

5-1-2012

Autism Spectrum Disorder: Sensory Needs in the Workplace

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AUTISM SPECTRUM DISORDER: SENSORY NEEDS IN THE WORKPLACE

A Thesis
Presented to
The Faculty of the College of Education and Behavioral Sciences
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
Of the Requirements for the Degree
Masters of Arts in Education

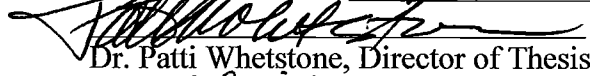
By
Amy Fogle Stiff

May 2012

AUTISM SPECTRUM DISORDER: SENSORY NEEDS IN THE WORKPLACE

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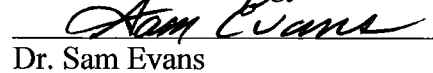
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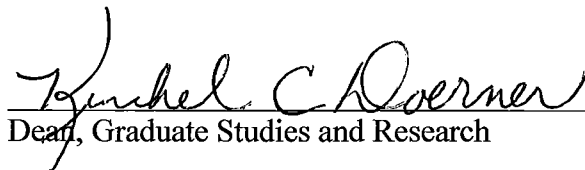
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28-june-2012

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ACKNOWLEDGMENTS

I would like to thank Dr. Patti Whetstone for walking me through this process in writing my thesis. Her patience has been enormous. I would like to thank Dr. Sam Evans and Dr. Chris Nagy for their time and effort in sitting on my master's committee. I would like to thank Dr. Marty Boman for giving me access to her students with Autism Spectrum Disorder and showing me great hospitality at Kelly Autism Program.

I would like to thank my husband Brad for his patience with all of the weekends I paid attention to my thesis and not onto him. I would like to thank my best friend Christa for being interested in my thesis subject and talking me through every step of the way. I would like to thank my parents for expecting nothing less of me but my best effort.

Finally, I would like to thank Dr. Dan Roenker for telling me from my undergraduate years that I have the potential to achieve my masters and not to give up until I have finished.

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AUTISM SPECTRUM DISORDER: SENSORY NEEDS IN THE WORKPLACE

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May 2012

52 Pages

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There is little to no empirical research for sensory sensitivities of individual with Autism Spectrum Disorder (ASD) and coping strategies used in the workplace. Seven students with ASD were interviewed about sensory sensitivities experienced and accommodations used at the workplace. This study found that participants self-regulated sensory sensitivities, and not asking for or using accommodations. Future research is needed to focus on the sensory sensitivities of individuals with ASD who have been in the work force for several years.

Introduction

A full day of work can be difficult. Imagine working in an environment where the noise is too loud, the light hurts your eyes, and overwhelming smells make your stomach ache. This is a reality for individuals who have sensory sensitivities. Research has demonstrated that individuals within the Autism Spectrum Disorder (ASD) have a high likelihood of sensory sensitivities (Leekam, Nieto, Libby, Wing, & Gould, 2007). This project explored how one group of individuals with ASD coped with sensory sensitivities in the workplace.

Autism Spectrum Disorder

ASD is a developmental disability that is evidenced by a lack of social interaction and verbal communication, and stereotypical repetitive patterns of behavior (Volkmar, Paul, Klin, & Cohen, 2005). Within the spectrum of ASD there are several sub-diagnoses: Autism, Asperger Syndrome, Rett's Syndrome, Childhood Disintegrative Disorder, and Pervasive Developmental Disorder or Not Otherwise Specified (PDD-NOS). There are varying degrees of severity of ASD from low-functioning to high-functioning. PDD-NOS, high functioning autism (HFA), and Asperger Syndrome (AS) are often categorized as higher functioning on the spectrum.

Sensory Sensitivities

One area of great interest among researchers is the sensory sensitivities of individuals with ASD. The senses most affected by individuals with ASD are auditory, visual, olfactory, and tactile which correspond to the sense of hearing, sight, smell, and touch respectively. When a sensory stimulus is found to be overwhelming to an

individual with ASD, the individual might overreact or underreact compared to typical individual.

Employment

There is a good deal of research on ASD focused on early intervention and education with school age children. Very little research addresses individuals leaving high school or transitioning into the workplace. Barnhill (2007) conducted a literature review employment issues of adults with Asperger Syndrome, and found employees with Asperger Syndrome have difficulty finding employment. In addition, individuals with ASD may have sensory sensitivities that create barriers in achieving and maintaining employment. Many individuals with ASD are underemployed or unemployed and very little research has been conducted and published on adults at the higher function end of the spectrum.

Purpose of Study

The purpose of this study was to examine how individuals with ASD managed sensory sensitivities at work. The specific objectives of this study were twofold: to determine what sensory sensitivities individuals with ASD were aware of, and to identify the coping strategies and accommodations utilized by individuals with ASD.

Research Questions

- Do college students with ASD identify bothersome stimuli including noises or sounds, lights or visual images, smells, or uncomfortable tactile items in the work environment?

- How do college students with ASD manage the sensory stimuli (sounds and noises, lights or visual images, smells, or uncomfortable feeling items) in the work environment?

Definition of Terms

The following definitions will help the reader to understand terms used in the project.

- Hypersensitivity – abnormal sensitivity or over reaction to sensory stimuli
- Hyposensitivity – abnormal sensitivity or under reaction to sensory stimuli
- Sensation seeking – seeking reaction for more sensory input
- Senses – a faculty by which the body perceives an external stimulus; sight, smell, hearing, taste, and touch
- Sensory modulation – becoming accustomed to sensory feelings and moderating the reactions (Miller, Anzalone, Lane, Cermak, & Osten 2007)
- Sensory sensitivities – abnormalities of the senses; a perception of familiar sensations as unbearable
- Sensory stimuli – the stimulation of any of the senses
- Stereotyped behavior – abnormal repetition of an action or movement
- Tactile defensiveness – over reaction to being touched (Baranek, Foster, & Berkson, 1997)
- Typical development – development of child acquiring skills appropriate to age

Significance of the Study

Research has demonstrated that individuals within the autism spectrum have a high likelihood of sensory sensitivities, but very little research focused on how sensory sensitivities affect the worker with ASD or how the worker copes. Workers with

ASD may utilize self-advocacy skills relating to sensory sensitivity accommodations in the workplace but this is not known. The researcher interviewed seven college students with ASD who experienced either full or part-time paid work experience. In addition, the researcher explored how these seven individuals with Autism Spectrum Disorder (ASD) managed sensory sensitivities in the workplace.

Literature Review

Many environmental factors could affect a person with Autism who experiences sensory sensitivity. For individuals with ASD, sensory sensitivity may be affected by fluorescent lighting or loud noises. Through personal interviews the researcher explored how seven individuals with Autism Spectrum Disorder (ASD) managed sensory sensitivities in the workplace.

The purpose of this research project was to:

- Determine the sensory sensitivities that individuals with ASD could distinguish.
- Identify coping strategies and accommodations employed by individuals with ASD.

The review of literature focused on six areas: (a) the description of Autism Spectrum Disorder (ASD), (b) the description of sensory sensitivities, (c) the description of sensory sensitivities and ASD, (d) the treatment of sensory sensitivities within the ASD community, (e) ASD individuals in the workplace, (f) and employment for college students with ASD.

Autism Spectrum Disorder

ASD is a pervasive developmental disorder defined by a lack of social interaction, verbal communication, and stereotypical repetitive patterns of behavior (American Psychiatric Association [*DSM-IV-TR*], 2000). Autism Spectrum Disorder is observed as a continuum of disorders, differentiated by behaviors impacting social interactions, communication, and imagination often accompanied with rigid repetitive behavior and varying levels of cognitive and intellectual capability (Wing, 1992). Examples of stereotypical repetitive patterns of behavior may include rocking, hand flapping, and

staring at a fixed location. Within the spectrum of ASD there are several sub-diagnoses, including Autism, Asperger Syndrome, Rett's Syndrome, Childhood Disintegrative Disorder, and Pervasive Developmental Disorder (PDD-NOS). The Center for Disease Control (2006) reports that one out of every 150 individuals are diagnosed with ASD each year.

Individuals with Autism typically have difficulty engaging in a conversation within a group and/or initiating social interaction. Difficulty maintaining eye contact and communication delays may also be experienced (Barnhill, 2007; Ozonoff, Rogers, & Pennington, 1991). An individual with autism differs from other conditions in the Autism Spectrum by level of functioning and nonverbal or have language delays (American Psychiatric Association [*DSM-IV-TR*], 2000).

