with poor ICC.

### **Phase Five: Ease of Use**

A feedback form survey was provided at the conclusion of the assessment in order to examine ease of use, understandability, and burden of format. The results of this form were analyzed primarily using qualitative methodology, although dichotomous responses and time of completion were analyzed via frequency counts. A content analysis method was used to analyze the responses provided in written format on the questionnaire. The researcher used inductive analysis to analyze data line by line to identify significant

statements and assign meaning. One researcher performed the analysis of the data and checked the data against the whole data set (Elo et al., 2014).

Qualitative content analysis is a method of analyzing word usage and message characteristics (Neuendorf, 2017). It provides a systematic approach to analyzing narrative data (Schreier, 2012). In this study, data was first downloaded from the PsychData site into an Excel spreadsheet. The narrative data was then copied into a word processing document. The researcher analyzed the data as a whole using inductive reasoning with a line by line approach to determine concepts within the responses as related to the research question of determining the ease of use and burden of administration of the assessment. First, the researcher used a constant comparison method to establish concepts, which served as the frame for the data analysis (Schreier, 2012). Frames included the following: additional content and understandability of questions, directions, or response options. Data from the word processing document was entered into Nvivo (2014) for coding and analysis into concepts and themes. The researcher then analyzed narrative data into the three frames, and then performed a frequency count of word use to generate a list of most commonly used words within a concept. These words were then examined in context. This allowed the concepts to be considered within the context of the statement (Kaefer, Roper, & Sinha, 2015). Concepts were developed into themes to describe the feedback of participants in relation to the content, wording of questions, definitions, and response options.

## CHAPTER IV

### RESULTS

Results of the study provide information as to the demographics of participations, factor analysis, internal consistency, test-retest, and feedback from participants in regards to the ease of use and utility of the instrument.

#### **Demographics of Participants**

Demographics were analyzed using descriptive statistics. One hundred and twenty-five participants completed the demographic questionnaire, while only 103 completed the questionnaire. Therefore, 103 participants were included in the demographic data set.

Participants represented 27 states and 4 countries (Table 2). Participants came from a variety of communities ranging from rural to major urban with the majority indicating they lived in either suburban or major urban area. The sample was similar to the population of the United States. According to the 2010 census, 80.7% of people live in urban areas (including suburban populations) and 19.3% of people live in rural areas (United States Census Bureau, 2015a). Participants taught in various preschool settings and represented a range of ages, years of experience, and education levels. Table 3 provides the information on the participant demographics.

Table 2

*Location of Participants*

Region	N	%
Northeast		
Massachusetts	2	1.9
New York	2	1.9
Pennsylvania	<u>2</u>	<u>1.9</u>
Total	6	5.8
Midwest		
Illinois	4	3.9
Michigan	2	1.9
Iowa	1	1.0
Kansas	1	1.0
Minnesota	1	1.0
Missouri	<u>18</u>	<u>17.5</u>
Total	27	26.2
South		
Alabama	2	1.9
Arkansas	2	1.9
Delaware	2	1.9
Florida	2	1.9
Georgia	3	2.9
Kentucky	1	1.0
Maryland	2	1.9
Mississippi	1	1.0
North Carolina	4	3.9
Oklahoma	1	1.0
Tennessee	1	1.0
Texas	8	7.8
Virginia	<u>3</u>	<u>2.9</u>
Total	32	31.1
West		
Arizona	21	20.4
California	4	3.9
Colorado	2	1.9
Montana	1	1.0
Alaska	2	1.9
Washington	<u>3</u>	<u>2.9</u>
Total	33	32.0

(continued)

Countries other than USA		
Germany	1	1.0
Philippines	1	1.0
Canada (Alberta)	<u>2</u>	<u>1.9</u>
Total	4	3.9
Missing	1	1.0

*Note.* Regions consistent with United States Census Bureau (2015b)

Table 3

*Demographic Information of Participants*

Demographic	N	%
Community Type		
Major Urban (population over 100,000)	33	32.0
Suburban (population between 20,000-99,000)	34	33.0
Small town (population between 3,000-20,000)	23	22.3
Rural (population less than 3,000)	13	12.6
Preschool Setting		
Public Preschool	20	19.4
Public Special Education Preschool	32	31.1
Private preschool	32	31.1
Private special education preschool	6	5.8
Charter preschool	1	1.0
Home-based preschool	1	1.0
Other	11	10.7
Age of Participants		
20-29 years	11	10.7
30-39 years	23	22.3
40-49 years	36	35
50-59 years	23	22.3
60-69 years	9	8.7
70 or over	1	1.0

(continued)

Race/Ethnicity		Sample	U.S. Population
American Indian or Alaska Native	1	1.0	1.2
Asian	4	3.9	5.6
Black	8	7.8	13.3
Hispanic or Latino	2	1.9	17.6
White	87	84.5	77.1
Other	1	1.0	--
Years in Profession			
0-3 years	13		12.6
4-7 years	17		16.5
8-11 years	20		19.4
12-15 years	15		14.6
15-18 years	10		9.7
18 or more years	28		27.2
Education Level of Participants			
High school diploma	3		2.9
Associate degree	3		2.9
Undergraduate degree	34		33.0
Master's degree	50		48.5
Doctoral degree	1		1.0
Other	12		11.7
Degree			
Early Childhood	19		18.4
Early childhood special education	15		14.6
Elementary education	12		11.7
Other	57		55.3
Percentage of Caseload with ASD			
1-10%	68		66
11-25%	11		10.7
26-50%	11		10.7
51-75%	6		5.8
76-100%	7		6.8

*Note.* US population according to United States Census Bureau (2015c)

Participants also reported demographic information on the child about whom the questionnaire was completed. Approximately 25% of the children were three years of



age, approximately 45% were four years of age, and approximately 30% were 5 years of age. There were 85 males and 18 females. According to the CDC (2016) ASD is 4.5 times more common among boys than girls. The sample provided in this study is similar to the national average with the sample provided having 4.7 times more boys than girls.

Table 4

*Demographic Information of Child*

Demographic	N	%
<b>Age of Child</b>		
3.0-3.11 years	26	25.2
4.0-4.11 years	46	44.7
5.0-5.11 years	21	30.1
<b>Race/Ethnicity of Child</b>		
American Indian or Alaska Native	1	1.0
Asian	3	2.9
Black	13	12.6
Hispanic or Latino	13	12.6
Native Hawaiian or other Pacific Islander	1	1.0
White	59	57.3
Two or more races	11	10.7
Other	2	1.9
<b>Source of ASD Diagnosis</b>		
Review of educational records	18	17.5
Review of medical records	31	30.1
Parent report	12	11.7
Report from other school personnel	5	4.9
Behaviors consistent with ASD	27	26.2
Other	10	9.7

### **Exploratory Factor Analysis**

The determination of sample size and correlations is the first step to determine if exploratory factor analysis (EFA) is appropriate. The sample size of this study is 103,

which is considered a sufficient sample to perform a factor analysis (Gorsuch, 1983). Of the 103 participants included in this study, 99 participants completed the entire assessment. The remaining four completed one or more of the subtests, but not all three subtests. Next, it is necessary to determine the relationship among the variables. Pearson's  $r$  was used to figure correlation coefficient. Pearson's  $r$  is a measure of correlation between variables (Portney & Watkins, 2009). It is better measure of association than a Spearman's  $\rho$  and is often used with factor analysis (Choi, Peters, & Mueller, 2010). Although it has downfall when used with ordinal data, Pearson's  $r$  provides and complementary analysis for data that is normally distributed (O'Brien, 1979). A correlation analysis between each of the three subtests was performed. Pearson  $r$  values ranged between 0.68 to 0.77 and were significant relationships at the  $p < 0.01$  level between each of the three subtest. This indicates a moderate correlation. Pearson's  $r$  correlations for subtests and total score ranges from 0.86 to 0.95 with significance at the  $p < 0.01$ . Items in each subtest contributed approximately equal to the total score.

Table 5

*Correlations of Subtests*

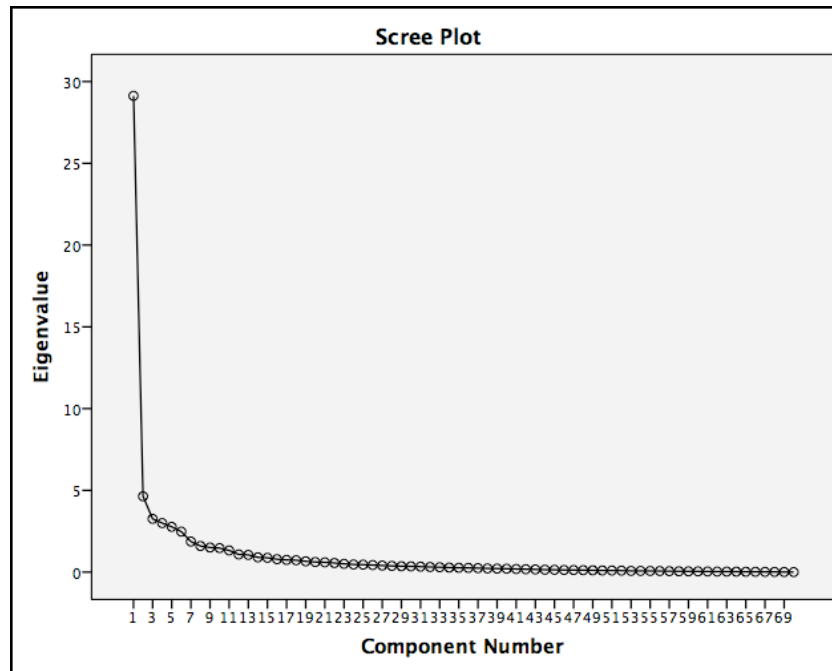
		Subtest1 Total	Subtest2 Total	Subtest3 Total	Total Score
Subtest1 Total	Pearson Correlation	1	.77**	.68**	.95**
	Sig. (2-tailed)		.000	.000	.000
	N	103	101	99	99
Subtest2 Total	Pearson Correlation	.77**	1	.70**	.87**
	Sig. (2-tailed)	.000		.000	.000
	N	101	101	99	99

(continued)

Subtest3 Total	Pearson	.68**	.70**	1	.86**
	Correlation				
	Sig. (2-tailed)	.000	.000		.000
Total Score	N	99	99	99	99
	Pearson	.95**	.87**	.86**	1
	Correlation				
	Sig. (2-tailed)	.000	.000	.000	
	N	99	99	99	99

*Note.* \*\*. Correlation is significant at the 0.01 level (2-tailed).

A correlation matrix of all of the items revealed multiple correlations among variables with correlation of  $\geq .30$ , an indication that EFA is appropriate. Kaiser Meyer Olkin (KMO) measure of sampling adequacy revealed a 0.73 variance, meaning that about 73% of variance in the variables can be explained by the factors. A variance above 0.60 is considered to be adequate for factor analysis (Dziuban & Shirkey, 1974). Barlett's Test of sphericity revealed a significance at .001. A significance of sphericity indicates that the variance of the scores are approximately equal and correlated (Portney & Watkins, 2009) and the correlation matrix meets the criteria to perform factor analysis (Dziuban & Shirkey, 1974). Each item revealed a normal distribution of scores in a Shapiro-Wilk test with significance at  $p < .001$ . Principle component analysis was used to extract factors that demonstrated a statistically strong linear relationship (Portney & Watkins, 2009). Missing data were excluded pairwise. Thirteen factors presented with eigenvalues greater than one accounting for approximately 82% of variance. These factors were also compared to the scree plot. A change of direction was observed after two components and another one after six components.



*Figure 2.* Scree plot. Components in principle component analysis reveals break or direction change at two and six components.

Six components were retained within the factor analysis. The method of varimax rotation revealed six factors accounting for approximately 65% of the variance. The cutoff for significant loading was set at 0.50 (Pituch & Stevens, 2016). In the case of this study, factors loadings were rounded up. For example, a factor loading at 0.46 was examined as significant loading in considering items within the factor. Table 6 displays the factor loadings for each question.

Seven items of the assessment did not have a significant enough correlation to any factor to meet the minimum criteria for cutoff. These items are displayed in Table 7. The items included the following: “Circle time: Touching or being near other children,” “Classroom routines: Drills such as fire or tornado,” “Classroom routines: Centers,” “Snack or lunch time: Trying new foods,” “Free play/recess: Playing on playground

equipment,” and “Movement/Music time: Listening to music,” all from subtest one. In addition, from subtest two the item “Drills such as fire or tornado drills” did not meet the minimum cutoff for factor loading.

Table 6  
*Factor Matrix*

	Modification	Support	Preschool Tasks	Group Routines	Mealtime	Tactile
Subtest 3: Transitions	.85					
Subtest 3: Recess	.81					
Subtest 3: Movement	.79					
Subtest 3: Free play	.77					
Subtest 3: Craft/Art time	.77		.35			
Subtest 3: Table time	.76		.35			
Subtest 3: Sensory table	.74					
Subtest 3: Snack or lunch time	.74					
Subtest 3: Centers	.73					
Subtest 3: Instruction time	.73		.41			
Subtest 3: Cleaning up	.73					
Subtest 3: Circle time	.72					
Subtest 3: Peer play	.70			.31		
Subtest 3: Music	.67					
Subtest 3: Self-care	.60	.34	.50		.33	
Subtest 3: Drills, such as fire or tornado drill	.55					
Subtest 2: Self-care		.68	.46			
Subtest 2: Free play	.32	.67				
Subtest 2: Centers		.65	.36			
Subtest 2: Recess	.35	.64				
Subtest 2: Peer play		.64				
Subtest 2: Cleaning up		.59				
Subtest 2: Movement time		.58		.37		
Subtest 2: Transitions		.58			.32	
Subtest 2: Craft/Art time	.30	.58	.43			
Subtest 2: Snack or lunch time		.58			.35	
Subtest 2: Sensory table		.57				.50

(continued)

	Modification	Support	Preschool Tasks	Group Routines	Mealtime	Tactile
Subtest 2: Music		<b>.55</b>		.39		
Classroom routines: Following classroom routines		<b>.53</b>		.35		
Subtest 2: Table time		<b>.52</b>	.43			
Subtest 2: Circle time		<b>.48</b>			.42	
Subtest 2: Instruction time		<b>.46</b>	<b>.46</b>			
Craft/Art time: use markers to color/write/draw		<b>.72</b>				
Self-Care: Using the toilet		.37	<b>.69</b>			
Craft/Art time: Completing coloring and cutting activities		<b>.68</b>				
Craft/Art time: Painting and coloring		<b>.63</b>				
Table time: Listening to instructions		<b>.62</b>				
Table time: Focusing to complete work			<b>.62</b>	.43		
Classroom routines: Attending to instructions/directions			<b>.61</b>	.36	.32	
Self-care: Washing hands		.39	<b>.58</b>			
Craft/Art time: Using glue for craft projects	.33		<b>.54</b>			
Free play/Recess: Playing with toys			<b>.52</b>			
Self-care: Dressing after toileting		<b>.46</b>	<b>.50</b>			
Self-care: Putting backpack and/or other belongings away		.38	<b>.48</b>			
Movement/Music time: Staying with the group		.30		<b>.71</b>		
Movement/Music time: Following movement		.32		<b>.69</b>		
Movement/Music time: Singing or playing instruments		.37		<b>.66</b>		
Circle time: Following movements in songs (e.g. finger plays)				<b>.64</b>		
Free play/Recess: Playing with other students/peers			.37	<b>.58</b>		

(continued)

	Modification	Support	Preschool Tasks	Group Routines	Mealtime	Tactile
Classroom Routines: Transitioning from one activity to another				<b>.58</b>	<b>.52</b>	
Free Play/Recess: Playing group games	.32		<b>.45</b>	<b>.54</b>		
Circle Time: Coming and staying with the group		.32		<b>.54</b>	.44	
Circle Time: Touching or being near other children				.44	.41	.32
Snack or Lunch Time: Sitting with other children					<b>.72</b>	
Snack or Lunch Time: Focusing to eat					<b>.67</b>	
Snack or Lunch Time: Eating snack/lunch			.32		<b>.62</b>	
Table Time: Sitting for table work			<b>.57</b>		<b>.58</b>	
Classroom Routines: Cleaning up supplies/toys	.32		.32	<b>.45</b>	<b>.50</b>	
Circle Time: Sitting still			.32	.31	<b>.50</b>	
Classroom Routines: Drills such as fire or tornado				.37	.47	
Snack or Lunch time: Bite sizes (e.g. stuffing food)					<b>.45</b>	
Subtest 2: Drills such as fire or tornado drill		.42			.44	
Classroom Routines: Centers			.37	.39	.42	
Snack or Lunch Time: Trying new foods	.38			.33	.37	
Sensory Table: Touching wet textures						<b>.80</b>
Sensory Table: Playing with items on sensory table						<b>.66</b>
Sensory Table: Touching dry textures						<b>.68</b>
Sensory Table: Touching sticky textures					.33	.44
Free play/Recess: Playing on the playground equipment					.33	.44
Movement/Music time: Listening to music		.30		.37	.31	.42

*Note.* Factors loading above the .50 cut off are bolded. Because subtest two and three had the same questions, the questions are distinguished in this table by indicating "Subtest 2" or "Subtest 3." Items from subtest one are labeled only as the question.



Table 7

*Items with Factor Loadings Below 0.50*

Item	Factor	Loading
Circle Time: Touching or being near other children	Factor 4	.44
	Factor 5	.41
Classroom Routines: Drills such as fire or tornado	Factor 5	.47
Classroom Routines: Centers	Factor 5	.42
Snack or Lunch time: Trying new foods	Factor 1	.38
	Factor 5	.39
Free play/Recess: Playing on playground equipment	Factor 6	.44
Movement/Music Time: Listening to music	Factor 6	.42
Subtest 2: Drills such as fire and tornado	Factor 2	.42
	Factor 5	.44

**Factors**

The first factor encompassed the concept of modification of the environment and is labeled “modification.” All items from subtest three demonstrated at least a sizable correlation with this factor of  $\geq 0.50$ . The second factor is labeled “support.” Thirteen items from subtest two demonstrated at least a sizable correlation of  $\geq 0.50$  with factor two. Two items had a loading of 0.46 or above. Only one item from this subtest was not correlated with factor two. That item was “drills, such as fire or tornado drills.” Factor three contained items that encompassed tasks that are typically associated with daily

aspects of the preschool day, such as crafts, table time, and self-care. This factor is labeled “preschool tasks.” Factor four is labeled “group routines” and encompasses items regarding tasks that required following instructions, staying with and participating with groups, and transitioning. Factor five encompasses items related to snack or mealtime. As a result, this factor is labeled “mealtime.” Factor six is labeled “tactile” and encompasses many of the items regarding touching a variety of textures.

Factors identified in the EFA aligned with the underlying theory of subtest ideals. Factor one and two encompass the concepts reflected in the subtest two and three, support and modifications. Factor one encompasses the concept of modifications, which include alterations to the sensory components of the environment, task, or routines. Persons within the environment, such as teachers or aids, are typically responsible for orchestrating modifications (Piller & Pfeiffer, 2016). Factor two, “support,” constitutes interactions from staff or other persons within the environment to the child. Support includes interactions via words, pictures, touch, or providing sensory support. Sensory support may occur by providing sensory input throughout the day in the form of sensory based interventions (Case-Smith et al., 2015). Factor two also included the item “following classroom routines” from subtest one. This concept was reflected in the qualitative study used to establish the questions for the assessment. Participants in the qualitative study indicated the teacher provided structure and consistency to the routine of the class as well as providing supports and modifications to routines and the use of strategies such as picture schedules (Piller & Pfeiffer, 2016). Therefore, the item “following classroom routines” fits within the concept of “support” as revealed by the

theoretical underpinnings of the assessment. Factor three was comprised of a variety of items that described tasks that occur throughout the preschool day. These items included tasks such as using markers, painting, performing toileting tasks, as well as attending and listening to instructions. The items encompass tasks that are performed throughout the day, but are unique to the preschool setting; for example, coloring and gluing are important tasks in the preschool setting, but not as important in the elementary setting. Toileting tasks are important in preschool due to the age of the child, but are not typically tasks that are considered in other school settings. Instead, they are assumed to be mastered and routine. Factor four consists of items that involve following directions or routines of a group. Items in this factor consisted of items that measured tasks involving following directions and/or instructions with a group or social component. Items in factor five consisted of tasks that were related to mealtime or snack time activities. Tactile is one of the seven sensory systems; however, in the case of the factors it refers to the tasks that have a high tactile component, not the sensory system. For example, touching wet or sticky items were highly correlated with this factor. Items in factor six consisted of touching a variety of textures and using the sensory table. Other tasks with a tactile component, such as painting and coloring, touching or being near other children, and dressing after toileting were minimally correlated with this factor. Tasks with an almost exclusive tactile components were highly correlated with the factor. Table 8 provides a description of each of the factors.

Table 8

*Description of Factors*

Factor	Description	Number of Items
Factor One: Modification	Modifications to tasks, the environment, or timing to increase participation	16
Factor Two: Support	Support provided to student in the form of words, visual cues, or touch	17
Factor Three: Preschool Tasks	Tasks that encompass the day of a preschool environment that tend to be unique to the preschool setting such as crafts, using scissors, markers, and glue, and toileting tasks.	12
Factor Four: Group Routines	Tasks that require multiple steps and often are performed as part of a group	8
Factor Five: Mealtime	Eating activities that occur during the school day	5
Factor Six: Tactile	Various textures encountered within the preschool environment	4

**Internal Consistency**

Cronbach's alpha was used to establish the internal consistency of the entire assessment, each subtest, and each factor. Cronbach's alpha for the entire assessment is 0.98 and remained the same even if an item was deleted. The mean of the item was 3.01 with a variance of 0.12. Inter-item correlations for the assessment ranged from 0.13 to 0.82, with the majority falling between the ideal range of 0.30 to 0.70. Appendix I provides the inter-item correlations for each item in the instrument. Corrected item-total

correlations ranged from 0.47 to 0.75. The total score was also compared to each of the three subtests. Standardized coefficient alpha's ranged from 0.86 to 0.95.

Table 9

*Internal Consistency*

Section	Inter-Item Correlation	Corrected Item Total Correlation	Cronbach's $\alpha$ if removed
Subtest 1	0.95	0.90	0.71
Subtest 2	0.87	0.84	0.85
Subtest 3	0.86	0.80	0.82
Total	0.98		0.80

Subtest one has an internal consistency of 0.96, mean of scores of 3.00 with variance of 0.10. Cronbach's alpha would remain the same if any item was deleted. Inter-item correlations range from 0.11 to 0.88, with the majority falling within the ideal range of 0.30 to 0.70. Item-to-total correlations range from 0.48 to 0.75. Cronbach's alpha for subtest two is 0.94 with mean of 3.24 and variance of 0.08. Inter-item correlations range from 0.30 to 0.73, within the ideal range. Item-to-total correlations 0.56 to 0.76. For subtest three, Cronbach's alpha revealed an internal consistency of 0.97, mean of items at 2.73 with a variance of 0.05. Cronbach's alpha would range from 0.96 to 0.97 if an item from the subtest was deleted. Inter-item correlations range from 0.47 to 0.82, with the majority within the expected range to consider unidimensionality of the subtest. Item-to-total correlations range 0.66 to 0.88. Although at the higher end of the range, all items fell within expected 0.70-0.90 for this subtest indicating although correlated, the items were not considered redundant.

Sixteen items made up factor one and encompassed all of the items on subtest three, no more, no less. As a result, the internal consistency for factor one is the same as for subtest three. The mean of this factor is 43.75 with standard deviation of 15.49. Factor two was made up of seventeen items. Cronbach's alpha revealed an internal consistency of 0.94. The mean of the factor is 55.04 with a standard deviation of 11.68. The mean of the items for this factor is 3.23 with a variance of 0.71. Inter-item correlations of factor two ranged from 0.30 to 0.73, within expected range indicating the factors measure the same concept. Item correlations as compared to the composite with the item removed ranged from 0.54 to 0.76. Factor three was comprised of 12 items with Cronbach's alpha of 0.92. The mean of the factor was 32.23 with standard deviation of 9.14. The mean of the items for this factor is 2.9 with a variance of 0.11. Inter-item correlations ranged from 0.28 to 0.81. Two items "Playing with Toys" and "Using Glue for craft projects" presented with a correlation slightly below the ideal cutoff of 0.30 as a minimum correlation. Item-to-total correlations ranged from 0.56 to 0.76. Eight items made up factor four. Cronbach's alpha was at 0.92 with a mean of the factor being 26.22 with standard deviation of 7.25. The mean for one item score was 3.30 with a variance of 0.05. Inter-item correlations ranged from 0.42 to 0.79. Item-to-total with item removed ranged from 0.59 to 0.78. Five items comprised factor five with Cronbach's alpha of 0.86, a factor mean of 14.72 and standard deviation of 4.34. The item mean was 2.94 with variance of 0.04. Inter-item correlations ranged from 0.36 to 0.89. Item-to-total correlations as compared to composite with the item removed ranged from 0.55 to 0.76. Factor six contained four items with a Cronbach's alpha of 0.87, a mean of 11.05 and

standard deviation of 3.77. The item mean is 2.80 with variance of 0.07. Inter-item correlations range from 0.55 to 0.70. Corrected item-to-total correlations ranged from 0.68 to 0.81. Overall, in each of the factors, Cronbach's alpha high indicating excellent reliability of the assessment. Inter-item correlations fell within expected range for all items within factors except for one item in factor three, which was slightly below the minimum range.

### **Removal of Items**

The EFA indicated items with poor loadings on the factors. Each item with a less than 0.50 loading in the factor analysis was placed in a chart (Table 7) and considered one-by-one in a decision chart (Appendix G). Of the seven items with less than 0.50 loading, six items were removed and one item was kept in the measure. The items removed included Circle time: Touching or being near other children, Classroom routines: Centers, Classroom routines: Drills, such as fire or tornado, Snack or Lunch time: Trying new foods, Free play/recess: Playing on playground equipment, and Movement/Music Time: Listening to music. Following the removal of the items, internal consistency of the measure was performed a second time. Cronbach's alpha remains the same at 0.98 for the final version of the assessment. Cronbach's alpha for subtest one with items removed also remained consistent at 0.96. The majority of the correlations had minimal change between subtests and the total score. Inter-item correlation between subtest one, subtest two, and the total score, corrected item total correlation for subtest one, and Cronbach's alpha if item removed for subtest one and the total score, had a slight change from the original version of the assessment.

Table 10

*Internal Consistency after Removal of Items*

Section	Inter-Item Correlation	Corrected Item Total Correlation	Cronbach's <i>a</i> if removed
Subtest 1	0.93	0.88	0.74
Subtest 2	0.88	0.84	0.85
Subtest 3	0.86	0.81	0.82
Total	1.00		0.82

**Classical Test Statistics**

One hundred and three participants completed the *Sensory Environment and Participation Questionnaire – Teacher Version*. Four questionnaires were incomplete for the final subtests, but had at least one subtest complete. The lowest score possible on an item was one, while the highest score possible on an item was five. In this assessment, the items are written in such a way that a lower score is more preferable outcome than a higher score. The total test items came to 70 for the original version and 64 for the revised version. Subtest one originally included 38 items, with 32 items included in the final version. Subtest two and three had 16 items for each subtest in both the original and revised version.

