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# Studying with Successful Sensory Environments: A Pilot Study

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STUDYING WITH SUCCESSFUL SENSORY ENVIRONMENTS: A PILOT STUDY

by

Katrina Kotta

Master of Occupational Therapy

University of North Dakota

2016

Advisor: Sarah Nielsen, PhD, OTR/L

An Independent Study

Submitted to the Occupational Therapy Department

of the

University of North Dakota

In partial fulfillment of the requirements

for the degree of

Master of Occupational Therapy

Grand Forks, North Dakota

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This Independent Study Paper, submitted by Katrina Kotta in fulfillment of the requirement for the Degree of Master of Occupational Therapy from the College of Graduate Studies at the University of North Dakota, has been read by the Faculty Advisor under whom the work has been done and is hereby approved.

*Janet Nielson, PhD OTR/L*

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Signature of Faculty Advisor

12-1-15

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Date

PERMISSION

Title                      Studying With Successful Sensory Environments: A Pilot Study  
Department              Occupational Therapy  
Degree                     Master of Occupational Therapy

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Katrina M. Kotta

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## ABSTRACT

**Background/Purpose:** Higher education institutions are facing pressure by state and federal authorities to retain and efficiently graduate students. The University of North Dakota (UND) has responded by implementing initiatives in light of declining retention rates within recent years. University of North Dakota's approach focused on best teaching practices and classroom learning approaches versus individualized student programs for academic success. *Studying With Successful Sensory Environments* (SWSSE) is an individualized approach created within occupational therapy, which focuses on effective management of the environment through knowledge of sensory processing patterns to enhance focus and productivity in higher education. The purpose of this study was to pilot and refine SWSSE.

**Methodology:** Chen's (2005) Formative Evaluation Approach is a six-step method utilized to determine the usefulness of each step and formulate solutions to problems identified. Information was obtained through the use of participant surveys, therapist surveys, and therapist reflections. Four UND students who met inclusion criteria participated in this study. Approval from the UND Institutional Review Board was obtained.

**Findings:** Major findings within the study include: (a) changing from a 6-step process to a 5-step process by combining the first and second sessions, (b) program flow chart and sensory profile results template creation to guide analysis and dissemination of assessment results, and (c) coaching methodology was instrumental for effective implementation of the program. Future research recommendations include pilot effectiveness studies on *Studying With Successful Sensory Environments 2.0* and pilot projects for application within other environments.

## **CHAPTER 1**

### **INTRODUCTION**

Multiple factors at the federal, state, and local levels have impacted colleges and universities by placing higher reliance on statistics related to retention and graduation rates for students as a way to distribute funds based on success in these areas. According to the Spellings Report (2006) for the Future of Higher Education, the United States ranks 12<sup>th</sup> overall in the world in regards to the quality of higher education opportunities for personal and professional growth. This is concerning as the American education was once prestigious in the eyes of other countries and due to funding deficits and increased cost of tuition, new ideas have been cultivated to form a sustainable solution within higher education (US Department of Education, 2014). Within the federal government, there have been shifts to provide funding based on academic achievements and retention of students making these statistics more important within the higher education atmosphere (US Department of Education, 2014). Due to recent economic times, this increases pressure at the state level for funding as well.

The state of North Dakota is aiming to follow suit with the federal government by implementing protocols and standards for universities to provide yearly reports of their rates of retention and graduation. Specifically, the North Dakota University System (2013c) has set specific goals to accomplish, which include: a) 15% increase in retention and graduation rates at research institutions, b) 10% increase in retention and graduation rates for comprehensive universities, c) increase their national ranking by ten points, and

d) to increase their partnerships with corporations (North Dakota University System, 2013c). Retention rates at the University of North Dakota (UND) within the freshman as well as transfer student populations have declined in recent years (Office of Institutional Research, 2013b; Office of Institutional Research, 2013c). This creates a difficult situation for the university as their main sources of funding as a public institution are from the state of North Dakota.

In response to recent declines in retention, UND has implemented several initiatives in order to increase retention rates. Some examples include the incorporation of the Student-Centered Active Learning Environment for Undergraduate Programs (SCALE-UP) classroom, living-learning communities (LLC), updating of various academic and living facilities around campus (such as the Wilkerson Dining Center, Memorial Union, and the medical school) and special programming by the Student Success Center during the first part of the semester focused on academic tips for college success (Kelsch, 2014). As a result, an increase in enrollment of the freshman classes has been shown within the past 4 years from 12,877 in 2011 to 13,816 in 2015, the average freshman grade point average has gone from 3.33 in 2012 to 3.4 in 2015, and retention rates have risen from 74% in 2012 to 81.3% in 2015 for the spring semester (UND, 2015a, UND, 2015b). Sol Jensen, Vice President of Enrollment Services states that this increase in quality and quantity of students is the result of “strategic practices focused on recruiting the very best students” (Johnson, 2015, ¶1). However, retention of the freshman dropped from 92% in the fall of 2014 to the 81.3% in the spring semester of 2015 (UND, 2015a, UND, 2015b). This indicates that while the University is improving in their ability to have students who are “expected to be the most

academically qualified (based on average high school GPA and ACT scores) class” as stated by Sol Jensen, they are still not able to retain them from semester to semester (Johnson, 2015, ¶1). While the university has been successful in focusing on recruiting new students, the articles published by the university do not address what they are focusing on to retain the 10% of students that they lose between the fall and spring semester each year within the freshman class.

While these numbers signify great improvement, UND is still losing roughly one-fifth of their freshman class each year. The initiatives that have been set in place in the past are best practice in higher education according to Kuh (2008) and Tinto (2009), however; another individual, student-focused intervention that could assist students with more effective engagement in the classroom to increase overall retention of these students could be a program based on sensory processing theory. Within the college atmosphere, classroom and study environments are inconsistent and each student holds a unique sensory processing pattern or preference that interacts with the environment to contribute or detract from their ability to learn. Occupational therapists are skilled in analyzing a student’s sensory processing patterns as well as their environment and client factors to determine how to make their learning environments acquiesce with their sensory preferences.

### **Purpose**

The purpose of this independent study was to evaluate the program *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) in order to further develop and refine the program for future use. This program aims to implement consultative occupational therapy services for students on the UND campus to increase



students' awareness of sensory stimuli that may exist in their educational environments, adversely affecting their ability to learn.

### **Research Questions**

Chen's Model of Formative Evaluation (Chen, 2005) was used to develop these questions to guide this study. The overarching questions for this program evaluation include: 1) What is the overall effectiveness of the process of *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014)? and 2) What changes can be made to the protocol for *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) to use for future implementation? Research questions were developed by the researchers for each individual session to determine the effectiveness or process within each step. Please refer to Chapter III: Methodology for a full listing of each separate set of questions.

### **Research Methods**

#### **Formative Evaluation Approach**

The formative evaluation approach (Chen, 2005) was used in order to guide the planning and implementation of this study. Chen (2005) outlines six steps in order to identify problems or potential barriers to a program and is useful for pilot studies seeking further research. The six basic steps include a) review of program documents and underlying assumptions, b) identify critical elements of the program for successful implementation and vulnerable elements that may be barriers, c) select data collection methods as appropriate for the program design, d) identify problems, e) probe for the source of the problem, and f) submit findings and document changes (Chen, 2005). The approach is flexible and allows for timeliness of results (Chen, 2005). Due to the time

restrictions of this study, this approach was able to provide valuable information in a short amount of time. Methods suggested for this approach include interviews, participant observation, and small-scale surveys, which were all used in order to evaluate the program itself (Chen, 2005). Overall, the formative evaluation approach (Chen, 2005) suggests that the researcher be familiar with the components of the program to ensure proper implementation for problem shooting future problems. This approach specifically suited this study as the researchers collecting the data were the program developers.

### **Description of Program Under Evaluation**

#### **Studying With Successful Sensory Environments (Kotta & Nielsen, 2014)**

A program titled, *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014), was created in order to fulfill this current need for student academic success through occupational therapy on a college campus. This program includes an individualized approach to assist college students by teaching them about their sensory processing patterns and the impact those patterns play within their ability to learn in their academic environments. However, this program has not been studied within the intended population, making this pilot study necessary for further development and refinement of the program components.

#### **Dunn's Model of Sensory Processing.**

Dunn's Model of Sensory Processing (2001) was used to guide the development of *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) as well as was used when implementing the program within this study. Dunn's Model stems from Ayres Model of Sensory Integration (Ayres, 1979) and focuses heavily on the

neurological aspects of sensory processing within the brain. Dunn's Model of Sensory Processing utilizes the basic premise of Sensory Integration theory, which is, "the organization of sensation for use" (Ayres, 1979, p. 5). Primary features of Dunn's Model of Sensory Processing include: "(a) consideration of one's neurological thresholds, (b) consideration of one's responding or self-regulation strategies, and (c) consideration of the interaction among thresholds and responding strategies" (Dunn, 2001, p. 611). After analyzing the sensory processing patterns it was determined if the student is sensory seeking, sensory sensitive, low registration, or sensory avoiding in order to give practical and realistic strategies to adapt any environment to suit their sensory needs during this study.

### **Coaching Model.**

The Coaching Model has been implemented in a variety of areas such as business models, early intervention therapy models, and adult education learning contexts (Dunn et al., 2012; Ellinger & Kim, 2014; Graham, 2011). The main competencies of the Coaching Model involve, "building rapport, active listening, ask powerful questions, positive feedback, encourage the coachee in order to help coachee to establish SMART (specific, measurable, achievable, realistic, timed) goals" (O'Conner & Lages, 2007 as cited in Fazel, 2013, p. 386). Through the Coaching Model, the therapist's role is not instructing, but a guiding approach that helps clients form solutions to their own problems. This model was incorporated in the development and implementation of the protocol *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014).

## **Importance of The Study**

The program *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) sought to fill the gap currently existing within higher education to assist students to modify their environment through understanding of their sensory processing patterns in order to become more successful at UND. In order to accomplish this goal for broad use within the college atmosphere, this independent pilot study was conducted to analyze and identify specific areas that could be improved within the program protocol and standardization for future use. This program evaluation allowed the manual to become more defined and developed for implementation by occupational therapists and occupational therapy graduate students in order to fulfill a current need not being met by college and university students at this time.

## **Key Terminology**

**Environment:** In previous years, classroom environment was used instead of today's term learning environment (Beard, 2009). As defined in higher education the learning environment is an, "operational place to manage, through measures and costs, inventories, equipment lists, offering an educational 'service'" (Beard, 2009, p. 2). Further, learning environments are made up of the chairs, technology, lecture material, aesthetics (such as plants, natural lighting, and artwork), and any other characteristic of a space where learning takes place with an instructor (Beard, 2009). Additionally, Beard (2009) states, "space becomes a place, as part of student identity: a place to be seen, a place just to 'be', to 'belong', and be met" (p. 3). In articulating this, he signifies that within the field of education, environment encompasses the cognitive, physical, and social aspect of learning within a specific space provided on a university or college campus (Beard, 2009). Environment in occupational therapy includes the social and

physical environment. The physical environment encompasses the “natural and built surroundings in which daily life occupations occur” (AOTA, 2014, p S8). The social environment incorporates relationships and the “expectations of persons, groups, and populations with whom clients have contact” (AOTA, 2014, p. S9). Additionally, context is a word in occupational therapy that is used interchangeably with environment (AOTA, 2014). Therefore, within the confines of this study, environment refers to all of the elements that surround the individual, which impact their ability to learn new information. These surroundings are dynamic and are perceived by the individual differently based on their sensory processing patterns.