Iarocci and McDonald (2006) defined individuals with Asperger Syndrome as a high functioning form of Autism. Myles and Simpson (2002) described an individual with Asperger as “socially awkward, emotionally blunted, self-centered, deficient at understanding nonverbal social cues and inflexible” (p. 133). An individual with Asperger cannot interpret facial expressions and body language and tend to misinterpret subtle social messages (Koning & McGill-Evans, 2001; Myles & Simpson, 2002; Myles & Southwick, 1999). An inability to show emotion or understand emotion may make interacting with friends, family, and co-workers challenging. Myles and Simpson (2002) conducted a comprehensive review of the literature relating to Asperger Syndrome and found individuals with Asperger Syndrome desire interaction with friends and family, yet do not possess the understanding to form deep friendships. The inability to form relationships may lead to depression, frustration, stress, anger, and social isolation. These

limitations may directly affect the ability of these individuals to succeed in the workplace.

Individual with Pervasive Developmental Disorder not Otherwise Specified (PDD-NOS) demonstrate fewer symptoms associated with ASD (Towbin, 2005).

Individuals who display symptoms associated with ASD at a later age typically are commonly diagnosis as PDD-NOS (Schaaf, & Miller, 2009). Several studies (Aarons & Gittens, 1999; Buitelaar & Gaag, 1998) defined individuals with PDD-NOS as possessing limited imaginary play, restricted interests, dedication to nonfunctional routines, and stereotyped behaviors. These stereotypical behaviors include hand-flapping, finger-licking, and hand-biting. Individuals with PDD-NOS may also a display difficulty with employment (Towbin, 2005).

Acker, Loncola, and Acker (2005) described Rett's Syndrome as symptoms of stereotypical movement of the hands, loss of acquired speech, and lack of interest in social interaction. Many individuals with Rett's Syndrome require a wheelchair for mobility by late childhood, and may lead to progressive muscle wasting and rigidity (Acker et al., 2005). There is a higher incidence of girls than boys diagnosed with Rett's Syndrome. Much like Rett's Syndrome, Childhood Disintegrative Disorder is diagnosed following years of normal development before a marked deterioration of behavioral and affective skills. These individual's diminished speech and social skills that previously had been acquired around 3–5 years of age (Volkmar, Koenig, & State, 2005).

Sensory Sensitivities

Sensory systems are the basis for the acquisition of information from the world in which an individual lives (Dunn, 2001). Sensory systems enable the brain to receive information (Miller, Anzalone, Lane, Cermak, & Osten, 2007). There are seven senses included in the sensory system: tactile, more often referred to as the sense of touch; vestibular, the ability to balance; vision, the ability to see; auditory, the ability to hear, gustatory; the ability to taste, and olfactory; the ability to smell (Dunn, 2001). Greater sensory sensitivity may be experienced in one or more areas by some individuals than in others.

Miller et al. (2007) identified the types of sensory modulation disorders as hypersensitivity and hyposensitivity. Hypersensitivity or sensory over-responsiveness occurs when the individual reacts to sensory input more quickly or with greater intensity than typical (Miller et al., 2007). Hypersensitivity may lead to overstimulation or even avoidance in common social interactions such as shaking hands or hugging another person (Baranek, David, Poe, Stone, & Watson, 2006; Iarocci & McDonald, 2006). Individuals with hypersensitivity are uncomfortable interacting in crowds (Greenspan, 2006). Hypersensitivity can elicit responses such as distraction, avoidance, withdrawal, or emotional outbursts. Individuals with ASD respond in a hypersensitive manner to sensory stimuli evidence by hearing a far off noise, or not being able to enjoy a hug (Blakemore et al., 2005; Cascio et al., 2008). According to Lane and Miller (2000), an individual with over-responsiveness may not tolerate common daily behaviors such as hair-brushing, haircuts, and/or hair washing. In these situations, symptoms of tactile sensitivities may be observed as withdrawing when being touched, needing hands cleaned at all times, and

bothered by texture in clothes. Individuals can appear to be uncooperative, and may have strict preferences on the types of food they consume (Dunn, 1999).

Hyposensitivity or sensory under-responsiveness occurs when the individual does not respond to or ignores sensory input. This can lead to sensory seeking behavior, such as actively engaging in actions that provide extreme sensory input (Miller et al., 2007). Hyposensitivity may lead to behavior such as rocking, spinning, hand-flapping, feeling disorientated when someone calls their name, or injuring themselves without noticing the pain (Cascio et al., 2008). A sensation seeking individual requires a high amount of sensory input and actually seeks input, which can include fidgeting, inattention, talkativeness, repetitive behaviors, poor impulse control, and hyperactivity (Mulligan, 1996).

Sensory Sensitivities and ASD

A meta-analysis of 14 studies on sensory modulation symptoms of individuals with ASD was reported by Ben-Sasson et al. (2009). The researchers found that 45 – 95% of individuals with ASD presented high frequencies of unusual sensory behaviors such as under-responsivity, over-responsivity, and sensation seeking (Ben-Sasson et al., 2009). In a study by Tomchek and Dunn (2007), the differences between children both with and without a diagnosis of ASD related to sensory processing abilities were explored utilizing the Short Sensory Profile (SSP). Finding from this study found that 95% of children with ASD demonstrated some degree of sensory processing dysfunction with the greatest differences appearing in sensation seeking and auditory filtering. Baranek et al. (2006) also questioned parents of children with ASD using the Sensory Experiences Questionnaire (SEQ) and found a pattern of hypo responsiveness to sensory stimuli.

These two studies established that numerous children with ASD seek sensory stimulus and react in over-responsiveness behaviors. Individuals with ASD may also have a hypersensitivity to sensory stimuli (Van-Wieren, Reid, & McHahon, 2008). Baranek, Foster, and Berkson (1997) found that individuals with ASD have higher levels of tactile defensiveness, demonstrate repetitive verbalizations and exhibit abnormal rigid behaviors.

Sensory sensitivities do not discriminate within the spectrum between low functioning, or high functioning, or based on age. Minshew and Hobson (2008) studied 60 individuals with ASD and 60 individuals without a diagnosis of ASD at different ages and levels of functioning. Minshew and Hobson (2008) reported no difference in sensory sensitivities of individuals with ASD between the young and the old. There was also no apparent difference in sensory sensitivities of low and high functioning individuals with ASD (Minshew & Hobson, 2008).

Some research has contradicting conclusions about whether sensory sensitivities decrease or increase with age. A study by Baranek et al. (2006) indicated that behaviors in response to sensory sensitivities decrease with age due to the children's ability to implement coping strategies for the sensations. Talay-Ongan and Wood (2000) studied the difference with children between the ages of four and fourteen by having the parents of both groups of children completed the Sensory Sensitivity Questionnaire Revised (SSQ-R). Results of the SSQ-R revealed minimal differences in sensory sensitivity between groups. However, differences were noted as the children aged. It was concluded that sensory sensitivities increased as the children became older due to heightened

language skills as well as heightened awareness. Older children were better able to report sensitivity to their parents than younger children (Talay-Ongan & Wood, 2000).

Treatment of Sensory Sensitivities within the ASD Community

Sensory Integration is the process of understanding sensory stimulation from the environment (Green et al., 2006; Schaaf & Miller, 2005; Stephenson, & Carter, 2009). The basic senses are the primary focus in sensory integration therapy. Individuals with Autism struggle to combine their senses. Sensory integration therapy is a type of occupational therapy that intentionally stimulates the individual's senses to help them adapt to the feeling of sensory overload. This procedure rewires the brain to process sensory information (Baranek, 2002). Sensory integration therapy centers on adaptive behaviors and functioning skills to help the individual advance their ability to incorporate sensory information in daily activities (Schaaf, & Miller, 2005). Interventions for individuals with hyposensitivity involve activities as brushing or rubbing the body with either a soft brush or a towel, as well as swinging in a hammock to provide stimulation (Smith, Mruzek, & Mozingo, 2005).

Occupational therapy addresses sensory stimulation treatment plans such as weighted clothing, lighting changes, and decreased environmental stimuli (Capo, 2000). Capo reviewed and summarized the literature detailing the role of occupational therapy in employment for persons with Autism. Capo listed subpar social and communication skills as barriers to employment that could be addressed through occupational therapy. Occupational therapy may also utilize sensory rooms. Sensory rooms provide soft cushions for sitting or lying, pleasant displays of colored lights, and soft sounds of music

(Leekam et al., 2007). Therapists design sensory rooms to provide an atmosphere that can calm an individual with ASD.