Subtest one included 103 complete cases with no cases excluded. The summary of item means was 3.00 with minimum of 2.39 and maximum of 3.67. Subtest two included 101 completed cases with two being incomplete and therefore excluded. The total mean was 3.24 with minimum range being 2.70 and maximum range 3.50 on average. Subtest three included 99 complete cases with four being excluded for missing data. The mean of all items in this subtest was 2.73 with the minimum score of 2.20 and



maximum of 3.06. Means, standard deviations and minimum and maximum score percentages for each subtest are represented in Tables 11-13. Item specific statistics can be found in Appendix H.

Table 11

*Subtest One Item Statistics*

	Mean	Standard Deviation	Minimum Score Percentage	Maximum Score Percentage
Sitting Still	3.23	1.13	7.8	11.7
Following movements in songs (e.g. finger plays)	3.18	1.19	7.8	13.6
Touching or being near other children**	3.19	.96	2.9	7.8
Coming and staying with group	3.19	1.17	9.7	11.7
Sitting for table work	3.03	1.00	7.8	1.9
Listening to instructions	3.34	.94	3.9	5.8
Focusing to complete work	3.32	1.04	6.8	7.8
Sitting with other children	2.77	1.15	17.5	5.8
Focusing to eat	2.85	1.12	13.6	5.8
Eating snack/lunch	2.83	1.06	12.6	4.9
Trying new foods**	3.39	1.32	12.6	22.3
Bite sizes (i.e. stuffing food)	2.55	1.27	28.2	5.8
Transitioning from one activity to another	3.43	.93	2.9	8.7
Cleaning up supplies/toys	3.24	1.09	8.7	9.7
Centers**	3.19	1.04	7.8	6.8
Attending to instructions/directions	3.34	.94	2.9	6.8
Following classroom routines	3.11	.97	3.9	5.8
Drills, such as fire or tornado**	3.28	1.26	12.6	16.5
Playing with other students/peers	3.47	1.08	6.8	15.5
Playing on playground equipment**	2.82	1.01	13.6	1.0
Playing group games	3.67	1.18	6.8	27.2

(continued)

	Mean	Standard Deviation	Minimum Score Percentage	Maximum Score Percentage
Playing with toys	3.67	1.18	8.7	2.9
Using glue for craft projects	3.04	1.08	6.8	10.7
Painting and coloring	2.91	1.03	7.8	5.8
Completing coloring and cutting activities	3.04	1.13	6.8	11.7
Use markers to color/write/draw	2.72	1.08	12.6	2.9
Using the toilet	2.78	1.08	29.1	13.6
Washing hands	2.43	1.19	29.1	5.8
Dressing after toileting	2.39	1.28	34.0	6.8
Putting backpack and/or other belongings away	2.56	1.19	22.3	6.8
Playing with items on sensory table	2.73	1.03	14.6	2.9
Touching wet textures	2.83	1.22	17.5	6.8
Touching dry textures	2.42	1.09	24.3	1.9
Touching sticky textures	3.08	1.12	9.7	6.8
Following movement	3.12	1.15	7.8	11.7
Singing or playing instruments	3.02	1.20	10.7	11.7
Listening to music**	2.50	1.11	22.3	3.9
Staying with the group	3.15	1.20	9.7	12.6

*Note.* \*\* Indicates item was removed from final version.

Table 12

*Subtest Two Item Statistics*

	Mean	Standard Deviation	Minimum Score Percentage	Maximum Score Percentage
Circle Time	3.55	.90	3.9	6.8
Table Time	3.42	.75	1.0	1.9
Snack or lunch time	3.08	.96	7.8	3.9
Transitions	3.58	.79	1.0	5.8
Cleaning up	3.40	1.00	5.8	8.7
Free play	3.02	.95	4.9	2.9
Centers	3.22	.89	1.9	2.9
Recess	2.71	1.04	12.6	2.9
Music	2.95	1.02	9.7	4.9
Instruction Time	3.50	.77	1.0	4.9

(continued)

	Mean	Standard Deviation	Minimum Score Percentage	Maximum Score Percentage
Sensory Table	2.86	1.06	10.7	3.9
Drills, such as fire or tornado drill	3.50	1.06	4.9	11.7
Movement time	3.19	.96	3.9	4.0
Self-care	3.07	1.10	8.7	5.8
Peer play	3.55	.90	2.9	8.7

Table 13

*Subtest Three Item Statistics*

	Mean	Standard Deviation	Minimum Score Percentage	Maximum Score Percentage
Circle Time	2.93	1.13	16.2	5.1
Table Time	2.83	1.13	17.5	2.9
Snack or lunch time	2.58	1.21	26.2	2.9
Transitions	2.92	1.19	18.2	4.0
Cleaning up	2.78	1.20	21.4	3.9
Free play	2.58	1.18	25.3	3.0
Centers	2.76	1.16	19.4	2.9
Recess	2.20	1.15	36.9	1.9
Music	2.46	1.14	26.2	1.9
Instruction Time	3.06	1.10	11.7	5.8
Craft/Art Time	2.88	1.14	17.5	2.9
Sensory Table	2.52	1.20	28.2	2.9
Drills, such as fire or tornado drill	2.90	1.43	26.2	11.7
Movement time	2.67	1.20	24.3	1.9
Self-care	2.66	1.23	25.2	3.9
Peer play	3.04	1.10	11.7	4.9

Floor and ceiling effects were figured for each item and for each subtest. Scores on each item ranged from one to five and all scores were represented at least once within the sample. The floor effect indicates the minimum score (a more desirable score). The minimum total possible score was not represented on the first or second subtest. The

lowest represented score on subtest one was 56 and 23 on subtest two. However, on the third subtest eight participants had the minimum possible score of 16. The third subtest sought to assess the amount of modification provided to the student to support participation. The ceiling effect was observed on only one participant for subtest one and two participants on subtest two and three. The total maximum total score of 350 was not seen on any of the assessments. Table 14 represents the floor and ceiling effects for each subtest and the total score. Table 15 presents the floor and ceiling scores of the revised version. In the revised version, the minimum total floor score was not observed, but the total maximum ceiling score was observed.

Table 14

*Floor and Ceiling Scores*

	Total Items	Min Possible Score	Max Possible Score	Min Score from sample	Max Score from sample
Subtest 1	38	38	190	56	190
Subtest 2	16	16	80	23	80
Subtest 3	16	16	80	16	80
Total	70	70	350	111	327

Table 15

*Floor and Ceiling Scores from Revised Version*

	Total Items	Min Possible Score	Max Possible Score	Min Score from sample	Max Score from sample
Subtest 1	32	32	160	48	160
Subtest 2	16	16	80	23	80
Subtest 3	16	16	80	16	80
Total	64	64	320	87	320

### Test-Retest Reliability

Intraclass correlation coefficient (ICC) was used to establish test-retest reliability. Participants for test-retest reliability were recruited via a convenience sample from the initial participants. A total of 20 participants completed the *Sensory Environment and Participation Questionnaire – Teacher Version* a second time approximately two weeks following the first administration. Descriptive statistics were used to determine the demographics of the participants as displayed in Table 16 and Table 17.

Table 16

<i>Demographics of Participants for Test-Retest</i>		
Demographic	N	%
Community Type		
Major Urban (population over 100,000)	2	10.0
Suburban (population between 20,000-99,000)	8	40.0
Small town (population between 3,000-20,000)	7	35.0
Rural (population less than 3,000)	3	15.0
State		
Arizona	5	25.0
California	1	5.0
Delaware	1	5.0
Georgia	1	5.0
Illinois	2	10.0
Missouri	4	20.0
Oklahoma	1	5.0
Pennsylvania	1	5.0
Tennessee	2	10.0
Texas	2	10.0

(continued)

Demographic	N	%
Preschool Setting		
Public Preschool	4	20.0
Public Special Education Preschool	6	30.0
Private preschool	6	30.0
Private special education preschool	1	5.0
Charter preschool	0	0
Home-based preschool	0	0
Other	3	15.0
Age of Participants		
20-29 years	1	5.0
30-39 years	2	10.0
40-49 years	9	45.0
50-59 years	7	35.0
60-69 years	1	5.0
70 or over	0	0
Education Level of Participants		
Undergraduate degree	8	40.0
Master's degree	9	45.0
Doctoral degree	1	5.0
Other	2	10.0
Degree		
Early Childhood	6	30.0
Early childhood special education	2	10.0
Elementary education	2	10.0
Other	10	50.0
Percentage of Caseload with ASD		
1-10%	11	55.0
11-25%	3	15.0
26-50%	3	15.0
51-75%	1	5.0
76-100%	2	10.0

Table 17

*Demographic Information of Child for Test-Retest*

Demographic	N	%
Age of Child		
3.0-3.11 years	4	20.0
4.0-4.11 years	8	40.0
5.0-5.11 years	8	40.0
Gender		
Male	15	75.0
Female	5	25.0
Race/Ethnicity of Child		
Asian	1	5.0
Black	5	25.0
Hispanic or Latino	2	10.0
White	11	55.0
Two or more races	1	5.0
Source of ASD Diagnosis		
Review of educational records	6	30.0
Review of medical records	5	25.0
Parent report	3	15.0
Behaviors consistent with ASD	5	25.0
Other	1	5.0

Intraclass correlation coefficient was figured for the total score, each subtest, and each individual item. The total test-retest reliability for the instrument was 0.68, indicating fair test-retest reliability (Cicchetti, 1994). Test-retest reliability of at least 0.70 is considered adequate (Lance, Butts, & Michels, 2006). Individual subtests ranged from 0.54 to 0.76 indicating fair to good reliability (Cicchetti, 1994). After items were removed from the instrument, the ICC was performed a second time for the instrument

and each of the subtests. The final version of the instrument reveals a ICC of 0.70, which is considered good (Cicchetti, 1994; Lance et al., 2006).

Table 18

*Intraclass Correlation Coefficient*

Subtest	Number of Items	ICC
Original Version		
Subtest One	38	0.54
Subtest Two	16	0.66
Subtest Three	16	0.76
Total	70	0.68
Revised Version		
Subtest One	32	0.56
Subtest Two	16	0.66
Subtest Three	16	0.76
Total	64	0.70

ICC was also figured for each item. Results ranged from poor to excellent.

Table 19

*Intraclass Correlation Coefficient by Item-Subtest One*

Item	ICC
Circle Time	
Sitting Still	0.67
Following movement in songs	-0.24
Touching or being near other children	0.56
Coming and staying with the group	0.38
Table Time	
Sitting for Table Work	0.66
Listening to instructions	0.25
Focusing to complete work	0.28

(continued)



---

Snack or Lunch Time		
Sitting with other children		0.46
Focusing to eat		0.60
Eating snack/lunch		0.62
Trying new foods		0.15
Bite sizes		0.44
Classroom Routines		
Transitioning from one activity to another		0.44
Cleaning up supplies/toys		0.55
Centers		0.65
Attending to instructions/directions		0.56
Following classroom routines		0.53
Drills, such as fire or tornado		0.15
Free play/Recess		
Playing with other students/peers		0.32
Playing on playground equipment		-0.58
Playing group games		0.13
Playing with toys		0.36
Sensory Table		
Playing with items on sensory table		0.15
Touching wet textures		0.59
Touching dry textures		0.38
Touching sticky textures		0.16
Movement/Music Time		
Following movement		0.28
Singing or playing instrument		0.47
Listening to music		0.44
Staying with group		0.37

---

Table 20

*Intraclass Correlation Coefficient by Item-Subtest Two and Three*


---

Subtest Two		
Circle time		0.21
Table time		0.68
Snack or lunch time		0.79
Transitions		0.59
Cleaning up		0.36
Free play		0.18
Centers		0.61
Recess		0.43
Music		0.44
Instruction time		0.35
Music		0.44
Instruction time		0.35
Craft/art time		0.22
Sensory table		0.57
Drills, such as fire or tornado		0.62
Movement time		0.27
Self-care		0.50
Peer play		0.22
Subtest Three		
Circle time		0.45
Table time		0.57
Snack or lunch time		0.69
Transitions		0.69
Cleaning up		0.65
Free play		0.76
Centers		0.80
Recess		0.82
Music		0.62
Instruction time		0.66
Craft/art time		0.41
Sensory table		0.77
Drills, such as fire or tornado		0.86
Movement time		0.52
Self-care		0.67
Peer play		0.45

---

### Ease of Use

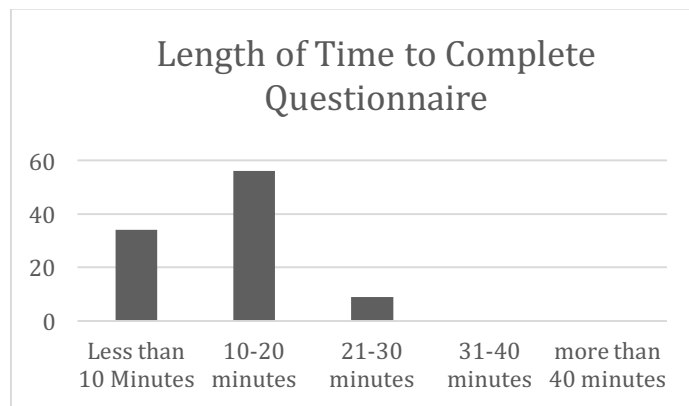
Ninety-nine participants completed the ease of use feedback form at the conclusion of the questionnaire. The ease of use feedback form provided a forum for participants to indicate any suggested changes, any difficulties they had in understanding questions or directions, and how long the questionnaire took the participant to complete. An additional text box was provided for participants to provide any additional comments regarding the assessment. Descriptive statistics revealed the frequency of responses. Twenty of the 99 participants to complete the feedback form indicated there were changes they would make to the questionnaire. The remaining 79 participants reported there were no changes they would make to the questionnaire. Eight participants indicated there was something in the questionnaire that was difficult to understand or confusing. Overall, 79.8% of participants completing the feedback form indicated there was nothing they would change in the questionnaire and 91.9% indicated there was nothing confusing or difficult to understand in the questionnaire.

Table 21

#### *Feedback Form for Ease of Use*

	Yes		No	
	Frequency	Percentage	Frequency	Percentage
Is there anything you would change about the questionnaire?	20	20.2%	79	79.8%
Was there anything difficult to understand or any part that was confusing in the questionnaire?	8	8.1%	91	91.9%

The majority of participants reported the time it took to complete the assessment was between 10 and 20 minutes. No respondent reported it took longer than 30 minutes to complete the assessment. Figure 3 provides the amount of time it took for respondents to complete the assessment.



*Figure 3. Chart of Length of Time. Amount of time participants reported it took to complete the questionnaire.*

Participants that indicated there were changes or confusing aspects of the questionnaire were given the opportunity to provide additional feedback in a narrative open text box. The researcher used a qualitative content analysis approach to analyzing the data provided in open text boxes. Each question was analyzed separately and data were categorized according to each question. The first question was in regards to what changes participants thought should be made to the questionnaire. Twenty participants responded to this question via the text box. The next question allowed participants to comment on any portion of the questionnaire they found confusing or difficult to understand. Seven participants responded to this question using the open-text box, although two of the seven only referred to their response on the first open-text response

with “see above.” Therefore, five responses for this question were included in the analysis. Finally, an open-text box was provided to allow participants to comment on any other aspects of the questionnaire or process. Sixteen participants provided some sort of narrative feedback in this provided text box, although 3 of the 15 provided the answer of “no” or “n/a.” As a result, 13 responses were included in the analysis.

Results of the ease of use of the assessment were generally positive. Almost 80% of participants did not indicate the need for any changes and over 90% did not indicate anything that was confusing or difficult to understand. Of the narrative feedback provided, participants reported both positive feedback regarding the assessment and suggestions for changes. Three main themes emerged from the data.

1. Additional response options
2. Additional concepts to assess
3. Definition of terms

Six participants reported that an additional choice of “not applicable” would have been helpful in the assessment. Two participants indicated that the “too much to participate” response “seemed like an answer that didn’t fit the questions” (Participant 45).

Suggestions for additional content for questions ranged from including an item about potty training (Participant 11) to additional items on behaviors such as hitting and biting (Participant 69). Other participants suggested the addition of concepts that fell outside of the purpose and scope of the assessment. These included asking the parents (Participant 69) and the “sensory issues causing the issues” (Participant 25). Two participants mentioned that the specific setting and type of preschool would be beneficial to describe

the setting. “We are a Montessori environment which allows for freedom of movement. I would add the kind of preschool environment. It may help in analyzing the answers better” (Participant 63). Participant 91 indicated how the preschool setting influenced philosophy of education in supporting participation:

We don’t really alter the environment for a student’s needs rather we empower the student to meet their own needs. For example, we don’t change the dining room environment but we’ve taught this particular student how to exit peacefully and finish his lunch elsewhere.

Finally, participants suggested further definition of terms. Two participants indicated further definition of the term “sensory” would have been helpful. However, the definition was included in the assessment as part of the initial instructions. Overall, the narrative text provided additional suggestions as to response options, content, and clarification of terms used in the assessment.

## CHAPTER V

### DISCUSSION AND CONCLUSION

The results of this study provide the preliminary psychometric properties, including validity and reliability, of the *Sensory Environment and Participation Questionnaire – Teacher Version*. Test statistics through factor analysis combined with feedback from participants provided information to establish the final format of the instrument. The implications and use of the instrument have the potential to impact both early childhood education and the practice of occupational therapy performed within the early childhood educational setting.

#### **Psychometric Properties**

Both reliability and validity are important to indicate a sound assessment. Reliability ensures an instrument is error free and consistent; therefore, making it reproducible. Validity provides information that the instrument measures what it intends to measure (Portney & Watkins, 2009), in this case the impact of the sensory environment on participation of preschool aged students with ASD in the preschool context. The purpose of this study was to establish the initial reliability of the *Sensory Environment and Participation Questionnaire – Teacher Version*. In addition, content and construct validity of the assessment has also been established through factor analysis.

#### **Content Validity**

Content validity refers to the extent to which a measure assesses the comprehensive theme of a concept (McDowell, 2006; Portney & Watkins, 2009). It is

not typically tested in a formal manner (McDowell, 2006); rather, the process of development and revision of items speaks to the content validity of a measure (McDowell, 2006; NIH, 2012; Portney & Watkins, 2009). The use of qualitative research in the development of items in a client-report questionnaire provides evidence of content validity of the instrument (NIH, 2012). In fact, the use of data that comes directly from communication with patients or clients is the best way to collect data for patient reported outcome measures (Brod, Tesler, & Christensen, 2009). The *Sensory Environment and Participation Questionnaire – Teacher Version* is a teacher-report questionnaire, similar to patient-reported outcome questionnaires. The exception is that the tool is designed for use in an educational setting rather than a medical setting. Qualitative methods provide a comprehensive process to develop content validity in the development of measures that rely on client report (Pandey & Chawla, 2016). Interviews or focus groups combined with literature reviews of the topic to generate questions and provides the foundation to establish content validity of a measure (Brod et al., 2009).

The questions in the *Sensory Environment and Participation Questionnaire – Teacher Version* were developed following an extensive literature review on the concept of how the sensory environment impacts preschool students with ASD's participation in the classroom. Thirteen qualitative interviews were conducted with the target population of preschool teachers and occupational therapists working with preschool students with ASD. Occupational therapists, in addition to preschool teachers, were included in the qualitative interview due to their expertise in the area of sensory processing and participation. The information gathered from the interviews was analyzed via content



analysis (Piller & Pfeiffer, 2016). The authors of the assessment used themes and categories from the qualitative study to develop the content and structure of the questions for the *Sensory Environment and Participation Questionnaire – Teacher Version*. The focus of content for the questions in the instrument reflected the activities identified by the qualitative study. In addition, the qualitative analysis of the interviews revealed the concept of participation through support and modifications. Therefore, these concepts were central in the development of the questions. Cognitive interviewing of the target population of preschool teachers, prior to releasing the research version of the instrument, provided further establishment of content validity (McDowell, 2006). Participants in the cognitive interviewing provided feedback on each question to ensure questions were interpreted as intended. Qualitative interview served as the foundation for question development, while cognitive interview ensured questions were interpreted as intended. These methods speak to the content validity of the assessment.

### **Construct Validity**

Construct validity is essential to reflect an instrument's ability to measure an abstract idea through a single concept. It is dependent upon content validity (Portney & Watkins, 2009) but also provides further definition to the concept measured by an assessment (McDowell, 2006). The concepts of participation and the impact of the sensory environment on participation provide the foundation for the construct of the *Sensory Environment and Participation Questionnaire – Teacher Version*. Theoretically, environmental features that are sensory related impact participation of students with ASD. Support within the environment and modifications of the environment or task

increases participation (Piller & Pfeiffer, 2016). These concepts were further validated by the factor analysis (McDowell, 2006; Portney & Watkins, 2009).

The factor analysis revealed six distinct factors, all of which further defined the construct measured by the *Sensory Environment and Participation Questionnaire – Teacher Version*. The first two factors encompassed the concept of support and modifications to increase participation. The qualitative study performed prior to the assessment development revealed support and modification as a theme of the study (Piller & Pfeiffer, 2016). Other studies support the concepts of modifications to the environment as well as physical and sensory support increase participation for children with ASD within the school setting. For example, the use of an alternative seating option of ball chairs is shown to increase in seat behavior for some students with ASD in the classroom setting (Bagatell, Mirigliani, Patterson, Reyes, & Test, 2010). Further, environmental modifications to lighting and sound are shown to increase attention within the school environment for children with ASD (Kinnealey et al., 2012).

The concept of participation within the specific preschool context was supported by three of the six factors. The environment of the preschool defines participation within that setting. Activities described by the factors included specific tasks such as crafts, toileting, and snack time. These activities incorporate aspects of the preschool day that are often not performed or not measured in educational settings of elementary and beyond. Further, the factors encompassed the social component of preschool such as following the group and playing with peers. Social activities are typically measured as a meaningful part of the preschool day and considered an important to the development of

children of the preschool age. The social element in preschool provides the foundation for language development, executive functioning skills, and social development (Reet, 2012). The three factors “preschool tasks,” “group activities,” and “meal time” provide the foundation for the construct of activities performed within the preschool day. These factors outline concepts that are unique to the preschool setting and support the construct of the assessment.

The final factor, tactile, was related to a specific aspect of the environment that is a frequent part of the preschool environment. Participation in activities and tasks that had a significant tactile element was identified as a strong component of the overall construct defined in the assessment. Tactile play is about exploration (Howie, 2016) and lends itself to the development of creativity and imagination in preschool children (Yin, Zakaria, Baharum, Hutagalung, & Sulaiman, 2015). It supports language development, concentration, problem-solving, and cooperation in preschool children. Tactile play provides preschool children the opportunity to gain understanding of the world (Howie, 2016). In children with sensory processing difficulties, impact of tactile on participation is defined in the literature, especially in the school setting. A student’s response to tactile input affects a student’s attention and engagement with peers within the classroom (Fernández-Andrés et al., 2015). As a result, both academics and socialization during the school day are impacted. The tactile factor in this study reveals that the tactile components of the environment impact school participation at an early age. Overall, the factor analysis revealed six factors and provides the basis for defining the construct validity of the assessment. The concepts revealed by the factor analysis aligned with the

theoretical concept of the impact of the sensory environment on participation within the preschool setting.

### **Reliability**

The primary purpose of this study was to establish the reliability of the *Sensory Environment and Participation Questionnaire – Teacher Version*. The results of the study revealed high reliability in internal consistency. An internal consistency of greater than 0.70 is considered to have sufficient internal reliability. However, 0.80 is a more accepted standard of reliability (Lance et al., 2006). Internal consistency for the *Sensory Environment and Participation Questionnaire – Teacher Version*, for each subtest, and for each factor was above 0.90 indicating excellent reliability. A high internal consistency reliability can be indicative of redundancy (Portney & Watkins, 2009; Streiner, 2003). However, in assessments that have a narrowly defined trait, a higher than 0.90 internal consistency may be appropriate without indicating redundancy (Streiner, 2003). The concept measured in this assessment is a very specific concept of only looking at one aspect of the environment, the sensory components, and the impact on participation. The specificity of the concept leaves minimal room for variability.

Test-retest reliability of the original version of the instrument was fair at 0.68, just below the what is considered adequate reliability for assessments (Lance et al., 2006). However, when items were removed from the original version of the assessment, the final version revealed a test-retest reliability of 0.70, which is considered adequate to establish the instrument as reliable (Lance et al., 2006). The sample size was small, which may have accounted for a lower test-retest reliability. Items with poor ICC were removed

from the version or reworded. It is anticipated that these changes will increase the test-retest reliability of the assessment.

A higher test-retest reliability would have been desired; however, the variance in participants is not surprising given the nature of sensory processing difficulties in children with ASD. The impact of the sensory environment on participation in preschool children is influenced by each child's unique sensory processing (Piller & Pfeiffer, 2016). Further, sensory stimuli vary from day to day even in consistent environments. Unexpected sensory stimuli can cause a child's participation to change on one day as compared to another day. Parents of children with ASD reported this concept in the community. Parents indicated unanticipated sensory stimuli as disruptive to participation, and they could not always plan for accommodations to support participation (Schaaf et al., 2011). Sensory input may not be consistent across days even in a consistent environment. Adults with ASD who presents with sensory processing pattern of over responsivity demonstrate increased autistic traits as measured by the Autism-Spectrum Quotient (Tavassoli, Miller, Schoen, Nielsen, & Baron-Cohen, 2014). If the presence of certain stimuli is higher on one day, a child who displays over responsivity to sensory input may demonstrate increased autistic traits which may impede participation in classroom activities.

Sensory functions are encompassed under the vast umbrella of client factors. Client factors include values of the person and body functions and structure that work together in response to task demands (AOTA, 2014). The myriad of other client factors also influences a child's participation on any given day. For example, a child may have

had little sleep the night before, thus affecting mental functions such as attention; or a child may have an illness that impedes respiratory functions. As a result, other client factors outside of sensory functions are impacted on that day. Because participation is influenced by many different factors, changes in any client factor also influences the response to task demands. As a result, participation is affected.

Although this instrument is designed to assess the impact of the sensory environment, rather than the sensory processing of student, the individual sensory processing of each child impacts the degree of response to the sensory environment (Piller & Pfeiffer, 2016; Smith Roley et al., 2015). The person and the environment interact to produce the result of participation (Law et al., 1996). Even in a consistent environment, aspects of the person (client factors) also vary each day. The constant shifts in the person and the subtle or extreme changes in the environment account, in part, for the differences in participation for children with ASD.

### **Assessment Question Considerations**

One purpose of EFA is to analyze the questions of an assessment with the purpose of reducing the length of the assessment by eliminating redundant questions (Portney & Watkins, 2009). The researcher used the results of the factor analysis, internal consistency, and ICC combined with information from the feedback form to make determinations in regards as to which questions should be eliminated. The researcher accounted for item correlations, length of time, and the concept of the question as it fit with the whole assessment and the subtest. Correlations between items and between item composites revealed fair to moderate correlations. None of the subtest or factor item

correlations revealed correlations higher than 0.90. As a result, they were not considered redundant in nature. The third factor, “modifications,” revealed high correlations among several items, although they remained slightly under the 0.90. However, all items were kept in the subtest in order to keep consistency with the items in subtest two. Factor loading revealed poor loading of seven questions. Six questions from subtest one were removed from the assessment due to poor factor loading. These questions were considered to have poor fit with the overall assessment or were considered to be redundant in nature. To summarize, six questions were removed from the final version of subtest one. All items were kept in subtest two and three to ensure consistency across the subtests.