**Context:** Context refers to elements surrounding a client that are intangible, but exert influence on an individual’s occupational performance (AOTA, 2014). There are four types of contexts: a) cultural, b) personal, c) temporal, and d) virtual. Cultural context incorporates “customs, beliefs, activity patterns, behavioral standards, and expectations accepted by the society of which a client is a member” (AOTA, 2014, p. S9). Personal context involves demographic features of a person such as age and gender (AOTA, 2014). Temporal context describes “stages of life, time of day or year, duration or rhythm of activity, and history” (AOTA, 2014, p. S9). Lastly, contexts occurring in “simulated, real-time, or near-time situations absent of physical contact” are virtual contexts (AOTA, 2014, p. S9). Some examples include smartphones and tablets, which in recent years have had tremendous influence on occupational performance (AOTA, 2014).

**Sensory Integration:** Sensory integration is a technique used by occupational therapists to manipulate the environment to best suit the sensory processing needs of a client (Ayres, 1979). Sensory integration seeks to engage clients in self-directed, purposeful

activity that organizes the specific sensations experienced in order to create an adaptive behavioral response (Ayres, 1979). As stated by Ayres (1979) sensory integration, therapy involves, “the organization of sensation for use” (p. 5).

**Sensory Processing:** The sensory integrative processing procedure involves the use of proprioceptive, vestibular, tactile, gustatory, and auditory sensations to stimulate an adaptive response (Clark & Pierce, 1998). Sensory processing is defined as, “the ability to register and modulate sensory information and to organize this sensory input to respond to situation demands” (Engel-Yeger & Dunn, 2011, p 210). Therefore, sensory processing is an individual’s ability to take in information and organize it in a way that helps them function in everyday life (Dunn, 2001).

## **CHAPTER II**

### **LITERATURE REVIEW**

#### **Higher Education**

##### **Federal.**

Secretary of Education Margaret Spellings (2006) and the Commission on the Future of Higher Education stated that higher education in the United States, which was once very prestigious, has slipped to 12<sup>th</sup> overall. Further, Spelling (2006) stated, “while educators and policymakers have commendably focused on getting more students into college, too little attention has been paid to helping them graduate” (p. 13). President Obama has developed a plan to combat barriers, which is divided into three parts: “paying for performance; promoting innovation and competition; and ensuring that student debt remains affordable” (US Department of Education, 2014, p.1).

Currently, the Federal Government spends approximately \$150 billion to support postsecondary education efforts, which includes technical and community colleges (US Department of Education, 2014). President Barak Obama is proposing to implement a system much like the Public Law (PL) 107-110, also known as the *No Child Left Behind Act* (2001), in order to implement a system where institutions will be given funding based on a rating system (Office of the Press Secretary, 2013; US Department of Education, 2014). President Obama seeks to develop a system that compares the academic performance of colleges with similar missions in the hopes of rating each school. The federal government would then be able to see which schools are progressing and award

the appropriate amount of funding based on that progress (US Department of Education, 2014). Therefore, retention rates will be the primary focus for higher education institutions in the near future in order to retain their primary funding sources.

### **State.**

The enrollment rate within the North Dakota University System (NDUS) has decreased in recent years going from 29,419 in 2007 to 31,766 in 2010 to 30,684 in 2013 (North Dakota University System, 2013a). Some of the goals that NDUS has outlined for 2020 to address this issue include: a) 15% increase in retention and graduation rates at research institutions, b) 10% increase for comprehensive universities, c) increase their national ranking by ten points, and d) to increase their partnerships with corporations (North Dakota University System, 2013c). North Dakota Senate Bill 2032, which followed suit of President Obama, outlined the need for accountability and urged acquiring data pertinent to understanding the depth of the situation regarding the standings of the institutions within NDUS (North Dakota S. 2032, 2013). Therefore, the bill outlines that each university keep track of degrees obtained, graduation rates, retention rates, average term GPA, and enrollment data such as resident versus non-resident enrollment rates (North Dakota S. 2032, 2013). Thus, the issue of retention rates and academic success within the university are two-fold, making graduation rates important for both state and federal funding.

### **University of North Dakota.**

In the past ten years, the University of North Dakota (UND) has seen a decline in retention rates for the freshman class from 78% in 2001 to 74% in 2011 (Office of Institutional Research, 2013c). Likewise, transfer student retention has also decreased



within the past four years with 74% retention in 2008 to 71% in 2010 (Office of Institutional Research, 2013b). Also stated in this research, the grade point average has steadily decreased within the past ten years along with retention rates for both transfer and freshman students (Office of Institutional Research, 2013a).

In order to combat the declining retention rates, UND has put forth several initiatives based on the leading higher education research. UND has been enhancing the learning environments of their students through living and learning communities within the residence halls as supported by Kuh (2008). He found that students interacted more with faculty and other students within their field of interest, dedicated more time to their academics, and excelled at educational problem-solving and synthesizing of information (Kuh, 2008). These systems are enabling institutions to help those students who need the extra support by getting them involved on campus, connecting them to a faculty member, providing them a positive mentor, or removing obstacles to obtain information that is key to student success (Kuh, 2008; Tinto, 2009). They have developed collaboration centers to promote problem-based learning opportunities within the library setting as suggested by Tinto (2009). In addition, UND has implemented a Student-Centered Active Learning Environment for Undergraduate Programs (SCALE-UP) also called an Active Learning Classroom (ALC), which is designed to encourage a kinesthetic and collaborative learning environment as supported by Tinto (2009). In addition updating of various academic and living facilities around campus (such as the Wilkerson Dining Center, Memorial Union, and the medical school) has been completed over the past 4 years. Lastly, UND has created a “one-stop shop”, which as evidenced by Tinto (2009), has eased the burden of students having to go from location to location seeking their needs.

This resource has allowed students to go to the Memorial Union to get either their questions answered or given the proper contact information in order to get to the correct location efficiently for their answers to be obtained.

As a result, an increase in enrollment of the freshman classes has been shown within the past 4 years from 12,877 in 2011 to 13,816 in 2015, the average freshman grade point average has gone from 3.33 in 2012 to 3.4 in 2015, and retention rates have risen from 74% in 2012 to 81.3% in 2015 for the spring semester (UND, 2015a, UND, 2015b). Sol Jensen, Vice President of Enrollment Services states that this increase in quality and quantity of students is the result of “strategic practices focused on recruiting the very best students” (Johnson, 2015, ¶1). However, retention of the freshman dropped from 92% in the fall of 2014 to the 81.3% in the spring semester of 2015 (UND, 2015a, UND, 2015b). This indicates that while the University is improving in their ability to have students who are “expected to be the most academically qualified (based on average high school GPA and ACT scores) class” as stated by Sol Jensen, they are still not able to retain them from semester to semester (Johnson, 2015, ¶1).

While these numbers signify great improvement, UND is still losing roughly one-fifth of their freshman class each year. Overall, UND has put forth great efforts to increase retention and graduation rates at the university, however; little attention has been paid to the student’s academic environment with the ever changing technological advances and aesthetically pleasing décor with limited natural light present in the current campus community.

## **Role of Occupational Therapy In Postsecondary Environment**

Jirikowic et al. (2013) wrote a position paper for the American Occupational Therapy Association (AOTA), which promoted the role of occupational therapy within the transition for students with disabilities to the postsecondary education environment. Jirikowic et al. (2013) stated that occupational therapists have a unique skill set that allows them to understand how illness, injury, or developmental disabilities impact an individual's ability to participate and are equipped with strategies to address physical, cognitive behavioral, sensory, and psychosocial hurdles. In addition, occupational therapists are able to modify environments, which is a key change within the college environment as classrooms change from semester to semester as well as social environments and academic demands that could create challenges if the individual does not have the proper skills to meet those demands. Jirikowic et al. (2013) stated, "coaching students on the development of productive habits and daily routines that promote effective organization, time management, social interaction, and other skills necessary for postsecondary education success" (§ 4). Kertcher (2014) adds to this stating occupational therapists have a role in, "the transition from PSE (postsecondary education) to independent living, facilitating students' productivity in academic and extracurricular occupations, and guiding students to become community participants so that they may cultivate a sustainable quality of life" (p. 7). In addition, Jirikowic et al. (2013) adds that occupational therapists are able to advocate for institutions to create conducive learning environments for students with disabilities. This indicates that there is a need for these students to receive occupational therapy services within the postsecondary educational environment in order to assist them to achieve their academic aspirations despite their

disabilities. However, the researchers also articulate the skill set of occupational therapists to modify the environment, indicating the sensory challenges of students who may or may not have a diagnosis, could be assisted if a program for occupational therapists to utilize was readily available.

Research in regards to other programs within the United States that involve occupational therapy services within the postsecondary institutional setting are limited at this time. In addition, the programs that have been developed and implemented, have been solely for students with a diagnosis and address routines or study habits rather than the sensory processing patterns of the individuals. Newman et al. (2011) found that out of a sample of 11,000 students, 60% of students with intellectual disabilities were enrolled in some type of postsecondary education. However, this information did not distinguish between education offered under the Johnson's Higher Education Act of 1965 and the education provided within college institutions. In addition, Kertcher (2014) makes the argument that due to decreased enrollment of students with disabilities, both physical as well as intellectual, these individuals are often denied employment opportunities and wage attainment as related to individuals without disabilities. If students with disabilities were assisted with navigating the challenges associated with this transition such as living environments, academic demands, and social environmental changes, they may be able to achieve post high school degrees at a more successful rate (Kertcher, 2014).

Within higher education, only one occupational therapy program exists and is currently at Colorado State University (CSU). Opportunities for Postsecondary Success is a program that was implemented through the US Department of Education grant under the Office of Postsecondary Education (Koethe, 2015). This program allows students

with Autism, Asperger's, or Traumatic Brain Injuries to have a student mentor for 30-40 hours a week who share a major or living environment to assist them with time management, studying strategies, effective communication, or social participation (Koethe, 2015). The program was trialed and is now operated out of the occupational therapy department at CSU (Koethe, 2015). This program costs students \$75.00 per hour or \$2,000 per semester with 33 student scholarships available per year (Koethe, 2015). Understanding of Opportunities for Postsecondary Success added to the development of *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) as the researcher strived to make it cost and time efficient for the student in order for the service to be utilized by the average student and offer the service to all students within the college community. Additionally, the lack of research for this program or any other occupational therapy program warrants the need for further research and pilot studies for implementing occupational therapy services within the higher education atmosphere.