Individuals with ASD in the Workplace

Unemployment or underemployment occurs among many individuals within the ASD spectrum (Muller, Schuler, Burton, & Yates, 2003). Barnhill (2007) reviewed the literature on adult outcomes of individuals with Asperger Syndrome including employment issues. Barnhill (2007) reported maintaining and retaining employment was exceedingly complicated for individuals with Asperger Syndrome. Although many individuals with Autism, Asperger, or PDD-NOS are highly educated, obstacles to employment resulted from characteristics associated with poor communication and social skills (Capo, 2000; Hagner, & Cooney, 2005). Muller et al. (2003) interviewed 18 adults with ASD about experiences within the workplace and found highly educated workers working entry level jobs. Unemployment or underemployment contributed to levels of stress and frustration for workers with ASD.

Hagner and Cooney (2005) interviewed 14 supervisors of employees with ASD. Using a semi-structured interview and job observation, Hagner and Cooney (2005) stated sensory sensitivities were addressed by the worker's supervisor. In one instance a barrier of productivity was the employee's inability to deal with unusually loud noises (Hagner, & Cooney, 2005). Employees with ASD may be detail oriented, which leads to success in such areas as data entry, engine repair, graphic artist, computer programming, proof reading, quality control, inventory stocking and control, mail room services, book keeping, laboratory work, library service aid, website maintenance design, and database maintenance (Wysocki & Neulicht, 1998).

Employees with ASD may demonstrate deficits in communication, negative behavior outbursts, and difficulty with change (Capo, 2000). On a positive note, employees with ASD may be more productive due to restricted social interactions, resulting in greater focus on job tasks. Employees with ASD often display skills in math and computer technology (Capo, 2000). Other strengths include accuracy in visual perception, sharp memory skills, and high tolerance for routine and repetitive duties (Hagner & Cooney, 2005).

Employment for College Students with ASD

Limited research identified the lower rate or availability of full or part-time employment for college students with ASD. The acquisition and retention of summer work is sometimes difficult for all college students, but those with ASD have an especially difficult time securing employment. Students with disabilities typically find work in cleaning, food services, stocking, or assembly-related work (Carter et al., 2010).

Methods

The purpose of this study was to examine how individuals with ASD manage sensory sensitivities at work. The specific objectives of this study were twofold: to determine what sensory sensitivities individuals with ASD were aware of and to identify the coping strategies and accommodations utilized by individuals with ASD. This chapter provides an overview of the research design, sample selection, procedure, interview instrument, data collection procedures, and data analysis.

Research Design

This study incorporated a between-participants design, which is a study of differences between participants (Cone & Foster, 2006). The independent variables in this study were every respondent had a diagnosis of ASD and either had been or were currently employed. The dependent variables were 1) participant's sensory sensitivity issues and; 2) strategies participants used to enhance productivity in the workplaces.

This study is qualitative in nature. Using a qualitative research design allowed this researcher to gather data rich in detail. Cheseboro and Borisoff (2007) noted five characteristics shared by qualitative research. First, qualitative research occurs in the participant's natural setting and he or she establishes the terms under which the research is conducted. Second, the researcher participates in the research as a co-participant which places the researcher and the participants on equal ground. Third, qualitative research is predicated on subject-based communication allowing the participant to dictate the pace, flow, and transition of conversation. Fourth, subject intentionality refers to the researcher's diligence to keep the unique aspects of each participant's words and meanings. Finally, qualitative research is pragmatic and seeks to find a purpose for the

data. The utility of the results is the key goal of qualitative approaches (Cheseboro, & Borisoff, 2007).

Qualitative studies provide valuable insight into everyday life experiences. Qualitative research has limitations including the utilization of smaller sample sizes when compared to many quantitative studies. Subjects are specifically selected for interviews which resulted in a lack of randomness and generalizability of the findings. The small sample size and the specific selection of participants can lead to questions regarding reliability and validity (Berg & Mutchnick, 1996). These limitations can be offset through the use of inter-rater peer review of data and panel review of methods and tools. For this study, inter-rater peer review of the data was used to ensure the accuracy of data interpretation.

Qualitative designs have been effectively used in other Autism Spectrum Disorder (ASD) studies. In a study by Barrett (2006), the research involved three students with ASD and nine teachers. Each student had extensive autobiographical conversations with three of their teachers. The teachers then completed a collaborative analysis on the material. Barrett (2006) suggested that individuals with ASD shared similar experiences, yet, even with a small sample size, a range of differences between young people was evident. Qualitative methods have been preferred when the number of participants with a particular attribute is difficult to locate (Portway & Johnson, 2005). Qualitative methods are the appropriate research approach for this study due to the limited availability to individuals with ASD.

Sample

Approval by Western Kentucky University Institutional Review Board was obtained on April 23, 2010 (Appendix A). Participants were recruited through a special needs program in central Kentucky. The mission of the special needs program is to provide services for children and young adults who are diagnosed along the Autism Spectrum Continuum. The center conducts parent meetings to provide education and advocacy for parents of children and youth diagnosed with ASD. When a student obtains employment, the center provides job coaching. College students were required to attend a particular number of hours of study time to receive services.

To be eligible for this study, participants needed to have a diagnosis of ASD, have held a job or were currently working outside the home, were independent in the workplace, and demonstrated sufficient communication skills to answer the interview questions. A total of 15 college students attending the center had a diagnosis of ASD. Of those 15, seven were employed or had been previously employed and agreed to be interviewed.

Participants ranged in age from 19 to 22 and were enrolled in college classes. Three participants were freshmen, three were sophomores, and one participant was a junior. The five male and two female participants were employed in summer jobs either at the time of the interview or previously. Three students identified themselves as having Asperger Syndrome, three students identified themselves as having Autism, and one student identified herself as having mild Autism. One student reported having both Asperger Syndrome and Autism. Table 1 presents the participants background characteristics.

Table 1

Background Characteristics

Characteristics	n	%
Age		
19	3	43
20	2	29
21	1	14
22	1	14
Gender		
Male	5	71
Female	2	29
School Classification		
Freshmen	3	43
Sophomore	3	43
Junior	1	14
Senior	0	0
Disability		
Autism	4	57
Asperger	3	43
Employment		
Part-time Seasonal	4	57
Part-time Continuous	3	43

Instrument

An extensive review of the literature revealed no commercially published or researcher-designed tool specifically able to address the area of focus for this study. For this reason the researcher developed an interview tool designed specifically for this study. The interview tool consisted of 22 open-ended questions, including demographic and employment history. The interview format employed a structured list of questions, which allowed for unscripted follow-up prompts to the participants' responses. Examples of prompts included questions such as "How so?" or "Tell me more about that." (Berg & Mutchnick, 1998). The interview questions were constructed to discern if any sounds, visual images, smells, or touches bothered the participant while at work. The interview tool was reviewed by an expert panel to ensure face validity to ensure that the questions did not include cues or leading questions. A copy of the interview can be found in Appendix B and the informed consent for participants can be found in Appendix C. The following set of questions was used to ascertain perceptions about sensory sensitivities:

- Do any sounds or noises bother you at work? If so, what are they?
- Do any lights or visual images bother you at work? If so, what are they?
- Do any smells at work make you nauseated or make you dizzy? If so, what are they?
- Do you have to touch anything at work that causes you discomfort? If so, what are they?
- Sensory sensitivity coping strategy questions:
- How do you deal with those sounds or noises at work?

- How do you deal with these lights or visual images at work?
- How do you deal with these smells at work?
- How do you deal with having to touch these things at work?
- How did you discover ways to manage the sounds or noises at work?
- How did you discover ways to manage these lights or visual images?
- How did you discover ways to manage these smells at work?
- How did you discover ways to manage these uncomfortable touches?

Data Collection

Prior to beginning the interview session, each participant was provided with an explanation of the study. All participants were over the age of 18 which is considered age of majority in Kentucky, written consent was obtained by students not parents. Each participant was provided with a copy of the signed informed consent that they could share with their parents. All interview sessions were conducted at the center to ensure the participants were comfortable in a familiar surrounding.

The interview process was consistent across all participants. The researcher and participants were introduced by the center director or member of the center staff. Participants were informed that they could stop the interview at any time. The researcher also provided reassurance in advance as well as during the interviews that participants may not have answers for every question. After a few minutes of rapport-building, the formal interview began.

Each interview session lasted about 20 minutes. All interviews were audio recorded to supplement the field notes taken during the interviews. Participants used their own words to describe employment sensory sensitivities experiences, as well as how they

coped with sensory sensitivities. The researcher heard personal explanations of how the participant handled his or her own disability in his or her own words. All materials and interview transcripts were stored in a secure, locked filing cabinet, to ensure confidentiality.