The length of time to complete an assessment is an important consideration in the clinical utility of an instrument. The majority of participants reported it took between 10 and 20 minutes to complete the assessment. This is a desirable length of time for a teacher-report questionnaire so that it does not take too much time from the teacher’s day. Removing six items would not significantly cut down on the amount of time it took to complete the assessment. However, the length of the assessment was considered to be appropriate for the type and setting of the assessment.

Finally, the researcher considered items with poor ICC and items with qualitative feedback regarding wording of the questions for rewording to increase clarity. Some questions with poor factor loading that also had negative qualitative feedback were removed from the final version of the assessment; for example, under the “Classroom Routines” activities, the item “Centers” was removed. This item had both poor factor

loading and negative qualitative feedback. The researcher also considered other qualitative feedback to generate a final version of the assessment. For example, six participants who completed the feedback form suggested an option of “not applicable.” Many of these participants provided specific examples of activities that they did not encounter within the routine of their day. The option to add a “not applicable” response was considered; however, instead of providing this response option the author of the assessment reworded some questions in attempt to make the activity more generalizable to a variety of preschool setting. The activity heading of “Sensory table” was changed to “Sensory play” in order to encompass all forms of sensory play rather than just activities confined to a sensory table setting. Participants also mentioned “circle time” as an activity they did not have in their preschool setting. As a result, this activity label was changed to “Circle time/Large group time” to encompass the concept of large group instruction without limiting it to a circle time format. It is anticipated that these changes will provide more applicability across the variety of preschool settings, thus increasing reliability.

### **Participants**

The participant sample for the study produced a variant sample of ages, years of experience, settings, and regions. The demographic information and the information gathered from the feedback form provided insightful information as to the use, possible modifications, and applicability of the assessment tool. The majority of the participants were gathered from the United States. As a result, the sample is most representative of the early childhood education culture of United States. However, four participants did



represent locations in countries other than the United States. Such a small representative sample from outside the United States is not likely to have had an influence on the results of the study. Future versions of the assessment should examine cultural differences in an international sample in hopes of creating an assessment that is applicable to many different educational cultures.

Reported preschool settings included a variety of traditional and nontraditional preschool settings. Some participants indicated on the demographic questionnaire the specific type of preschool setting where they taught. Montessori preschool was a common setting named in the “other” category. Some participants provided additional qualitative feedback specifically mentioning the Montessori preschool environment as not encompassing all of the activities and tasks listed on the *Sensory Environment and Participation Questionnaire – Teacher Version*. The purpose of this assessment is to consider the impact of the sensory environment on participation in the preschool setting. The intent is that the assessment is applicable across preschool environments, including nontraditional preschools. Question development was based upon the qualitative study of preschool teachers and occupational therapist. The majority of these participants worked in a traditional, public preschool setting. Therefore, the items in the assessment reflected the activities of a traditional preschool setting.

A nontraditional setting, such as Waldorf or Montessori, presents a different structure of activities and tasks as compared to a traditional preschool. The presence of sensory input is consistent across environments, although the amount of sensory stimuli may vary (Piller & Pfeiffer, 2016). Activities may be different in traditional versus

nontraditional preschools; however, the presence of sensory stimuli is consistent. The final version of the assessment provided rewording of questions to allow them to be more general in order to be applicable to traditional and nontraditional preschool settings while maintaining the intent of the question. The final version also includes a place for teachers to indicate the type of preschool setting in order to gather additional information on the structure of the environment in both traditional and nontraditional preschool settings.

Qualitative data revealed specific feedback from participants working in a Montessori setting. These participants indicated that the structure of the day and philosophy of education differed from a traditional setting. Variance in philosophy of education may have accounted for difference in scores. Subtest three sought to assess the amount of modification provided to the student to support participation. This subtest revealed several floor scores, an indication that no modifications were made to support participation. The frequency of the minimum score on the third subtest may reveal a philosophy of teaching to not modify the environment or task for a student but rather equip students with the tools to meet their own needs. Participant 91 commented in the feedback form that the philosophy of their setting was not to modify the environment, but rather to equip the students with the tools to meet their own needs.

The Montessori philosophy is to engross children within the environment, which presents natural learning opportunities. Montessori philosophy also states that the environment is structured in such a way as to present learning in a natural and child-centered manner (Rathunde, 2001). In the Montessori setting, environmental modifications may not be directly modified for a specific child. Rather, the teacher

arranges the environment for the entire class. Environmental modifications occur naturally and are dictated by the philosophy of Montessori education (Montessori, 1964/2014). Modifications that take place as part of the regular structure of the day may not have been reflected in the assessment responses because the modification occur indirectly or for the entire class, not just one student. Other nontraditional preschool settings were not specifically identified in this study, but should be further explored to ensure the universality of the assessment.

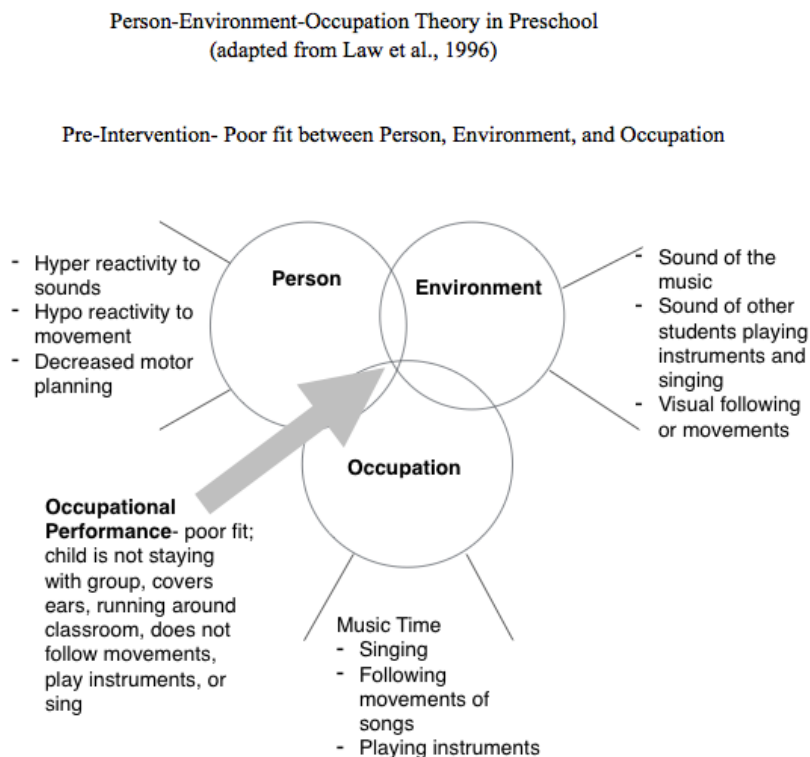
Children with ASD and other students with sensory processing difficulties have increased difficulties participating in the educational environment (Fernández-Andrés et al., 2015; Smith Roley et al., 2015). Support and modifications to the environment increase participation and the teacher is most often the coordinator of these supports and modifications (Piller & Pfeiffer, 2016). The *Sensory Environment and Participation Questionnaire – Teacher Version* provides a method to evaluate the impact of the sensory environment on the participation of students with ASD. In turn, educators are better able to identify and decrease barriers to participation. Modifications may take place at any level of the environment including the individual, micro-system, and meso-system (Bronfenbrenner, 1994). Educators can use information gathered from the *Sensory Environment and Participation Questionnaire – Teacher Version* to make modifications or support at a child specific level or from a whole class perspective. By providing support at various levels of the environment, educators are able to tailor the support to the needs of the child and align with their own educational philosophy.

### **Implications for Practice**

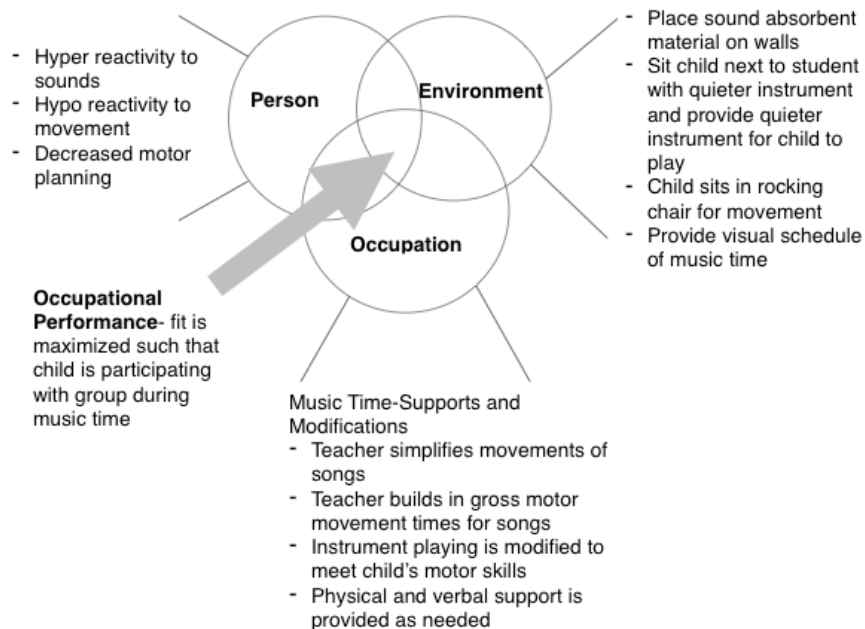
The Person-Environment-Occupation theory is a common theory used in occupational therapy. It serves as the underlying theory for the development of the *Sensory Environment and Participation Questionnaire – Teacher Version*. It also establishes a theoretical basis to provide intervention after barriers to participation have been identified. The use of the *Sensory Environment and Participation Questionnaire – Teacher Version* as an assessment tool identifies sensory-related environmental barriers. The occupational therapy practitioner can then modify the environment through reduction of stimuli, increasing stimuli, or changing the type of sensory stimuli within the environment. As the sensory environment is altered, the fit between the person, environment, and occupation increases. As a result, occupational performance, or participation, is maximized for the child. Further, occupational therapy practitioners can use the information gathered from the *Sensory Environment and Participation Questionnaire – Teacher Version* to change sensory aspects of occupations, including activities and tasks. Modifications to the sensory components of occupations can also increase the fit between person, occupation, and environment.

Modifications to the environment or task were identified as frequently being coordinated by the teacher (Piller & Pfeiffer, 2016). Teachers have the ability to make changes within the larger classroom environment and within the smaller environments that exist in the preschool setting. They also are experts in modifying curriculum, or activities and tasks, performed during the school day and serve as the main person to provide support within the school environment. Occupational therapy practitioners can

work with classroom teachers using the information gathered from the *Sensory Environment and Participation Questionnaire – Teacher Version* to increase the fit between the person, environment, and occupation through modifications and support in the environment and in occupations. The collaborative relationship between the occupational therapy practitioner and classroom teacher allows the PEO theory to be implemented within the preschool setting to maximize occupational performance of preschool children with ASD. Pre and post intervention is represented in Figure 4 using music time as an example.



Post-Intervention- Maximized fit between Person, Environment, and Occupation



*Figure 4.* Pre and Post Intervention using Person-Environment-Occupation Theory. The figure represents an increase in fit between the person, environment and occupation with a preschool student in the occupation of music time.

Many children with ASD receive special education services through the school system as outlined in IDEA (AOTA, 2015c). The purpose of IDEA is to provide access to education for all students, including those with disabilities (IDEA, 2004). The provisions within IDEA dictate that students should be educated in the least restrictive environment alongside student without disabilities whenever possible. Instead of providing education in a separate environment, schools should provide supports and aids to support students with disabilities in the regular education classroom (IDEA, 2004; Yell, 2006). Response to intervention is part of the new initiative under the

reauthorization of IDEA. Response to intervention has emerged within the public school setting as a standard of education under *No Child Left Behind* and was originally designed to better identify and accommodate students who may need additional support in order to experience success in the general education environment (The Division for Early Childhood of the Council for Exceptional Children [DEC], National Association for the Education of Young Children [NAEYC], & National Head Start Association [NHSA], 2013). Response to intervention is a school-wide, tiered approach initiative to provide supplemental instruction to students who may be falling behind in the regular education classroom by providing academic and behavioral support (National Education Association [NEA], 2010). The approach is typically seen in the K-12 education setting. However, it is also important to enact within the early childhood education (DEC, NAEYC, & NHSA, 2013). The approach is enveloped within a tiered model with more support across the three tiers. Tier one allows for interventions to be made at the classroom level including modifications and screenings for all students (Brown-Chidsey & Steege, 2010). The *Sensory Environment and Participation Questionnaire – Teacher Version* provides a manner to quickly assess, or screen, the needs of a student within the classroom setting. Results of the assessment can be used to modify the classroom environment, thus providing intervention at the classroom level, tier one, for all students.

The purpose of least restrictive environment and response to intervention are to provide support while allowing the student to remain in the general education classroom as much as possible. The use of the *Sensory Environment and Participation Questionnaire – Teacher Version* provides an individualized assessment to address the

unique needs of each child within the provided environment. The results of the assessment can be used to adapt support levels and types of support as well as making modifications to the environment to increase the fit between the student and the environment. Under the PEO theoretical framework, the manipulation of the environment provides for the most straightforward method to change the fit of the person and the environment. A more desirable fit results in increased occupational performance, or participation (Law et al., 1996). When fit is increased, the student is able to access and participate in educational activities within the least restrictive environment. The use of the *Sensory Environment and Participation Questionnaire – Teacher Version* provides an assessment tool to quickly identify barriers to participation from the sensory environment standpoint. The results can be used in the regular education setting to provide modifications under a response to intervention approach, at the tier one level. The goal is to increase independence and reduce staffing burdens at the school and district level. In addition, the use of the *Sensory Environment and Participation Questionnaire – Teacher Version* has the potential to allow administrative personnel to provide resources and training for teachers to modify and support students within the classroom. In turn, students are more successful in the classroom with less supports, thus saving districts money and resources.

The *Sensory Environment and Participation Questionnaire – Teacher Version* can also be used with children already receiving special education services. Occupational therapy practitioners can use the information provided by the assessment to orchestrate changes to the classroom environment to support participation and allow students



increased access to the curriculum. The *Sensory Environment and Participation Questionnaire- Teacher Version* provides the necessary evaluation to implement services from a consultative model to decrease environmental barriers and increase participation. The use of the assessment to modify and support the student within the classroom and other preschool contexts through a more consultative model, has the potential to free up more time for the occupational therapy practitioner in the school setting in order to service more students and to increase the student's time and participation within the classroom and learning activities.

### **Limitations**

Limitations for this study include the method of factor analysis. By design the method is subjective in nature and relies on the interpretation and opinion of the researcher to make decisions regarding factors. In this study, only a single researcher made the decisions regarding the factor analysis. The researcher who performed the factor analysis is the same researcher who co-developed the assessment. As a result, the potential for bias within the factor analysis is higher than if more than one researcher had contributed or reviewed the factors. Further, the narrative information provided via the feedback form was also only analyzed by one researcher. Although this is an appropriate method for qualitative content analysis, there is an increased risk of bias. Finally, the sample size for test-retest reliability was small. This may have had an impact on the test-retest reliability, which was lower than expected. A larger sample size would have provided a more accurate measure of test-retest reliability.

## **Future Research**

The *Occupational Therapy Research Agenda* (American Occupational Therapy Foundation [AOTF] & AOTA, 2011) outlines the research priorities for occupational therapy. This document indicates that research in developmental disorders, such as ASD, and the development of assessments that simultaneously evaluate the person, environment, and occupation, are of the highest priorities of research. This study provides the initial psychometric properties of the *Sensory Environment and Participation Questionnaire – Teacher Version*, an assessment that fulfills the need of research in development disorders and assessments designed to measure the impact of the environment on occupation. This study established both content and construct validity of the assessment. Future research will compare the assessment to similar tools in order to establish concurrent validity. Scoring methods also need to be established and should be consistent with scoring methods on the home and community version of the assessment. The establishment of scaled scores is a logical next step before the assessment is ready to be widely distributed.

The assessment in this study was limited to children with ASD. Future research will expand the population of the assessment to other preschool aged children with other types of disabilities and those without disabilities. Research will focus on establishing psychometric properties of the assessment with other populations. In addition, the tool will be explored to determine if it is a sound tool that is able to discriminate between populations of children without disabilities and children with ASD. Participants provided feedback as to the specific setting of the preschool influenced the tasks performed as well

participation within the setting. This concept needs to be explored in more detail. In addition to nontraditional preschool settings, outcomes from various types of preschools, such as Head Start, and urban versus rural areas should be explored to determine if differences exist in these settings.

The purpose of the tool is to provide information as to the impact of the sensory environment on participation with the intention of providing information to reorganize the environment to support participation. Future research will focus on the use of tool as a pre- and post- measure of participation after changes to the environment. This will determine the sensitivity of the assessment to change. If the assessment is shown to be sensitive to change, it can be used as an outcome measure of participation following environmental changes and supports under the theoretical framework of PEO. The current study demonstrated adequate, but lower test-retest reliability. This is an initial indication that the assessment may not be a reliable tool as an outcome measure. However, with changes made to the wording of the questions, removal of questions, and format of the assessment, it is hoped that future studies will show an increase in test-retest reliability. If test-retest reliability is shown to be higher with these changes, then the assessment may prove to be a reliable outcome measure.

The *Occupational Therapy Practice Guidelines for Individuals with Autism Spectrum Disorder* (Tomcheck & Koenig, 2016) provides an outline of current research and treatment guidelines in delivering occupational therapy services for persons with ASD. In addition, it provides direction for future research in occupational therapy and ASD. Research recommendations include the need for future outcomes research in

participation in work and school. The development of the *Sensory Environment and Participation Questionnaire – Teacher Version* provides a psychometrical sound assessment to examine participation in the specific environment of the preschool. Future studies will focus on the development of assessments to examine participation in other contexts and with participants of other ages to determine the impact of the specific sensory environment on participation in a particular context. Outcome research specific to contexts such as work environments, school environments beyond preschool, and specific community environments such as places of worship, museums, and sporting venues provides the basis for measuring and improving participation across various contexts.

### **Conclusion**

Results of this study indicate the *Sensory Environment and Participation Questionnaire – Teacher Version* has excellent internal consistency and good test-retest reliability, as well as strong content and construct validity. The initial psychometric properties of the instrument indicate the *Sensory Environment and Participation Questionnaire – Teacher Version* is a reliable and valid instrument that can be used to assess the impact of the sensory environment on participation of preschool students with ASD in the school setting.

## REFERENCES

- Allen, M. J., & Yen, W. M. (2002). *Introduction to measurement theory*. Long Grove, IL: Waveland Press, Inc. (First published 1979).
- American Occupational Therapy Association. (2014). Occupational therapy practice framework: Domain and process (3rd ed.). *American Journal of Occupational Therapy*. 68(Suppl. 1) S1–S48. doi.10.501/ajot2014682006
- American Occupational Therapy Association. (2015a). *Occupational therapy fact sheet*. Retrieved from: <http://www.aota.org/-/media/corporate/files/advocacy/hill-day-12/hill-day-ot-fact-sheet.pdf>
- American Occupational Therapy Association. (2015b). Occupational therapy for children and youth using sensory integration theory and methods in school-based practice. (2015). *American Journal of Occupational Therapy* 2015;69(Suppl. 3), 6913410040p1–6913410040p20. doi: 10.5014/ajot.2015.696S04
- American Occupational Therapy Association (2015c). Occupational therapy's perspective on the use of environments and contexts to facilitate health, well-being, and participation in occupations. *American Journal of Occupational Therapy*. 69(Suppl. 3):6913410050p1–6913410050p13. doi: 10.5014/ajot.2015.696S05.
- American Occupational Therapy Association. (2015d). Scope of occupational therapy services for individuals with autism spectrum disorder across the life course.

- American Journal of Occupational Therapy*, 69(Suppl. 3), 6913410054p2–6913410054p12. doi: 10.5014/ajot.2015.696S18
- American Occupational Therapy Foundations & American Occupational Therapy Association. (2011). Occupational therapy research agenda. *American Journal of Occupational Therapy*. 65 (Suppl. 6), S4–S7. Doi: 10.50104ajot.2011.65
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, D.C.: American Psychiatric Association.
- Ashburner, J., Ziviani, J., & Rodger, S. (2008). Sensory processing and classroom emotional, behavioral, and education outcomes in children with autism spectrum disorder. *American Journal of Occupational Therapy*, 62(5), 564–573. doi: 10.5014/ajot.62.5.564
- Asher, I. E. (Ed.). (2014a). *Asher's occupational therapy assessment tools: An annotated index* (4th ed.). Bethesda, MD: American Occupational Therapy Association.
- Asher, I. E. (2014b). How to use this book. In Asher, I. E. (Ed.), *Asher's occupational therapy assessment tools: An annotated Index* (4th ed.). (pp. 3–8). Bethesda, MD: American Occupational Therapy Association.
- Ayres, A.J. (1979). *Sensory integration and the child*. Los Angeles, CA: Western Psychological Services.
- Ayres, A.J. (1989). *Sensory Integration and Praxis Tests: Manual*. Los Angeles: Western Psychological Services.
- Bagatell, N., Mirigliani, G., Patterson, C., Reyes, Y., & Test, L. (2010). Effectiveness of therapy ball chairs on classroom participation in children with autism spectrum

- disorders. *American Journal of Occupational Therapy*, 64(6): 895–903. doi: 10.5014/ajot.2010.09149
- Barnes, K. J., & Turner, K. D. (2001). Team collaborative practices between teachers and occupational therapists. *American Journal of Occupational Therapy*, 55(1): 83–89. doi: 10.5014/ajot.55.1.83
- Bedell, G. M., Khetani, M. A., Cousins, M. A., Coster, W. J., & Law, M. C. (2011). Parent perspective to inform development measures of children's participation and environment. *Physical Medicine and Rehabilitation*, 92(5). 765–773. doi:10.1016/j.apmr.2010.12.029
- Boyd, B. A., Odom, S. L., Humphreys, B. P., & Sam, A. M. (2010). Infants and toddlers with autism spectrum disorder: Early identification and early intervention. *Journal of Early Intervention*, 32(2), 75–98. doi: 10.1177/1053815110362690
- Bronfenbrenner, U. (1994). Ecological models of human development. In *International encyclopedia of education* (Vol 3) (2nd ed.) (pp. 37–43). Oxford: Elsevier.
- Brod, M., Tesler, L. E., & Christensen, T. L. (2009). Qualitative research and content validity: Developing best practices based on science and experience. *Qualitative Life Research*, 18(9), 1263–1278. doi:10.007/s11136-009-9540-9
- Brown-Chidsey, R. & Steege, M. W. (2010). *Response to intervention: Principles and strategies for effective practice* (2nd ed.). New York: Guilford Press.
- Bundy, A. C., Lane, S. J., & Murray, E. A. (2002). *Sensory integration theory and practice* (2nd ed.). Philadelphia, PA: F. A. Davis Company.

- Caldwell, B. M. & Bradley, R. H. (2003). *Home Observation for Measurement of the Environment: Administration manual*. Tempe, AZ: Family and Human Dynamics Research Institute, Arizona State University.
- Case-Smith, J., Weaver, L. L., Fristad, M. A. (2015). A systematic review of sensory processing interventions for children with autism spectrum disorders. *Autism, 19*(2), 133–148. doi: 10.1177/1362361313517732
- Centers for Disease Control and Prevention. (n.d.). Key findings: Trends in the prevalence of developmental disabilities in U.S. children, 1997-2008. Retrieved from: <http://www.cdc.gov/ncbddd/developmentaldisabilities/features/birthdefects-dd-keyfindings.html>
- Centers for Disease Control and Prevention. (2014). Prevalence of autism spectrum disorder among children aged 8 years— Autism and developmental disabilities monitoring network, 11 sites, United States, 2010. *MMWR: Surveillance Summaries, 63*(SS02), 1–21. Retrieved from <http://www.cdc.gov/mmwr/preview/mmwrhtml/ss6302a1.html>
- Centers for Disease Control and Prevention. (2016). Autism spectrum disorder. Retrieved from: <http://www.cdc.gov/ncbddd/autism/data.html>
- Chapparo, C., & Lowe, S. (2012). School: Participating in more than just the classroom. In S. Lane & A. Bundy (Eds.), *Kids can be kids: A childhood occupations approach* (pp. 83–101). Philadelphia: F.A. Davis.



- Choi, J., Peters, M., & Mueller, R.O. (2010). Correlational analysis of ordinal data: From Pearson's  $r$  to Bayesian polychoric correlation. *Asia Pacific Education Review*, 11(4), 459–466. doi: 10.1007/s12564-010-9096-y
- Cicchetti, D. V. (1994). Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychological Assessment*, 6(4), 284–290. doi: 10.1037/1040-3590.6.4.284
- Comrey, A. L., & Lee, H. B. (1992). *A first course in factor analysis* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Coster, W., Deeney, T., Haltiwanger, J., & Haley, S. (1998). *School Function Assessment*. San Antonio, TX: Pearson, Inc.
- Coster, W., Law, M., Bedell, G., Khetani, M., Cousins, M., & Teplicky, R. (2012). Development of the participation and environment measure for children and youth: Conceptual basis. *Disability and Rehabilitation*. 34(3), 238–246.  
doi:10.3109/09638288.2011.603017
- Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches* (3rd Ed.). Thousand Oaks, CA: Sage Publications, Inc.
- DeVillis, R. F. (2006). Classical test theory. *Medical Care*, 44(11), S50–S59.
- The Division for Early Childhood of the Council for Exceptional Children, National Association for the Education of Young Children, & National Head Start Association. (2013). *Frameworks for response to intervention in early childhood: Description and implications*. Retrieved from:  
<http://www.naeyc.org/files/naeyc/RTI%20in%20Early%20Childhood.pdf>

- Dunn, W. (2014). *Sensory Profile 2*. Bloomington, MN: PsychCorp.
- Dunn, W., Brown, C., & McGuigan, A. (1994). The ecology of human performance: A framework for considering the effect of context. *American Journal of Occupational Therapy, 48*, 595–607. doi:10.5014/ajot.48.7.595
- Dziuban, C. D., & Shirkey, E. C. (1974). When is a correlation matrix appropriate for factor analysis: Some decision rules. *Psychological Bulletin, 81*(6), 358–361. doi: 10.1037/h0036316
- Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K., & Kyngäs, H. (2014). Qualitative content analysis. *SAGE Open, 4*(1). doi: 10.1177/2158244014522633
- Emilson, A., & Folkesson, A. (2006). Children's participation and teacher control. *Early Child Development and Care, 176*(3–4), 219–238. doi. 10.1080/0300443050039846
- Faller, P., Hunt, J., van Hooydonk, E., Mailloux, Z., & Schaaf, R. (2015). Application of data-driven decision making using Ayres sensory integration with a child with autism. *American Journal of Occupational Therapy, 70*(1). 7001220020p1–7001220020p9. doi: 10.5014/ajot.2016.016881
- Ferketich, S. (1991). Focus on psychometrics: Aspects of item analysis. *Research in Nursing and Health, 14*(2): 165–168. doi: 10.1002/nur.4770140211
- Fernández-Andrés, M. I., Pastor-Cerezuela, G., Sanz-Cervera, P., & Tárraga-Mínguez, R. (2015). A comparative study of sensory processing in children with and without autism spectrum disorder in the home and classroom environments. *Research in Developmental Disabilities, 38*, 202–212. doi: 10.1016/j.ridd.2014.12.034

- Forsyth, R., & Jarvis, S. (2002). Participation in childhood. *Child: Care, Health and Development*, 28(4), 277–279. doi:10.1046/j.1365-2214.2002.00272.x
- Gitlow, L. (2014). Assessments of context: Physical environment. In Asher, I. E. (Ed.), *Asher's occupational therapy assessment tools: An annotated Index* (4th ed.) (pp. 755–778). Bethesda, MD: American Occupational Therapy Association.
- Gorsuch, R. L. (1983). *Factor analysis* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Harms, T., Clifford, R., & Cryer, D. (2005). *Early Childhood Environment Rating Scale—Revised Edition*. New York: Teachers College Press.
- Harms, T., Clifford, R., & Cryer, D. (2006). *Infant/Toddler Environment Rating Scale—Revised Edition*. New York: Teachers College Press.
- Harms, T., Clifford, R., & Cryer, D. (2007). *Family Child Care Environment Rating Scale—Revised Edition*. New York: Teachers College Press.
- Harms, T., Jacobs, E. V., & White, D. R. (2014). *School-Age Care Environment Rating Scale—Revised Edition*. New York: Teachers College Press.
- Haynes, C. J., & Anderson, M. (2014). Sensory-perceptual assessments. In Asher, I. E. (Ed.), *Asher's occupational therapy assessment tools: An annotated Index* (4th ed.) (pp. 363–440). Bethesda, MD: American Occupational Therapy Association.
- Hemmingsson, H., Egilson, S., Hoffman, O., & Kielhofner, G. (2005). *The School Setting Interview (SSI), Version 3.0*. Chicago: Model of Human Occupation Clearinghouse.
- Howie, F. (2016). The wonders of messy play [online]. *Every Child*, 22(2). Retrieved from

<http://search.informit.com.au/documentSummary;dn=124243096575274;res=IELHS>

S>

Hwang, A., Yen, C., Liou, T., Simeonsson, R. J., Lollar, D. J., Chiu, W....Chiu, W.T.