### **Studying With Successful Sensory Environments**

The program *Studying With Successful Study Environments* was a product of an Honors Thesis written by the researchers (Kotta & Nielsen, 2014). It was concluded through the literature that occupational therapy services should be utilized on the UND campus in order to increase a students' awareness of their sensory processing patterns to provide tools in order to adapt their environment to suit those needs (Kotta & Nielsen, 2014). This product was designed to be used for consultation services with the college student population because it involves multiple academic environments and therefore, sensory processing patterns may be difficult to manage in certain contexts.

The purpose of *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014), is to educate students to implement adaptations and modifications to their environment that suit his or her sensory processing patterns to increase their academic performance, thus retaining them at the University of North Dakota. The intent of this product is for an occupational therapist to collaborate with Universities, through resources such as Disability Services For Students or Student Success Centers to facilitate consultation services in order to assist students to increase their academic performance (Kotta & Nielsen, 2014).

### **Overarching program goal..**

The overall goal of *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) is to educate students on how to apply tools necessary to modulate their sensory experiences, through environmental adaptation or sensory strategies, in order for them to be academically successful on the UND campus. Even though this program was designed for UND based on the literature, the researchers hope to expand and standardize the program to be used nationwide for college campuses to implement.

### **Program contents.**

Within the product, *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014), it is outlined how to implement occupational therapy services on a college campus in order to educate students on their sensory processing patterns. The program protocol includes the following sections: a) Problem Statement, b) Target Population, c) Overarching Program Goal, d) Desired Outcomes, e) Guiding Framework, f) Dunn's Model of Sensory Processing, g) Coaching, h) Proposed Program Schedule (Referral, Screening and Occupational Profile, Assessment, Intervention/Consultation, Outcomes), i) Appendices (coaching guidelines, the various worksheets to use during the

program process, and a case study with an example of how to use each aspect of the program), and j) References. Table 1 illustrates the steps used within the program protocol.

Table 1

*Studying With Successful Sensory Environments Protocol Schedule*

<b>Referral</b>	Students at the University of North Dakota can either be referred from different on campus services such as the Student Success Center and Disability Services for Students or by self-referral.
<b>Session</b>	<b>Objective</b>
<b>1. Screening and Occupational Profile</b>	The therapist and student will discuss the referral form with the student and obtain an occupational profile.
<b>2. Evaluation/Assessment</b>	Based upon screening and referral previously, the therapist will conduct the appropriate assessment.
<b>3. Review of Assessment</b>	The therapist will discuss the results of the assessment with the student using the <i>Your</i> Sensory Processing Patterns for the specific results of the student and providing the handouts to them.
<b>4. Education</b>	The therapist will discuss the results of the assessment with the students to educate them on their sensory processing patterns.
<b>5. Follow up</b>	The therapist and student will discuss how the implementation of the plan is going and make modifications to the plan as necessary.
<b>6. Check-up and Outcomes</b>	The therapist and student will either meet or correspond over email in order to

	check for progress after use of the plan over time.
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Source: Kotta, K., & Nielsen, S. (2015). *Studying With Successful Sensory Environments*.

Each section of the program schedule is outlined in-depth to instruct the therapist on what to do during each session (Kotta & Nielsen, 2014). Each worksheet has instructions at the top of the page and is referenced in the program schedule on when and how to use it (Kotta & Nielsen, 2014). The therapist needs to have access to the Environmental Profile (Brown, 2007) and the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) assessments in order to implement this program. The therapist should have working knowledge of these assessments and must be well versed in sensory processing theory, assessment, and intervention to obtain quality results.

### **Research For Program Development**

The following section of the literature review will outline the research from the thesis used to develop the program *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014). Research in sensory processing, neurological connections between learning and sensory processing, theoretical foundations, and the assessments used within the program were reviewed.

### **Sensory Integration and Processing**

“Ayres sensory integration is one of the most developed and distinctive frames of reference to emanate from the profession of occupational therapy” (Mailloux et al., 2011, p. 150). Developed in the late 1950’s, this theory formed from its foundational roots in neuropsychological and neurobiological basis and was originally designed for children with learning disabilities (Mailloux, 1990; Parham & Mailloux, 2010). Ayres did not merely consider sensory integration as integration of information within the synapses of



the brain, but rather, she looked at how those connections affected functional behavior (Parham & Mailloux, 2010). When the theory was first developed, Ayres (1979) focused on three main areas (a) body schema, (b) the relationship between sensory perception and movement, and (c) praxis (Mailloux, 1990). Ayres (1979) created the theory with the basic belief that “organization of sensation for use” (p. 5) would provide the foundation for learning and skill development (Parham & Mailloux, 2010; Watling & Dietz, 2007). Further, Ayres described sensory stimulation as nourishment for the brain, much as food is nourishment for the body so that a person can function properly (Parham & Mailloux, 2010). There are five basic assumptions within the sensory integration theory, which are:

“(1) the central nervous system is plastic, (2) sensory processing occurs in stages, (3) the brain works as an integrated whole, (4) adaptive interactions are critical to sensory integration, and (5) people have an inner drive to develop sensory integration through participation in sensorimotor activities” (Cole & Tufano, 2008, pp. 229-231).

Within the premise of Ayres original Sensory Integration theoretical approach to therapy, Dunn (2001) created a frame of reference entitled Dunn’s Model of Sensory Processing. Sensory processing and integration were interchangeable within the literature review due to the similar properties, however, Dunn’s Model of Sensory Processing serves as the foundation for the development and implementation of the program studied.

## **Neurological Connection Between Learning and Sensory Processing**

### **Learning theory.**

Contemporary learning theory recognizes that reflection on past experiences and associating these experiences to new information plays an important role in the

development of skills and thought processes (Hammond et al., 2001). Additionally, this theory incorporates culture and other external environmental factors that allow a person to understand content matter and helps develop the brain throughout life (Hammond et al., 2001). Lindblom-Ylanne and Lonka (1999) add by validating that application-based learning approaches incorporating problem-solving produce the most learning and comprehension of new material as a result of their study involving medical students. Contemporary learning theory acknowledges that environments rich in stimuli and sensory feedback allow the learner to have continuous brain development, which ultimately changes the physical structure of the brain (Hammond et al., 2001). Hammond's theory accounts for the different learning styles and processing abilities by stating, "learners have processing differences that influence how they handle visual, aural, or kinesthetic information" (Hammond et al., 2001, p. 12). Therefore, each student learns differently depending on their ability to process sensory input available in their environment.

### **Neurological learning processes.**

Connections in the brain are created through different experiences, and therefore, "we essentially create our own brains by means of the choices that we make about how we will live our lives" (Fishback, 1999, p. 2). Cozolino and Sprokay (2006) comment that the brain is a social organ where we have to interact with others to create memories in order to learn. As adults learn new material, synapses are solidified when they make a connection between something new and something from the past (Fishback, 1999). This is due to neuroplasticity of the brain where each new relationship to another experience in line with the environmental demand generates a deviation in the architecture of the brain

(Cozolino & Sprokay, 2006). Enriched conditions such as sensory experiences or problem-solving opportunities elicit neuroplasticity in areas of the brain involved in memory and learning (Lane & Schaaf, 2010). Overall, Cozolino and Sprokay (2006) have determined key ingredients needed in order for a person to be able to learn and form connections in the brain. They include: a) a safe and trusting relationship with an attuned other, b) maintenance of a moderate level of arousal, c) activation of both thinking and feeling, d) a language of self-reflection, and e) construction of a narrative that reflects a positive and optimistic self (Cozolino & Sprokay, 2006).

“Activation of the receptor, if of sufficient intensity or if applied over time, triggers propagation of an action potential down the nerve” (Lane et al., 2010, p. 1). Integration of sensory information requires a signal to that synapse to increase, decrease, inhibit, or defer a specific signal. The thalamus is responsible for the integration as well as modulation, which is “any act that produces change or adjustment with the intent to match a biological, social, or contextual condition” (Lane et al., 2010, p. 1). Modulation occurs at the cellular level and is observable through the behaviors exhibited by the person in response to a stimulus (Lane et al., 2010). The ability to modulate sensory input in order to demonstrate an appropriate or more functional response to stimuli within the environment, is the foundational concept within sensory integration. In essence, modulation allows the individual to produce a behavioral response that adheres to their environmental demands.

In addition, the limbic system, the amygdala specifically, transmits signals relating sensory input from the thalamus and connects them to certain emotions or experiences (Lane et al., 2010). The amygdala also remembers reinforcement or

punishment as a result of behaviors after sensory experiences (Lane et al., 2010). Emotions hinder an individual's ability to think straight in order to make sound decisions (Cozolino & Sprokay, 2006). Therefore, individuals respond emotionally to each stimulus, which affects the way they behave and act (Lane et al., 2010). Emotion has been tied to arousal levels and thus, sensory stimulation increases the rate at which the synapses are working (Cozolino & Sprokay, 2006). The increase in arousal will initiate release of hormones and neurotransmitters, which enhance neural connections and neuroplasticity (Cozolino & Sprokay, 2006). However, negative emotions, such as stress, resound negative memories leading to a halt in learning (Cozolino & Sprokay, 2006). Therefore, when a person is in a state of high stress, they will be less likely to take in and retain new information. Stress is a common occurrence within the higher education atmosphere, making the ability of the brain to associate sensory input with emotional responses, key to understanding the demand for therapy within this population.

Lane and Schaaf (2010) conducted a systematic review in order to examine the basic science literature to specifically identify evidence for the assumptions and tenets of Ayres' theory of Sensory Integration. There were 50 articles within the study that focused on changes in the brain linked to changes in the environment or context and the influences of those changes on behavior or occupational performance (Lane & Schaaf, 2010). The implications of the evidence found within the literature included: a) intervention is best delivered if it is client-directed, playful, allows for flexible adaptations, and is the "just-right" challenge, b) rich sensory input, within meaningful occupations facilitates growth, development, and behavior leading to neuroplasticity, c) sensory integration should be applied generally rather than just to a specific occupation or

environment, and d) enriched sensory environments promote sensory, motor, and problem-solving opportunities in order to produce neuroplastic changes related to learning and memory within the academic environment (Lane & Schaaf, 2010). Lane and Schaaf (2010) also linked learning to the neuroplasticity associated with sensory processing to conclude that learning was supported if sensory enriched environments were provided to produce neuroplastic changes, which ultimately changed behavior to increase occupational performance. Therefore, this study provided the base of evidence in support of implementing sensory integrative strategies with students to change their neurological thresholds to increase positive behavior within their classroom environments through adaptations to suit their sensory processing needs.

Additionally, Lane and Schaaf (2010) found that sensory input given to an individual in an intentional context through a meaningful activity generates brain growth and neuroplasticity. This brain growth can occur rapidly and can be observed through behavior changes that occur, especially in the case of children (Lane & Schaaf, 2010). Emotion has also been tied to arousal levels and thus, sensory stimulation increases the rate at which the synapses are working (Cozolino & Sprokay, 2006). The increase in arousal will initiate release of hormones and neurotransmitters, which enhance neural connections and neural plasticity (Cozolino & Sprokay, 2006).