Data Analysis

Following the interviews the audio recordings were transcribed. The identity of each participant was kept confidential through the use of a unique identification number. Interviews were reviewed and emergent themes were identified (Dey, 1993; Richards 2005). A second reviewer completed the same process to ensure that the outcomes were both reliable and valid. The use of a secondary rater also limited the potential for bias in the researcher's interpretation of results. The researcher and the secondary rater agree 93% on theme determination.

The researcher used a hands-on technique to identify the emerging themes. Sheets of paper with labels of "Auditory", "Visual", "Olfactory", and "Tactile" were taped on the wall. Each participant's responses were taped under each appropriate category and organized by themes. Under auditory sensitivities, themes of background noises, and industrial noises emerged. The secondary rater identified a theme of non-industrial noises in the auditory sensitivity category instead of background noises. The two raters met and resolved differences by including non-industrial noises and background noises as themes of auditory sensitivity. Visual sensitivities themes included natural lights and artificial lighting. Olfactory sensitivities themes focused on chemical smells and natural smells. Tactile sensitivities themes identified receptive touches and chemical touches.

Two themes that were noticed in sensory sensitivity accommodations in the workplace involved using mentally proactive approaches such as ignoring the stimulus, and utilizing a physical accommodation (tinted glasses or gloves).

Results

The purpose of this study was to examine how individuals with ASD manage sensory sensitivities at work. The specific objectives of this study were twofold: to determine what sensory sensitivities individuals with ASD were aware of, and to identify the coping strategies and accommodations utilized by individuals with ASD.

Interview data showed that participants were acclimated to the world of work. Jobs held by participants were minimum wage, minimal skill jobs requiring moderate levels of supervision. Employment opportunities were found in offices, an animal shelter, a homeless meals program, a school library, a restaurant, a local major retail outlet store, a pharmacy, and a lifeguard at a pool. Three of the participants worked for one summer, two participants had worked for two summers, and the other two participants had maintained employment for over three years.

Research Question 1. Do college students with ASD identify bothersome stimuli including noises or sounds, lights or visual images, smells, or uncomfortable tactile items in the work environment?

Auditory Sensitivity

Bogdashina (2003) defined auditory sensitivity is evidenced in a person:

May seem deaf at some occasions but hears the slightest sounds at other occasions, covers ears even if there are no loud sounds (seems to hear sounds which other people do not hear), a very light sleeper, produces sounds (banging

doors, tapping things, making vocalizations), cannot concentrate in noisy environments, and speech problems (Bogdashina, 2003, p.130)

Participants working in a more manufacturing setting such as a major retail store and a restaurant identified a sensory sensitivity to industrial noises. Five of the participants reported having an auditory sensitivity; all hypersensitive in nature and none hyposensitive. Through a review of the interviews recurring themes of industrial and non-industrial noises were identified. Two students found industrial, external noises such as forklift beeps, train whistles, and the ringing of the bell tower to be bothersome. One participant acknowledged “siren, loud beeping of certain industrial equipment like forklifts and what not” as a bothersome industrial noise.

Participants working in non-industrial settings including an office, at a swimming pool, a homeless shelter, and a library noted other types of noises. Participants reported being distracted by non-industrial noises or background voices while listening to directions. Two other participants found external non-industrial sounds (rap music and loud music) to be distracting. One participant acknowledged a non-industrial noise as when “Mostly too much noise going on at once. Or I am just having a hard time listening to people. When I am trying to listen to one person when there is a bunch of other people talking.” Two participants stated no auditory sensitivities. Table 2 displays the auditory sensitivity themes.

Table 2

Auditory Sensitivity Themes

Theme	n	%
Industrial noises	2	28.5
Non-industrial noises	3	43.0
None	2	28.5

One participant who categorized industrial noises as an auditory sensitivity was a junior who had worked for one summer. The participant was the oldest and had one of the shortest lengths of employment. This student disclosed training received during school that helped him recognize sensory sensitivities.

Visual Sensitivity

Bogdashina (2003) reported that individuals with visual sensitivity often have trouble concentrating when exposed to fluorescent lighting or bright sunlight. Visual sensitivity themes grouped in the study were artificial lights and natural lights. Three participants reported sensitivity to artificial lights such as computer screens, strobe lights, flashing lights, and fluorescent lights. One participant explained, “You see I usually can’t stand the bright intensity of the fluorescent.” One participant mentioned not having any visual sensitivity, “unless it’s bright sun light, natural light such as sunlight disturbing.” Table 3 represents the visual sensitivity themes.

Table 3

Visual Sensitivity Themes

Themes	n	%
Artificial Lights	3	43
Natural Lights	1	14
None	3	43

Six of the seven participants were employed inside buildings while one participant worked outdoors. The three participants with a sensitivity to artificial light worked in an office, warehouse, and at a pool. The one participant who identified sensitivity to natural light mentioned that it was not work related since his job was inside a building. Three participants related no visual sensitivities.

Olfactory Sensitivity

Volkmar and Wiesner (2007) stated that individuals with olfactory sensitivity will react strongly to smells, perfumes, or food smells. Two olfactory sensory sensitivities recognized were chemical smells (cigarette smoke) and natural smells (foods). Three participants reported olfactory sensitivities. One participant who worked in an office named sensitivity to cigarettes and one participant who worked at major retail store named sensitivity to rotting food. Another participant who reported sensitivity to both cigarette smoke and food worked in a restaurant. The participant who worked in an office setting described intolerance for chemical smells this way: “to be perfectly honest I can not stand cigarette smoke.”

The participant who worked at major retail store described a natural smell as “Expired food products. Sometimes the crates of food would be smashed.” Four students recounted no sensitivity to smell. Table 4 presents the olfactory sensitivity themes.

Table 4

Olfactory Sensitivity Themes

Themes	n	%
Chemical smells	2	28
Natural smells	1	14
None	4	58

Tactile Sensitivity

Individuals with tactile defensiveness cannot bear touching or being touched by items such as various fabrics used in clothing (Volkmar & Wiesner, 2007). Only one aspect of the definition was identified in this study. Three students reported sensitivity to touching items but no sensitivity to being touched. Two students reported sensitivity to touching food or textured boxes. The participant who worked at major retail store described his tactile sensitivity as sometimes. Some boxes at work had an unusual feel to them. And then we had the pallets we had to move around.” One participant stated a different sensitivity to touching food that was handled while clearing tables at a restaurant. One participant reflected about cleaning disinfectants on her hands when she worked in the kennels at the animal shelter. “I swear they made my hands feel really

irritable and dry.” Four students reported no tactile sensitive of which they were aware.

Table 5 relates the different tactile sensitivity themes.

Table 5

Tactile Sensitivity Themes

Themes	n	%
Food	1	14
Boxes	1	14
Cleaning Disinfectant	1	14
None	4	58

Research Question 2: How do college students with ASD manage the sensory stimuli (sounds and noises, lights or visual images, smells, or uncomfortable feeling items) at work?

Accommodations for Audio Sensitivity

Five of the seven participants identified auditory sensitivities; two participants to industrial noises and three students to non-industrial noises. Regardless of whether it was an industrial noise or a non-industrial noise, participants used a mentally proactive approach to cope with their sensory sensitivity. When asked how they dealt with the auditory sensitivities, five of the participants mentioned using proactive approaches such as concentrating, anticipating the noise, keeping busy, adjusting mentally, and “just dealing with it”. Two of the participants mentioned no auditory accommodations at all.

None of the participants mentioned needing or using physical materials such as earplugs or headphones.

Accommodations for Visual Sensitivity

Four of the seven participants reported visual sensitivities; three participants to artificial lights, and one to natural lights. Three participants stated using a proactive approach to coping by adjusting mentally. One participant took a mentally proactive approach to visual sensitivities by walking away from the computer screen or taking headache medicine. The fourth participant used a physical material for coping by wearing glasses with colored lenses that lessened the harshness of fluorescent lights. The participant who reported sensitivity to natural light did not work outside but wore sunglasses. The five other participants stated no need for visual sensitivity accommodations.

Accommodations for Olfactory Sensitivity

Three students reported having an olfactory sensitivity. One student had sensitivity to cigarette smoke. The second student reported sensitivity to rotting food. The third participant reported sensitivity to both cigarette smoke and food. Participants reported using a mentally proactive approach to deal with bothersome smells by holding their breath or just walking away. The student who worked with the smell of rotting fruit in pallets or boxes at major retail store answered that he would: "Just hold my breath and take as little breath as possible." The four other participants mentioned no other smell sensitivity accommodations were needed.