(2015). Participation of children with disabilities in Taiwan: The gap between independence and frequency. *PLoS One*, 10(5) doi: 10.1371/journal.pone.0126693

IBM Corp. Released 2015. IBM SPSS Statistics for Macintosh, Version 24.0. Armonk, NY: IBM Corp.

Individuals with Disabilities Education Improvement Act of 2004, Pub.L. 108–446, 20 U.S.C SS 1400–1483

Johansson, I., & Sandberg, A. (2010). Learning and participation: Two interrelated key-concepts in the preschool. *European Early Childhood Education Research Journal*, 18(2), 229–242. doi: 10.1080/13502931003784560

Kaefer, F., Roper, J., & Sinha, P. (2015). A software-assisted qualitative content analysis of news articles: Examples and reflections. *Forum: Qualitative Social Research*, 16(2). Retrieved from <http://nbn-resolving.de/urn:nbn:de:0114-fqs0202260>

Kielhofner, G. (2008). *A model of human occupation: Theory and application* (4th ed.). Philadelphia: Lippincott Williams & Wilkins.

King, G., Law, M., King, S., Hurley, P., Hanna, S., Rosenbaum, P., & Young, N. (2004). *Children's Assessment of Participation and Enjoyment (CAPE) and Preference for Activities of Children (PAC)*. San Antonio, TX: Harcourt Assessment, Inc.

King, G., Law, M., King, S., Rosenbaum, P., Kertoy, M. K., & Young, N. L. (2003). A conceptual model of the factors affecting the recreation and leisure participation of

- children with disabilities. *Physical & Occupational Therapy in Pediatrics*, 23(1), 63–90. doi:10.1080/J006v23n01\_05
- King, G., Law, M. Petrenchik, T., & Kertoy, M. (2006). *Assessment of Preschool Children's Participation (APCP)*. Hamilton, Canada: CanChild Centre for Childhood Disability Research, McMaster University.
- Kinnealey, M., Pfeiffer, B., Miller, J., Roan, C., Shoener, R., & Ellner, M. L. (2012). Effect of classroom modification on attention and engagement of students with autism or dyspraxia. *American Journal of Occupational Therapy*. 66(5): 511–519. doi: 10.5014/ajot.2012.004010
- Kline, T. J. B. (2005). *Psychological testing: A practical approach to design and evaluation*. Thousands Oaks, CA: Sage Publications.
- Kramer, J. M., Olsen, S., Mermelstein, M., Balcells, A., & Liljenquist, K. (2012). Youth with disabilities' perspectives of the environment and participation: A qualitative meta-synthesis. *Child: Care, Health and Development* 38(6), 763–777. doi:10.1111/j.1365-22142.01365.x
- Kuhaneck, H. M., & Kelleher, J. (2015). Development of the Classroom Sensory Environment Measure (CSEA). *American Journal of Occupational Therapy*, 69(6): 6906180040p1–6906180040p9. doi: 10.5014/ajot.2015.019430
- Lance, C. E., Butts, M. M., & Michels, L. C. (2006). The sources of four commonly reported cutoff criteria: What did they really say? *Organizational Research Methods*, 9(2), 202–220. doi: 10.1177/1094428105284919

- Lane, S. J., Smith Roley, S. & Champagne, T. (2014) Sensory integration and processing. In B. A. B. Schell, G. Gillen, & M. E. Scaffa (Eds.), *Willard & Spackman's occupational therapy* (12th ed.) (816–868). Philadelphia: Lippincott Williams & Wilkins.
- Lane, A. E., Young, R. L., Baker, A. E. Z., Angley, M. T. (2009). Sensory processing subtypes in autism: Association with adaptive behavior. *Journal of Autism and Developmental Disorders*, 40, 112–122. doi: 10.1007/s10803-009-0840-2
- LaVesser, P., & Berg, C. (2011). Participation patterns in preschool children with an autism spectrum disorder. *OTJR: Occupation, Participation, Health*, 31(1), 33–39. doi:10.3928/15394492-20100823-01
- Law, M. (2002). Participation in occupations of everyday life. *American Journal of Occupational Therapy*, 56(6), 640–649. doi: 10.5014/ajot.65.6.640
- Law, M., Cooper, B., Strong, S., Steward, D., Rigby, P. & Letts, L. (1996). The person-environment-occupation model: A transactive approach to occupational performance. *Canadian Journal of Occupational Therapy*, 63, 9–23.
- Law, M., Petrenchik, T., Ziviani, J. & King, G. (2006). Participation of children in school and community. In J. Ziviani & S. Rodger (Eds.) *Occupational therapy with children: Understanding children's occupations and enabling participation*. (pp. 67–90). Oxford: Blackwell Publishing Ltd.
- Little, L., M., Sideris, J., Ausderau, K., & Baranek, G., T. (2014). Activity participation among children with autism spectrum disorder. *American Journal of Occupational Therapy*, 68(20), 177–185. doi:10.5014/ajot.2014.009894

- McDowell, I. (2006). *Measuring health: A guide to rating scales and questionnaires*. New York: Oxford University Press.
- Montessori, M. (2014). *The Montessori method*. New Brunswick: Transaction Publishers. (Original work published 1964).
- Mori, A. B., Clippard, H., del Pilar Saa, M. Pfeiffer, B. (2016). A review of pediatric assessment tools. *American Occupational Therapy Association Special Interest Section Quarterly Practice Connections*, 1(1), 7–9.
- Martin, L. M. (2014). Social participation assessments. In Asher, I. E. (Ed.), *Asher's occupational therapy assessment tools: An annotated Index* (4th ed.) (pp. 335–360). Bethesda, MD: American Occupational Therapy Association.
- National Education Association. (2010). *Response to intervention: A transformational approach*. Retrieved from:  
[http://www.nea.org/assets/docs/HE/PB27\\_ResponseToIntervention.pdf](http://www.nea.org/assets/docs/HE/PB27_ResponseToIntervention.pdf)
- National Institute of Health (2012). PROMIS instrument development and psychometric evaluation scientific standards, Retrieved from:  
[http://www.nihpromis.org/Documents/PROMIS\\_Standards\\_050212.pdf](http://www.nihpromis.org/Documents/PROMIS_Standards_050212.pdf)
- Neuendorf, K. A. (2017). *The content analysis guidebook*. (2nd ed.). Los Angeles: SAGE Publications.
- Noonan, V. K., Kopec, J. A., Noreau, L., Singer, J., & Dvorak, M. F. (2009). A review of participation instruments based on the international classification of functioning, disability and health. *Disability & Rehabilitation*, 2009, 31(23), 1883–1901.  
doi:10.1080/09638280902846947

- NVivo qualitative data analysis software (2014). QSR International Pty Ltd. Version 10.
- O'Brien, R. M. (1979). The use of Pearson's  $r$  with ordinal data. *American Sociological Review*, 44(5), 851–857
- O'Donnell, S., Deitz, J. Kartin, D., Nalty, T., & Dawson, G. (2012). Sensory processing, problem behavior, adaptive behavior, and cognition in preschool children with autism spectrum disorders. *American Journal of Occupational Therapy*, 65(5), 586–594. doi: 10.5014/ajot.2012.004168
- Osborne, J. W. (2014). *Best practices in exploratory factor analysis*. (n.p.)
- Pandey, S. & Chawla, D. (2016). Using qualitative research for establishing content validity of e-lifestyle and website quality constructs. *Qualitative Market Research*, 19(3), 339–356. doi: 10.1108QMR-05-2015-0033
- Parham, L. D., Ecker, C., Miller Kahaneck, H., Henry, D. A., & Glennon, T. J. (2007). *Sensory processing measure (SPM): Manual*. Los Angeles: Western Psychological Services.
- Patton, M. Q. (2015). *Qualitative research & evaluation methods* (4th Ed.). Thousand Oaks, CA: Sage Publications, Inc.
- Pfeiffer, B., Coster, W., Snethen, G., Piller, A., Derstine, M., & Tucker, C. (2016). *The sensory environment and participation in daily activities for children with autism spectrum disorder*. Manuscript submitted for publication.
- Piller, A., & Pfeiffer, E. (2016). The sensory environment and participation of preschool children with autism spectrum disorder. *OTJR: Occupation, Participation and Health*, 36(3), 103–111. doi: 10.1177/1539449216665116



- Pituch, K. A., & Stevens, J. P. (2016). *Applied multivariate statistics for the social sciences: Analyses with SAS and IBM's SPSS*. (6th ed.). New York: Taylor & Frances.
- Portney, L. G., & Watkins, M. P. (2009). *Foundations of clinical research: Applications to practice* (3rd ed.). Upper Saddle River, NJ: Pearson.
- Raghavendra, P. (2013). Participation of children with disabilities: Measuring subjective and objective outcomes. *Child: Care, Health and Development*, 39(4), 461–465. doi:10.1111/cch.12084
- Rathunde, K. (2001). Montessori education and optimal experience: A framework for new research. *NAMTA Journal*, 26(2), 11–43. Retrieved from: <http://www.montessori-namta.org/PDF/rathundeframework.pdf>
- Reet, J. V. (2012). Learning through play: Procedural versus declarative knowledge. In A. M. Pinkham, T. Kaefer, & S. B. Neuman (Eds.), *Knowledge development in early childhood: Sources of learning and classroom implications*. (pp. 18–34). New York: Guilford Press.
- Reynolds, S., Bendixen, R., Lawrence, T., & Lane, S. (2011). A pilot study examining activity participation, sensory responsiveness, and competence in children with high functioning autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 41(11), 1496–1506. doi:10.1007/s10803-010-1173-x
- Rosenberg, L., Ratzon, N. Z., Jarus, T., & Bart, O. (2012). Perceived environmental restrictions for the participation of children with mild developmental disabilities.

- Child: Care, Health and Development*, 38(6), 836–843. doi:10.1111/j.1365-2214.2011.01303.x
- Sandberg, A., & Eriksson, A. (2010). Children's participation in preschool—on the conditions of the adults? Preschool staff's concepts of children's participation in preschool everyday life. *Early Child Development and Care*, 180(5), 619-631. doi:10.1080/03004430802181759
- Sandelowski, M. (2000). Whatever happened to qualitative description? *Research in Nursing & Health*, 23(4), 334-340. doi:10.1002/1098-240X(200008)23:4<334::AID-NUR9>3.0.CO;2-G
- Schaaf, R. C. & Mailloux, Z. (2015). *Clinician's guide for implementing Ayres sensory integration: Promoting participation for children with autism*. Bethesda, MD: AOTA Press.
- Schaaf, R. C., Toth-Cohen, S., Johnson, S. L., Outten, G. & Benevides, T. W. (2011). The everyday routines of families of children with autism: Examining the impact of sensory processing difficulties on the family. *Autism*, 15(3), 373–389. doi: 10.1177/1362361310386505
- Schneidert, M., Hurst, R., Miller, J., & Ustun, B. (2003). The role of environment in the international classification of functioning, disability and health (ICF). *Disability and Rehabilitation*, 25, 588–595. doi: 10.1080/0963828031000137090
- Schreier, M. (2012). *Qualitative content analysis in practice*. Thousand Oaks, CA: SAGE Publication Inc.

- Simons, R. L. & Leech, S. W. (2014). Education assessments. In Asher, I. E. (Ed.), *Asher's occupational therapy assessment tools: An annotated Index* (4th ed.) (pp. 263–278). Bethesda, MD: American Occupational Therapy Association.
- Singleton, R. (2001). Participation. *British Journal of Social Work*, 31(4), 633–634.
- Smith Roley, S., Mailloux, Z., Parham, L., D., Schaaf, R., C., Lane, C., J., & Cermak, S. (2015). Sensory integration and praxis patterns in children with autism. *American Journal of Occupational Therapy*, 69(1), 1–8. doi:10.5014/ajot.2015.012476
- Spencer, J. (2003). Evaluation of performance contexts. In Crepeau, E., E. Cohn, & B. Schell (Eds.) *Willard & Spackman's occupational therapy*, (10th ed.) (pp. 427–448). Philadelphia, PA: Lippincott Williams & Wilkins.
- Streiner, D. L. (2003). Starting at the beginning: An introduction to coefficient alpha and internal consistency. *Journal of Personality Assessment*, 80(1), 99–103. doi: 10.1207/S15327752JPA8001\_18
- Streiner, D. L., & Norman, G. R. (2008). *Health measurement scales: A practical guide to their development and use*. Oxford, UK: Oxford University Press.
- Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53–55. doi:10.5116/ijme.4dfb.8dfd
- Tavassoli, T., Miller, L. J., Schoen, S. A., Nielsen, D. M., Baron-Cohen, S. (2014). Sensory over-responsivity in adults with autism spectrum conditions. *Autism*. 18(4), 428–432. doi: 10.1177/1362361313477246

- Tomchek, S. D., Huebner, R. A., & Dunn, W. (2014). Patterns of sensory processing in children with an autism spectrum disorder. *Research in Autism Spectrum Disorders*, 8(9), 1214–1224. doi:10.1016/j.rasd.2014.06.006
- Tomcheck, S. D., & Koenig, K. P. (2016). *The AOTA practice guidelines series: Occupational therapy practice guidelines for individuals with autism spectrum disorder*. Bethesda, MD: American Occupational Therapy Association, Inc.
- United States Census Bureau. (2015a). *2010 census urban and rural classification and urban area criteria*. Retrieved from:  
<https://www.census.gov/geo/reference/ua/urban-rural-2010.html>
- United States Census Bureau. (2015b). *Economic census: Regions and divisions*. Retrieved from:  
[http://www.census.gov/econ/census/help/geography/regions\\_and\\_divisions.html](http://www.census.gov/econ/census/help/geography/regions_and_divisions.html)
- United States Census Bureau. (2015c). *Quick fact: United States*. Retrieved from:  
<https://www.census.gov/quickfacts/table/PST045215/00>
- Watling, R., Deitz, J., Kanny, E. M., McLaughlin, J. F. (1999). Current practice of occupational therapy for children with autism. *American Journal of Occupational Therapy*, 53(5), 498–505. doi: 10.5014/ajot.53.5.498
- Webb, N. M., Shavelson, R. J., Haertel, E. H. (2006). Reliability coefficients and generalizability theory. In C. R. Rao & S. Sinharay (Eds.) *Handbook of Statistics 26* (pp. 81–124). Oxford, United Kingdom.
- Whiteneck, G., & Dijkers, M. P. (2009). Difficult to measure constructs: Conceptual and methodological issues concerning participation and environmental factors. *Archives*

- of Physical Medicine and Rehabilitation*, 90(11), S22–S35. doi:  
10.1016/j.apmr.2009.06.009
- World Health Organization. (2001). *ICF: International classification of functioning, disability and health*. Geneva: World Health Organization
- Yell, M.L. (2006). *Least restrictive environment, mainstreaming, and inclusion*. The Law and Special Education. Retrieved from:  
<http://www.education.com/reference/article/mainstreaming-inclusion/>
- Yin, L. C., Zakaria, A. R., Baharun, H., Hutagalung, F., Sulaiman, A. M. (2015). Messy play: Creativity and imagination amount preschool children. In F. L. Gaol (Ed.), *Interdisciplinary Behavior and Social Sciences*. (pp. 299–306). London: Taylor & Francis Group
- Zachor, D. A. & Ben-Itzhak, E. (2013). The relationship between clinical presentation and unusual sensory interests in autism spectrum disorders: A preliminary investigation. *Journal of Autism and Developmental Disorders*, 44, 229–235. doi:  
10.1007/s10803-013-1867-y
- Ziviani, J. & Rodger, S. (2006). Environmental influences on children's participation. In J. Ziviani & S. Rodger (Eds.) *Occupational therapy with children: Understanding children's occupations and enabling participation*. (pp. 41–66). Oxford: Blackwell Publishing Ltd.

## Appendix A

Sensory Environment and Participation Questionnaire – Teacher Version

Original Version

**Instructions:**

This questionnaire measures how a child's response to sensory input affects participation within the preschool environment. It also looks at how much support and modification are required for the child to participate in the preschool activities. Participation refers to the child's involvement in the activity. It does not necessarily mean that the child is able to perform the task independently; only that he or she actively participates in the activity. Sensory features refer to the type of sensory stimuli that is in the environment or present when participating in the activity. This could include: the way something feels to the touch or the texture (tactile); the amount or type of noise (auditory); the amount or type of visual information or light; the amount of movement (vestibular); the way something smells or tastes; or the amount of heavy muscle work (proprioception). A child's responses to the sensory features of the environment may include sensory seeking (i.e. jumping, running, crashing into things, touching things more than usual), typical responses, and hypersensitive responses (overly sensitive or reactive).

Please answer each of the following questions as to how much a student's response to sensory input impacts participation based on the following scale:

None- The student's response to sensory input does not affect the child's participation in the activity at all.

A Little- The student's response to sensory input affects the child's participation the activity a little.

Some- The student's response to sensory input affects the child's participation in the activity somewhat.

A Lot- The student's response to sensory input affects the child's participation in the activity a lot.

Too Much to Participate- The student's response to sensory input affects the child to the point that the child does not participate in the activity.

### Section One

How much do the student's responses (hypersensitivity and/or sensory seeking) to sensory features of the environment or activity impact participation?

#### Circle Time

	None	A Little	Some	A lot	Too Much to Participate
Sitting Still	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Following movements in songs (e.g. finger plays)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Touching or being near other children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Coming and staying with group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### Table Time

	None	A Little	Some	A lot	Too Much to Participate
Sitting for Table Work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Listening to instructions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Focusing to complete work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



### Snack or Lunch Time

	None	A Little	Some	A lot	Too Much to Participate
Sitting with other children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Focusing to eat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eating snack/lunch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trying new foods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bite sizes (i.e stuffing food)					

### Classroom Routines

	None	A Little	Some	A lot	Too Much to Participate
Transitioning from one activity to another	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cleaning up supplies/toys	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Centers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attending to instructions/directions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Following classroom routines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drills, such as fire or tornado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Free Play/Recess

	None	A Little	Some	A lot	Too Much to Participate
Playing with other students/peers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Playing on playground equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Playing group games	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Playing with toys	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Craft/Art Time

	None	A Little	Some	A lot	Too Much to Participate
Using glue for craft projects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Painting and coloring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completing coloring and cutting activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use markers to color/write/draw	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Self-Care

	None	A Little	Some	A lot	Too Much to Participate
Using the toilet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Washing hands	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dressing after toileting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Putting backpack and/or other belongings away	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Sensory Table

	None	A Little	Some	A lot	Too Much to Participate
Playing with items on sensory table	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Touching wet textures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Touching dry textures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Touching sticky textures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Movement/Music Time

	None	A Little	Some	A lot	Too Much to Participate
Following movement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Singing or playing instruments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Listening to music	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Staying with the group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Section Two

How much support do you or other staff provide to the child in order to participate in the task? (Support is considered direct interaction through words, visual cues, or touch)

	None	A Little	Some	A Lot	Child does not participate in activity
Circle time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Table time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Snack or lunch time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transitions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cleaning up	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Free play	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Centers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recess	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Music	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instruction Time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Craft/Art Time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sensory Table	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drills, such as fire or tornado drill	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Movement Time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-Care	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Peer Play	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Section Three

How much do you modify the environment to support participation in the following activities? (Modify the environment consists of changes to the environment, task, or timing of the activity).

	None	A Little	Some	A Lot	Child does not participate in activity
Circle time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Table time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Snack or lunch time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transitions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cleaning up	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Free play	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Centers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recess	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Music	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instruction Time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Craft/Art Time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sensory Table	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drills, such as fire or tornado drill	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Movement Time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-Care	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Peer Play	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix B

### Questions for Cognitive Testing

**Instructions**

Did you feel you had a good understanding of the instructions?

Was there any portion of the instructions that you do not understand or feel you needs more clarity on?

Based upon the instructions, what does sensory features mean? What does environment mean? What does participation mean?

Are there other things you would like to see in the instructions to make them more clear?

**Section One**

Do you feel you have a good understanding of the instructions? Do you feel more information should be included?

Is “response to sensory input” clear to you? What do you feel this means?

The following areas are included in as classroom tasks: circle time, table time, snack or lunch time, classroom routines, free play/recess, craft/art time, self-care, sensory table, movement/music time. Are there any other major areas of classroom tasks that you would like to see included?

Does the rating scale provide enough options? Do you find it easy to understand? Would more instructions on the rating scale be helpful or a hindrance?

**Each Subsection**

Are there other areas you would like to see included in this section?

Were any of the questions confusing? If so, which ones.

**Sections Two**

Do you feel you have a good understanding of the instructions for this section?

Was support defined in a way you understand? How do you define support?

Does the rating scale provide enough options? Do you find it easy to understand? Would more instructions on the rating scale be helpful or a hindrance?

Are there other areas you would like to see included in this section?



Were any of the questions confusing? If so, which ones.

**Section Three**

Do you feel you have a good understanding of the instructions for this section?

How do you define “modify the environment”? Would further explanation of modifications to environment be helpful in understanding this section?

Does the rating scale provide enough options? Do you find it easy to understand? Would more instructions on the rating scale be helpful or a hindrance?

Are there other areas you would like to see included in this section?

Were any of the questions confusing? If so, which ones.

Appendix C  
Demographic Form

Participant Number: \_\_\_\_\_ (completed by research staff)

---

## **Demographic Questionnaire**

Your responses to these questions will be used only to describe the group of teachers participating the study.

The following questions are about you specifically.

1. What type of community do you work in now? Select ONE answer.

☐ Major Urban (population over 100,000)  
☐ Suburban (population between 20,000-99,000)  
☐ Small town (population between 3,000-20,000)  
☐ Rural (population less than 3,000)

2. What state do you work in now? \_\_\_\_\_

3. How old are you?

☐ 20-29 years      ☐ 50-59 years  
☐ 30-39 years      ☐ 60 or over  
☐ 40-49 years

4. What racial or ethnic group best describes you?

☐ American Indian or Alaska Native  
☐ Asian  
☐ Black  
☐ Hispanic or Latino  
☐ Native Hawaiian or other Pacific Islander  
☐ White  
☐ Two or More Races  
☐ Other (please specify): \_\_\_\_\_

5. What setting do you work as a preschool teacher? (choose one)

☐ Public preschool  
☐ Public special education preschool  
☐ Private preschool  
☐ Private special education preschool  
☐ Charter preschool  
☐ Home-based preschool

- ☐ Other (please specify): \_\_\_\_\_
6. How many years have you worked in your current profession?
- |                                     |   |
|-------------------------------------|---|
| <input type="checkbox"/> 0-3 years  | <input type="checkbox"/> 12-15 years      |
| <input type="checkbox"/> 4-7 years  | <input type="checkbox"/> 15-18 years      |
| <input type="checkbox"/> 8-11 years | <input type="checkbox"/> 18 or more years |
7. How much education have you completed? Select ONE answer.
- ☐ Associate Degree
- ☐ Undergraduate Degree
- ☐ Master's Degree
- ☐ Doctoral Degree
- ☐ Other (please specify): \_\_\_\_\_
8. What area is your degree in?
- ☐ Early childhood
- ☐ Early childhood special education
- ☐ Elementary education
- ☐ Other (please specify): \_\_\_\_\_
9. Do you have any specialty certifications or advanced training? ☐ yes ☐ no
- If yes, please specify: \_\_\_\_\_
10. What is the average percentage of your caseload/classroom over the past year of children between the ages of 3 to 5 with Autism spectrum disorder?
- |  |   |
|--|---|
| <input type="checkbox"/> 1-10 percent  | <input type="checkbox"/> 50-75 percent  |
| <input type="checkbox"/> 10-25 percent | <input type="checkbox"/> 75-100 percent |
| <input type="checkbox"/> 25-50 percent |   |

The following questions are about the child you are completing the assessment about.

1. How old is the child?
- ☐ 3.0-3.11 years
- ☐ 4.0-4.11 years
- ☐ 5.0-5.11 years
2. What racial or ethnic group best describes the child?
- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Black
- ☐ Hispanic or Latino
- ☐ Native Hawaiian or other Pacific Islander

- ☐ White
- ☐ Two or More Races
- ☐ Other (please specify): \_\_\_\_\_

3. What gender is the child?

- ☐ Male
- ☐ Female

4. How do you know the child has autism spectrum disorder?

- ☐ Review of educational records
- ☐ Review of medical records
- ☐ Parent report
- ☐ Report from other school personnel
- ☐ Other (please specify): \_\_\_\_\_

**Thank you for completing this background questionnaire!**

Appendix D  
Feedback Form

Participant Number: \_\_\_\_\_ (completed by research staff)

---

## Feedback Form

Thank you for completing the questionnaire. We appreciate your feedback on your experience in completing the questionnaire.

- 1) Is there anything that you would change about the questionnaire?

☐ yes

Please specify: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

☐ no

- 2) Was there anything difficult to understand or any part that was confusing in the questionnaire?

☐ yes

Please specify: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

☐ no

- 3) How long did it take you to complete the questionnaire?

☐ less than 10 minutes

☐ 10-20 minutes

☐ 21-30 minutes

☐ 31-40 minutes

☐ more than 40 minutes

4) Are there any additional comments you have about the questionnaire?

---

---

---

---



Appendix E  
Informed Consent

TEXAS WOMAN'S UNIVERSITY  
CONSENT TO PARTICIPATE IN RESEARCH

Title: Development of a Measure of the Sensory Environment on Participation in  
Preschool Children with Autism Spectrum Disorder

Investigator: Aimee Piller.....[apiller@twu.edu](mailto:apiller@twu.edu) 480-xxx-xxxx  
Advisor: Tina Fletcher ..... [Tfletcher1@twu.edu](mailto:Tfletcher1@twu.edu) 214-xxx-xxxx

Explanation and Purpose of the Research

You are being asked to participate in a research study for Aimee Piller at Texas Woman's University. The purpose of this research is develop psychometric properties and pilot test a new measure assessing sensory environmental factors that impact participation for children with autism spectrum disorders within the preschool setting. You are being asked to participate in a research study because you are a preschool teacher who works with a child or children with autism spectrum disorders.