### **Neuroscience and sensory processing on learning.**

Adults learn through interactions with their peers and environment to form connections called synapses with material based on past experience (Cozolino & Sprokay, 2006; Fishback, 1999). Opportunities that are rich, which means they include multiple sensory experiences or occur in context specific environment, promote the most

brain growth and neuroplasticity and therefore, contribute the greatest to areas of the brain involved in learning and memory (Lane & Schaaf, 2010). Emotions and stress also play a role in a person's behavior, which in turn, can help or hinder learning (Cozolino & Sprokay, 2006). After surveying 135 healthy adults, Engel-Yeger & Dunn (2011) found that healthy individuals with sensory hypersensitivity or low registration may have elevated anxiety levels. Higher anxiety was positively correlated with higher levels of low registration, sensory sensitivity, and sensation avoiding (Engel-Yeger & Dunn, 2011). This study justifies the need for looking into sensory processing within young adults to alleviate possible problems such as anxiety that are commonly associated with inadequate modulation of sensory input (Engel-Yeger & Dunn, 2011). Lastly, building new neurological connections is a process that occurs over a lifespan, however, as a person ages, the ability to form new connections is slower and the types of new information that can be learned is decreased in certain areas such as language and speech (Fishback, 1999). Therefore, providing environments with stimuli to match a student's preferences has the potential to decrease anxiety that may otherwise exist and slow the students' ability to learn.

To add to this body of knowledge, Koenig and Rudney (2010) conducted a systematic review to understand the functional performance difficulties faced by children and adolescents with difficulty processing and integrating sensory information. For education, children demonstrated decreased academic achievement and attention, which led to overall learning difficulties. In a particular study by Baranek et al. (2002) as cited in Koenig and Rudney (2010), students that exhibited avoidant sensory behaviors had lower scores for school function. Dyspraxia and motor coordination were specifically

related to arithmetic declines in a study by Parham (1998) as cited in Koenig and Rudney (2010). Additionally, Parham (1998) as cited in Koenig and Rudney (2010) articulated that in older children, sensory integrative difficulties had the most profound effect on reading abilities. Lastly, in a study by Dewey et al. (2002) as cited by Koenig and Rudney (2010), children with motor coordination deficits exhibited poorer performance on attention tasks and learning tasks such as spelling, reading, and writing. Overall, the clinical significance of this study was that there are wide varieties of diagnoses that differ in severity, but can all lead to sensory processing deficits. These deficits impede a child or adolescents ability to successfully engage in occupation, specifically within education.

### **Learning Environments**

Students retain information by developing a context-specific memory with the material. Every person prefers different environments to learn and, therefore; “the ideal learning environment is context-dependent and thus can never be permanently defined” (Yang et al., 2013, p. 178). As stated by Kirschinger et al. (1997) “knowledge is context-dependent and cannot be abstracted from the situation in which it is learned” (p. 162). In addition, students retain material even greater when they learn material in a specific context and integrate that information with previously known material or a certain memory (Entwistle & Peterson, 2004). The context in which information is processed matters and can detract or enhance a students’ ability to retain material. Additionally, as stated by Stone (2001), “negative mood is affected by task, whereas positive mood is affected by the environment (p. 187)”, further signifying the effect environment can have on a person’s motivation to learn.

Lindblom-Ylänne and Lonka (1999) conducted a study on advanced medical students in order to understand the relationship between success of medical students', their learning environments, and the strategies for learning within those environments. Sixty-seven participants completed a survey at the end of their fifth year of medical school and thirty-five participants within that group volunteered to complete a semi-structured interview (Lindblom-Ylänne & Lonka, 1999). Grades were used as a progress marker to determine success within the academic environment with the preclinical classes of anatomy, physiology, pharmacology, and medical chemistry and post clinical classes of children's diseases, child psychiatry, ophthalmology, and pulmonary diseases (Lindblom-Ylänne & Lonka, 1999). The study indicated that success is impacted based on the environment a student studies. Lindblom-Ylänne and Lonka (1999) concluded that study environments affect the way that advanced medical students achieved success academically, which can be generalized to students studying other disciplines.

Even though there is no ideal defined learning environment, there are three important elements of the environment one must incorporate in order to extract the best results, which include: ambient conditions, spatial design, and technology (Yang et al., 2013). Ambient conditions refer to temperature (which was found to be most important to students), acoustics, air quality, and lighting. Spatial attributes are categorized into the layout of a space, the furniture within the space, and visibility within the classroom. Lastly, technology was found by Yang et al. (2013) to be the most conducive to learning with medium or low use in the classroom and was most helpful when utilized as a cognitive tool rather than a presentation tool.



When considering the various aspects of learning environments, students put the highest emphasis on ambient and spatial attributes of a space (Yang et al., 2013). In order to improve the design, management, and maintenance of learning environments, acoustics, lighting, air quality, and layout are top priorities (Yang et al., 2013). Students felt that acoustics were the second highest concern and had the greatest impact on learning, lighting should be balanced between artificial and natural light, air quality needs to be high in order to allow for optimal concentration, and the layout needs to represent the demands of the material being mastered (Yang et al., 2013). This article relates to occupational therapy within higher education in that it demonstrates every student has a different preference for learning environments. Even though many students' preferences may appear similar, learning environment preferences are not universal within the data, signifying the need for an individual to be educated on their sensory processing in order to adapt or modify their environments within the higher education atmosphere, which strives to create a universal learning environment.

Gordon-Hickey and Lemley (2012) conducted a study to understand the impact that personality has on the acceptance of background noise acceptance within the college population. The study was conducted at the University of Alabama with ten college students who preferred quiet study environments and ten college students who preferred background music while studying (Gordon-Hickey & Lemley, 2012). Personality was found to have no significant difference on the preference for background noise and psychological factors did not influence an environmental preference (Gordon-Hickey & Lemley, 2012). This study further validated that colleges and universities need to create different types of spaces on their campuses to serve the different preferences of students

in order to allow for different auditory tolerances when studying (Gordon-Hickey & Lemley, 2012). The clinical significance of these results are that occupational therapists are suited to analyze those auditory preferences that do exist through different assessments of the sensory system in order to make recommendations for ways to modify the environments to suit those sensory needs, which validates the need for a program to be implemented in the university setting.

### **Learning environments and sensory processing.**

Brown and Dunn (2010) conducted a study on 49 children with autism to identify the correlation between sensory processing and context using the School Companion (Dunn, 2006) and Sensory Profile (Brown & Dunn, 2002) within the educational setting. Each participant's teacher completed the School Companion (Dunn, 2006) and parent completed the Sensory Profile (Brown & Dunn, 2002) for this study and the researchers used an external testing company to eliminate bias (Brown & Dunn, 2010). Results of data analysis indicated good and fair correlations suggesting that the sensory processing patterns have both universal and context-specific properties for children with autism (Brown & Dunn, 2010). The authors concluded that there are differences in sensory processing patterns across contexts (Brown & Dunn, 2010). Brown and Dunn (2010) suggest that teachers and parents could be able to implement different strategies that are context specific with the help of occupational therapists within the school system to guide intervention planning. Although this study was conducted within the pediatric population, the evidence could be applied across a different age range within the same settings utilized in this study, but specifically targeting the college-aged population.

## **Theoretical Foundations**

### **Dunn's Model of Sensory Processing.**

Dunn states, “this model of sensory processing is meant to provide a framework for studying, interpreting, and gaining insights into the nature of sensory processing, including all of its complexities, and the impact of sensory processing on daily life” (Dunn, 2001, p. 612). Further, she views sensory processing patterns as mere outside reflections of who a person is, which occupational therapists are not aiming to fix, but to understand, in order to address how this behavior could be modified to decrease interference with their occupations in daily life (Dunn, 2001). The main contribution of Dunn's Model of Sensory Processing (Dunn, 2001), based on sensory integration theory, brought to sensory integration was that it can be used to consider what type of work, play, or leisure environment is most optimal for an individual with sensory processing difficulties (Parham & Mailloux, 2010).

Dunn focused her approach with a heavy basis in neuroscience with the theory that the brain has neurological thresholds that determine how a person will respond to sensory input, which can be observed through the adaptive behavioral response initiated (Cole & Tufano, 2008; Dunn, 2001). Neurological thresholds are defined as the amount of stimuli needed to trigger a response by the central nervous system (Cole & Tufano, 2008; Dunn, 1997). The central nervous system is the main center for modulating sensory information by creating a balance between hyperresponsivity and hyporesponsivity in order to function (Brown & Dunn, 2010). Additionally, she analyzed the relationship between a person's neurological thresholds and their strategies to self-regulate their behavior by creating continua (Cole & Tufano, 2008; Engel-Yeger et al., 2013). The

neurological threshold continua is made up of habituation or high thresholds (the simplest form of learning where the central nervous system recognizes a stimuli familiar to it and uses fewer cells to transmit the signal) and sensitization or low thresholds (where the stimulus is identified by the central nervous system as important or harmful and generates a heightened response) (Dunn, 1997; Lane et al., 2010). To describe the sensory processing of the individual the tool designed to coincide with the model, the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002), outlines the four categories that an individual falls into: low registration, sensory seeking, sensory sensitivity, and sensory avoiding (Dunn, 2001; Parham & Mailloux, 2010).

Low registration indicates that a person contains a high level of neurological thresholds and passively responds to stimuli (Cole & Tufano, 2008; Dunn, 1997; Dunn, 2001; Parham & Mailloux, 2010). This means that in order for the neurons to fire the individual will require a high level of sensory stimuli. Therefore, these individuals will not notice changes to the environment and are often described as either easy going or withdrawn, unmotivated, self-centered, or inattentive (Dunn, 1997). Sensory seeking individuals have a high threshold for sensory stimulation with an active response (Cole & Tufano, 2008; Dunn, 1997; Dunn, 2001; Parham & Mailloux, 2010). These people are active in trying to obtain sensory experiences by engaging in bodily movement through climbing and swinging as well as sensory stimuli of scents of perfume, touching objects, or humming due to the auditory sensation as well as the vibration feeling in the lips. In addition, they are often considered exuberant and become distracted easily (Dunn, 1997).

Low thresholds in terms of sensory processing indicate that the individual is sensitive to noticing sensory stimuli (Cole & Tufano, 2008; Dunn, 2001; Parham &

Mailloux, 2010). People who have sensory sensitivity have low thresholds, which cause them to become distracted easily and have a harder time remaining focused for long periods of time (Cole & Tufano, 2008; Dunn, 2001; Parham & Mailloux, 2010). These individuals notice smells, movements, textures, and temperatures frequently and passively respond to the stimuli. Often, these individuals are seen as meticulous or particular because they experience discomfort with numerous different sensory stimuli (Dunn, 1997). Lastly, sensory avoiders hold a low threshold for sensory stimuli, but react to the stimuli in an active manner (Cole & Tufano, 2008; Dunn, 2001; Parham & Mailloux, 2010). Therefore, they will often remove themselves from a room where there are various people or objects in motion and will generate a daily routine in order to minimize possible sensory surprises. Typically, these individuals are seen as reserved or shy and avoid environments with excessive stimuli such as carnivals or theme parks (Cole & Tufano, 2008; Dunn, 1997).