Accommodations for Tactile Sensitivity

Three participants identified having a tactile sensitivity. One student reported sensitivity to feeling chemicals on her hands, but gave no answer for how she coped with this sensitivity. The second student stated sensitivity to feeling unusual boxes at major retail store and reported that wearing gloves would relieve the tactile sensitivity experienced. However, gloves limited dexterity, so he chose not to wear the gloves and instead used a mentally proactive approach of “just handling it as long as possible and just moving on.” The third student identified sensitivity to touching food. This individual used a mentally proactive approach by trying to stay clean when bussing tables at the restaurant. The same participant also used gloves as a physical material provided by his supervisor to collect cigarette butts in the parking lot of the restaurant. For this specific work related activity, wearing gloves was required of all employees. The five other participants did not need accommodations for tactile sensitivity.

Summary and Discussion

The purpose of this study was to examine how individuals with ASD managed sensory sensitivities at work. The specific objectives of this study were twofold: to determine whether individuals with ASD were aware of their own sensory sensitivities, and to identify the coping strategies and accommodations utilized.

Seven participants took part in the face to face qualitative interviews. Recurring auditory sensitivity themes were industrial noises and non-industrial noises. Visual sensitivity themes grouped in the study were artificial lights and natural lights. Olfactory sensory sensitivities recognized were chemical smells and natural smells. Tactile sensitivities were the feeling of unusual boxes, and the feeling of cleaning disinfectants on hands.

Of the seven college students, five reported concerns with experiencing auditory sensory sensitivity to industrial external noises such as forklift beeps, train whistles, and the ringing of the bell tower. Three participants reported being distracted by non-industrial noises such as background voices and/or rap music and loud music. Three of the seven participants reported visual sensitivity to artificial lights associated with computer screens, strobe lights, flashing lights, and/or fluorescent lights. One participant mentioned natural light, including sunlight, as disturbing. Two of the seven participants reported sensitivity to chemical smells including the smell of cigarette smoke. Two also identified natural smells, such as rotting food or the smell of grease, as annoying. A receptive sensitivity in relation to touching food or unusual feeling boxes was reported by two individuals. One student reported a chemical tactile sensitivity to disinfectants.

Sensitivity accommodation themes focused on using a mentally proactive approach or using physical materials, such as earplugs, gloves, or tinted glasses. Mentally proactive approaches were described as concentrating, anticipating the noise, keeping busy, adjusting mentally, and “just dealing with it”. One participant used physical materials for his visual sensitivity by wearing glasses with colored lenses that reduced the harshness of fluorescent lights. For olfactory sensory sensitivity accommodation students described holding their breath or walking away. A tactile sensory accommodation technique used by one student was to try to stay clean.

This study found types of employment and length of employment important factors. Type of employment seemed to be a factor in whether the participant experienced sensory sensitivities and utilized coping strategies. Employment opportunities were offices, the animal shelter, a homeless meals program, a school library, a restaurant, a local major retail store, a pharmacy, and as a lifeguard at a pool.

The type of employment performed did prompt different kinds of sensory sensitivity. These sensitivities might not have been so prevalent if the work setting was different. For example, a bus boy in a restaurant with a sensitivity to smell had to deal with disposed food. If the student with sensitivity to touching food had a different job at the place of business or another place of business, he/she might not have been aware of the tactile sensitivity.

Two participants with sensitivity to chemical smells such as cigarette smoke and restaurant grease worked inside buildings. If they worked in a job outdoors or at a business that did not allow smoking, they would not have been disturbed by the cigarette

smoke. The participant with sensitivity to the smell of grease might need to avoid work in food services.

The length of employment and time spent in an educational setting was relevant to the outcome of the study. Participants who worked the longest length of time were able to describe more sensory sensitivities and coping strategies. Students with little job experience may have participated in more educational supports for ASD and sensory sensitivities before attempting employment. One participant identified industrial noises as an auditory sensitivity, sensitivity to fluorescent lights as a visual sensitivity, and a tactile sensitivity to unusual feeling boxes, was a junior who had worked for only one summer. This student disclosed training received during school that helped him recognize sensory sensitivities and was the oldest of the participants and had one of the shortest employment histories. The participant's short length of employment may be due to staying in an educational setting before starting work or may be due to having difficulty finding employment due to his awareness of his three different sensory sensitivities, which was more than any of the other participants.

This study found that when the participants were first asked about sensitivities, the participants did not reveal any known sensitivities. When questioned further, however, the participants discussed sensory sensitivities in the work places and strategies they used to cope with them. Dunn (2001) described a similar behavior and stated that individuals with sensory sensitivities were often passive about sensory needs. The researcher found that many of the participants seemed unaware of the noises, lights, smells, or tactile sensations that were bothersome and had learned coping strategies for the workplace that were beneficial. Baranek et al. (2006) explained that people with

sensory sensitivities acquire coping strategies as they age. The students may have learned these coping strategies after acquiring experiences on the job.

There were multiple responses to the question, “How do you deal with those sounds or noises at work?” Participant# 4 stated that loud noises could be anticipated, and Participant #6 took steps to insulate him from the noise. “Eventually I just learned to ignore them. Just learning to anticipate them I suppose. Keep myself busy.” Participant #2 had a different approach to loud noises by ignoring external noises and concentrating on the work at hand. Participant #3 stated that when confronted with noise, ignoring the distraction and working harder was effective. When given examples of noises that were bothersome, Participant #6 explained how he focused and blocked out loud music in the dorm room. “I don’t know, I can flush that stuff out if I have to. That is how I get work done, I put myself in a void, where everything else blanks out and I focus on one thing. Time flies and I don’t even notice.” By focusing and blocking out the loud music, the participant utilized a mentally proactive approach to cope and demonstrated a self-regulating sensory modulation. Participant #6 did not have help from supervisors to provide physical accommodations; instead he made a mental game of ignoring the stimulus and mentally regulating his senses.

The strategies employed by the participants in the current study support the findings of Jones, Quigley, and Huws (2003). The most prominent coping mechanism for individuals with ASD was “shutting out the outside world, and entering their own inner tranquil one” (Jones et al., 2003, p.117). The current research not only confirmed the findings of Jones et al., (2003), but also determined the use of coping strategies as an important finding.

Limitations can be found in this project. The small sample was limited to the availability of the few college students attending one southeast university who had previous work experience. Subjects were selected for interviews which result in a lack of randomness and generalizability of the findings.

Recommendations and Conclusion

This study draws attention to the need for further research in self-advocacy and employment for individuals with ASD. Future research needs to focus on how the typical individual with ASD self-advocates and uses self-determination to adapt to sensory sensitivity needs. An important part of special education today is teaching self-determination. Self-determination involves promoting the knowledge, skills, and attitudes students will manage for themselves, as well as how to advocate for their own needs (Fields, 1996). Schloss, Alper, & Jayne (1994) said that self-determination is immersed in the concepts of mainstreaming and independence. Self-determination is described as empowering skills that embrace unique capabilities (Fields, 1996; Schloss et al., 1994; Wehmeyer, Agran, & Hughes, 1998).

Much research has focused on educational needs of children with ASD's; however, more research should be centered on the sensory sensitivities of adults with ASD and coping skills in the workplace. Future research should focus on older individuals with ASD about self-advocacy, self regulation, and accommodations in the work place. Future research could explore the availability of work for individuals with ASD and sensory sensitivities. Why are individuals with ASD not working at this time? Is school adequately preparing students with ASD who have sensory sensitivities adequately for the workplace? Surprisingly, workers with ASD cope with all the issues in

the workplace, including their sensory sensitivities, and do without complaint or added attention from supervisors. Additional longitudinal studies to explore the work experiences of individuals with ASD and coping strategies in regards of sensory sensitivity is needed.