Description of Procedures

As a participant in this study you will be asked to complete three questionnaires. The total time to complete the three questionnaires is approximately 30-45 minutes. a pilot version of the assessment measure. The first questionnaire will ask you to provide background information about yourself. The next questionnaire will be a pilot version of the measure. It will ask you questions regarding the sensory aspects (e.g. noise, smells, sounds, tastes, movement, and touch) of the environment and the impact the sensory aspects have on the child's participation within preschool tasks. The final questionnaire will allow you to provide feedback on the measure itself. You may complete the questionnaires online via the email link sent to you. If you do not have access to a computer, the questionnaires can be mailed to you to complete the questionnaires via paper and pencil. A stamped return envelope will be provided for you to return the questionnaires. A group of participants who completed the questionnaires will be asked to complete the pilot measure a second time two to three weeks after the first completion.

Potential Risks

Although there are no anticipated risks from participating in this study, it will require at least 30-45 minutes of your time. You will be asked to share details about the children you work with and that you may feel uncomfortable answering some of the questions. However, we do not wish for this to happen. A possible risk in this study is discomfort with the questions you are asked. No participant is required to answer any questions that makes them feel uncomfortable. These risks are most likely to be immediate, and with no long-term effects. No physical dangers exist for the participants in this

Another risk in this study is loss of confidentiality. Confidentiality will be protected to the extent that is allowed by law. Safeguards are in place to protect your information. All participants will be assigned a number and only be referred to by that number. The results of the study may be published or presented but no participant will be referred to by name.

The researchers will try to prevent any problem that could happen because of this research. You should let the researchers know at once if there is a problem and they will help you. However, TWU does not provide medical services or financial assistance for injuries that might happen because you are taking part in this research.

#### Participation and Benefits

Your involvement in this study is completely voluntary and you may withdraw from the study at any time. There will be no direct benefit to you, but your participation is likely to contribute to the understanding of the topic and help us find out more about children with Autism spectrum disorders. You will not be provided any incentive to take part in the research. If you would like the results of the study, we will mail them to you.

#### Questions Regarding the Study

You will be given a copy of this signed and dated consent form to keep. If you have any questions about the research study you should ask the researchers; their phone numbers are at the top of this form. If you have questions about your rights as a participant in this research or the way this study has been conducted, you may contact the Texas Woman's University Office of Research and Sponsored Programs at 940-898-3378 or via e-mail at [IRB@twu.edu](mailto:IRB@twu.edu).

---

Signature of Participant

---

Date

\*If you would like to know the results of this study tell us where you want them to be sent:

Email: \_\_\_\_\_

or

Address:

---

Appendix F  
Recruitment Script

My name is Aimee Piller. I am a PhD candidate at Texas Woman's University. I am conducting a research study to determine the psychometric properties of a new measure developed to examine the sensory components of the environment and how they impact participation of preschool children with autism spectrum disorders. I am looking for preschool teachers who work with at least one student with autism spectrum disorder to participate in our study. The total time commitment is approximately 30-45 minutes. During this time, you will complete a series of three questionnaires. The questionnaires can be completed either online or in person. Your participation will provide valuable information to the development of the measure. If you are interested in participating, please contact Aimee Piller at [apiller@twu.edu](mailto:apiller@twu.edu) or 480-xxx-xxxx.

Appendix G  
Decision Table

### Decision Table

Item	Rules							Decision
	1	2	3	4	5	6	7	
Circle Time: Touching or being near other children	Y	Y	N	N	N	Y	Y	Remove item.
Classroom Routines: Drills such as fire or tornado	Y	N	N	Y	Y	N	Y	Remove item.
Classroom Routines: Centers	Y	N	N	N	N	Y	Y	Remove item.
Snack or Lunch time: Trying new foods	N	Y	N	Y	N	N	N	Remove item.
Free play/Recess: Playing on playground equipment	Y	N	N	Y	N	N	Y	Remove item.
Movement/Music Time: Listening to music	Y	N	N	Y	N	Y	Y	Remove item.
Subtest 2: Drills such as fire and tornado	Y	Y	N	Y	Y	Y	Y	Keep item.

Initiation of decision table: Does not load with any factor at  $\geq 0.50$ .

### Decision Table Rules

1. Loads  $\geq 0.40$ .
2. Rule one met and loads with factor that encompasses concept of question.
3. If item is removed, there will still be less than three items under category.
4. No negative or confusing feedback provided on feedback form regarding question.

5. Conceptually, questions could not be considered as part of another item in the same section or subtest.
6. ICC for  $\geq 0.40$  on test-retest reliability.
7. Inter-item correlation with other items under same heading or in same subtest falling between  $\geq 0.30$  and  $\geq 0.70$ .

Answer of at least six positives and the item is kept in the measure. A positive is considered a “yes” answer to any of the rules except number three in which case a “no” is considered a positive.



Appendix H  
Item Statistics by Subtest

## Subtest One

### Circle Time

		Sitting still	Following movements in songs (e.g. finger plays)	Coming and staying with group
N	Valid	103	103	103
	Missing	0	0	0
Mean		3.23	3.18	3.19
Median		3.00	3.00	3.00
Std. Deviation		1.131	1.186	1.172
Minimum		1	1	1
Maximum		5	5	5
Sum		333	328	329

#### 1. *Sitting still*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	8	7.8	7.8	7.8
	A Little	20	19.4	19.4	27.2
	Some	27	26.2	26.2	53.4
	A Lot	36	35.0	35.0	88.3
	Too Much to Participate	12	11.7	11.7	100.0
	Total	103	100.0	100.0	

2. *Following movements in songs (e.g. finger plays)*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	8	7.8	7.8	7.8
	A Little	26	25.2	25.2	33.0
	Some	22	21.4	21.4	54.4
	A Lot	33	32.0	32.0	86.4
	Too Much to Participate	14	13.6	13.6	100.0
	Total	103	100.0	100.0	

3. *Coming and staying with group*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	10	9.7	9.7	9.7
	A Little	20	19.4	19.4	29.1
	Some	25	24.3	24.3	53.4
	A Lot	36	35.0	35.0	88.3
	Too Much to Participate	12	11.7	11.7	100.0
	Total	103	100.0	100.0	

**Table Time**

		Sitting for table work	Listening to instructions	Focusing to complete work
N	Valid	103	103	103
	Missing	0	0	0
Mean		3.03	3.34	3.32
Median		3.00	4.00	4.00
Std. Deviation		1.004	.935	1.040
Minimum		1	1	1
Maximum		5	5	5
Sum		312	344	342

4. *Sitting for table work*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	8	7.8	7.8	7.8
	A Little	24	23.3	23.3	31.1
	Some	30	29.1	29.1	60.2
	A Lot	39	37.9	37.9	98.1
	Too Much to Participate	2	1.9	1.9	100.0
	Total	103	100.0	100.0	

5. *Listening to instructions*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	4	3.9	3.9	3.9
	A Little	15	14.6	14.6	18.4
	Some	32	31.1	31.1	49.5
	A Lot	46	44.7	44.7	94.2
	Too Much to Participate	6	5.8	5.8	100.0
	Total	103	100.0	100.0	

6. *Focusing to complete work*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	7	6.8	6.8	6.8
	A Little	15	14.6	14.6	21.4
	Some	27	26.2	26.2	47.6
	A Lot	46	44.7	44.7	92.2
	Too Much to Participate	8	7.8	7.8	100.0
	Total	103	100.0	100.0	

**Snack or Mealtime**

		Sitting with other children	Focusing to eat	Eating snack/lunch	Bite sizes (i.e stuffing food)
N	Valid	103	103	103	103
	Missing	0	0	0	0

Mean	2.77	2.85	2.83	2.55
Median	3.00	3.00	3.00	3.00
Std. Deviation	1.148	1.115	1.061	1.266
Minimum	1	1	1	1
Maximum	5	5	5	5
Sum	285	294	291	263

7. *Sitting with other children*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	18	17.5	17.5	17.5
	A Little	22	21.4	21.4	38.8
	Some	35	34.0	34.0	72.8
	A Lot	22	21.4	21.4	94.2
	Too Much to Participate	6	5.8	5.8	100.0
	Total	103	100.0	100.0	

8. *Focusing to eat*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	14	13.6	13.6	13.6
	A Little	24	23.3	23.3	36.9
	Some	34	33.0	33.0	69.9
	A Lot	25	24.3	24.3	94.2
	Too Much to Participate	6	5.8	5.8	100.0
	Total	103	100.0	100.0	

9. *Eating snack/lunch*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	13	12.6	12.6	12.6
	A Little	24	23.3	23.3	35.9
	Some	39	37.9	37.9	73.8
	A Lot	22	21.4	21.4	95.1
	Too Much to Participate	5	4.9	4.9	100.0
	Total	103	100.0	100.0	

10. Bite sizes (e.g. stuffing food)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	29	28.2	28.2	28.2
	A Little	22	21.4	21.4	49.5
	Some	24	23.3	23.3	72.8
	A Lot	22	21.4	21.4	94.2
	Too Much to Participate	6	5.8	5.8	100.0
	Total	103	100.0	100.0	

**Classroom Routines**

		Transitioning from one activity to another	Cleaning up supplies/toys	Attending to instructions/directions	Following classroom routines
N	Valid	103	103	103	103
	Missing	0	0	0	0
Mean		3.43	3.24	3.34	3.11
Median		4.00	3.00	3.00	3.00
Std. Deviation		.925	1.089	.935	.969
Minimum		1	1	1	1
Maximum		5	5	5	5
Sum		353	334	344	320

11. Transitioning from one activity to another

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	3	2.9	2.9	2.9
	A Little	13	12.6	12.6	15.5
	Some	33	32.0	32.0	47.6
	A Lot	45	43.7	43.7	91.3
	Too Much to Participate	9	8.7	8.7	100.0
	Total	103	100.0	100.0	

*12. Cleaning up supplies/toys*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	9	8.7	8.7	8.7
	A Little	14	13.6	13.6	22.3
	Some	33	32.0	32.0	54.4
	A Lot	37	35.9	35.9	90.3
	Too Much to Participate	10	9.7	9.7	100.0
	Total	103	100.0	100.0	

*13. Attending to instructions/directions*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	3	2.9	2.9	2.9
	A Little	17	16.5	16.5	19.4
	Some	32	31.1	31.1	50.5
	A Lot	44	42.7	42.7	93.2
	Too Much to Participate	7	6.8	6.8	100.0
	Total	103	100.0	100.0	

*14. Following classroom routines*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	4	3.9	3.9	3.9
	A Little	25	24.3	24.3	28.2
	Some	36	35.0	35.0	63.1
	A Lot	32	31.1	31.1	94.2
	Too Much to Participate	6	5.8	5.8	100.0
	Total	103	100.0	100.0	

### Free Play/Recess

		Playing with other students/peers	Playing group games	Playing with toys
N	Valid	103	103	103
	Missing	0	0	0
Mean		3.47	3.67	2.93
Median		4.00	4.00	3.00
Std. Deviation		1.083	1.175	1.003
Minimum		1	1	1
Maximum		5	5	5
Sum		357	378	302

#### 15. Playing with other students/peers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	7	6.8	6.8	6.8
	A Little	10	9.7	9.7	16.5
	Some	30	29.1	29.1	45.6
	A Lot	40	38.8	38.8	84.5
	Too Much to Participate	16	15.5	15.5	100.0
	Total	103	100.0	100.0	

#### 16. Playing group games

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	7	6.8	6.8	6.8
	A Little	10	9.7	9.7	16.5
	Some	21	20.4	20.4	36.9
	A Lot	37	35.9	35.9	72.8
	Too Much to Participate	28	27.2	27.2	100.0
	Total	103	100.0	100.0	



*17. Playing with toys*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	9	8.7	8.7	8.7
	A Little	25	24.3	24.3	33.0
	Some	36	35.0	35.0	68.0
	A Lot	30	29.1	29.1	97.1
	Too Much to Participate	3	2.9	2.9	100.0
	Total	103	100.0	100.0	

**Craft/Art Time**

		Using glue for craft projects	Painting and coloring	Completing coloring and cutting activities	Use markers to color/write/draw
N	Valid	103	103	103	103
	Missing	0	0	0	0
Mean		3.04	2.91	3.04	2.72
Median		3.00	3.00	3.00	3.00
Std. Deviation		1.075	1.030	1.128	1.079
Minimum		1	1	1	1
Maximum		5	5	5	5
Sum		313	300	313	280

*18. Using glue for craft projects*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	7	6.8	6.8	6.8
	A Little	25	24.3	24.3	31.1
	Some	39	37.9	37.9	68.9
	A Lot	21	20.4	20.4	89.3
	Too Much to Participate	11	10.7	10.7	100.0
	Total	103	100.0	100.0	

*19. Painting and coloring*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	8	7.8	7.8	7.8
	A Little	29	28.2	28.2	35.9
	Some	36	35.0	35.0	70.9
	A Lot	24	23.3	23.3	94.2
	Too Much to Participate	6	5.8	5.8	100.0
	Total	103	100.0	100.0	

*20. Completing coloring and cutting activities*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	7	6.8	6.8	6.8
	A Little	30	29.1	29.1	35.9
	Some	30	29.1	29.1	65.0
	A Lot	24	23.3	23.3	88.3
	Too Much to Participate	12	11.7	11.7	100.0
	Total	103	100.0	100.0	

*21. Use markers to color/write/draw*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	13	12.6	12.6	12.6
	A Little	36	35.0	35.0	47.6
	Some	24	23.3	23.3	70.9
	A Lot	27	26.2	26.2	97.1
	Too Much to Participate	3	2.9	2.9	100.0
	Total	103	100.0	100.0	

## Self-Care

		Using the toilet	Washing hands	Dressing after toileting	Putting backpack and/or other belongings away
N	Valid	103	103	103	103
	Missing	0	0	0	0
Mean		2.78	2.43	2.39	2.56
Median		3.00	2.00	2.00	2.00
Std. Deviation		1.428	1.193	1.278	1.194
Minimum		1	1	1	1
Maximum		5	5	5	5
Sum		286	250	246	264

### 22. Using the toilet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	30	29.1	29.1	29.1
	A Little	14	13.6	13.6	42.7
	Some	22	21.4	21.4	64.1
	A Lot	23	22.3	22.3	86.4
	Too Much to Participate	14	13.6	13.6	100.0
	Total	103	100.0	100.0	

### 23. Washing hands

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	30	29.1	29.1	29.1
	A Little	23	22.3	22.3	51.5
	Some	32	31.1	31.1	82.5
	A Lot	12	11.7	11.7	94.2
	Too Much to Participate	6	5.8	5.8	100.0
	Total	103	100.0	100.0	

24. Dressing after toileting

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	35	34.0	34.0	34.0
	A Little	22	21.4	21.4	55.3
	Some	24	23.3	23.3	78.6
	A Lot	15	14.6	14.6	93.2
	Too Much to Participate	7	6.8	6.8	100.0
	Total	103	100.0	100.0	

25. Putting backpack and/or other belongings away

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	23	22.3	22.3	22.3
	A Little	29	28.2	28.2	50.5
	Some	28	27.2	27.2	77.7
	A Lot	16	15.5	15.5	93.2
	Too Much to Participate	7	6.8	6.8	100.0
	Total	103	100.0	100.0	

**Sensory Play**

		Playing with items on sensory table	Touching wet textures	Touching dry textures	Touching sticky textures
N	Valid	103	103	103	103
	Missing	0	0	0	0
Mean		2.73	2.83	2.42	3.08
Median		3.00	3.00	2.00	3.00
Std. Deviation		1.031	1.216	1.089	1.118
Minimum		1	1	1	1
Maximum		5	5	5	5
Sum		281	291	249	317

26. *Playing with items on sensory table*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	15	14.6	14.6	14.6
	A Little	24	23.3	23.3	37.9
	Some	41	39.8	39.8	77.7
	A Lot	20	19.4	19.4	97.1
	Too Much to Participate	3	2.9	2.9	100.0
	Total	103	100.0	100.0	

27. *Touching wet textures*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	18	17.5	17.5	17.5
	A Little	25	24.3	24.3	41.7
	Some	24	23.3	23.3	65.0
	A Lot	29	28.2	28.2	93.2
	Too Much to Participate	7	6.8	6.8	100.0
	Total	103	100.0	100.0	

28. *Touching dry textures*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	25	24.3	24.3	24.3
	A Little	31	30.1	30.1	54.4
	Some	28	27.2	27.2	81.6
	A Lot	17	16.5	16.5	98.1
	Too Much to Participate	2	1.9	1.9	100.0
	Total	103	100.0	100.0	

29. *Touching sticky textures*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	10	9.7	9.7	9.7
	A Little	23	22.3	22.3	32.0
	Some	26	25.2	25.2	57.3
	A Lot	37	35.9	35.9	93.2
	Too Much to Participate	7	6.8	6.8	100.0
	Total	103	100.0	100.0	

**Movement/Music Time**

		Following movement	Singing or playing instruments	Staying with the group
N	Valid	103	103	103
	Missing	0	0	0
Mean		3.12	3.02	3.15
Median		3.00	3.00	3.00
Std. Deviation		1.149	1.196	1.200
Minimum		1	1	1
Maximum		5	5	5
Sum		321	311	324

30. *Following movement*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	8	7.8	7.8	7.8
	A Little	26	25.2	25.2	33.0
	Some	27	26.2	26.2	59.2
	A Lot	30	29.1	29.1	88.3
	Too Much to Participate	12	11.7	11.7	100.0
	Total	103	100.0	100.0	

*31. Singing or playing instruments*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	11	10.7	10.7	10.7
	A Little	27	26.2	26.2	36.9
	Some	26	25.2	25.2	62.1
	A Lot	27	26.2	26.2	88.3
	Too Much to Participate	12	11.7	11.7	100.0
	Total	103	100.0	100.0	

*32. Staying with the group*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	10	9.7	9.7	9.7
	A Little	24	23.3	23.3	33.0
	Some	23	22.3	22.3	55.3
	A Lot	33	32.0	32.0	87.4
	Too Much to Participate	13	12.6	12.6	100.0
	Total	103	100.0	100.0	

## Subtest Two

	Circle time	Table time	Snack or lunch time	Transitions	Cleaning up	Free play	Centers	Recess
N	Valid 101	101	101	101	101	101	101	101
Missing	2	2	2	2	2	2	2	2
Mean	3.55	3.42	3.08	3.58	3.40	3.02	3.22	2.71
Median	4.00	4.00	3.00	4.00	4.00	3.00	3.00	3.00
Std. Deviation	.900	.752	.956	.791	1.001	.948	.890	1.042
Variance	.810	.565	.914	.625	1.002	.900	.792	1.087
Minimum	1	1	1	1	1	1	1	1
Maximum	5	5	5	5	5	5	5	5
Sum	359	345	311	362	343	305	325	274

	Music	Instruction time	Craft/Art time	Sensory play	Drills, such as fire or tornado drill	Movement time	Self-care	Peer play
N	Valid 101	101	101	101	101	101	101	101
Missing	2	2	2	2	2	2	2	2
Mean	2.95	3.50	3.31	2.86	3.50	3.19	3.07	3.55
Median	3.00	4.00	3.00	3.00	4.00	3.00	3.00	4.00
Std. Deviation	1.023	.770	.914	1.059	1.055	.956	1.098	.900
Variance	1.048	.592	.835	1.121	1.112	.914	1.205	.810
Minimum	1	1	1	1	1	1	1	1
Maximum	5	5	5	5	5	5	5	5
Sum	298	354	334	289	353	322	310	359



35. Circle time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	4	3.9	4.0	4.0
	A Little	9	8.7	8.9	12.9
	Some	22	21.4	21.8	34.7
	A Lot	59	57.3	58.4	93.1
	Too Much to Participate	7	6.8	6.9	100.0
	Total	101	98.1	100.0	
Missing	System	2	1.9		
Total		103	100.0		

36. Table time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	1	1.0	1.0	1.0
	A Little	11	10.7	10.9	11.9
	Some	36	35.0	35.6	47.5
	A Lot	51	49.5	50.5	98.0
	Too Much to Participate	2	1.9	2.0	100.0
	Total	101	98.1	100.0	
Missing	System	2	1.9		
Total		103	100.0		

37. Snack or lunch time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	8	7.8	7.9	7.9
	A Little	14	13.6	13.9	21.8
	Some	45	43.7	44.6	66.3
	A Lot	30	29.1	29.7	96.0
	Too Much to Participate	4	3.9	4.0	100.0
	Total	101	98.1	100.0	
Missing	System	2	1.9		
Total		103	100.0		

38. Transitions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	1	1.0	1.0	1.0
	A Little	10	9.7	9.9	10.9
	Some	25	24.3	24.8	35.6
	A Lot	59	57.3	58.4	94.1
	Too Much to Participate	6	5.8	5.9	100.0
	Total	101	98.1	100.0	
Missing	System	2	1.9		
Total		103	100.0		

39. Cleaning up

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	6	5.8	5.9	5.9
	A Little	11	10.7	10.9	16.8
	Some	30	29.1	29.7	46.5
	A Lot	45	43.7	44.6	91.1
	Too Much to Participate	9	8.7	8.9	100.0
	Total	101	98.1	100.0	
Missing	System	2	1.9		
Total		103	100.0		

40. Free play

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	5	4.9	5.0	5.0
	A Little	26	25.2	25.7	30.7
	Some	35	34.0	34.7	65.3
	A Lot	32	31.1	31.7	97.0
	Too Much to Participate	3	2.9	3.0	100.0
	Total	101	98.1	100.0	
Missing	System	2	1.9		
Total		103	100.0		

41. *Centers*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	2	1.9	2.0	2.0
	A Little	22	21.4	21.8	23.8
	Some	32	31.1	31.7	55.4
	A Lot	42	40.8	41.6	97.0
	Too Much to Participate	3	2.9	3.0	100.0
	Total	101	98.1	100.0	
Missing	System	2	1.9		
Total		103	100.0		

42. *Recess*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	13	12.6	12.9	12.9
	A Little	31	30.1	30.7	43.6
	Some	32	31.1	31.7	75.2
	A Lot	22	21.4	21.8	97.0
	Too Much to Participate	3	2.9	3.0	100.0
	Total	101	98.1	100.0	
Missing	System	2	1.9		
Total		103	100.0		

43. *Music*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	10	9.7	9.9	9.9
	A Little	20	19.4	19.8	29.7
	Some	41	39.8	40.6	70.3
	A Lot	25	24.3	24.8	95.0
	Too Much to Participate	5	4.9	5.0	100.0
	Total	101	98.1	100.0	
Missing	System	2	1.9		
Total		103	100.0		

44. *Instruction time*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	1	1.0	1.0	1.0
	A Little	9	8.7	8.9	9.9
	Some	34	33.0	33.7	43.6
	A Lot	52	50.5	51.5	95.0
	Too Much to Participate	5	4.9	5.0	100.0
	Total	101	98.1	100.0	
Missing	System	2	1.9		
Total		103	100.0		

45. *Craft/Art time*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	3	2.9	3.0	3.0
	A Little	16	15.5	15.8	18.8
	Some	35	34.0	34.7	53.5
	A Lot	41	39.8	40.6	94.1
	Too Much to Participate	6	5.8	5.9	100.0
	Total	101	98.1	100.0	
Missing	System	2	1.9		
Total		103	100.0		

46. *Sensory table*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	11	10.7	10.9	10.9
	A Little	27	26.2	26.7	37.6
	Some	32	31.1	31.7	69.3
	A Lot	27	26.2	26.7	96.0
	Too Much to Participate	4	3.9	4.0	100.0
	Total	101	98.1	100.0	
Missing	System	2	1.9		
Total		103	100.0		

47. Drills, such as fire or tornado drill

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	5	4.9	5.0	5.0
	A Little	16	15.5	15.8	20.8
	Some	16	15.5	15.8	36.6
	A Lot	52	50.5	51.5	88.1
	Too Much to Participate	12	11.7	11.9	100.0
	Total	101	98.1	100.0	
Missing	System	2	1.9		
Total		103	100.0		

48. Movement time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	4	3.9	4.0	4.0
	A Little	22	21.4	21.8	25.7
	Some	30	29.1	29.7	55.4
	A Lot	41	39.8	40.6	96.0
	Too Much to Participate	4	3.9	4.0	100.0
	Total	101	98.1	100.0	
Missing	System	2	1.9		
Total		103	100.0		

49. Self-care

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	9	8.7	8.9	8.9
	A Little	24	23.3	23.8	32.7
	Some	25	24.3	24.8	57.4
	A Lot	37	35.9	36.6	94.1
	Too Much to Participate	6	5.8	5.9	100.0
	Total	101	98.1	100.0	
Missing	System	2	1.9		
Total		103	100.0		

50. *Peer play*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	3	2.9	3.0	3.0
	A Little	10	9.7	9.9	12.9
	Some	25	24.3	24.8	37.6
	A Lot	54	52.4	53.5	91.1
	Too Much to Participate	9	8.7	8.9	100.0
	Total	101	98.1	100.0	
Missing	System	2	1.9		
Total		103	100.0		

### Subtest Three

	Circle time	Table time	Snack or lunch time	Transitions	Cleaning up	Free play	Centers	Recess
N	99	99	99	99	99	99	99	99
Valid	4	4	4	4	4	4	4	4
Missing								
Mean	2.93	2.83	2.58	2.92	2.78	2.58	2.76	2.20
Median	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00
Std. Deviation	1.127	1.125	1.205	1.192	1.200	1.179	1.161	1.152
Variance	1.270	1.266	1.451	1.422	1.440	1.390	1.349	1.326
Minimum	1	1	1	1	1	1	1	1
Maximum	5	5	5	5	5	5	5	5
Sum	290	280	255	289	275	255	273	218

	Music	Instruction time	Craft/Art time	Sensory table	Drills, such as fire or tornado drill	Movement time	Self-care	Peer play
N	99	99	99	99	99	99	99	99
Valid	4	4	4	4	4	4	4	4
Missing								
Mean	2.46	3.06	2.88	2.52	2.90	2.67	2.66	3.04
Median	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Std. Deviation	1.137	1.096	1.136	1.198	1.432	1.204	1.230	1.097
Variance	1.292	1.200	1.291	1.436	2.051	1.449	1.514	1.202
Minimum	1	1	1	1	1	1	1	1
Maximum	5	5	5	5	5	5	5	5
Sum	244	303	285	249	287	264	263	301

51. Circle time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	16	15.5	16.2	16.2
	A Little	13	12.6	13.1	29.3
	Some	37	35.9	37.4	66.7
	A Lot	28	27.2	28.3	94.9
	Too Much to Participate	5	4.9	5.1	100.0
	Total	99	96.1	100.0	
Missing	System	4	3.9		
Total		103	100.0		

52. Table time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	18	17.5	18.2	18.2
	A Little	15	14.6	15.2	33.3
	Some	35	34.0	35.4	68.7
	A Lot	28	27.2	28.3	97.0
	Too Much to Participate	3	2.9	3.0	100.0
	Total	99	96.1	100.0	
Missing	System	4	3.9		
Total		103	100.0		