### **Coaching model.**

Coaching is defined as, “a collaborative, solution-focused, result-oriented systematic process, in which the coach facilitates the enhancement of the coachee’s life experience and performance in various domains and foster self-directed learning, personal growth, and goal attainment of the coachee” (Grant, 2001 as cited in Fazel, 2013, p. 386). Coaching is a therapy approach that is solution-centered that incorporates psychological, behavioral, and cognitive strategies (Ellinger & Kim, 2014). The Coaching Model is utilized by occupational therapists to educate clients through a collaborative partnership on how to problem-solve and identify elements they can adapt throughout their daily routine, which for the purposes of this program, would be

educating students on their individual sensory preferences and watching them form solutions (Dunn et al., 2012; Fazel, 2013; Rush & Shelden, 2008).

Coaching has been used throughout the literature with the parents of children with Autism Spectrum Disorders (Dunn et al., 2012; Kientz & Dunn, 1979). Dunn et al. (2012) found that the Coaching Model was an effective approach to use to help parents adapt an environment with their children with ASD. In early intervention, occupational therapists using coaches have ensured that parents of the clients “receive consistent, unduplicated, timely, evidence-based, individualized, and comprehensive information and support” (Rush & Shelden, 2008, p. 2). Lindbom-Ylanne and Lonka (1999) validated use of the coaching approach using the problem-solving mode with medical students to help them best understand their sensory processing needs within the college atmosphere as well. This has been compared to adult learning by Graham (2011) who states “adult learning principles, enablement perspectives of disability and models of occupation underpin therapists’ use of reflection, questioning, modelling and demonstration within the approach” (p. 41), which indicates that occupational therapy can apply coaching principles mentioned previously implemented in early intervention, for the adult population.

Within this approach, therapists are asked to use strategic questioning or open-ended questioning to help the client analyze their problem themselves to formulate an appropriate solution. Therapists seek to learn what the client already knows and the solutions they have tried in order to create a joint plan through support from the therapist to reach their goals (Rush & Shelden, 2008). As discussed by Fazel (2013), adults within the college atmosphere seek to be self-directed in their learning; therefore, it is essential

to create a collaborative, equal partnership where the therapist is merely a guide to help them identify their motivations and strengths in finding solutions that are directly applicable to their situation.

There are four basic steps within the Coaching Model that should be followed: initiation, observation, action, and reflection (Graham, 2011). The therapist was referred the clients, therefore, initiation was completed prior to working with the client. Observation consists of evaluating the client through the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and Environmental Profile (Brown, 2007). Third, the therapist actively promoted the problem-solving process with the client by going over the results of the assessments and coaching on how they could use that information within the academic environment. Reflection was done through an email, grade self-reports, or a follow up consultation visit as it is preferred by the client. The result of this process should include: 1) active participation by the participant to acknowledge the adaptations or modification to their environment they need to make in order to be successful, 2) self-reflection and refinement of their skills to act based on their sensory processing patterns, and 3) use the knowledge they have to be more academically successful on the UND campus in the hopes that greater academic success will allow the student to stay at UND.

### **Assessments**

Looking at the assessments published for pediatric and adult populations in this area as well as some of the unpublished assessments therapist are currently using will provide insight as to the best way to assess the sensory processing patterns of an adult as well the educational environment around them (Kotta & Nielsen, 2014). Therefore, the Sensory Integration and Praxis Test (Ayres, 1989) and Sensory Processing Measure

(Parham & Ecker, 2010) were reviewed, however; the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and Environmental Profile (Brown, 2007) were determined to suit the program the best.

**Adolescent/Adult Sensory Profile (Brown & Dunn, 2001).**

Assessment tools have been developed to measure the sensory processing patterns of individuals including the Infant/Toddler Sensory Profile (Dunn, 2002) for children birth to 3 years, the Sensory Profile (Dunn, 1999) for Children 3-10 years of age, the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) for young adults throughout life, the Sensory Processing Measure (Parham & Ecker, 2010), and the Sensory Processing Measure – Preschool (Ecker et al., 2010). Dunn’s Model of Sensory Processing was used in the formation of the Adolescent/Adult Sensory Profile by Brown and Dunn (2002) as the theoretical underpinning within its development, which aligns with the theoretical foundation of the development and implementation of *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014), making the assessment an optimal choice. Each subsection of the assessment involves a standardized series of questions filled out by a parent who has daily interaction with the child or the client himself or herself and are based on a 5-point Likert scale (Dunn, 2001; Parham & Mailloux, 2010). The questions are related to the behaviors that the client regularly exhibits and the assessments have been reported to show good internal consistency, strong reliability, and strong validity (Dunn, 2001). According to Dunn (2001) the Sensory Profile (Dunn, 1999) allows a therapist to gain insight into the client’s system responding patterns, which provides the therapist with valuable information regarding the processing of sensory stimuli by the central nervous system. Further, Engel-Yeger &



Dunn (2011), felt therapists should employ the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) to evaluate and treat patients for help modulate their sensory environment to be able to elevate the person's quality of life through decreasing their anxiety level, which is a prominent concern within the college student population. Lastly, in a pivotal study by Dunn and Brown (1997) the Sensory Profile (Dunn, 1999) was determined to be a valid tool for populations without disabilities in order to identify sensory processing patterns that are impacting the function of an individual in everyday life (Dunn & Brown, 1997).

### **Environmental Profile.**

The Environment Profile (EP) (Brown, 2007) is an unpublished assessment that has been used to evaluate the environments of clients with schizophrenia or schizoaffective disorder. This assessment is intended to be used in conjunction with the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and contains a self-report and therapist analysis portion (Waltermire et al., 2010). The EP examines different components of the environment such as lighting, noise, and smell as well as traits pertaining to sensations such as intensity, frequency, and predictability of stimuli within a given space (Waltermire et al., 2010). The information obtained from this assessment is used by the therapist to further understand the aspects of the environment that may hinder occupational performance in order to assist the client in adapting those contexts (Waltermire et al., 2010).

## **Program Evaluation Literature**

Program evaluation is, “the collection of data from a variety of sources, including students, to assess the effectiveness of a program” (Stern & Kramer, 1992, p. 620). The overall goal is to obtain information that will allow for future refinement and modification of the program for continual program development (Stern & Kramer, 1992). Blanche et al. (2011) adds to this by stating that feasibility studies include “assessing the success of the participant recruitment process, identifying unanticipated logistical problems, uncovering local politics that may determine the success of the intervention, and assessing costs” (p. 714). Contrary to an outcome assessment, a program evaluation strives to assess the effectiveness of a program, which does not always coincide with the effect on the participant or in this case, the student (Stern & Kramer, 1992). In understanding how to properly evaluate a program, it is imperative that the researchers incorporated certain aspects into the protocol development. Bellg et al. (2004) felt that there were five areas of an evaluation to maintain fidelity, which included, a) study design, b) training of providers, c) delivery of treatment, d) receipt of treatment, e) enactment of treatment skills. In addition, Bellg et al. (2004) suggest that standardization of therapist training, monitoring of the intervention with checklists, inclusion of measures to score participant’s understanding, and enactment of treatment principles were of the utmost importance.

This portion of the literature review analyzes the different approaches to program evaluation within the occupational therapy and related disciplines literature. The different types of literature considered for this program included pretest posttest designs, focus groups, individual interviews, surveys, posttest only design, qualitative studies, and

activity log or reflection studies. This analysis was completed in order to identify the best approach for evaluation of *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) within this study.

## **Quantitative Methods**

### **Pre-test posttest designs.**

King et al. (2011) implemented a pretest-posttest design to understand the usefulness of mentorship programs for children's rehabilitation services. Participants were asked to complete questionnaires prior to and at the conclusion of the intervention. Brunero et al. (2008) used a pretest-posttest design using a 34-item Nurse Stress Scale (NSS). All nurses attended a one-day workshop, which included role-play, examples of work experience that were applied to the model, and group exploration and discussion of examples (Brunero et al., 2008). At the conclusion of the workshop, follow-up reading and self-directed learning material was distributed to the participants (Brunero et al., 2008).

Cooper et al. (2005) conducted a pretest-posttest study using the Readiness for InterProfessional Learning (RIPL) survey in order to measure change in student beliefs on interprofessional education. The researchers sought to identify change between the control and intervention groups evidenced from statistical results from baseline to the conclusion of the study. The survey provided the researchers objective evidence to determine the overall effectiveness of the program.

In a study conducted by Schindler and Sauerwald (2013), occupational therapy services were implemented to support individuals with mental illnesses for attainment of supported employment or supported higher education. Researchers utilized a one-group

pretest-posttest design to understand the effectiveness of their program over a four-year period (Schindler & Sauerwald, 2013). In order to do this, researchers used a survey to obtain statistical data on the progress of their participants (Schindler & Sauerwald, 2013). Using this design, statistical significance as well as descriptive statistics were obtained (Schindler & Sauerwald, 2013). Obtaining information in this way allowed researchers to gain information from a variety of people within the program anonymously, could gather it in a short amount of time, and with ease as they did not have to worry about the location of the client as they could send the results in electronically or through the mail if they had changed locations within the four years.

### **Survey.**

Engel-Yeger and Dunn (2011) conducted a study using a survey design with 135 healthy adults from age 18 to 50 in order to understand the correlations between anxiety and sensory processing patterns. The researchers sought to obtain information about the connection specifically between genders and processing pattern differences (Engel-Yeger & Dunn, 2011). Dunn and Brown (2010) conducted a similar study surveying 49 parents of children with Autism Spectrum Disorder to identify the correlation between sensory processing and context within the educational setting. Authors encouraged the use of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) by therapists in order to evaluate and treat clients for promoting modulation of their sensory environments in order to elevate the person's quality of life through decreasing their anxiety level (Engel-Yeger & Dunn, 2011).

Gordon-Hickey and Lemley (2012) conducted a study to understand the impact that personality has on the acceptance of background noise acceptance within the college

population. The researchers administered personality questionnaires and performed auditory testing to determine the relationship between the two variables (Gordon-Hickey & Lemley, 2012). This type of design allowed the researchers to obtain objective evidence on the correlation and significance between their variables in an efficient manner.

Dunn and Brown (1997) used a survey design in order to survey the parents of 1,115 children through distribution of the Sensory Profile (Dunn, 1999) to those families. The aim of this study was to obtain evidence to assist occupational therapists in designing and implementing interventions for these children as well as determined the effectiveness of the Sensory Profile (Dunn, 1999). This design allowed the researchers to survey a vast amount of parents in an efficient manner leading to results for changing the course of occupational therapy for children with sensory difficulties by identifying the gaps between different populations (Brown & Dunn, 1997). In addition, the Sensory Profile (Dunn, 1999) was evaluated for potential problems within the healthy population prior to use with the people the assessment was originally intended.