References

- Aarons, M., & Gittens, T. (1999). *The Handbook of autism: A guide for parents and professionals*. (4th ed.). London: Routledge.
- Acker, R., Loncola, J., & Acker, E. (2005). Rett Syndrome: A pervasive developmental disorder. In F.R. Volkmar, R. Paul, A. Klin, & D. Cohen (3rd Ed.), *Handbook of autism and pervasive developmental disorders Vol. 1. Diagnosis, development, neurobiology, and behavior*. (pp.126-164). Hoboken, NJ: John Wiley & Sons.
- American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington D.C: Author.
- Baranek, G.T., Foster, L.G., & Berkson, G. (1997). Tactile defensiveness and stereotyped behaviors. *American Journal of Occupational Therapy*, 51, 91-95.
- Baranek, G.T. (2002). Efficacy of sensory and motor interventions for children with autism. *Journal of Autism and Developmental Disorders*, 32, 397-422. doi: 0162-3257/02/1000-0397/0
- Baranek, G.T., David, F., Poe, M., Stone, W., & Watson, L. (2006). Sensory experience questionnaire: Discriminating sensory features in young children with autism, developmental delays, and typical development. *Journal of Child Psychology And Psychiatry*, 47, 591-601. doi: 10.1111/j.1469-7610.2005.01546.x
- Barnhill, F. (2007). Outcomes in adults with asperger syndrome. *Focus on Autism & Other Developmental Disabilities*, 22 (2), 116-126.
- Barrett, M. (2006). "Like dynamite going off in my ears": Using autobiographical accounts of autism with teaching professionals. *Educational Psychology in Practice*, 22, 95-110.

- Berg, B., & Mutchnick, R. (1996). *Research methods for the social sciences: Practice and applications*. Needham Heights, MA: Allyn & Bacon.
- Ben-Sasson, A., Hen, L., Fluss, R., Cermak, S., Engel-Yeger, B., & Gal, E. (2009). A meta-analysis of sensory modulation symptoms in individuals with autism spectrum disorders. *Journal for Autism Developmental Disorders*, 39(1), 1-11. doi 10.1007/s10803-008-0593-3
- Blakemore, S., Tavassoli, T., Calo, S., & Thomas, R. (2005). Tactile sensitivity in aspergers syndrome. *Journal of Autism and Developmental Disorders*, 38, 127-137.
- Bogdashina, O. (2003). *Sensory perceptual issues in autism and asperger syndrome: Different sensory experiences different perceptual worlds*. London: Jessica Kingsley.
- Buitelaar, J., & Gaag, R. (1998). Diagnostic rules for children with PDD-NOS and multiple complex developmental disorder. *Journal of Child Psychology and Psychiatry*, 39, 911-919.
- Capo, L.C. (2000). Autism, employment, and the role of occupational therapy. *Work: A Journal of Prevention Assessment and Rehabilitation*, 16 (3), 201-7.
- Carter, E., Ditchman, N., Sun, Y., Trainor, A., Swedeen, B., & Owens, L. (2010). Summer employment and community experiences of transition-age youth with severe disabilities. *Exceptional Children*, 76, 194-212.
- Cascio, C., McGlone, F., Folger, S., Tannan, V., Baranek, G., Pelphrey, K., & Essick, G. (2008). Tactile perception in adults with autism: A multidimensional psychophysiological study. *Journal of Autism and Developmental Disorders*,

38, 127-137. doi: 10.1007/s10803-007-0370-8

Center for Disease Control. (2006). *Mental health in the United States: Parental report of diagnosed autism in children aged 4 – 17 years in the United States, 2003 – 2004*. 55(17), 481– 486.

Cheseboro, J., & Borisoff, D. (2007). What makes qualitative research qualitative? *Qualitative Research Reports in Communication*, 8(1), 3-14. doi: 10.1080/117459430701617846

Cone, J., & Foster, S. (2006). *Dissertations and theses from start to finish: Psychology and related fields*. (2nd Ed.). Washington D.C.: American Psychology Association.

Dey, I. (1993). *Qualitative data analysis: A user-friendly guide for social scientists*. London: Routledge.

Dunn, W. (1999). *Sensory profile*. San Antonio, TX: The Psychological Corporation.

Dunn, W. (2001). The sensations of everyday life: Empirical, theoretical, and pragmatic considerations. *Canadian Journal of Occupational Therapy*, 55, 608-620.

Fields, S. (1996). Self-determination instructional strategies for youth with learning disabilities. *Journal of Learning Disabilities*, 29, 40–52.

Green, V.A., Pituch, K.A., Itchon, J., Choi, A., O'Reilly, M., & Sigasfoos, J. (2006). Internet survey of treatments used by parents of children with autism. *Research in Developmental Disabilities*, 27, 70–84.

Greenspan, S. (2006). Understanding sensory sensitivity. *Scholastic Parent & Child*, April, 36 -37.

- Hagner, D., & Cooney, B. (2005). "I do that for everybody": Supervising employees with autism. *Focus on Autism & Other Developmental Disabilities*, 20, 91-97.
- Iarocci, G., & McDonald, J. (2006). Sensory integration and the perceptual experience of persons with autism. *Journal of Autism and Developmental Disorders*, 36 (1), 77-90. doi: 0162-3257/06/0100-0077/0
- Jones, R., Quigney, C., & Huws, J.C. (2003). First-hand accounts of sensory perceptual experiences in autism: A qualitative analysis. *Journal of Intellectual & Developmental Disability*, 28, 112-121. doi: 10.1080/136682503/000/47058
- Koning, C., & McGill-Evans, J. (2001). Social language skills in adolescent boys with asperger syndrome. *Autism: The International Journal of Research and Practice*, 5, 23-26.
- Leekam, S., Nieto, C., Libby, S., Wing, L., & Gould, J. (2007). Describing the sensory abnormalities of children and adults with autism. *Journal of Autism Developmental Disorder*, 37, 894-910. doi: 10.1007/s10803-006-0218-7
- Lane, S. J. , & Miller, L.J., (2000). Towards a consensus in terminology in sensory integration theory and practice: Part I: Toxonomy of neurophysiological processes. *Sensory Integration Special Interest Section*, 23(1), 1-4.
- Miller, L.J., Anzalone, M.E., Lane, S.J., Cermak, S.A., & Osten, E.T. (2007). Concept evolution in sensory integration: A proposed nosology for diagnosis. *American Journal of Occupational Therapy*, 61, 135–140.
- Minshew, N., & Hobson, J. (2008). Sensory sensitivities and performance on sensory perceptual tasks in high functioning individuals with autism. *Journal of*

Autism and Developmental Disorders, 38(8), 1485-1498. doi: 10.1007/s10803-007-0528-4

Muller, E., Schuler, A., Burton, B.A., & Yates, G.B. (2003). Meeting the vocational support needs of individuals with asperger syndrome and other autism spectrum disabilities. *Journal of Vocational Rehabilitation*, 18, 163-75.

Mulligan, S. (1996). An analysis of score patterns of children with attention disorders on the sensory integration and praxis tests. *American Journal of Occupational Therapy*, 50, 647-654.

Myles, B.S., & Simpson, R.L. (2002). Asperger Syndrome: An overview of characteristics focus on autism and other developmental disabilities. *Focus on Autism and Other Developmental Disabilities*, 17, 132-137.

Myles, B.S., & Southwick, J. (1999). *Asperger syndrome and difficult moments: Practical solutions for tantrums, rages, and meltdowns*. Shawnee Mission, KS: AAPC.

Ozonoff, S., Rogers, S.J., & Pennington, B.F. (1991). Executive function deficits in high functioning autistic individuals: Relationship to theory of mind. *Journal of Child Psychology and Psychiatry*, 32, 1081-1106.

Portway, S., & Johnson, B. (2005). Do you know I have Asperger's Syndrome? Risks of a non-obvious disability. *Health, Risk, and Society*, 7, 73-83. doi: 10.1080/0950083050042086

Richards, L. (2005). *Handling qualitative data: A practical guide*. Thousand Oaks, CA: Sage.

Schaaf, R., & Miller, L. (2005). Occupational therapy using a sensory integrative

- approach for children with developmental disabilities. *Mental Retardation and Developmental Disabilities Research Reviews*, 11, 143-148. doi: 10.1002/mrdd.20067
- Schaaf, R., & Miller, L. (2009). Sensory integrative therapy for children with autism. *Journal of Autism Developmental Disorders*, 39, 1099-1111.
- Schloss, P., Alper, S., & Jayne, D. (1994). Self-determination for persons with disabilities: Choice, risk, and dignity. *Exceptional Children*, 60, 215-225.
- Smith, T., Mruzek, D.W., & Mozingo, D. (2005). Sensory integrative therapy. In J.W. Jacobson, R.M. Foxx, & S.A. Mulick (Eds.), *Controversial therapies for developmental disabilities: Fad, fashion, and science, in professional practice* (pp. 331-350). Mahwah, NJ: Lawrence Erlbaum.
- Stephenson, J., & Carter, M. (2009). The use of weighted vests with children with autism spectrum disorders and other disabilities. *Journal of Autism Developmental Disorders*, 39, 105–114.
- Talay-Ongan, A., & Wood, K. (2000). Unusual sensory sensitivities in autism: A possible crossroads. *International Journal of Disability, Development, and Education*, 47,(2), 201-211.
- Tomchek, S.D., & Dunn, W. (2007). Sensory processing in children with and without autism: A comparative study using the short sensory profile. *The American Journal of Occupational Therapy*, 61(2), 190 -200.
- Towbin, K. (2005). Pervasive developmental disorder not otherwise specified. In F.R.Volkmar, R. Paul, A. Klin, & D. Cohen (3rd Ed.), *Handbook of autism and pervasive developmental disorders Vol. 1. Diagnosis, development,*