53. Snack or lunch time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	27	26.2	27.3	27.3
	A Little	17	16.5	17.2	44.4
	Some	29	28.2	29.3	73.7
	A Lot	23	22.3	23.2	97.0
	Too Much to Participate	3	2.9	3.0	100.0
	Total	99	96.1	100.0	
Missing	System	4	3.9		
Total		103	100.0		



54. *Transitions*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	18	17.5	18.2	18.2
	A Little	16	15.5	16.2	34.3
	Some	25	24.3	25.3	59.6
	A Lot	36	35.0	36.4	96.0
	Too Much to Participate	4	3.9	4.0	100.0
	Total	99	96.1	100.0	
Missing	System	4	3.9		
Total		103	100.0		

55. *Cleaning up*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	22	21.4	22.2	22.2
	A Little	14	13.6	14.1	36.4
	Some	31	30.1	31.3	67.7
	A Lot	28	27.2	28.3	96.0
	Too Much to Participate	4	3.9	4.0	100.0
	Total	99	96.1	100.0	
Missing	System	4	3.9		
Total		103	100.0		

56. *Free play*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	25	24.3	25.3	25.3
	A Little	20	19.4	20.2	45.5
	Some	29	28.2	29.3	74.7
	A Lot	22	21.4	22.2	97.0
	Too Much to Participate	3	2.9	3.0	100.0
	Total	99	96.1	100.0	
Missing	System	4	3.9		
Total		103	100.0		

57. Centers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	20	19.4	20.2	20.2
	A Little	18	17.5	18.2	38.4
	Some	30	29.1	30.3	68.7
	A Lot	28	27.2	28.3	97.0
	Too Much to Participate	3	2.9	3.0	100.0
	Total	99	96.1	100.0	
Missing	System	4	3.9		
Total		103	100.0		

58. Recess

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	38	36.9	38.4	38.4
	A Little	20	19.4	20.2	58.6
	Some	26	25.2	26.3	84.8
	A Lot	13	12.6	13.1	98.0
	Too Much to Participate	2	1.9	2.0	100.0
	Total	99	96.1	100.0	
Missing	System	4	3.9		
Total		103	100.0		

59. Music

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	27	26.2	27.3	27.3
	A Little	21	20.4	21.2	48.5
	Some	31	30.1	31.3	79.8
	A Lot	18	17.5	18.2	98.0
	Too Much to Participate	2	1.9	2.0	100.0
	Total	99	96.1	100.0	
Missing	System	4	3.9		
Total		103	100.0		

60. *Instruction time*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	12	11.7	12.1	12.1
	A Little	14	13.6	14.1	26.3
	Some	35	34.0	35.4	61.6
	A Lot	32	31.1	32.3	93.9
	Too Much to Participate	6	5.8	6.1	100.0
	Total	99	96.1	100.0	
Missing	System	4	3.9		
Total		103	100.0		

61. *Craft/Art time*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	18	17.5	18.2	18.2
	A Little	13	12.6	13.1	31.3
	Some	34	33.0	34.3	65.7
	A Lot	31	30.1	31.3	97.0
	Too Much to Participate	3	2.9	3.0	100.0
	Total	99	96.1	100.0	
Missing	System	4	3.9		
Total		103	100.0		

62. *Sensory table*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	29	28.2	29.3	29.3
	A Little	16	15.5	16.2	45.5
	Some	31	30.1	31.3	76.8
	A Lot	20	19.4	20.2	97.0
	Too Much to Participate	3	2.9	3.0	100.0
	Total	99	96.1	100.0	
Missing	System	4	3.9		
Total		103	100.0		

63. Drills, such as fire or tornado drill

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	27	26.2	27.3	27.3
	A Little	13	12.6	13.1	40.4
	Some	14	13.6	14.1	54.5
	A Lot	33	32.0	33.3	87.9
	Too Much to Participate	12	11.7	12.1	100.0
	Total	99	96.1	100.0	
Missing	System	4	3.9		
Total		103	100.0		

64. Movement time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	25	24.3	25.3	25.3
	A Little	16	15.5	16.2	41.4
	Some	27	26.2	27.3	68.7
	A Lot	29	28.2	29.3	98.0
	Too Much to Participate	2	1.9	2.0	100.0
	Total	99	96.1	100.0	
Missing	System	4	3.9		
Total		103	100.0		

65. Self-care

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	26	25.2	26.3	26.3
	A Little	15	14.6	15.2	41.4
	Some	29	28.2	29.3	70.7
	A Lot	25	24.3	25.3	96.0
	Too Much to Participate	4	3.9	4.0	100.0
	Total	99	96.1	100.0	
Missing	System	4	3.9		
Total		103	100.0		

66. *Peer play*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	12	11.7	12.1	12.1
	A Little	16	15.5	16.2	28.3
	Some	32	31.1	32.3	60.6
	A Lot	34	33.0	34.3	94.9
	Too Much to Participate	5	4.9	5.1	100.0
	Total	99	96.1	100.0	
Missing	System	4	3.9		
Total		103	100.0		

### Items Statistics for Removed Items

		Touching or being near other children	Trying new foods	Centers
N	Valid	103	103	103
	Missing	0	0	0
	Mean	3.19	3.39	3.19
	Median	3.00	4.00	3.00
	Std. Deviation	.961	1.323	1.039
	Minimum	1	1	1
	Maximum	5	5	5
	Sum	329	349	329

		Drills, such as fire or tornado	Playing on playground equipment	Listening to music
N	Valid	103	103	103
	Missing	0	0	0
	Mean	3.28	2.82	2.50
	Median	4.00	3.00	2.00
	Std. Deviation	1.256	1.007	1.110
	Minimum	1	1	1
	Maximum	5	5	5
	Sum	338	290	257

### *Touching or being near other children*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	3	2.9	2.9	2.9
	A Little	22	21.4	21.4	24.3
	Some	38	36.9	36.9	61.2
	A Lot	32	31.1	31.1	92.2
	Too Much to Participate	8	7.8	7.8	100.0
	Total	103	100.0	100.0	

*Trying new foods*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	13	12.6	12.6	12.6
	A Little	15	14.6	14.6	27.2
	Some	17	16.5	16.5	43.7
	A Lot	35	34.0	34.0	77.7
	Too Much to Participate	23	22.3	22.3	100.0
	Total	103	100.0	100.0	

*Centers*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	8	7.8	7.8	7.8
	A Little	16	15.5	15.5	23.3
	Some	34	33.0	33.0	56.3
	A Lot	38	36.9	36.9	93.2
	Too Much to Participate	7	6.8	6.8	100.0
	Total	103	100.0	100.0	

*Drills, such as fire or tornado*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	13	12.6	12.6	12.6
	A Little	14	13.6	13.6	26.2
	Some	24	23.3	23.3	49.5
	A Lot	35	34.0	34.0	83.5
	Too Much to Participate	17	16.5	16.5	100.0
	Total	103	100.0	100.0	

*Playing on playground equipment*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	14	13.6	13.6	13.6
	A Little	20	19.4	19.4	33.0
	Some	41	39.8	39.8	72.8
	A Lot	27	26.2	26.2	99.0
	Too Much to Participate	1	1.0	1.0	100.0
	Total	103	100.0	100.0	

*Listening to music*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	23	22.3	22.3	22.3
	A Little	29	28.2	28.2	50.5
	Some	32	31.1	31.1	81.6
	A Lot	15	14.6	14.6	96.1
	Too Much to Participate	4	3.9	3.9	100.0
	Total	103	100.0	100.0	



Appendix I  
Inter-Item Correlation Matrix

	A1Sitting still	A1Following movements in songs	A1Touching or being near other children	A1Coming and staying with group
A1Sitting still	1.000	.407	.459	.603
A1Following movements in songs	.407	1.000	.488	.541
A1Touching or being near other children	.459	.488	1.000	.539
A1Coming and staying with group	.603	.541	.539	1.000
B1Sitting for table work	.598	.170	.306	.505
B1Listening to	.425	.330	.333	.575
B1Focusing to complete work	.370	.404	.294	.561
C1Sitting with other children	.418	.345	.525	.551
C1Focusing to eat	.319	.201	.372	.390
C1Eating snack/lunch	.351	.216	.319	.350
C1Trying new foods	.354	.464	.383	.453
C1Bite sizes	.391	.251	.290	.468
D1Transitioning from one activity to another	.449	.436	.542	.613
D1Cleaning up supplies/toys	.500	.504	.564	.575
D1Centers	.543	.538	.448	.554
D1Attending to instructions/directions	.427	.502	.381	.550
D1Following classroom routines	.476	.479	.493	.631
D1Drills, such as fire or tornado	.257	.291	.489	.489
E1Playing with other students/peers	.401	.584	.505	.485
E1Playing on playground equipment	.270	.274	.396	.341
E1Playing group games	.347	.657	.533	.474
E1Playing with toys	.426	.203	.237	.289
F1Using glue for craft projects	.272	.457	.304	.444
F1Painting and coloring	.388	.427	.365	.450

	B1Sitting for table work	B1Listening to instructions	B1Focusing to complete work	C1Sitting with other children
A1Sitting still	.598	.425	.370	.418
A1Following movements in songs	.170	.330	.404	.345
A1Touching or being other children	.306	.333	.294	.525
A1Coming and staying with group	.505	.575	.561	.551
B1Sitting for table work	1.000	.605	.563	.618
B1Listening to instruction	.605	1.000	.756	.404
B1Focusing to complete work	.563	.756	1.000	.414
C1Sitting with other children	.618	.404	.414	1.000
C1Focusing to eat	.503	.351	.339	.616
C1Eating snack/lunch	.493	.360	.310	.593
C1Trying new foods	.377	.387	.401	.475
C1Bite sizes	.359	.269	.126	.461
D1Transitioning from one activity to another	.366	.450	.479	.425
D1Cleaning up supplies/toys	.514	.578	.568	.601
D1Centers	.514	.448	.478	.563
D1Attending to instructions/directions	.543	.695	.669	.568
D1Following classroom routines	.381	.541	.526	.465
D1Drills, such as fire or tornado	.334	.380	.364	.538
E1Playing with other students/peers	.247	.501	.399	.359
E1Playing on playground equipment	.222	.335	.174	.468
E1Playing group games	.313	.493	.469	.395
E1Playing with toys	.467	.425	.378	.332
F1Using glue for craft projects	.355	.374	.437	.377
F1Painting and coloring	.471	.448	.468	.447

	C1Focusing to eat	C1Eating snack/lunch	C1Trying new foods	C1Bite sizes
A1Sitting still	.319	.351	.354	.391
A1Following movements in songs	.201	.216	.464	.251
A1Touching or being other children	.372	.319	.383	.290
A1Coming and staying with group	.390	.350	.453	.468
B1Sitting for table work	.503	.493	.377	.359
B1Listening to instruction	.351	.360	.387	.269
B1Focusing to complete work	.339	.310	.401	.126
C1Sitting with other children	.616	.593	.475	.461
C1Focusing to eat	1.000	.887	.538	.320
C1Eating snack/lunch	.887	1.000	.531	.319
C1Trying new foods	.538	.531	1.000	.305
C1Bite sizes	.320	.319	.305	1.000
D1Transitioning from one activity to another	.376	.295	.431	.369
D1Cleaning up supplies/toys	.362	.353	.496	.386
D1Centers	.348	.390	.422	.338
D1Attending to instructions/directions	.447	.461	.475	.303
D1Following classroom routines	.318	.319	.238	.403
D1Drills, such as fire or tornado	.396	.300	.406	.331
E1Playing with other students/peers	.274	.265	.390	.321
E1Playing on playground equipment	.417	.452	.242	.325
E1Playing group games	.354	.314	.440	.351
E1Playing with toys	.343	.397	.121	.233
F1Using glue for craft projects	.308	.369	.495	.325
F1Painting and coloring	.435	.437	.340	.345

	D1Transitionin g from one activity to another	D1Cleaning up supplies/toys	D1Centers	D1Attending to instructions/direc tions
A1Sitting still	.449	.500	.543	.427
A1Following movements in songs	.436	.504	.538	.502
A1Touching or being other children	.542	.564	.448	.381
A1Coming and staying with group	.613	.575	.554	.550
B1Sitting for table work	.366	.514	.514	.543
B1Listening to instruction	.450	.578	.448	.695
B1Focusing to complete work	.479	.568	.478	.669
C1Sitting with other children	.425	.601	.563	.568
C1Focusing to eat	.376	.362	.348	.447
C1Eating snack/lunch	.295	.353	.390	.461
C1Trying new foods	.431	.496	.422	.475
C1Bite sizes	.369	.386	.338	.303
D1Transitioning from one activity to another	1.000	.697	.512	.537
D1Cleaning up supplies/toys	.697	1.000	.707	.657
D1Centers	.512	.707	1.000	.635
D1Attending to instructions/directions	.537	.657	.635	1.000
D1Following classroom routines	.515	.595	.533	.604
D1Drills, such as fire or tornado	.607	.566	.450	.427
E1Playing with other students/peers	.451	.532	.457	.566
E1Playing on playground equipment	.291	.430	.244	.375
E1Playing group games	.494	.513	.415	.602
E1Playing with toys	.154	.419	.478	.431
F1Using glue for craft projects	.318	.386	.450	.504
F1Painting and coloring	.327	.408	.398	.562

	D1Following classroom routines	D1Drills, such as fire or tornado	E1Playing with other students/peer s	E1Playing on playground equipment
A1Sitting still	.476	.257	.401	.270
A1Following movements in songs	.479	.291	.584	.274
A1Touching or being other children	.493	.489	.505	.396
A1Coming and staying with group	.631	.489	.485	.341
B1Sitting for table work	.381	.334	.247	.222
B1Listening to instruction	.541	.380	.501	.335
B1Focusing to complete work	.526	.364	.399	.174
C1Sitting with other children	.465	.538	.359	.468
C1Focusing to eat	.318	.396	.274	.417
C1Eating snack/lunch	.319	.300	.265	.452
C1Trying new foods	.238	.406	.390	.242
C1Bite sizes	.403	.331	.321	.325
D1Transitioning from one activity to another	.515	.607	.451	.291
D1Cleaning up supplies/toys	.595	.566	.532	.430
D1Centers	.533	.450	.457	.244
D1Attending to instructions/directions	.604	.427	.566	.375
D1Following classroom routines	1.000	.423	.462	.415
D1Drills, such as fire or tornado	.423	1.000	.363	.316
E1Playing with other students/peers	.462	.363	1.000	.473
E1Playing on playground equipment	.415	.316	.473	1.000
E1Playing group games	.416	.423	.766	.409
E1Playing with toys	.364	.198	.374	.441
F1Using glue for craft projects	.305	.302	.435	.196
F1Painting and coloring	.364	.250	.413	.386

	E1Playing group games	E1Playing with toys	F1Using glue for craft projects	F1Painting and coloring
A1Sitting still	.347	.426	.272	.388
A1Following movements in songs	.657	.203	.457	.427
A1Touching or being other children	.533	.237	.304	.365
A1Coming and staying with group	.474	.289	.444	.450
B1Sitting for table work	.313	.467	.355	.471
B1Listening to instruction	.493	.425	.374	.448
B1Focusing to complete work	.469	.378	.437	.468
C1Sitting with other children	.395	.332	.377	.447
C1Focusing to eat	.354	.343	.308	.435
C1Eating snack/lunch	.314	.397	.369	.437
C1Trying new foods	.440	.121	.495	.340
C1Bite sizes	.351	.233	.325	.345
D1Transitioning from one activity to another	.494	.154	.318	.327
D1Cleaning up supplies/toys	.513	.419	.386	.408
D1Centers	.415	.478	.450	.398
D1Attending to instructions/directions	.602	.431	.504	.562
D1Following classroom routines	.416	.364	.305	.364
D1Drills, such as fire or tornado	.423	.198	.302	.250
E1Playing with other students/peers	.766	.374	.435	.413
E1Playing on playground equipment	.409	.441	.196	.386
E1Playing group games	1.000	.336	.510	.471
E1Playing with toys	.336	1.000	.265	.384
F1Using glue for craft projects	.510	.265	1.000	.618
F1Painting and coloring	.471	.384	.618	1.000

	F1Completing coloring and cutting activities	F1Use markers to color/write/draw	G1Using the toilet	G1Washing hands
A1Sitting still	.358	.260	.358	.446
A1Following movements in songs	.436	.281	.393	.309
A1Touching or being other children	.388	.258	.233	.359
A1Coming and staying with group	.422	.355	.372	.443
B1Sitting for table work	.475	.490	.444	.529
B1Listening to instruction	.498	.434	.561	.532
B1Focusing to complete work	.446	.425	.506	.375
C1Sitting with other children	.390	.404	.284	.339
C1Focusing to eat	.396	.436	.241	.356
C1Eating snack/lunch	.384	.434	.290	.441
C1Trying new foods	.455	.350	.328	.257
C1Bite sizes	.321	.349	.304	.411
D1Transitioning from one activity to another	.328	.309	.273	.351
D1Cleaning up supplies/toys	.459	.403	.417	.416
D1Centers	.426	.422	.469	.461
D1Attending to instructions/directions	.533	.484	.553	.496
D1Following classroom routines	.333	.308	.495	.538
D1Drills, such as fire or tornado	.334	.298	.296	.386
E1Playing with other students/peers	.466	.420	.472	.411
E1Playing on playground equipment	.326	.371	.249	.392
E1Playing group games	.590	.460	.470	.428
E1Playing with toys	.390	.423	.442	.619
F1Using glue for craft projects	.586	.585	.484	.428
F1Painting and coloring	.652	.695	.521	.529



	G1Dressing after toileting	G1Putting backpack and/or other belongings away	H1Playing with items on sensory table	H1Touching wet textures
A1Sitting still	.410	.337	.267	.156
A1Following movements in songs	.377	.407	.317	.194
A1Touching or being other children	.473	.412	.461	.329
A1Coming and staying with group	.486	.526	.419	.327
B1Sitting for table work	.459	.391	.219	.249
B1Listening to instruction	.466	.466	.272	.264
B1Focusing to complete work	.450	.529	.268	.216
C1Sitting with other children	.420	.305	.345	.342
C1Focusing to eat	.300	.300	.216	.342
C1Eating snack/lunch	.362	.250	.175	.302
C1Trying new foods	.232	.226	.198	.287
C1Bite sizes	.351	.210	.262	.339
D1Transitioning from one activity to another	.311	.382	.255	.149
D1Cleaning up supplies/toys	.520	.480	.358	.257
D1Centers	.504	.398	.325	.195
D1Attending to instructions/directions	.521	.494	.288	.240
D1Following classroom routines	.619	.543	.443	.322
D1Drills, such as fire or tornado	.336	.403	.387	.294
E1Playing with other students/peers	.476	.413	.344	.313
E1Playing on playground equipment	.375	.344	.358	.393
E1Playing group games	.424	.429	.316	.288
E1Playing with toys	.468	.429	.261	.284
F1Using glue for craft projects	.455	.395	.423	.409
F1Painting and coloring	.501	.494	.421	.418

	H1Touching dry textures	H1Touching sticky textures	I1Following movement	I1Singing or playing instruments
A1Sitting still	.254	.254	.361	.277
A1Following movements in songs	.256	.354	.713	.695
A1Touching or being other children	.387	.458	.396	.519
A1Coming and staying with group	.337	.369	.524	.463
B1Sitting for table work	.286	.224	.285	.109
B1Listening to instruction	.341	.356	.397	.322
B1Focusing to complete work	.284	.279	.443	.346
C1Sitting with other children	.318	.351	.237	.291
C1Focusing to eat	.319	.273	.236	.181
C1Eating snack/lunch	.304	.255	.186	.151
C1Trying new foods	.140	.432	.405	.291
C1Bite sizes	.279	.318	.166	.209
D1Transitioning from one activity to another	.182	.235	.414	.431
D1Cleaning up supplies/toys	.297	.362	.407	.450
D1Centers	.233	.183	.431	.409
D1Attending to instructions/directions	.247	.359	.459	.429
D1Following classroom routines	.363	.280	.402	.525
D1Drills, such as fire or tornado	.236	.364	.312	.393
E1Playing with other students/peers	.286	.368	.591	.632
E1Playing on playground equipment	.433	.382	.288	.434
E1Playing group games	.281	.435	.556	.555
E1Playing with toys	.434	.215	.218	.198
F1Using glue for craft projects	.197	.479	.428	.331
F1Painting and coloring	.423	.535	.450	.373

	IIListening to music	IIStaying with the group	SCircle time	STable time
A1Sitting still	.347	.488	.539	.282
A1Following movements in songs	.302	.615	.340	.402
A1Touching or being other children	.373	.405	.439	.287
A1Coming and staying with group	.420	.745	.533	.370
B1Sitting for table work	.331	.360	.388	.366
B1Listening to instruction	.310	.489	.260	.360
B1Focusing to complete work	.210	.567	.226	.412
C1Sitting with other children	.375	.425	.442	.389
C1Focusing to eat	.407	.253	.295	.281
C1Eating snack/lunch	.365	.222	.340	.351
C1Trying new foods	.281	.379	.189	.352
C1Bite sizes	.311	.273	.395	.335
D1Transitioning from one activity to another	.360	.560	.314	.251
D1Cleaning up supplies/toys	.370	.545	.354	.338
D1Centers	.416	.552	.408	.412
D1Attending to instructions/directions	.268	.531	.357	.540
D1Following classroom routines	.374	.580	.459	.508
D1Drills, such as fire or tornado	.364	.401	.214	.197
E1Playing with other students/peers	.401	.538	.286	.392
E1Playing on playground equipment	.378	.272	.272	.262
E1Playing group games	.272	.495	.278	.380
E1Playing with toys	.335	.246	.277	.266
F1Using glue for craft projects	.256	.428	.276	.378
F1Painting and coloring	.311	.321	.318	.408

	SSnack or lunch time	STransitions	SCleaning up	SFree play	SCenters
A1Sitting still	.259	.262	.336	.356	.396
A1Following movements in songs	.323	.318	.429	.500	.490
A1Touching or being other children	.344	.384	.405	.389	.275
A1Coming and staying with group	.338	.524	.578	.412	.465
B1Sitting for table work	.313	.312	.414	.267	.423
B1Listening to instruction	.206	.281	.450	.181	.351
B1Focusing to complete work	.178	.323	.453	.273	.379
C1Sitting with other children	.488	.399	.420	.275	.334
C1Focusing to eat	.466	.308	.416	.185	.216
C1Eating snack/lunch	.523	.285	.401	.215	.256
C1Trying new foods	.389	.285	.359	.210	.292
C1Bite sizes	.265	.281	.235	.226	.309
D1Transitioning from one activity to another	.255	.555	.448	.238	.286
D1Cleaning up supplies/toys	.351	.457	.541	.336	.456
D1Centers	.356	.346	.415	.387	.562
D1Attending to instructions/directions	.373	.406	.507	.350	.480
D1Following classroom routines	.425	.560	.624	.464	.592
D1Drills, such as fire or tornado	.346	.415	.373	.257	.287
E1Playing with other students/peers	.309	.247	.372	.389	.375
E1Playing on playground equipment	.367	.318	.352	.346	.300
E1Playing group games	.235	.224	.341	.381	.377
E1Playing with toys	.301	.112	.274	.343	.369
F1Using glue for craft projects	.251	.314	.287	.327	.467
F1Painting and coloring	.394	.304	.399	.363	.425

	SRecess	SMusic	SInstruction time	SCraft/Art time	SSensory table
A1Sitting still	.215	.316	.391	.317	.266
A1Following movements in songs	.451	.469	.459	.365	.414
A1Touching or being other children	.458	.393	.333	.378	.504
A1Coming and staying with group	.415	.492	.495	.461	.446
B1Sitting for table work	.122	.249	.449	.336	.180
B1Listening to instruction	.192	.332	.406	.353	.172
B1Focusing to complete work	.175	.304	.455	.415	.206
C1Sitting with other children	.401	.294	.429	.293	.378
C1Focusing to eat	.304	.286	.289	.280	.315
C1Eating snack/lunch	.302	.337	.363	.316	.283
C1Trying new foods	.265	.342	.263	.264	.260
C1Bite sizes	.266	.266	.284	.265	.284
D1Transitioning from one activity to another	.289	.305	.266	.250	.292
D1Cleaning up supplies/toys	.416	.318	.412	.354	.351
D1Centers	.332	.454	.485	.372	.386
D1Attending to instructions/directions	.339	.325	.604	.468	.283
D1Following classroom routines	.587	.466	.526	.526	.437
D1Drills, such as fire or tornado	.388	.333	.211	.255	.338
E1Playing with other students/peers	.372	.432	.301	.321	.308
E1Playing on playground equipment	.578	.229	.221	.355	.385
E1Playing group games	.325	.273	.320	.355	.293
E1Playing with toys	.245	.175	.292	.318	.216
F1Using glue for craft projects	.294	.387	.506	.523	.356
F1Painting and coloring	.309	.330	.450	.630	.422

	SDrills, such as fire or tornado drill	SMovement time	SSelf-care	SPeer play	MCircle time
A1Sitting still	.287	.376	.343	.284	.495
A1Following movements in songs	.278	.585	.387	.476	.357
A1Touching or being other children	.351	.398	.253	.365	.403
A1Coming and staying with group	.430	.557	.410	.476	.540
B1Sitting for table work	.331	.288	.352	.282	.409
B1Listening to instruction	.254	.422	.406	.357	.314
B1Focusing to complete work	.172	.299	.409	.267	.315
C1Sitting with other children	.430	.370	.254	.341	.429
C1Focusing to eat	.332	.206	.221	.199	.338
C1Eating snack/lunch	.271	.242	.279	.239	.371
C1Trying new foods	.278	.265	.217	.294	.454
C1Bite sizes	.441	.326	.274	.222	.305
D1Transitioning from one activity to another	.493	.306	.283	.219	.442
D1Cleaning up supplies/toys	.398	.444	.371	.364	.543
D1Centers	.393	.386	.412	.385	.438
D1Attending to instructions/directions	.251	.448	.473	.484	.439
D1Following classroom routines	.365	.489	.560	.447	.448
D1Drills, such as fire or tornado	.660	.354	.296	.315	.430
E1Playing with other students/peers	.277	.465	.377	.494	.390
E1Playing on playground equipment	.358	.506	.327	.384	.348
E1Playing group games	.285	.418	.311	.401	.363
E1Playing with toys	.210	.320	.361	.319	.337
F1Using glue for craft projects	.289	.346	.422	.359	.338
F1Painting and coloring	.218	.414	.449	.304	.213

	MTable time	MSnack or lunch time	MTransitions	MCleaning up	MFree play
A1Sitting still	.301	.280	.221	.368	.348
A1Following movements in songs	.364	.294	.396	.454	.366
A1Touching or being other children	.312	.396	.428	.410	.278
A1Coming and staying with group	.411	.337	.373	.430	.337
B1Sitting for table work	.342	.296	.225	.357	.303
B1Listening to instruction	.352	.230	.235	.282	.225
B1Focusing to complete work	.431	.227	.301	.318	.197
C1Sitting with other children	.359	.475	.374	.447	.342
C1Focusing to eat	.287	.482	.341	.430	.331
C1Eating snack/lunch	.348	.537	.373	.439	.354
C1Trying new foods	.463	.481	.445	.448	.344
C1Bite sizes	.254	.299	.212	.304	.286
D1Transitioning from one activity to another	.321	.289	.441	.407	.314
D1Cleaning up supplies/toys	.467	.483	.508	.565	.452
D1Centers	.466	.343	.350	.438	.384
D1Attending to instructions/directions	.549	.378	.409	.486	.318
D1Following classroom routines	.406	.358	.425	.449	.366
D1Drills, such as fire or tornado	.352	.448	.443	.376	.324
E1Playing with other students/peers	.458	.325	.356	.344	.323
E1Playing on playground equipment	.295	.412	.318	.327	.309
E1Playing group games	.477	.350	.394	.405	.342
E1Playing with toys	.359	.365	.234	.394	.322
F1Using glue for craft projects	.510	.345	.383	.378	.321
F1Painting and coloring	.424	.382	.291	.354	.283