Yang et al. (2013) conducted a study with college students in order to identify key attributes within a classroom environment, which served as barriers or facilitators of academic performance as well as their satisfaction with their academic environments overall using a survey design. Surveys were emailed to the students over two different semesters to 627 students at the University of Southern California.

## **Qualitative Methods**

### **Individual interviews.**

Brunero et al. (2008) conducted a study to analyze the effect of a cognitive behavioral therapy (CBT) in the reduction of stress with nurses using the qualitative questions, “What was good about this workshop?” (p. 110) and “How could this workshop be improved?”(p. 110) with a sample of 18 new graduate nurses within a one-day workshop that consisted of three different areas. The three areas addressed in the intervention included: a) education and discussion about what stress is, the stress response, and CBT principles, b) the ABC model of emotional disturbance developed by Ellis (1962) was taught, and c) application of the model to the work setting was addressed (Brunero et al., 2008). Brunero et al. (2008) validates the need for asking qualitative questions as well as obtaining quantitative data in order to ensure the outcomes of the program are reported as well as to identify the aspects of the program that can be improved. Additionally, Brunero et al. (2008) noted the need for the most accurate assessment of the program to be used and urged increased rigor in order to properly evaluate the program.

In order to obtain in-depth information, Cooper et al. (2005) conducted individual interviews as well as collected written feedback on the intervention. Individual interviews allowed for specific descriptions of perceptions of participants in order to understand how an individual’s experience was for the duration of the study (Cooper et al., 2005). The written responses were used in order to understand the strengths and weaknesses of the intervention. In obtaining these responses, researchers were able to ascertain themes

among participants for changes to make to the intervention. These themes resected from the responses were able to be understood and analyzed through statistical data.

Individual interviews to identify the perspective of participants in an intervention program were conducted during a study by Binder et al. (2009). Using a phenomenological approach, they aimed to identify the lived experience using a posttest only design with their interviews (Binder et al., 2009). The interviews were semi-structure and tape-recorded in order to be transcribed verbatim (Binder et al., 2009). This allowed researchers to develop themes about the lived experience of the participants as well as aspects of the intervention they could enhance for future implementation of the program (Binder et al., 2009).

In order to identify the experience of participants during a construction project of older men mentoring at risk boys, Wilson et al. (2013) conducted individual interviews. The authors used a constant comparative methods design of grounded theory to obtain their data. Individual interviews were conducted prior to and following the completion of the program with the mentors (Wilson et al., 2013). In this manner, the researchers were able to gain insight into who the participants were at the beginning of the study and how their views had changed as individuals at the conclusion of the intervention (Wilson et al., 2013).

### **Focus groups.**

A focus group design is commonly used within occupational therapy to identify the lived experience of patients, families, or practitioners. Within the focus group, it was identified that therapists perceived their thinking to change with the use of the mentorship intervention rather than their actual clinical abilities (King et al., 2011). The conclusion

made at the end of this study found that providing opportunities for professional growth through focus groups, peer interaction, and feedback improved therapists' relational skills and clinical behaviors (King et al., 2011).

Schindler and Sauerwald (2013) used a focus group in order to develop themes that would represent the data qualitatively in order to increase the triangulation of their study. Further, the researchers used an interview guide listing questions in order to gain information about the same topics that were the basis of the study, which made the study more reliable as it could be replicated more easily (Schindler & Sauerwald, 2013). In doing the focus group, Schindler and Sauerwald (2013) were able to support their statistical evidence by quoting the lived experience of the participants of the Bridge Program as their employment may not have progressed, however; their self-confidence or ability to stay on track with their illness may have been enhanced.

Wilson et al. (2013) used a qualitative focus group in order to identify key themes within their intervention. Specifically, they aimed to understand what the strengths and weaknesses of their intervention were as well as ideas of how to enhance the program for future participants (Wilson et al., 2013). This design allowed for a plethora of information to be obtained at one time in order to have quotations about the perceptions of the participants to promote as well as improve different aspects of their program for the future (Wilson et al., 2013).

#### **Activity log (reflection) studies.**

In the study conducted by King et al. (2011), the number of meetings with the mentor, sessions attended, and content of case studies was tracked through activity logs that were turned in mid-study and at the conclusion of the study. Cooper et al. (2005)



used an activity log as well as reflections of the participants within his design to provide logistical information for attendance as well as qualitative information based on the perception of the participants.

### **Summary of Design Types**

#### **Quantitative methods.**

King et al. (2011) used a pretest-posttest design to determine the competency discrepancies between new and experienced therapists. The authors were able to show significant gains at the conclusion of the study, however; required testing prior to as well as at the conclusion of the study. In addition, Brunero et al. (2008) used a pretest-posttest design using a 34-item Nurse Stress Scale (NSS). Again, authors were interested in identifying progress for nurses from baseline to the conclusion of the workshop, but were not concerned with what portions of the workshop were specifically successful or the reasons for the progress. Schindler and Sauerwald (2013) demonstrated the use of this design in making inferences based on information over time using just one group, which is similar to the design of this independent study using surveys. Lastly, Cooper et al. (2005) sought to identify the difference between two groups using objective data during baseline and conclusion of the study, however; this is not relative to this study as there is not a control group. Overall, this type of design requires a baseline and conclusive testing, which is not currently written within the *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) protocol as sensory processing is not necessarily a deficit that needs fixing, but rather by educating the student can be used in order to make them more successful. Therefore, although this type of design has been utilized within the occupational therapy literature, it is not conducive to this study. In addition, the authors

did not aim to obtain results about the progress of the students because academic performance is not always correlated with a student's feeling about their ability to learn material. Lastly, this study sought to identify gaps or problems within the protocol, which cannot be attained with this study design.

The survey design has been used within multiple studies in occupational therapy, however; is not ideal as a lone evaluation tool for the purposes of this study. Engel-Yeger and Dunn's study (2011) exemplifies how surveys can be used in order to provide information about the correlations between two constructs. However, survey results did not relay information about the significance of those correlations, nor did the results allow the researcher individualized information about sensory processing patterns needed to evaluate *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014). Gordon-Hickey and Lemley's (2012) study adds to the knowledge of the overall design of this independent study showing that obtaining data in a survey manner is both efficient and provides a plethora of information to formulate conclusions. However, this study compared multiple variables, whereas, this independent study is determining change necessary for program enhancement for each step using variables that are unrelated. Lastly, Dunn and Brown (1997) serve as the evidence promoting the survey design for this program evaluation as the authors were able to evaluate both the validity of the Sensory Profile (1999) based on results as well as obtain information of how the assessment should be modified for future use in occupational therapy. This is the epitome of the program evaluation, which justified the heavy emphasis within this study for using a survey design as well as the depth of information gathered using the design. Although surveys do not always generate statistically significant data, they do allow a researcher to

obtain information in a short amount of time in order to problem-solve areas of concern, which suits the goal of this independent study and therefore, is the main method of data collection due to time constraints as well.

### **Qualitative methods.**

Brunero et al. (2008), King et al. (2011), and Schindler and Sauerwald (2013) used this type of approach to synthesize information about a client through generation of ideas within a group or supports statistical data obtained through quantitative methods for triangulation of information and allowed these researchers to obtain this information in a relatively short amount of time. However, it was not feasible within this program evaluation as the sample size is small and participants were to remain anonymous to the college community at UND. In addition, implementation of a focus group requires expertise in order to guide the discussion to suit the research and due to the inexperience of one of the main researchers on this project, this design was not feasible. Lastly, even though information can be obtained quickly, it takes time and expertise, which the researchers lacked, to be able to transcribe the group verbatim for identification of themes.

Through Brunero et al.'s (2008) study, identifying the nurses' perspective about the one-day workshop, a qualitative design was utilized. Cooper et al. (2005) used a qualitative design to understand the experience of the intervention process as well as develop themes for future adjustments to the intervention. This design allowed for the authors to identify and acknowledge the lived experience of the nurses attending the workshop in order to enhance the interventions in the future both making it more efficient and enjoyable. In addition, Binder et al. (2009) sought to identify the lived experience

following an intervention in older woman through semi-structured individual interviews and they focused on past memories and emotional reactions to the intervention, which could not be obtained statistically. Lastly, Wilson et al. (2009) was able to understand how perspectives changed through their constant comparative methods of grounded theory after their intervention through a pretest-posttest individual interviews.

While information that cannot be obtained statistically can be powerful using this type of research design, it takes time to administer, transcribe verbatim, or read in order to produce the most ethical dissemination of results. In addition, qualitative data allows for themes to be produced in order to further an intervention, but does not relate to this program as themes are difficult to ascertain when academic performance and sensory processing progress do not appear similar for every student. However, these studies included multiple approaches with qualitative data, which suits this program evaluation to allow triangulation of data and identification of problems from the lived experience of the students participating. Reflection through written or oral qualitative data was also chosen for this study in order to capture the thoughts from the perspective of the researcher for future implementation and was used by both an entry-level as well as experienced therapist.

### **CHAPTER III**

#### **METHODOLOGY**

This independent study was a pilot program evaluation of *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) in order to identify potential improvements and verify usefulness of the program within the postsecondary education atmosphere. The original program was developed by the researcher and advisor (Kotta & Nielsen, 2014) in order to complete the requirements of an undergraduate Honors thesis to provide initial data on the impact of occupational therapy sensory processing services on a college campus. The idea to develop the program being piloted in this study came about after reviewing recent retention rates on the UND campus. The retention rates have been declining in recent years (Office of Institutional Research, 2013b; Office of Institutional Research, 2013c) and it was proposed by the researcher and her academic advisor that there might be sensory processing deficits influencing the performance of students. After initial review of research, UND retention rates, and formulating a thesis question and problem statement, there was adequate evidence to propose the project to the Honors Program and Occupational Therapy Department at UND.

Therefore, a program titled, *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014), was created in order to fulfill this current need through occupational therapy on a college campus. This program includes an individualized approach to assist college students by teaching them about their sensory processing patterns and the impact those patterns play within their ability to learn within their

academic environments. However, this program has not been studied within the intended population, making this pilot study necessary for further development and refinement of the program components.

The product of the Honors thesis was titled *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) and consisted of a six-step program to provide individualized education to students on a college campus of their sensory preferences and coaching to assist them in adapting their environments to best suit those preferences. The overall goal of *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) is to educate students on how to apply tools necessary to modulate their sensory experiences, through environmental adaptation or sensory strategies, in order for them to be academically successful on the UND campus.

### **Purpose**

The objective of this study was to evaluate the ease of use and effectiveness of the *Studying With Sensory Environments* (Kotta & Nielsen, 2014) program in students who are struggling academically. More specifically, the aim of this independent study was to evaluate and refine the program, *Studying With Successful Study Environments*, in order to enhance the program for future use within the field of occupational therapy. The following research questions were addressed: a) How effective was the referral process?, b) How effective was the screening and occupational profile?, c) How effective was the evaluation/assessment step?, d) What was the effectiveness of the review of the assessment step?, e) How effective were the worksheets and coaching method utilized during this step of the program?, d) How effective was the follow up meeting?, f) How

effective was the program for each of the participants?, and g) What types of changes should be made for future success of this program?