- neurobiology, and behavior* (pp.165-200). Hoboken, NJ: John Wiley & Sons.
- Van-Wieren, T., Reid, C., & McHahon, B. (2008). Workplace discrimination and autism spectrum disorder: The national EEOC Americans with disabilities act research project. *WORK: A Journal of Prevention, Assessment and Rehabilitation*, 31(3), 299-308.
- Volkmar, F., Koenig, K., & State, M. (2005). Childhood disintegrative disorder. In F.R. Volkmar, R. Paul, A. Klin, & D. Cohen (3rd Ed.), *Handbook of autism and pervasive developmental disorders Vol. 1: Diagnosis, development, neurobiology, and behavior* (pp.70-87). Hoboken, NJ: John Wiley & Sons.
- Volkmar, R. Paul, A. Klin, & D. Cohen (3rd Ed.). (2005). *Handbook of autism and pervasive developmental disorders Vol. 1: Diagnosis, development, neurobiology, and behavior* (pp.70-87). Hoboken, NJ: John Wiley & Sons.
- Volkmar, F., & Wiesner, L. (2007). *A practical guide to autism. What every parent, family member, and teacher needs to know*. Hoboken, NJ: John Wiley & Sons, Inc.
- Wehmeyer, M.L., Agran, M., & Hughes, C. (1998). *Teaching self-determination to students with disabilities: Basic skills for successful transitions*. Baltimore, MD: Paul H. Brookes.
- Wing, L. (1992). Manifestations of social problems in high functioning autistic people. In E. Schopler & G. B. Mesilov (Eds.), *High functioning individuals with autism*.

New York: Plenum Press.

Wysocki, D., & Neulicht, A. (1998). Adults with developmental disabilities and work.

In Ross, M, Bachner, S. (Eds.), *Adults with developmental disabilities: Current*

approaches in occupational therapy (pp.45-60). American Occupational Therapy

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In future correspondence, please refer to HS10-269, April 23, 2010

Amy Fogle Stiff
c/o Dr. Patti Whetstone
School of Teacher Educational
WKU

Amy Fogle Stiff:


Your research project, *Autism Spectrum Disorder Sensory Needs in the Workplace*, was reviewed by the HSRB and it has been determined that risks to subjects are: (1) minimized and reasonable; and that (2) research procedures are consistent with a sound research design and do not expose the subjects to unnecessary risk. Reviewers determined that: (1) benefits to subjects are considered along with the importance of the topic and that outcomes are reasonable; (2) selection of subjects is equitable; and (3) the purposes of the research and the research setting is amenable to subjects' welfare and producing desired outcomes; that indications of coercion or prejudice are absent, and that participation is clearly voluntary.

1. In addition, the IRB found that you need to orient participants as follows: (1) signed informed consent is required; (2) Provision is made for collecting, using and storing data in a manner that protects the safety and privacy of the subjects and the confidentiality of the data. (3) Appropriate safeguards are included to protect the rights and welfare of the subjects.

This project is therefore approved at the Expedited Review Level until May 20, 2010.

2. Please note that the institution is not responsible for any actions regarding this protocol before approval. If you expand the project at a later date to use other instruments please re-apply. Copies of your request for human subjects review, your application, and this approval, are maintained in the Office of Sponsored Programs at the above address. Please report any changes to this approved protocol to this office. A Continuing Review protocol will be sent to you in the future to determine the status of the project. Also, please use the stamped approval forms to assure participants of compliance with The Office of Human Research Protections regulations.

Sincerely,


Paul J. Mooney, M.S.T.M.
Compliance Coordinator
Office of Sponsored Programs
Western Kentucky University



cc: HS file number Stiff HS10-269

HSRB APPLICATION # 10-265
APPROVED 4/23/10 to 5/20/10
EXEMPT EXPEDITED FULL BOARD
DATE APPROVED 4/23/10

The Spirit Makes the Master

Office of Sponsored Programs | Western Kentucky University | 1906 College Heights Blvd. #11026 | Bowling Green, KY 42101-1026
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Informed Consent Form

Project Title: Autism Spectrum Disorder Sensory Needs in the Workplace

Investigator: Amy Fogle Stiff, Interdisciplinary Program Department, (270) 316-0465



You are being asked to participate in a project conducted through Western Kentucky University.

The University requires that you give your signed agreement to participate in this project.

The investigator will explain to you in detail the purpose of the project, the procedures to be used, and the potential benefits and possible risks of participation. You may ask him/her any questions you have to help you understand the project. A basic explanation of the project is written below. Please read this explanation and discuss with the researcher any questions you may have.

If you then decide to participate in the project, please sign on the last page of this form in the presence of the person who explained the project to you. You should be given a copy of this form to keep.

1.Nature and Purpose of the Project: The purpose of this study is to investigate how college students identified with ASD manage the accommodations needed for their sensory sensitivity needs in the workplace. This research is being conducted in an effort to fulfill the requirements for the completion of a Master of Art in Education in Behavioral Science Studies.

2.Explanation of Procedures: You will be asked several questions regarding the research topic-your story. Your responses will be recorded on a digital recorder if you participate in in-depth interviews or on paper or e-mail if you participate in completing a formal survey. These questions will be of a personal nature.

3.Discomfort and Risks: There are no foreseen risks to the participant.

4.Benefits: The possible benefit of this study to respondents such as yourself may be knowing that your story will be used in an effort to education others more in the study of Autism Spectrum Disorder.

5.Confidentiality: Confidentiality of your identity is guaranteed. Your name will not be used anywhere other than on this consent form which will be seen only by me. Pseudonyms, or a name other than you own that cannot be related back to you, will be used in all places where names are necessary.

6.Refusal/Withdrawal: You are voluntarily participating. You are free to refuse to answer any questions, or end the interview at any time. Refusing to participate in the interview or completing the interview will not lead to any consequence from the University.

HSRB APPLICATION # 10-269

APPROVED 4/23/10 to 5/20/10

EXEMPT EXPEDITED FULL BOARD

Refusal to participate in this study will have no effect on any future services you may be entitled to from the University. Anyone who agrees to participate in this study is free to withdraw from the study at any time with no penalty.

You understand also that it is not possible to identify all potential risks in an experimental procedure, and you believe that reasonable safeguards have been taken to minimize both the known and potential but unknown risks.

Audio Recording of Participant: Audio recording devices will be used for the interview. All recordings will be kept and maintained in a locked file cabinet in the research sponsor's office. Please initial to consent to audio recordings _____

Signature of Participant

Date

Witness

Date

THE DATED APPROVAL ON THIS CONSENT FORM INDICATES THAT
THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY
THE WESTERN KENTUCKY UNIVERSITY HUMAN SUBJECTS REVIEW BOARD
Paul Mooney, Compliance Coordinator
TELEPHONE: (270) 745-4652



HSRB APPLICATION # 10-269
APPROVED 4/23/10 to 5/20/10
EXEMPT EXPEDITED FULL BOARD
DATE APPROVED 4/23/10

WESTERN KENTUCKY UNIVERSITY

Human Subjects of Research Review Board
Continuing Review Report

NOTE: This completed, signed report must be returned to the Office of Sponsored Programs within 30 days of receipt. If not, the approval for this project WILL terminate on the expiration date and a new application must be approved before data collection may continue.

The Office for Human Subjects of Research Protection (OHRP) Reports, Number 95-01, January 10, 1995, Human Subject Protections reminds institutional officials and IRB Chairs of their responsibilities in continuing review of research activities under Department of Health and Human Services (HHS) Regulations, Title 45 Code of Federal Regulations Part 46 (45 CFR 46). Section 46.109(e) of 45 CFR 46 states that "an IRB shall conduct continuing review covered by this policy at intervals appropriate to the degree of risk, but not less than once per year . . ."

Continuing review must be substantive and meaningful. Review by the convened IRB, with recorded vote, is required unless the research is otherwise appropriate for expedited review under Section 46.110. Ordinarily, if your research did not qualify for expedited review at the time of initial review, it does not qualify for expedited review at the time of continuing review. It is also possible that research activities that were previously judged as exempt in accordance with Section 46.101(b), or were qualified for expedited review in accordance with Section 46.110, have changed or will change, such that other than expedited IRB review is now required.