	MCenters	MRecess	MMusic	MInstruction time	MCraft/Art time
A1Sitting still	.353	.223	.289	.332	.304
A1Following movements in songs	.428	.335	.402	.403	.428
A1Touching or being other children	.327	.383	.378	.327	.355
A1Coming and staying with group	.402	.324	.399	.413	.452
B1Sitting for table work	.396	.185	.239	.257	.310
B1Listening to instruction	.328	.171	.304	.356	.380
B1Focusing to complete work	.379	.156	.332	.409	.419
C1Sitting with other children	.390	.447	.322	.293	.309
C1Focusing to eat	.403	.416	.299	.297	.322
C1Eating snack/lunch	.402	.443	.335	.340	.327
C1Trying new foods	.407	.354	.416	.364	.402
C1Bite sizes	.315	.301	.228	.230	.280
D1Transitioning from one activity to another	.372	.308	.358	.309	.363
D1Cleaning up supplies/toys	.504	.519	.438	.405	.466
D1Centers	.482	.369	.445	.380	.384
D1Attending to instructions/directions	.480	.348	.372	.525	.495
D1Following classroom routines	.403	.358	.384	.367	.414
D1Drills, such as fire or tornado	.386	.406	.341	.265	.358
E1Playing with other students/peers	.397	.305	.389	.381	.425
E1Playing on playground equipment	.300	.483	.230	.270	.327
E1Playing group games	.469	.325	.312	.514	.492
E1Playing with toys	.336	.327	.221	.317	.314
F1Using glue for craft projects	.424	.344	.371	.471	.544
F1Painting and coloring	.416	.369	.364	.397	.544



	MSensor y table	MDrills, such as fire or tornado drill	MMovement time	MSelf-care	MPeer play
A1Sitting still	.294	.212	.277	.258	.172
A1Following movements in songs	.439	.427	.488	.410	.491
A1Touching or being other children	.473	.434	.467	.259	.400
A1Coming and staying with group	.458	.484	.490	.402	.392
B1Sitting for table work	.241	.160	.276	.336	.239
B1Listening to instruction	.289	.303	.283	.480	.373
B1Focusing to complete work	.342	.291	.343	.497	.407
C1Sitting with other children	.402	.458	.466	.267	.370
C1Focusing to eat	.380	.346	.372	.259	.261
C1Eating snack/lunch	.372	.335	.351	.304	.302
C1Trying new foods	.427	.386	.470	.372	.391
C1Bite sizes	.271	.400	.285	.244	.194
D1Transitioning from one activity to another	.373	.532	.417	.358	.339
D1Cleaning up supplies/toys	.469	.482	.518	.469	.465
D1Centers	.437	.431	.424	.433	.393
D1Attending to instructions/directions	.392	.418	.449	.581	.553
D1Following classroom routines	.420	.466	.382	.520	.475
D1Drills, such as fire or tornado	.464	.651	.497	.360	.353
E1Playing with other students/peers	.406	.418	.378	.421	.566
E1Playing on playground equipment	.379	.376	.368	.218	.414
E1Playing group games	.460	.432	.454	.457	.534
E1Playing with toys	.296	.222	.269	.353	.344
F1Using glue for craft projects	.483	.313	.436	.504	.480
F1Painting and coloring	.438	.289	.331	.450	.306

	A1Sitting still	A1Following movements in songs	A1Touching or being near other children	A1Coming and staying with group
F1Completing coloring and cutting activities	.358	.436	.388	.422
F1Use markers to color/write/draw	.260	.281	.258	.355
G1Using the toilet	.358	.393	.233	.372
G1Washing hands	.446	.309	.359	.443
G1Dressing after toileting	.410	.377	.473	.486
G1Putting backpack and/or other belongings away	.337	.407	.412	.526
H1Playing with items on sensory table	.267	.317	.461	.419
H1Touching wet textures	.156	.194	.329	.327
H1Touching dry textures	.254	.256	.387	.337
H1Touching sticky textures	.254	.354	.458	.369
I1Following movement	.361	.713	.396	.524
I1Singing or playing instruments	.277	.695	.519	.463
I1Listening to music	.347	.302	.373	.420
I1Staying with the group	.488	.615	.405	.745
SCircle time	.539	.340	.439	.533
STable time	.282	.402	.287	.370
SSnack or lunch time	.259	.323	.344	.338
STransitions	.262	.318	.384	.524
SCleaning up	.336	.429	.405	.578
SFree play	.356	.500	.389	.412
SCenters	.396	.490	.275	.465
SRecess	.215	.451	.458	.415
SMusic	.316	.469	.393	.492
SInstruction time	.391	.459	.333	.495
SCraft/Art time	.317	.365	.378	.461
SSensory table	.266	.414	.504	.446

	B1Sitting for table work	B1Listening to instructions	B1Focusing to complete work	C1Sitting with other children
F1Completing coloring and cutting activities	.475	.498	.446	.390
F1Use markers to color/write/draw	.490	.434	.425	.404
G1Using the toilet	.444	.561	.506	.284
G1Washing hands	.529	.532	.375	.339
G1Dressing after toileting	.459	.466	.450	.420
G1Putting backpack and/or other belongings away	.391	.466	.529	.305
H1Playing with items on sensory table	.219	.272	.268	.345
H1Touching wet textures	.249	.264	.216	.342
H1Touching dry textures	.286	.341	.284	.318
H1Touching sticky textures	.224	.356	.279	.351
I1Following movement	.285	.397	.443	.237
I1Singing or playing instruments	.109	.322	.346	.291
I1Listening to music	.331	.310	.210	.375
I1Staying with the group	.360	.489	.567	.425
SCircle time	.388	.260	.226	.442
STable time	.366	.360	.412	.389
SSnack or lunch time	.313	.206	.178	.488
STransitions	.312	.281	.323	.399
SCleaning up	.414	.450	.453	.420
SFree play	.267	.181	.273	.275
SCenters	.423	.351	.379	.334
SRecess	.122	.192	.175	.401
SMusic	.249	.332	.304	.294
SInstruction time	.449	.406	.455	.429
SCraft/Art time	.336	.353	.415	.293
SSensory table	.180	.172	.206	.378

	C1Focusing to eat	C1Eating snack/lunch	C1Trying new foods	C1Bite sizes
F1Completing coloring and cutting activities	.396	.384	.455	.321
F1Use markers to color/write/draw	.436	.434	.350	.349
G1Using the toilet	.241	.290	.328	.304
G1Washing hands	.356	.441	.257	.411
G1Dressing after toileting	.300	.362	.232	.351
G1Putting backpack and/or other belongings away	.300	.250	.226	.210
H1Playing with items on sensory table	.216	.175	.198	.262
H1Touching wet textures	.342	.302	.287	.339
H1Touching dry textures	.319	.304	.140	.279
H1Touching sticky textures	.273	.255	.432	.318
I1Following movement	.236	.186	.405	.166
I1Singing or playing instruments	.181	.151	.291	.209
I1Listening to music	.407	.365	.281	.311
I1Staying with the group	.253	.222	.379	.273
SCircle time	.295	.340	.189	.395
STable time	.281	.351	.352	.335
SSnack or lunch time	.466	.523	.389	.265
STransitions	.308	.285	.285	.281
SCleaning up	.416	.401	.359	.235
SFree play	.185	.215	.210	.226
SCenters	.216	.256	.292	.309
SRecess	.304	.302	.265	.266
SMusic	.286	.337	.342	.266
SInstruction time	.289	.363	.263	.284
SCraft/Art time	.280	.316	.264	.265
SSensory table	.315	.283	.260	.284

	D1Transitionin g from one activity to another	D1Cleaning up supplies/toys	D1Centers	D1Attending to instructions/direc tions
F1Completing coloring and cutting activities	.328	.459	.426	.533
F1Use markers to color/write/draw	.309	.403	.422	.484
G1Using the toilet	.273	.417	.469	.553
G1Washing hands	.351	.416	.461	.496
G1Dressing after toileting	.311	.520	.504	.521
G1Putting backpack and/or other belongings away	.382	.480	.398	.494
H1Playing with items on sensory table	.255	.358	.325	.288
H1Touching wet textures	.149	.257	.195	.240
H1Touching dry textures	.182	.297	.233	.247
H1Touching sticky textures	.235	.362	.183	.359
I1Following movement	.414	.407	.431	.459
I1Singing or playing instruments	.431	.450	.409	.429
I1Listening to music	.360	.370	.416	.268
I1Staying with the group	.560	.545	.552	.531
SCircle time	.314	.354	.408	.357
STable time	.251	.338	.412	.540
SSnack or lunch time	.255	.351	.356	.373
STransitions	.555	.457	.346	.406
SCleaning up	.448	.541	.415	.507
SFree play	.238	.336	.387	.350
SCenters	.286	.456	.562	.480
SRecess	.289	.416	.332	.339
SMusic	.305	.318	.454	.325
SInstruction time	.266	.412	.485	.604
SCraft/Art time	.250	.354	.372	.468
SSensory table	.292	.351	.386	.283

	D1Following classroom routines	D1Drills, such as fire or tornado	E1Playing with other students/peer s	E1Playing on playground equipment
F1Completing coloring and cutting activities	.333	.334	.466	.326
F1Use markers to color/write/draw	.308	.298	.420	.371
G1Using the toilet	.495	.296	.472	.249
G1Washing hands	.538	.386	.411	.392
G1Dressing after toileting	.619	.336	.476	.375
G1Putting backpack and/or other belongings away	.543	.403	.413	.344
H1Playing with items on sensory table	.443	.387	.344	.358
H1Touching wet textures	.322	.294	.313	.393
H1Touching dry textures	.363	.236	.286	.433
H1Touching sticky textures	.280	.364	.368	.382
I1Following movement	.402	.312	.591	.288
I1Singing or playing instruments	.525	.393	.632	.434
I1Listening to music	.374	.364	.401	.378
I1Staying with the group	.580	.401	.538	.272
SCircle time	.459	.214	.286	.272
STable time	.508	.197	.392	.262
SSnack or lunch time	.425	.346	.309	.367
STransitions	.560	.415	.247	.318
SCleaning up	.624	.373	.372	.352
SFree play	.464	.257	.389	.346
SCenters	.592	.287	.375	.300
SRecess	.587	.388	.372	.578
SMusic	.466	.333	.432	.229
SInstruction time	.526	.211	.301	.221
SCraft/Art time	.526	.255	.321	.355
SSensory table	.437	.338	.308	.385

	E1Playing group games	E1Playing with toys	F1Using glue for craft projects	F1Painting and coloring
F1Completing coloring and cutting activities	.590	.390	.586	.652
F1Use markers to color/write/draw	.460	.423	.585	.695
G1Using the toilet	.470	.442	.484	.521
G1Washing hands	.428	.619	.428	.529
G1Dressing after toileting	.424	.468	.455	.501
G1Putting backpack and/or other belongings away	.429	.429	.395	.494
H1Playing with items on sensory table	.316	.261	.423	.421
H1Touching wet textures	.288	.284	.409	.418
H1Touching dry textures	.281	.434	.197	.423
H1Touching sticky textures	.435	.215	.479	.535
I1Following movement	.556	.218	.428	.450
I1Singing or playing instruments	.555	.198	.331	.373
I1Listening to music	.272	.335	.256	.311
I1Staying with the group	.495	.246	.428	.321
SCircle time	.278	.277	.276	.318
STable time	.380	.266	.378	.408
SSnack or lunch time	.235	.301	.251	.394
STransitions	.224	.112	.314	.304
SCleaning up	.341	.274	.287	.399
SFree play	.381	.343	.327	.363
SCenters	.377	.369	.467	.425
SRecess	.325	.245	.294	.309
SMusic	.273	.175	.387	.330
SInstruction time	.320	.292	.506	.450
SCraft/Art time	.355	.318	.523	.630
SSensory table	.293	.216	.356	.422

	F1Completing coloring and cutting activities	F1Use markers to color/write/draw	G1Using the toilet	G1Washing hands
F1Completing coloring and cutting activities	1.000	.810	.543	.562
F1Use markers to color/write/draw	.810	1.000	.560	.555
G1Using the toilet	.543	.560	1.000	.744
G1Washing hands	.562	.555	.744	1.000
G1Dressing after toileting	.474	.465	.709	.740
G1Putting backpack and/or other belongings away	.489	.483	.573	.636
H1Playing with items on sensory table	.286	.323	.332	.410
H1Touching wet textures	.245	.347	.263	.361
H1Touching dry textures	.325	.399	.283	.423
H1Touching sticky textures	.409	.361	.261	.293
I1Following movement	.424	.357	.429	.394
I1Singing or playing instruments	.331	.232	.399	.418
I1Listening to music	.280	.293	.340	.482
I1Staying with the group	.339	.279	.398	.367
SCircle time	.232	.185	.237	.266
STable time	.329	.362	.507	.426
SSnack or lunch time	.301	.288	.382	.405
STransitions	.203	.185	.350	.398
SCleaning up	.364	.321	.427	.413
SFree play	.301	.184	.294	.340
SCenters	.367	.360	.465	.448
SRecess	.322	.217	.309	.375
SMusic	.299	.273	.373	.401
SInstruction time	.477	.374	.425	.431
SCraft/Art time	.389	.419	.502	.442
SSensory table	.211	.224	.263	.323



	G1Dressing after toileting	G1Putting backpack and/or other belongings away	H1Playing with items on sensory table	H1Touching wet textures
F1Completing coloring and cutting activities	.474	.489	.286	.245
F1Use markers to color/write/draw	.465	.483	.323	.347
G1Using the toilet	.709	.573	.332	.263
G1Washing hands	.740	.636	.410	.361
G1Dressing after toileting	1.000	.648	.551	.444
G1Putting backpack and/or other belongings away	.648	1.000	.477	.331
H1Playing with items on sensory table	.551	.477	1.000	.679
H1Touching wet textures	.444	.331	.679	1.000
H1Touching dry textures	.490	.445	.589	.692
H1Touching sticky textures	.372	.338	.547	.684
I1Following movement	.314	.479	.424	.329
I1Singing or playing instruments	.488	.539	.534	.330
I1Listening to music	.383	.329	.445	.388
I1Staying with the group	.398	.497	.364	.228
SCircle time	.272	.282	.231	.015
STable time	.460	.378	.218	.231
SSnack or lunch time	.401	.272	.229	.169
STransitions	.442	.467	.362	.227
SCleaning up	.466	.537	.345	.234
SFree play	.413	.413	.298	.171
SCenters	.514	.469	.405	.202
SRecess	.453	.407	.408	.295
SMusic	.444	.377	.337	.240
SInstruction time	.461	.379	.224	.113
SCraft/Art time	.557	.476	.498	.451
SSensory table	.434	.356	.579	.499

	H1Touching dry textures	H1Touching sticky textures	I1Following movement	I1Singing or playing instruments
F1Completing coloring and cutting activities	.325	.409	.424	.331
F1Use markers to color/write/draw	.399	.361	.357	.232
G1Using the toilet	.283	.261	.429	.399
G1Washing hands	.423	.293	.394	.418
G1Dressing after toileting	.490	.372	.314	.488
G1Putting backpack and/or other belongings away	.445	.338	.479	.539
H1Playing with items on sensory table	.589	.547	.424	.534
H1Touching wet textures	.692	.684	.329	.330
H1Touching dry textures	1.000	.551	.346	.391
H1Touching sticky textures	.551	1.000	.324	.382
I1Following movement	.346	.324	1.000	.754
I1Singing or playing instruments	.391	.382	.754	1.000
I1Listening to music	.475	.245	.568	.616
I1Staying with the group	.265	.249	.719	.584
SCircle time	.169	.105	.287	.232
STable time	.232	.242	.332	.332
SSnack or lunch time	.155	.211	.275	.264
STransitions	.261	.199	.358	.428
SCleaning up	.285	.185	.543	.445
SFree play	.179	.202	.418	.452
SCenters	.169	.174	.448	.415
SRecess	.298	.281	.366	.506
SMusic	.326	.236	.564	.602
SInstruction time	.171	.160	.310	.344
SCraft/Art time	.362	.482	.383	.360
SSensory table	.375	.395	.461	.471

	IIListening to music	IIStaying with the group	SCircle time	STable time
F1Completing coloring and cutting activities	.280	.339	.232	.329
F1Use markers to color/write/draw	.293	.279	.185	.362
G1Using the toilet	.340	.398	.237	.507
G1Washing hands	.482	.367	.266	.426
G1Dressing after toileting	.383	.398	.272	.460
G1Putting backpack and/or other belongings away	.329	.497	.282	.378
H1Playing with items on sensory table	.445	.364	.231	.218
H1Touching wet textures	.388	.228	.015	.231
H1Touching dry textures	.475	.265	.169	.232
H1Touching sticky textures	.245	.249	.105	.242
I1Following movement	.568	.719	.287	.332
I1Singing or playing instruments	.616	.584	.232	.332
I1Listening to music	1.000	.480	.272	.231
I1Staying with the group	.480	1.000	.372	.334
SCircle time	.272	.372	1.000	.357
STable time	.231	.334	.357	1.000
SSnack or lunch time	.289	.281	.331	.544
STransitions	.398	.431	.446	.456
SCleaning up	.450	.525	.499	.500
SFree play	.250	.358	.517	.436
SCenters	.305	.448	.442	.594
SRecess	.314	.400	.391	.363
SMusic	.665	.562	.359	.409
SInstruction time	.239	.334	.546	.569
SCraft/Art time	.261	.316	.380	.571
SSensory table	.432	.390	.363	.350

	SSnack or lunch time	STransitions	SCleaning up	SFree play	SCenters
F1Completing coloring and cutting activities	.301	.203	.364	.301	.367
F1Use markers to color/write/draw	.288	.185	.321	.184	.360
G1Using the toilet	.382	.350	.427	.294	.465
G1Washing hands	.405	.398	.413	.340	.448
G1Dressing after toileting	.401	.442	.466	.413	.514
G1Putting backpack and/or other belongings away	.272	.467	.537	.413	.469
H1Playing with items on sensory table	.229	.362	.345	.298	.405
H1Touching wet textures	.169	.227	.234	.171	.202
H1Touching dry textures	.155	.261	.285	.179	.169
H1Touching sticky textures	.211	.199	.185	.202	.174
I1Following movement	.275	.358	.543	.418	.448
I1Singing or playing instruments	.264	.428	.445	.452	.415
I1Listening to music	.289	.398	.450	.250	.305
I1Staying with the group	.281	.431	.525	.358	.448
SCircle time	.331	.446	.499	.517	.442
STable time	.544	.456	.500	.436	.594
SSnack or lunch time	1.000	.471	.545	.458	.468
STransitions	.471	1.000	.674	.397	.393
SCleaning up	.545	.674	1.000	.529	.524
SFree play	.458	.397	.529	1.000	.723
SCenters	.468	.393	.524	.723	1.000
SRecess	.598	.522	.582	.667	.546
SMusic	.458	.488	.553	.482	.524
SInstruction time	.323	.437	.510	.484	.572
SCraft/Art time	.479	.464	.590	.609	.645
SSensory table	.517	.395	.503	.608	.531

	SRecess	SMusic	SInstruction time	SCraft/Art time	SSensory table
F1Completing coloring and cutting activities	.322	.299	.477	.389	.211
F1Use markers to color/write/draw	.217	.273	.374	.419	.224
G1Using the toilet	.309	.373	.425	.502	.263
G1Washing hands	.375	.401	.431	.442	.323
G1Dressing after toileting	.453	.444	.461	.557	.434
G1Putting backpack and/or other belongings away	.407	.377	.379	.476	.356
H1Playing with items on sensory table	.408	.337	.224	.498	.579
H1Touching wet textures	.295	.240	.113	.451	.499
H1Touching dry textures	.298	.326	.171	.362	.375
H1Touching sticky textures	.281	.236	.160	.482	.395
I1Following movement	.366	.564	.310	.383	.461
I1Singing or playing instruments	.506	.602	.344	.360	.471
I1Listening to music	.314	.665	.239	.261	.432
I1Staying with the group	.400	.562	.334	.316	.390
SCircle time	.391	.359	.546	.380	.363
STable time	.363	.409	.569	.571	.350
SSnack or lunch time	.598	.458	.323	.479	.517
STransitions	.522	.488	.437	.464	.395
SCleaning up	.582	.553	.510	.590	.503
SFree play	.667	.482	.484	.609	.608
SCenters	.546	.524	.572	.645	.531
SRecess	1.000	.540	.417	.587	.689
SMusic	.540	1.000	.434	.449	.544
SInstruction time	.417	.434	1.000	.550	.329
SCraft/Art time	.587	.449	.550	1.000	.695
SSensory table	.689	.544	.329	.695	1.000

	SDrills, such as fire or tornado drill	SMovement time	SSelf-care	SPeer play	MCircle time
F1Completing coloring and cutting activities	.232	.372	.352	.291	.284
F1Use markers to color/write/draw	.280	.258	.379	.233	.217
G1Using the toilet	.354	.368	.719	.512	.300
G1Washing hands	.487	.437	.644	.477	.317
G1Dressing after toileting	.374	.437	.697	.516	.372
G1Putting backpack and/or other belongings away	.316	.515	.607	.427	.328
H1Playing with items on sensory table	.385	.359	.360	.373	.249
H1Touching wet textures	.246	.254	.299	.296	.171
H1Touching dry textures	.182	.356	.289	.238	.126
H1Touching sticky textures	.239	.405	.237	.193	.209
I1Following movement	.290	.606	.430	.549	.306
I1Singing or playing instruments	.388	.557	.447	.514	.307
I1Listening to music	.461	.374	.260	.447	.337
I1Staying with the group	.321	.546	.422	.450	.441
SCircle time	.262	.479	.256	.409	.548
STable time	.361	.427	.578	.508	.341
SSnack or lunch time	.428	.471	.570	.560	.327
STransitions	.523	.541	.519	.518	.432
SCleaning up	.382	.566	.526	.536	.517
SFree play	.368	.594	.505	.506	.403
SCenters	.418	.539	.571	.599	.475
SRecess	.397	.611	.551	.537	.382
SMusic	.389	.517	.461	.596	.349
SInstruction time	.261	.423	.446	.465	.428
SCraft/Art time	.323	.527	.654	.508	.328
SSensory table	.370	.562	.441	.473	.321

	MTable time	MSnack or lunch time	MTransitions	MCleaning up	MFree play
F1Completing coloring and cutting activities	.365	.310	.230	.353	.246
F1Use markers to color/write/draw	.345	.254	.156	.235	.156
G1Using the toilet	.452	.294	.288	.371	.252
G1Washing hands	.404	.380	.288	.374	.331
G1Dressing after toileting	.443	.419	.367	.435	.294
G1Putting backpack and/or other belongings away	.359	.330	.357	.473	.293
H1Playing with items on sensory table	.228	.360	.283	.327	.242
H1Touching wet textures	.249	.339	.252	.264	.190
H1Touching dry textures	.189	.296	.193	.250	.152
H1Touching sticky textures	.308	.436	.322	.315	.259
I1Following movement	.326	.169	.268	.363	.240
I1Singing or playing instruments	.334	.307	.413	.387	.306
I1Listening to music	.298	.277	.261	.322	.299
I1Staying with the group	.409	.240	.339	.396	.282
SCircle time	.313	.267	.370	.463	.399
STable time	.577	.378	.362	.338	.305
SSnack or lunch time	.412	.581	.408	.452	.386
STransitions	.341	.309	.558	.494	.327
SCleaning up	.455	.387	.518	.601	.387
SFree play	.472	.374	.417	.489	.510
SCenters	.580	.366	.393	.469	.462
SRecess	.400	.485	.481	.502	.438
SMusic	.452	.332	.405	.406	.331
SInstruction time	.481	.301	.376	.436	.319
SCraft/Art time	.535	.434	.419	.450	.375
SSensory table	.381	.407	.368	.418	.366

	MCenters	MRecess	MMusic	MInstruction time	MCraft/Art time
F1Completing coloring and cutting activities	.318	.292	.287	.418	.464
F1Use markers to color/write/draw	.287	.232	.203	.323	.395
G1Using the toilet	.405	.227	.292	.479	.441
G1Washing hands	.356	.315	.306	.388	.405
G1Dressing after toileting	.468	.367	.328	.396	.432
G1Putting backpack and/or other belongings away	.416	.333	.332	.424	.491
H1Playing with items on sensory table	.334	.291	.271	.194	.358
H1Touching wet textures	.263	.299	.244	.145	.304
H1Touching dry textures	.225	.276	.289	.165	.243
H1Touching sticky textures	.280	.343	.326	.238	.398
I1Following movement	.339	.186	.417	.268	.434
I1Singing or playing instruments	.334	.328	.518	.303	.412
I1Listening to music	.293	.314	.564	.191	.266
I1Staying with the group	.345	.273	.456	.352	.421
SCircle time	.362	.342	.287	.423	.381
STable time	.406	.266	.362	.455	.449
SSnack or lunch time	.423	.427	.326	.276	.394
STransitions	.389	.430	.450	.327	.429
SCleaning up	.539	.448	.471	.432	.514
SFree play	.552	.389	.351	.333	.467
SCenters	.637	.345	.392	.385	.533
SRecess	.446	.611	.383	.319	.469
SMusic	.401	.360	.679	.274	.432
SInstruction time	.415	.320	.402	.582	.494
SCraft/Art time	.550	.394	.415	.471	.624
SSensory table	.413	.407	.369	.255	.442



	MSensory table	MDrills, such as fire or tornado drill	MMovement time	MSelf-care	MPeer play
F1Completing coloring and cutting activities	.323	.263	.328	.419	.335
F1Use markers to color/write/draw	.289	.218	.250	.349	.266
G1Using the toilet	.359	.302	.298	.671	.431
G1Washing hands	.373	.375	.302	.574	.372
G1Dressing after toileting	.457	.394	.409	.610	.503
G1Putting backpack and/or other belongings away	.429	.323	.398	.581	.371
H1Playing with items on sensory table	.532	.377	.395	.368	.270
H1Touching wet textures	.440	.273	.328	.238	.296
H1Touching dry textures	.327	.226	.295	.224	.223
H1Touching sticky textures	.405	.334	.376	.279	.290
I1Following movement	.420	.250	.439	.395	.432
I1Singing or playing instruments	.475	.482	.489	.444	.491
I1Listening to music	.394	.364	.401	.211	.324
I1Staying with the group	.462	.350	.500	.407	.440
SCircle time	.349	.261	.351	.228	.351
STable time	.284	.377	.345	.521	.478
SSnack or lunch time	.367	.371	.406	.433	.423
STransitions	.383	.494	.435	.442	.436
SCleaning up	.446	.431	.493	.520	.468
SFree play	.476	.332	.400	.400	.481
SCenters	.467	.339	.433	.519	.494
SRecess	.539	.445	.499	.406	.528
SMusic	.480	.406	.491	.368	.472
SInstruction time	.316	.372	.397	.440	.468
SCraft/Art time	.531	.346	.435	.559	.436
SSensory table	.639	.353	.496	.318	.368