### **Description of Program**

*Studying with Successful Sensory Environments* (Kotta & Nielsen, 2015) program includes six individual sessions approximately one hour in length each. Each session will utilize Dunn’s Model of Sensory Processing (Dunn, 2001) and the Coaching Model (Graham, 2011). The forms used to implement each session can be found in the *Studying With Successful Sensory Environments* program (Kotta & Nielsen, 2015). Table 2 outlines each session within the program.

Table 2

#### *Studying With Successful Sensory Environments Outline*

<b>Referral</b>	Students at the University of North Dakota can either be referred from different on campus services such as the Student Success Center and Disability Services for Students or by self-referral.
<b>Session</b>	<b>Objective</b>
<b>1. Screening and Occupational Profile</b>	The therapist and student will discuss the referral form with the student and obtain an occupational profile.
<b>2. Evaluation/Assessment</b>	Based upon screening and referral previously, the therapist will conduct the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and Environmental Profile (Brown, 2007).
<b>3. Review of Assessment</b>	The therapist will discuss the results of the assessment with the student using the <i>Your Sensory Processing Patterns</i> worksheets for the specific results of the student and providing the handouts to them.
<b>4. Education</b>	The therapist will discuss the results of the assessment with the students to educate them on their sensory processing patterns and will work with the student

	through a collaborative partnership to develop a plan to modify or adapt their environments based on their sensory processing patterns.
<b>5. Follow up</b>	Two weeks after implementing the plan, the therapist and student will discuss how the implementation of the plan is going and make modifications to the plan as necessary.
<b>6. Check-up and Outcomes</b>	The therapist and student will either meet or correspond over email in order to check for progress after use of the plan over time.

*Source: Kotta, K., & Nielsen, S. (2015). Studying With Successful Sensory Environments.*

### **Assessments Used for Implementing Program**

#### **Adolescent/ Adult Sensory Profile (Brown & Dunn, 2002).**

This assessment was used to evaluate how sensory experiences are affecting the everyday behavior of an individual. This evaluation is a self-report and consists of a series of questions evaluating the different sensory experiences with the individual rating the questions from 5 (almost always) to 1 (almost never). This assessment tool features a focus on everyday behaviors, can be used with people with or without disabilities, it is efficient, provides intervention ideas based on results, allows for results that can be understood by non-health professionals, was formulated based on Dunn’s Model of Sensory Processing (Dunn, 2001) matching the guiding framework for the study, and results can be applied to multiple contexts needed for the different classroom and study environments students experience each day. In addition, this tool was selected because it has been heavily researched to show reliability and validity of results.

#### **Environmental Profile (Brown, 2007).**

This assessment identifies the different sensory components of the environment and the traits of sensation (frequency and intensity). It was developed as a companion to



the Sensory Profile (Brown & Dunn, 2002) in order to compare the two assessments to identify incongruities that exist within the environment for the individual. This assessment allows the client to look at their environment to identify barriers and facilitators. The client indicates if a statement refers to them. Each statement has a high or low after the statement, which refers to whether the statement addresses an environment challenge for someone with either a high or low neurological threshold. Occupational therapists are specifically trained to observe the environments to assess what types of environmental modifications could be made as well as performing task analysis through the use of the therapist analysis component of the assessment. The Environmental Profile (Brown, 2007) was chosen to in order to examine the sensory components of the environment, cross-reference the Adolescent/ Adult Sensory Profile (Brown & Dunn, 2002), is a simple checklist format, and allows for an occupational therapist to directly observe the in a non-invasive manner This assessment was given to the researcher with permission from Dr. Catana Brown to utilize for the purpose of this study. Please refer to Appendix H for a copy of the written confirmation of permission to use for the purpose of this study. Only the results sheet will be shared within the appendices of the program upon the request of Dr. Brown.

### **Research Design**

The aim of this independent study is to evaluate the program *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) in order to determine the usefulness of each step within the program to enhance the features of the program. The researchers utilized a formative evaluation approach (Chen, 2005) and analyzed the program with a variety of sensory processing needs based on the participants in the

sample. The outcome of the program for the students who participated was also reviewed. In order to accomplish this goal, the formative evaluation approach outlined by Chen (2005) was used. This method is a six-step process that includes a) review program documents and note underlying assumptions, b) identify the program elements crucial to successful implementation and determine which may be vulnerable, c) select well-suited data collection methods, d) identify problems, e) probe for sources of problems to help stakeholders choose remedial action, and f) submit findings to stakeholders and document changes they make based on findings (Chen, 2005). Prior to any research beginning, University of North Dakota Institutional Review Board approval was received.

### **1. Review Program Documents and Note Underlying Assumptions**

This step was implemented within the Honors thesis as the product was created by both researchers who implemented the program; therefore, the researcher understood the program components and purpose in fine detail. A review of the literature was completed in the areas of higher education and sensory processing theory and intervention in order to formulate the program, *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014). Additionally, an outside researcher was utilized to give their overall opinion of the bias that may exist from a therapist's perspective that could affect the implementation of the program. The program documents reviewed to determine underlying assumptions included the background and associated steps of the evaluation and intervention steps of *Studying With Successful Sensory Environments* and are noted in Table 3. The purpose of identifying assumptions was to understand the intended outcome of each step in order to then establish appropriate methods of evaluating each step.

Table 3

*Underlying Program Assumptions*

Step	Research Question	Assumptions
Referral	How effective is the referral process?	The intended purpose of this step is to work with the referral sources including the Student Success Center, Athletics, and Residence Halls in order to obtain the sample needed for the study. The referral form is in its infancy and may not ask all pertinent questions needed to carry out the program effectively. However, the basic nature of the form was developed for ease of use by consumers. The referral form will allow for entry information about each student to understand if the program could benefit them academically.
1. Screening and Occupational Profile	How effective was the screening and occupational profile?	The objective of this step and the accompanying forms are to assist the OTS/Clinician in obtaining information that informs their ability to curtail their intervention plan. This step will allow for the OTS/Clinician to understand the student's academic issues in order to gain additional information not addressed on the referral form.
2. Evaluation/Assessment	How effective was the evaluation/assessment step?	This step aims to give the OTS/Clinician standardized and objective information about the sensory processing patterns of the student and environmental analysis.
3. Review of Assessment	What was the effectiveness of the review of the assessment step?	This step is intended to use the worksheets provided to explain the results of the assessments to the student in an interactive and individualistic manner. During this step it will be important to explain the assessment in terms that the student can understand and not using OT language and to make sure that the student understand they do not have a problem or issue, but have a unique sensory pattern that when they understand, can be an asset.
4. Education	How effective were the worksheets and	There are a variety of forms available for the OTS/Clinician to choose from in

	coaching method utilized during this step of the program?	this step to educate the student and will be chosen through clinical reasoning. The goal of this step is to formulate a plan with the student through the coaching method in order to allow them to develop techniques to adapt their environment to suit their sensory preferences. It is imperative that the therapist remains neutral and adheres to the coaching philosophy to help the student engage in problem solving. This step will allow us to get information about the ability of an OT to use the coaching method and the feelings of the student related to this approach within consultative services.
5. Follow up	How effective was the follow up meeting?	This phase is designed to help the student adjust their plan and the therapist to see if they are able to problem solve small issues that may have arisen during the course of the program. It will also give us initial data about how the student perceives the changes in their sensory processing pattern habits to help them engage in academic tasks.
6. Check-up and Outcomes	How effective was the program for each of the participants? What types of changes should be made for future success of this program?	The objective for this step is to formulate an overall understanding of the effectiveness of the program as well as capture the students' gains after going through the program. The surveys will allow the OTS/Clinician to obtain objective and subjective data to further refine the program overall.

## 2. Identify The Program Elements Crucial To Successful Implementation

In order to complete this step, the researcher and advisor formulated a plan of which steps would be the most difficult to implement. It was determined that obtaining the sample would be the most difficult. Due to the timing of the study, extensive effort was put into creating PowerPoint presentations, publicizing the study through flyers and brochures, and specifically contacting organizations that work with students in the

college atmosphere such as the Student Success Center and the Athletics department. The referral form went through several revisions based on the feedback received from those sources.

In addition to identifying the potential referral sources, there were other elements of the program that needed to be met in order for the program to be followed correctly. An occupational therapist or occupational therapy student who is skilled at performing the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and interpreting the results, access to both the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) the Environmental Profile (Brown, 2007), participants dedicated to fulfilling all six sessions of the program, adequate space to store confidential information, ensuring that the procedure outlined within the institutional review board proposal is followed by the researchers, and working knowledge of the theoretical frameworks involved with the Coaching Model (Graham, 2011) and Dunn's Model of Sensory Processing (Dunn, 2001). The largest key found within the study was communication between the two researchers through debriefing sessions in order to maintain consistency in intervention and communicate with students throughout the process.

### **3. Select Well-Suited Data Collection Methods**

The literature review within this independent study sought to achieve this step within Chen's (2005) formative evaluation approach. Existing literature on program evaluations was sparse within the field of occupational therapy, and therefore, literature from similar disciplines was used to inform the data collection methods. Within the formative approach quick and flexible methods that allow for timely feedback are preferred, which aligned with the timeline of one semester to complete the study. The tools used to conduct the program evaluation included surveys filled out by the referral

sources, a survey for each step filled out by each student, a reflexive journal guided by prompts for each step, and an outcome measure self-reported by each student at the conclusion of the program. By identifying the time constraints of the study, a population size was able to be determined, it was determined that surveys would provide the most practical and efficient data for formative evaluation, post-test only surveys were used often within the field of occupational therapy for pilot studies to determine initial effectiveness of an intervention, and reflection by the therapist about the program implementation was highly supported throughout the literature. Lastly, all data methods were aimed at the same goal of having documentation of the successful aspects as well as the unsuccessful components of the program in order to further its implementation in future studies within the college atmosphere.

#### **4. Identify Problems**

Based on the data gathered in formative evaluation, the primary problems will be determined after analyzing the data collected from the referral sources, students, and therapist reflections. All data provided feedback of ways to enhance the program manual for future use within the collegiate academic environment.

#### **5. Probe For Sources of Problems To Help Stakeholders Choose Remedial Action**

Based upon the findings of each step within the program evaluation, the researcher probed for additional information from the appropriate sources prior to recommending changes. In addition, the researcher sought to understand how the problems impacted the rest of the step of the program. The researcher analyzed each step separately as well as interdependently to assess the true source of problems by determining if the problem enhanced or adversely contributed to the program in order to make the appropriate changes as necessary.

## **6. Submit Findings To Stakeholders and Document Changes Based On Findings**

Based on the data collected, recommendations for changes and modifications to the program, *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014), were made.