OHRP interprets "not less than once per year" review to mean on or before the 1-year anniversary date of the **previous IRB review** required by 45 CFR 46, even though the research activity may not begin until some time after the IRB has given approval.

To comply with the above-referenced policy, the WKU IRB has prepared the following report format to facilitate your annual continuing review report. Please complete the report and attach any information you think is needed to define any planned changes in the conduct of your study, since these may affect the protection of human subjects. The WKU IRB will review your minor proposed changes for your previously approved research in an expedited manner prior to the scheduled continuing review date in accordance with Section 46.110. When you propose a change in your research study that is not minor, then the IRB must review and approve changes at its monthly meeting before your changes can be implemented. The only exception is the rare circumstance in which a change is necessary to eliminate apparent immediate hazards to the research subjects. If this happens to your research study, please promptly inform the IRB of the change you made following its implementation. The IRB will review the change to determine that it is consistent with protection of human subjects. Unanticipated risks to subjects or new information that may affect the risk/benefit assessment you defined in your approved application must be promptly reported to, and reviewed by, the IRB to ensure adequate protection of human subjects.

The WKU IRB wants to know if your information is still accurate and complete. You may do this by completing the information below and on the back and attach any additional information you think suitable to explain changes in your study. If this is your third Continuing Review Request, please complete a new application. Please return this document with any attachments you may have to the Office of Sponsored Programs, 301 Potter Hall. If you have questions please call 4652.

WESTERN KENTUCKY UNIVERSITY
Human Subjects of Research Review Board
Continuing Review Report

If this is your third year for your Continuing Review Request, please complete a new application.

Application Number:		
Date of Original IRB Approval:		
Level of Approval (Previous Level):	<input type="checkbox"/> Exempt	<input type="checkbox"/> Expedited <input type="checkbox"/> Full Board
Was the project minimum risk or above?	<input type="checkbox"/> Minimum Risk	<input type="checkbox"/> Above Minimum Risk
<small>(If "Above" HSRB Chair and one other HSRB reviewer may determine whether the PI needs to appear before the HSRB).</small>		
Name of Project:		
Name of Researcher:	CITIProgram.org Training - Yes / No	
Department:	Date:	<i>required 6/1/2009</i>

How many total subjects have participated in the study since its inception? # _____

How many subjects have participated in the project since the last review? # _____

Is your data collection with human subjects complete? ☐ Yes ☐ No
 (If "Yes", please sign below and return to the Office of Sponsored Programs, Room 301, Potter Hall. If "No", please respond to the questions below, sign and return).

1. Has there been any change in the level of risks to human subjects?
 (If "Yes", please explain changes on a separate sheet). ☐ Yes ☐ No
2. Have informed consent procedures changed so as to put subjects
 above minimal risk? (If "Yes", please describe on a separate sheet). ☐ Yes ☐ No
3. Have any subjects withdrawn from the research due to adverse
 events or any unanticipated risks/problems? (If "Yes", please describe
 on a separate sheet). ☐ Yes ☐ No
4. Have there been any changes to the source(s) of subjects and the
 Selection criteria? (If "Yes", please describe on a separate sheet). ☐ Yes ☐ No
5. Have there been any changes to your research design that were not
 specified in your application, including the frequency, duration and
 location of each procedure. (If "Yes", please describe on a
 separate sheet). ☐ Yes ☐ No
6. Has there been any change to the way in which confidentiality of the
 Data is maintained? (If "Yes", please describe on a separate sheet). ☐ Yes ☐ No
7. On what date do you anticipate data collection with human subjects to be completed? _____

_____ (Print)	_____ Signature of Principal Investigator	_____ Date
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HSRB Approvals:

_____ Signature of Reviewer	_____ Date
_____ Signature of Reviewer	_____ Date

Appendix B

Informed Consent Form

Project Title: Autism Spectrum Disorder Sensory Needs in the Workplace

Investigator: Amy Fogle Stiff, Interdisciplinary Program Department, (270) 316-0465

You are being asked to participate in a project conducted through Western Kentucky University. The University requires that you give your signed agreement to participate in this project.

The investigator will explain to you in detail the purpose of the project, the procedures to be used, and the potential benefits and possible risks of participation. You may ask him/her any questions you have to help you understand the project. A basic explanation of the project is written below. Please read this explanation and discuss with the researcher any questions you may have.

If you then decide to participate in the project, please sign on the last page of this form in the presence of the person who explained the project to you. You should be given a copy of this form to keep.

1.Nature and Purpose of the Project: The purpose of this study is to investigate how college students identified with ASD manage the accommodations needed for their sensory sensitivity needs in the workplace. This research is being conducted in an effort to fulfill the requirements for the completion of a Master of Art in Education in Behavioral Science Studies.

2.Explanation of Procedures: You will be asked several questions regarding the research topic-your story. Your responses will be recorded on a digital recorder if you participate in in-depth interviews or on paper or e-mail if you participate in completing a formal survey. These questions will be of a personal nature.

3.Discomfort and Risks: There are no foreseen risks to the participant.

4.Benefits: The possible benefit of this study to respondents such as yourself may be knowing that your story will be used in an effort to education others more in the study of Autism Spectrum Disorder.

5.Confidentiality: Confidentiality of your identity is guaranteed. Your name will not be used anywhere other than on this consent form which will be seen only by me.

Pseudonyms, or a name other than you own that cannot be related back to you, will be used in all places where names are necessary.

6. Audio Recording of Participant: Audio recording devices will be used for the interview. All recordings will be kept and maintained in a locked file cabinet in the researcher's home office.

7. Refusal/Withdrawal: You are voluntarily participating. You are free to refuse to answer any questions, or end the interview at any time. Refusing to participate in the interview or completing the interview will not lead to any consequence from the University.

Refusal to participate in this study will have no effect on any future services you may be entitled to from the University. Anyone who agrees to participate in this study is free to withdraw from the study at any time with no penalty.

You understand also that it is not possible to identify all potential risks in an experimental procedure, and you believe that reasonable safeguards have been taken to minimize both the known and potential but unknown risks.

Signature of Participant

Date

Witness

Date

THE DATED APPROVAL ON THIS CONSENT FORM INDICATES THAT
THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY
THE WESTERN KENTUCKY UNIVERSITY HUMAN SUBJECTS REVIEW BOARD

Paul Mooney, Compliance Coordinator

TELEPHONE: (270) 745-4652

Appendix C

Interview Protocol

Interviewee:

Interviewer: Amy Fogle Stiff

Date:

Purpose of the Interview: I am a graduate student at WKU writing my master's thesis on accommodations needed for individuals with Autism Spectrum Disorder in the workplace.

Comfort: Are you comfortable?

Informed Consent: I have been approved to do this study by WKU, and I have to follow strict guidelines when conducting this interview and to maintain your privacy. I want to assure you that everything you say here will be kept confidential. I will not tell anyone what you said. I will not use your real name when I write my paper to protect your identity and your privacy. Here is a copy of the consent form for this study. Take a minute to review it and I would ask you to sign at the bottom. The interview will last 30 minutes, and I will be audio-taping it. In addition to tape recording this interview I will be notes.

Questions for the Master's Thesis

DEMOGRAPHICS

How old are you?

Do you have a disability? If so, what?

Do you have a job?

Describe your job – what do you do when you go to work?

How long have you worked there?

What makes your job enjoyable?

What makes your job difficult?

What would make your job easier for you?

AUDITORY SENSITIVITY

Do any sounds or noises bother you at work? If so, what are they?

How do you deal with those sounds or noises at work?

How did you discover ways to manage the sounds or noises at work?

VISUAL SENSITIVITY

Do any lights or visual images bother you at work? If so, what are they?

How do you deal with these lights or visual images at work?

How did you discover ways to manage these lights or visual images?

SMELL SENSITIVITY

Do any smells at work make you nauseated or make you dizzy? If so, what are they?

How do you deal with these smells at work?

How did you discover ways to manage this smells?

TACTILE SENSITIVITY

Do you have to touch anything at work that causes you discomfort? If so, what are they?

How do you deal with having to touch these things at work?

How did you discover ways to manage these uncomfortable touches?

CLOSING: Thank you for taking the time to answer my questions. I will be writing up the results of my study and presenting it to my committee. You have the right to

withdraw your responses if at any time you change your mind and do not want your information to be used as part of my research. On your copy of the Informed Consent Form is my contact information which you can use to contact me about my research.

Thanks and Good Bye