	A1Sitting still	A1Following movements in songs	A1Touching or being near other children	A1Coming and staying with group
SDrills, such as fire or tornado drill	.287	.278	.351	.430
SMovement time	.376	.585	.398	.557
SSelf-care	.343	.387	.253	.410
SPeer play	.284	.476	.365	.476
MCircle time	.495	.357	.403	.540
MTable time	.301	.364	.312	.411
MSnack or lunch time	.280	.294	.396	.337
MTransitions	.221	.396	.428	.373
MCleaning up	.368	.454	.410	.430
MFree play	.348	.366	.278	.337
MCenters	.353	.428	.327	.402
MRecess	.223	.335	.383	.324
MMusic	.289	.402	.378	.399
MInstruction time	.332	.403	.327	.413
MCraft/Art time	.304	.428	.355	.452
MSensory table	.294	.439	.473	.458
MDrills, such as fire or tornado drill	.212	.427	.434	.484
MMovement time	.277	.488	.467	.490
MSelf-care	.258	.410	.259	.402
MPeer play	.172	.491	.400	.392

	B1Sitting for table work	B1Listening to instructions	B1Focusing to complete work	C1Sitting with other children
SDrills, such as fire or tornado drill	.331	.254	.172	.430
SMovement time	.288	.422	.299	.370
SSelf-care	.352	.406	.409	.254
SPeer play	.282	.357	.267	.341
MCircle time	.409	.314	.315	.429
MTable time	.342	.352	.431	.359
MSnack or lunch time	.296	.230	.227	.475
MTransitions	.225	.235	.301	.374
MCleaning up	.357	.282	.318	.447
MFree play	.303	.225	.197	.342
MCenters	.396	.328	.379	.390
MRecess	.185	.171	.156	.447
MMusic	.239	.304	.332	.322
MInstruction time	.257	.356	.409	.293
MCraft/Art time	.310	.380	.419	.309
MSensory table	.241	.289	.342	.402
MDrills, such as fire or tornado drill	.160	.303	.291	.458
MMovement time	.276	.283	.343	.466
MSelf-care	.336	.480	.497	.267
MPeer play	.239	.373	.407	.370

	C1Focusing to eat	C1Eating snack/lunch	C1Trying new foods	C1Bite sizes
SDrills, such as fire or tornado drill	.332	.271	.278	.441
SMovement time	.206	.242	.265	.326
SSelf-care	.221	.279	.217	.274
SPeer play	.199	.239	.294	.222
MCircle time	.338	.371	.454	.305
MTable time	.287	.348	.463	.254
MSnack or lunch time	.482	.537	.481	.299
MTransitions	.341	.373	.445	.212
MCleaning up	.430	.439	.448	.304
MFree play	.331	.354	.344	.286
MCenters	.403	.402	.407	.315
MRecess	.416	.443	.354	.301
MMusic	.299	.335	.416	.228
MInstruction time	.297	.340	.364	.230
MCraft/Art time	.322	.327	.402	.280
MSensory table	.380	.372	.427	.271
MDrills, such as fire or tornado drill	.346	.335	.386	.400
MMovement time	.372	.351	.470	.285
MSelf-care	.259	.304	.372	.244
MPeer play	.261	.302	.391	.194

	D1Transitionin g from one activity to another	D1Cleaning up supplies/toys	D1Centers	D1Attending to instructions/direc tions
SDrills, such as fire or tornado drill	.493	.398	.393	.251
SMovement time	.306	.444	.386	.448
SSelf-care	.283	.371	.412	.473
SPeer play	.219	.364	.385	.484
MCircle time	.442	.543	.438	.439
MTable time	.321	.467	.466	.549
MSnack or lunch time	.289	.483	.343	.378
MTransitions	.441	.508	.350	.409
MCleaning up	.407	.565	.438	.486
MFree play	.314	.452	.384	.318
MCenters	.372	.504	.482	.480
MRecess	.308	.519	.369	.348
MMusic	.358	.438	.445	.372
MInstruction time	.309	.405	.380	.525
MCraft/Art time	.363	.466	.384	.495
MSensory table	.373	.469	.437	.392
MDrills, such as fire or tornado drill	.532	.482	.431	.418
MMovement time	.417	.518	.424	.449
MSelf-care	.358	.469	.433	.581
MPeer play	.339	.465	.393	.553

	D1Following classroom routines	D1Drills, such as fire or tornado	E1Playing with other students/peer s	E1Playing on playground equipment
SDrills, such as fire or tornado drill	.365	.660	.277	.358
SMovement time	.489	.354	.465	.506
SSelf-care	.560	.296	.377	.327
SPeer play	.447	.315	.494	.384
MCircle time	.448	.430	.390	.348
MTable time	.406	.352	.458	.295
MSnack or lunch time	.358	.448	.325	.412
MTransitions	.425	.443	.356	.318
MCleaning up	.449	.376	.344	.327
MFree play	.366	.324	.323	.309
MCenters	.403	.386	.397	.300
MRecess	.358	.406	.305	.483
MMusic	.384	.341	.389	.230
MInstruction time	.367	.265	.381	.270
MCraft/Art time	.414	.358	.425	.327
MSensory table	.420	.464	.406	.379
MDrills, such as fire or tornado drill	.466	.651	.418	.376
MMovement time	.382	.497	.378	.368
MSelf-care	.520	.360	.421	.218
MPeer play	.475	.353	.566	.414

	E1Playing group games	E1Playing with toys	F1Using glue for craft projects	F1Painting and coloring
SDrills, such as fire or tornado drill	.285	.210	.289	.218
SMovement time	.418	.320	.346	.414
SSelf-care	.311	.361	.422	.449
SPeer play	.401	.319	.359	.304
MCircle time	.363	.337	.338	.213
MTable time	.477	.359	.510	.424
MSnack or lunch time	.350	.365	.345	.382
MTransitions	.394	.234	.383	.291
MCleaning up	.405	.394	.378	.354
MFree play	.342	.322	.321	.283
MCenters	.469	.336	.424	.416
MRecess	.325	.327	.344	.369
MMusic	.312	.221	.371	.364
MInstruction time	.514	.317	.471	.397
MCraft/Art time	.492	.314	.544	.544
MSensory table	.460	.296	.483	.438
MDrills, such as fire or tornado drill	.432	.222	.313	.289
MMovement time	.454	.269	.436	.331
MSelf-care	.457	.353	.504	.450
MPeer play	.534	.344	.480	.306

	F1Completing coloring and cutting activities	F1Use markers to color/write/dr aw	G1Using the toilet	G1Washing hands
SDrills, such as fire or tornado drill	.232	.280	.354	.487
SMovement time	.372	.258	.368	.437
SSelf-care	.352	.379	.719	.644
SPeer play	.291	.233	.512	.477
MCircle time	.284	.217	.300	.317
MTable time	.365	.345	.452	.404
MSnack or lunch time	.310	.254	.294	.380
MTransitions	.230	.156	.288	.288
MCleaning up	.353	.235	.371	.374
MFree play	.246	.156	.252	.331
MCenters	.318	.287	.405	.356
MRecess	.292	.232	.227	.315
MMusic	.287	.203	.292	.306
MInstruction time	.418	.323	.479	.388
MCraft/Art time	.464	.395	.441	.405
MSensory table	.323	.289	.359	.373
MDrills, such as fire or tornado drill	.263	.218	.302	.375
MMovement time	.328	.250	.298	.302
MSelf-care	.419	.349	.671	.574
MPeer play	.335	.266	.431	.372



	G1Dressing after toileting	G1Putting backpack and/or other belongings away	H1Playing with items on sensory table	H1Touching wet textures
SDrills, such as fire or tornado drill	.374	.316	.385	.246
SMovement time	.437	.515	.359	.254
SSelf-care	.697	.607	.360	.299
SPeer play	.516	.427	.373	.296
MCircle time	.372	.328	.249	.171
MTable time	.443	.359	.228	.249
MSnack or lunch time	.419	.330	.360	.339
MTransitions	.367	.357	.283	.252
MCleaning up	.435	.473	.327	.264
MFree play	.294	.293	.242	.190
MCenters	.468	.416	.334	.263
MRecess	.367	.333	.291	.299
MMusic	.328	.332	.271	.244
MInstruction time	.396	.424	.194	.145
MCraft/Art time	.432	.491	.358	.304
MSensory table	.457	.429	.532	.440
MDrills, such as fire or tornado drill	.394	.323	.377	.273
MMovement time	.409	.398	.395	.328
MSelf-care	.610	.581	.368	.238
MPeer play	.503	.371	.270	.296

	H1Touching dry textures	H1Touching sticky textures	I1Following movement	I1Singing or playing instruments
SDrills, such as fire or tornado drill	.182	.239	.290	.388
SMovement time	.356	.405	.606	.557
SSelf-care	.289	.237	.430	.447
SPeer play	.238	.193	.549	.514
MCircle time	.126	.209	.306	.307
MTable time	.189	.308	.326	.334
MSnack or lunch time	.296	.436	.169	.307
MTransitions	.193	.322	.268	.413
MCleaning up	.250	.315	.363	.387
MFree play	.152	.259	.240	.306
MCenters	.225	.280	.339	.334
MRecess	.276	.343	.186	.328
MMusic	.289	.326	.417	.518
MInstruction time	.165	.238	.268	.303
MCraft/Art time	.243	.398	.434	.412
MSensory table	.327	.405	.420	.475
MDrills, such as fire or tornado drill	.226	.334	.250	.482
MMovement time	.295	.376	.439	.489
MSelf-care	.224	.279	.395	.444
MPeer play	.223	.290	.432	.491

	IIListening to music	IIStaying with the group	SCircle time	STable time
SDrills, such as fire or tornado drill	.461	.321	.262	.361
SMovement time	.374	.546	.479	.427
SSelf-care	.260	.422	.256	.578
SPeer play	.447	.450	.409	.508
MCircle time	.337	.441	.548	.341
MTable time	.298	.409	.313	.577
MSnack or lunch time	.277	.240	.267	.378
MTransitions	.261	.339	.370	.362
MCleaning up	.322	.396	.463	.338
MFree play	.299	.282	.399	.305
MCenters	.293	.345	.362	.406
MRecess	.314	.273	.342	.266
MMusic	.564	.456	.287	.362
MInstruction time	.191	.352	.423	.455
MCraft/Art time	.266	.421	.381	.449
MSensory table	.394	.462	.349	.284
MDrills, such as fire or tornado drill	.364	.350	.261	.377
MMovement time	.401	.500	.351	.345
MSelf-care	.211	.407	.228	.521
MPeer play	.324	.440	.351	.478

	SSnack or lunch time	STransitions	SCleaning up	SFree play	SCenters
SDrills, such as fire or tornado drill	.428	.523	.382	.368	.418
SMovement time	.471	.541	.566	.594	.539
SSelf-care	.570	.519	.526	.505	.571
SPeer play	.560	.518	.536	.506	.599
MCircle time	.327	.432	.517	.403	.475
MTable time	.412	.341	.455	.472	.580
MSnack or lunch time	.581	.309	.387	.374	.366
MTransitions	.408	.558	.518	.417	.393
MCleaning up	.452	.494	.601	.489	.469
MFree play	.386	.327	.387	.510	.462
MCenters	.423	.389	.539	.552	.637
MRecess	.427	.430	.448	.389	.345
MMusic	.326	.450	.471	.351	.392
MInstruction time	.276	.327	.432	.333	.385
MCraft/Art time	.394	.429	.514	.467	.533
MSensory table	.367	.383	.446	.476	.467
MDrills, such as fire or tornado drill	.371	.494	.431	.332	.339
MMovement time	.406	.435	.493	.400	.433
MSelf-care	.433	.442	.520	.400	.519
MPeer play	.423	.436	.468	.481	.494

	SRecess	SMusic	SInstruction time	SCraft/Art time	SSensory table
SDrills, such as fire or tornado drill	.397	.389	.261	.323	.370
SMovement time	.611	.517	.423	.527	.562
SSelf-care	.551	.461	.446	.654	.441
SPeer play	.537	.596	.465	.508	.473
MCircle time	.382	.349	.428	.328	.321
MTable time	.400	.452	.481	.535	.381
MSnack or lunch time	.485	.332	.301	.434	.407
MTransitions	.481	.405	.376	.419	.368
MCleaning up	.502	.406	.436	.450	.418
MFree play	.438	.331	.319	.375	.366
MCenters	.446	.401	.415	.550	.413
MRecess	.611	.360	.320	.394	.407
MMusic	.383	.679	.402	.415	.369
MInstruction time	.319	.274	.582	.471	.255
MCraft/Art time	.469	.432	.494	.624	.442
MSensory table	.539	.480	.316	.531	.639
MDrills, such as fire or tornado drill	.445	.406	.372	.346	.353
MMovement time	.499	.491	.397	.435	.496
MSelf-care	.406	.368	.440	.559	.318
MPeer play	.528	.472	.468	.436	.368

	SDrills, such as fire or tornado drill	SMovement time	SSelf-care	SPeer play	MCircle time
SDrills, such as fire or tornado drill	1.000	.416	.448	.430	.405
SMovement time	.416	1.000	.543	.590	.401
SSelf-care	.448	.543	1.000	.641	.282
SPeer play	.430	.590	.641	1.000	.458
MCircle time	.405	.401	.282	.458	1.000
MTable time	.311	.363	.399	.477	.698
MSnack or lunch time	.343	.364	.346	.352	.586
MTransitions	.354	.318	.330	.439	.762
MCleaning up	.306	.447	.394	.466	.728
MFree play	.359	.345	.298	.300	.691
MCenters	.394	.374	.458	.483	.657
MRecess	.314	.428	.335	.331	.656
MMusic	.293	.406	.343	.408	.583
MInstruction time	.216	.291	.382	.423	.665
MCraft/Art time	.267	.473	.483	.474	.631
MSensory table	.339	.457	.408	.447	.662
MDrills, such as fire or tornado drill	.678	.380	.309	.383	.545
MMovement time	.370	.536	.355	.507	.735
MSelf-care	.334	.422	.738	.520	.527
MPeer play	.281	.470	.469	.671	.663

	MTable time	MSnack or lunch time	MTransitions	MCleaning up	MFree play
SDrills, such as fire or tornado drill	.311	.343	.354	.306	.359
SMovement time	.363	.364	.318	.447	.345
SSelf-care	.399	.346	.330	.394	.298
SPeer play	.477	.352	.439	.466	.300
MCircle time	.698	.586	.762	.728	.691
MTable time	1.000	.661	.742	.636	.645
MSnack or lunch time	.661	1.000	.708	.732	.670
MTransitions	.742	.708	1.000	.815	.701
MCleaning up	.636	.732	.815	1.000	.676
MFree play	.645	.670	.701	.676	1.000
MCenters	.749	.626	.723	.700	.744
MRecess	.610	.769	.763	.742	.770
MMusic	.629	.563	.690	.608	.598
MInstruction time	.737	.515	.683	.647	.581
MCraft/Art time	.734	.655	.731	.661	.670
MSensory table	.649	.690	.708	.648	.676
MDrills, such as fire or tornado drill	.540	.602	.670	.533	.470
MMovement time	.703	.669	.735	.732	.662
MSelf-care	.650	.582	.628	.598	.553
MPeer play	.742	.538	.705	.612	.582

	MCenters	MRecess	MMusic	MInstruction time	MCraft/Art time
SDrills, such as fire or tornado drill	.394	.314	.293	.216	.267
SMovement time	.374	.428	.406	.291	.473
SSelf-care	.458	.335	.343	.382	.483
SPeer play	.483	.331	.408	.423	.474
MCircle time	.657	.656	.583	.665	.631
MTable time	.749	.610	.629	.737	.734
MSnack or lunch time	.626	.769	.563	.515	.655
MTransitions	.723	.763	.690	.683	.731
MCleaning up	.700	.742	.608	.647	.661
MFree play	.744	.770	.598	.581	.670
MCenters	1.000	.663	.573	.677	.735
MRecess	.663	1.000	.660	.573	.705
MMusic	.573	.660	1.000	.583	.692
MInstruction time	.677	.573	.583	1.000	.752
MCraft/Art time	.735	.705	.692	.752	1.000
MSensory table	.670	.759	.669	.606	.788
MDrills, such as fire or tornado drill	.537	.569	.531	.505	.538
MMovement time	.679	.756	.681	.658	.768
MSelf-care	.662	.532	.560	.652	.729
MPeer play	.665	.608	.591	.677	.700



	MSensory table	MDrills, such as fire or tornado drill	MMovement time	MSelf-care	MPeer play
SDrills, such as fire or tornado drill	.339	.678	.370	.334	.281
SMovement time	.457	.380	.536	.422	.470
SSelf-care	.408	.309	.355	.738	.469
SPeer play	.447	.383	.507	.520	.671
MCircle time	.662	.545	.735	.527	.663
MTable time	.649	.540	.703	.650	.742
MSnack or lunch time	.690	.602	.669	.582	.538
MTransitions	.708	.670	.735	.628	.705
MCleaning up	.648	.533	.732	.598	.612
MFree play	.676	.470	.662	.553	.582
MCenters	.670	.537	.679	.662	.665
MRecess	.759	.569	.756	.532	.608
MMusic	.669	.531	.681	.560	.591
MInstruction time	.606	.505	.658	.652	.677
MCraft/Art time	.788	.538	.768	.729	.700
MSensory table	1.000	.554	.814	.647	.644
MDrills, such as fire or tornado drill	.554	1.000	.625	.490	.555
MMovement time	.814	.625	1.000	.604	.760
MSelf-care	.647	.490	.604	1.000	.661
MPeer play	.644	.555	.760	.661	1.000

## Appendix J

### Final Version of Assessment

# Sensory Environment and Participation Questionnaire – Teacher Version

Student's Name: _____		Date of Birth: _____
<b>Gender:</b> <input type="checkbox"/> Male <input type="checkbox"/> Female	<b>Race:</b> <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> American Indian or Alaska Native  <input type="checkbox"/> Asian  <input type="checkbox"/> Black  <input type="checkbox"/> Hispanic or Latino         </div> <div> <input type="checkbox"/> White  <input type="checkbox"/> Native Hawaiian or other Pacific Islander  <input type="checkbox"/> Two or more races  <input type="checkbox"/> Other         </div> </div>	

Person Completing Report	
Name: _____	
<b>Relationship to child:</b> <input type="checkbox"/> main classroom teacher <input type="checkbox"/> special education classroom teacher <input type="checkbox"/> para professional/aide <input type="checkbox"/> other: _____	<b>Preschool Setting:</b> <input type="checkbox"/> public preschool <input type="checkbox"/> private preschool <input type="checkbox"/> public special education preschool <input type="checkbox"/> private special education preschool <input type="checkbox"/> Montessori <input type="checkbox"/> Waldorf <input type="checkbox"/> Reggio Emilia <input type="checkbox"/> ABA school <input type="checkbox"/> home school or Co-op <input type="checkbox"/> other

<b>In what activity does the child seem to do the best in or enjoy the most during the preschool day?</b> _____ _____
<b>In what activity does the student have the most trouble participating during the preschool day?</b> _____ _____ _____
<b>Other concerns:</b> _____ _____

# **Sensory Environment and Participation Questionnaire –**

## **Teacher Version**

### **Instructions:**

This questionnaire measures how a child's response to sensory input affects participation within the preschool environment. It also looks at how much support and modification are required for the child to participate in the preschool activities. Participation refers to the child's involvement in the activity. It does not necessarily mean that the child is able to perform the task independently; only that he or she actively participates in the activity. Sensory features refer to the type of sensory stimuli that is in the environment or present when participating in the activity. This could include: the way something feels to the touch or the texture (tactile); the amount or type of noise (auditory); the amount or type of visual information or light; the amount of movement (vestibular); the way something smells or tastes; or the amount of heavy muscle work (proprioception). A child's responses to the sensory features of the environment may include sensory seeking (i.e. jumping, running, crashing into things, touching things more than usual), typical responses, and hypersensitive responses (overly sensitive or reactive).

Please answer each of the following questions as to how much a student's response to sensory input impacts participation based on the following scale:

None- The student's response to sensory input does not affect the child's participation in the activity at all.

A Little- The student's response to sensory input affects the child's participation the activity a little.

Some- The student's response to sensory input affects the child's participation in the activity somewhat.

A Lot- The student's response to sensory input affects the child's participation in the activity a lot.

Too Much to Participate- The student's response to sensory input affects the child to the point that the child does not participate in the activity.

## Subtest One: Activities

### Circle Time/Large Group Time

	None	A Little	Some	A Lot	Too Much to Participate
1. Sitting Still	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Following movements in songs (e.g. finger plays)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Coming and staying with the group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Table Time

	None	A Little	Some	A Lot	Too Much to Participate
4. Sitting for table work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Listening to instructions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Focusing to complete work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Snack or Lunch Time

	None	A Little	Some	A Lot	Too Much to Participate
7. Sitting with other children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Focusing to eat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Eating snack/ lunch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Bite sizes (e.g. stuffing food)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Classroom Routines

	None	A Little	Some	A Lot	Too Much to Participate
11. Transitioning from one activity to another	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Cleaning up supplies/toys	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Attending to instructions/ directions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Following classroom routines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Classroom Routines

	None	A Little	Some	A Lot	Too Much to Participate
11. Transitioning from one activity to another	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Cleaning up supplies/toys	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Attending to instructions/directions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Following classroom routines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Craft/Art Time

	None	A Little	Some	A Lot	Too Much to Participate
18. Using glue for craft projects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. Painting and coloring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. Completing coloring and cutting activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. Use markers to color/write/draw	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Self-Care

	None	A Little	Some	A Lot	Too Much to Participate
22. Using the toilet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. Washing hands	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. Dressing after toileting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. Putting backpack and/or other belongings away	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Sensory Play

	None	A Little	Some	A Lot	Too Much to Participate
26. Playing with items on sensory table	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. Touching wet textures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. Touching dry textures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. Touching sticky textures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Movement/Music Time

	None	A Little	Some	A Lot	Too Much to Participate
30. Following movement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31. Singing or playing instrument	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32. Staying with the group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



## Subtest Two: Support

How much support do you or other staff provide to the child in order to participate in the task? (Support is considered direct interaction through words, visual cues, or touch)

	None	A Little	Some	A Lot	Too Much to Participate
33. Circle time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34. Table time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35. Snack or lunch time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
36. Transitions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
37. Cleaning up	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
38. Free play	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
39. Centers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
40. Recess	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
41. Music	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
42. Instruction time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
43. Craft/art time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
44. Sensory table	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
45. Drills, such as fire or tornado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
46. Movement time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
47. Self-Care	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
48. Peer play	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Subtest Three: Modifications

How much do you modify the environment to support participation in the following activities? (Modify the environment consists of changes to the environment, task, or timing of the activity).

	None	A Little	Some	A Lot	Too Much to Participate
49. Circle time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
50. Table time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
51. Snack or lunch time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
52. Transitions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
53. Cleaning up	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
54. Free play	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
55. Centers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
56. Recess	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
57. Music	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
58. Instruction time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
59. Craft/art time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
60. Sensory table	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
61. Drills, such as fire or tornado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
62. Movement time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
63. Self-Care	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
64. Peer play	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Scoring Key:**

None: 1

A Little: 2

Some: 3

A Lot: 4

Too Much to Participate: 5

**Subtest One: Activities**

Circle Time/Large Group Time	Score
1. Sitting Still	
2. Following Movements in songs	
3. Coming and Staying with group	
Total Circle Time	
Table Time	Score
4. Sitting for table work	
5. Listening to instructions	
6. Focusing to complete work	
Total Table Time	
Snack or Lunch Time	Score
7. Sitting with other children	
8. Focusing to eat	
9. Eating snack/lunch	
10. Bite sizes	
Total Snack or Lunch Time	
Classroom Routines	Score
11. Transitioning from one activity to another	
12. Cleaning up supplies/toys	
13. Attending to instructions	

14. Following Classroom routines	
Total Classroom Routines	
Free Play/Recess	Score
15. Playing with other students/peers	
16. Playing group games	
17. Playing with toys	
Total Play/Recess	
Craft/Art Time	Score
18. Using glue for craft projects	
19. Painting and coloring	
20. completing coloring and cutting activities	
21. using markers to color/write/draw	
Total Craft/Art Time	
Self-Care	Score
22. Using the toilet	
23. Washing hands	
24. Dressing after toileting	
25. Putting backpack and/or other belongings away	
Total Self-Care	
Sensory Play	Score
26. Playing with items on sensory table	
27. Touching wet textures	
28. Touching dry textures	
29. Touching sticky textures	
Total Sensory Play	

<b>Movement/Music</b>	<b>Score</b>
30. Following movement	
31. Singing or playing instrument	
32. Staying with the group	
<b>Total Movement/Music</b>	
<b>Total Score</b>	

## Subtest Two: Support

	Score
33. Circle Time	
34. Table time	
35. Snack or lunch time	
36. Transitions	
37. Cleaning up	
38. Free play	
39. Centers	
40. Recess	
41. Music	
42. Instruction time	
43. Craft/art time	
44. Sensory table	
45. Drills, such as fire or tornado	
46. Movement time	
47. Self-Care	
48. Peer play	
<b>Total</b>	

## Subtest Three: Modifications

	Score
49. Circle Time	
50. Table time	
51. Snack or lunch time	
52. Transitions	
53. Cleaning up	
54. Free play	
55. Centers	
56. Recess	
57. Music	
58. Instruction time	
59 Craft/art time	
60. Sensory table	
61. Drills, such as fire or tornado	
62. Movement time	
63. Self-Care	
64. Peer play	
<b>Total</b>	

## Total Scores

	Score
Total Section One: Activities	
Total Section Two: Support	
Total Section Three: Modifications	
<b>Total</b>	

Appendix K  
IRB Approval Letter



**Institutional Review Board**  
Office of Research and Sponsored Programs  
P.O. Box 425619, Denton, TX 76204-5619  
940-898-3378  
email: IRB@twu.edu  
<http://www.twu.edu/irb.html>

DATE: April 21, 2016  
TO: [REDACTED]  
Occupational Therapy - Dallas  
FROM: Institutional Review Board (IRB) - Dallas

Re: *Approval for The Reliability of the Participation and Sensory Environment Questionnaire - Teacher Version (Protocol #: 18998)*

The above referenced study has been reviewed and approved by the Dallas IRB (operating under FWA00000178) on 4/21/2016 using an expedited review procedure. This approval is valid for one year and expires on 4/21/2017. The IRB will send an email notification 45 days prior to the expiration date with instructions to extend or close the study. It is your responsibility to request an extension for the study if it is not yet complete, to close the protocol file when the study is complete, and to make certain that the study is not conducted beyond the expiration date.

If applicable, agency approval letters must be submitted to the IRB upon receipt prior to any data collection at that agency. A request to close this study must be filed with the Institutional Review Board at the completion of the study. Because you do not utilize a signed consent form for your study, the filing of signatures of subjects with the IRB is not required.

Any modifications to this study must be submitted for review to the IRB using the Modification Request Form. Additionally, the IRB must be notified immediately of any adverse events or unanticipated problems. All forms are located on the IRB website. If you have any questions, please contact the TWU IRB.

cc. Dr. Noralyn Davel Pickens, Occupational Therapy - Dallas  
Dr. Tina Fletcher, Occupational Therapy - Dallas  
Graduate School