### **Location of Study**

Due to the nature of this study, a variety of environments were utilized. For each participant, the Occupational Therapy Department at the University of North Dakota was used. A classroom within the department as well as a private room (when available) were used in order to assess, educate, and coach each student throughout the steps. This space was used due to access to a private and quiet area, at the preference of the researcher and advisor, and it was each to access by the student participating. In addition, various classrooms were used in order to assess the students' academic environments, which had to be approved by the student prior to the assessment.

### **Sampling Method**

Participants were recruited from the University of North Dakota. Specific referral sources were the Student Success Center, Residence Halls, and Athletics. Flyers were distributed to these departments or areas as well as presentations by the researchers were done in order to advertise the program. Flyers and educational materials were distributed after institutional review board approval from the University of North Dakota and recruitment continued until 4 participants were secured. The participants were expected to commit to the six, one-hour sessions within the program.

## **Population of Study**

The sample for this study included 4 participants. This sample size was appropriate because the following study is designed to pilot the program, *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014). The sample included any student struggling academically who is referred by one of the aforementioned sources who filled out the referral form or self-refers to the department. While some students within the sample may have a diagnosed sensory processing or learning disorder, this was not required for the participation in this study. Exclusion criteria included non-UND students, students under the age of 18, and students who are not fluent in English. This study is targeting UND students who speak English, because the intervention approach requires fluency for extensive discussion and understanding to discuss problem areas.

## **Program Evaluation Procedures**

This study was approved by the University of North Dakota Institutional Review Board to be implemented in the fall of 2015. Prior to the first session, the participant was emailed the consent form and asked to review it in order to come with any questions they may have. The participants of the study were informed of all intervention and acknowledged their understanding through informed consent. Participants were asked often if they understand the information presented to them in order to decrease emotional frustration. The participant was provided a paper copy of the informed consent at the initial meeting with the researcher. The consent form was signed prior to starting the intervention session and any questions by the participant were clarified at this time.

A survey pertaining to each session was filled out at the conclusion of each session in order to understand what improvements need to be made by each participant.



The student was given the survey, asked to complete it without putting their name on it, and left it with the researcher prior to leaving the session. The researcher used the students' numerical code to identify the individual in the case that it was necessary during outcome data analysis of the program overall. A journal by the researchers was completed at the conclusion of the session using guiding questions prior to analyzing the student survey results.

The objective of this study is to evaluate the ease of use and effectiveness of the *Studying With Sensory Environments* (Kotta & Nielsen, 2014) program in students who are struggling academically. If effective, modifications to the program as indicated by the results of the program evaluation can be made in order to increase the scope of occupational therapy consultative services. By enhancing this program, it would provide a standardized program for occupational therapists to assist students attending higher education to be educated on their sensory processing patterns in order to assist them to be successful academically.

### **Instrumentation Used for Implementing Program Evaluation**

There were numerous ways that the data collected within this study was evaluated and consisted of both quantitative and qualitative methods. Assumptions by the researcher were recorded prior to the initiation of the study for each step. Table 4 outlines the research question for each step.

Table 4

*Research Question Outline*

<b>Step</b>	<b>Research Question</b>
<b>Referral</b>	How effective is the referral process? 1. What were the number of referrals during the pilot? 2. Where did referrals come from? 3. Did the referral form meet the needs of: a. Student b. Referral Source c. OTS/Clinician
<b>1. Screening and Occupational Profile</b>	How effective was the screening and occupational profile for: 1. Student? 2. OTS/Clinician?
<b>2. Evaluation/Assessment</b>	How effective was the evaluation/assessment step for: 1. Student? 2. OTS/Clinician?
<b>3. Review of Assessment</b>	What was the effectiveness of the review of the assessment step for: 1. Student? 2. OTS/Clinician?
<b>4. Education</b>	Were the educational materials useful and easy to use for: 1. Student? 2. OTS/Clinician?
<b>5. Follow up</b>	How effective was the follow up meeting for: 1. Student? 2. OTS/Clinician?
<b>6. Check-up and Outcomes</b>	How effective was the program for each of the participants? What types of changes should be made for future success of this program?

**Referral source survey.**

Each referral source (Student Success Center, Residence Halls, and Athletics Department), was asked to complete a brief survey about the effectiveness of the referral form, recruitment methods, and presentation (if applicable). This survey was distributed after the sample had been confirmed. Descriptive statistics were used to analyze these

results for the likert scale and qualitative data was recorded respectively. Please refer to Appendix B to view this form.

### **Student surveys.**

Student surveys were created for each session to address each research question. Both quantitative and qualitative data was obtained. Each survey consisted of a 3-point likert scale where the student marks agree, neutral, or disagree for each statement. These surveys were administered at the conclusion of each session and were coded by the therapist after it was completed by the student. Qualitative questions follow to allow the student to express their ideas of what facilitated or hindered the session and ways they felt could be improved. Descriptive statistics were used to analyze these results for the likert scale and qualitative data was recorded respectively. Each student survey data was analyzed separately for each session. To preview these surveys, please refer to Appendices C, G, I, M, P, T, and V.

### **Student outcome survey.**

The student outcome survey was originally part of the *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2015) manual and was administered during the follow up and final session of the program. It consisted of a 5-point likert scale ranging from strongly agree to strongly disagree as to the impact of the sensory intervention techniques on the students ability to study and perform in their academic endeavors. This is a post-test only survey because there was no control within the study, but the effectiveness of the intervention was determined through this tool. Descriptive statistics were used to analyze the results. Please refer to Appendix U for this survey.

### **Occupational therapist guiding questions.**

The guiding questions were developed to provide prompts for the therapist at the conclusion of each session. Prior to analyzing the survey results from the student, the therapist will use the prompt guide in order to engage in reflection of the session. Special attention will be directed toward the things that facilitated or detracted from the session and improvements that should be made to the *Studying With Successful Sensory Environments* manual for each specific step. The journal data was recorded qualitatively in order to make specific suggestions for program modifications. See Appendix W for details of each session prompt.

### **Data Collection**

#### **Reliability and Validity**

Reliability was addressed through the development of the program manual to allow for explicit instructions and paperwork to be used for each session. The researchers engaged in debriefings between sessions to ensure consistency with the protocol and clarify any misinterpretations of the upcoming step to be implemented. The researchers used non-standardized assessments, but through the creation of results sheets, they were able to reproduce the results for each student a simplified way.

Validity was maintained through making sure that the data was measuring each step of the program in order to evaluate its practical use within the college environment and enhance the program for future use. Researchers sought to be consistent in the design of the study to conduct a program evaluation with relatively little emphasis on the results of the program itself.

## Qualifications

The researchers were able to outline the standardization, measurement of understanding, and monitoring of intervention through the use of the protocol for *Studying With Successful Sensory Environments*. The developers of the protocol were trained as they were the authors of the program, meaning they were well suited to provide the treatment.

Katrina Kotta is a third year occupational therapy students in the graduate entry-level masters occupational therapy program at the University of North Dakota. She completed a fieldwork in pediatrics that deals with sensory processing and was the developer of the program being tested. Katrina Kotta attended the American Occupational Therapy Association Conference in Nashville, TN in 2015 where she attended the following sessions to inform her study: *Strengths-Based Coaching: Learn How To Implement This Evidenced-Based Practice* by Dr. Winnie Dunn, *Lifestyle Redesign? For Young Adults With ADHD: Providing Occupational Therapy Support Services in Higher Education* by Dr. Carlin Daley, *Neuro-Occupation: How Neuroplasticity Impacts Rehabilitation* by Dr. Joy Doll, and *Creating Sensory Environments: A Guide For Teachers and Parents of Children With Autism and SPD* by Dr. Anjali Sane. In addition, she attended the American Occupational Therapy Foundation State of the Science Symposium titled *Sensory Function and Its Impact on Daily Life Across the Lifespan* presented by Dr. Leanne Carey, Dr. Winnie Dunn, Dr. Grace Baranek, and Dr. Scott Frey.

Dr. Sarah Nielsen has worked with children and adolescents with sensory processing disorders in her work experience for eleven years. Dr. Nielsen was the advisor

in the development of the program and this independent study. No other researchers were used for this study, however, explicit written directions for implementing the program are described in the *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2015) manual for each session.

## **CHAPTER IV**

### **RESULTS**

The purpose of this independent study was to evaluate the program *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) in order to further develop and refine the program for future use. This program implemented consultative occupational therapy services for students on the UND campus to increase students' awareness of sensory stimuli that may exist in their educational environments, adversely affecting their ability to learn. Four participants completed the program for the purpose of this pilot study. This chapter provides the results of each session through student surveys, therapist surveys, and therapist journals after the completion of each session. In addition, recommendations of changes to the program from the researcher are also provided based on these results.

#### **Assessment Results**

This pilot study was conducted based on Chen's (2005) Formative Evaluation Approach. Chen (2005) outlines six steps in order to identify problems or potential barriers to a program and is useful for formative research on new programs. Therefore, this section outlines Chen's (2005) steps four through six of the approach, namely, 4) identify problems, 5) probe for the source of the problem, and 6) submit findings and document changes. The results and recommendations are presented for each step of the process by (a) providing background for the step in the program, (b) participant data, (c)

therapist data, (d) recommendations, and (e) specific changes made to the manual based on the recommendations presented.

### **Referral Process**

The referral process included in-service presentations to the Student Success Center and Resident Assistants working in the residence halls. Flyers and brochures were also distributed to the Student Success Center, Residence Halls, and public areas of campus including the Apartment Community Center, Catholic Newman Center, and the Memorial Union. Emails were sent to the students within the UND Occupational Therapy program in order to obtain the sample population.

### **Participant data.**

Table 5 includes information from the student regarding the results of the survey upon completion of the referral process.

Table 5

#### *Student Referral Evaluation Survey Results*

<b>Question</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>
The referral forms were accessible.	0	0	4
The referral form was helpful to determine if I needed this service.	0	2	2
The referral process was explained clearly on the form.	0	3	1
The referral sources assisted me in getting connected to the occupational therapy department.	0	0	4
The researcher made contact with me in a timely manner after submitting my request for services.	0	0	4

In summary, all participants felt that the referral forms were accessible, confidentiality of the participant was maintained, and the therapist responded to the request in a timely manner. In addition, qualitative data within this step revealed that



students were puzzled by the first question of the referral form as they were not sure what to say prior to checking the boxes and had to return to the question after completion of the checklist. There were no suggestions of information that should be omitted from the form and all participants felt this process was easy to complete.

#### **Referral source data.**

None of the student participants were referred to the program through either the Student Success Center or Residence Halls. Therefore, limited insight is known about the process. In addition, measures were not set in place to measure the effectiveness of the marketing strategy through the use of posters, flyers, and emails, which could be enhanced for future studies. Through Chen's (2005) Formative Evaluation Model, this was anticipated to be the most difficult aspect of the program, which the results validated for the purposes of this study. Referrals were received through word of mouth and intentional recruitment of the researchers conducting the study.

#### **Recommendations.**

In order to increase the amount of students for this study the researcher has suggested several options which include: (a) establish media connections in order to spread the word to students, (b) create a link on the occupational therapy department webpage for easy access to the referral form and contact information of the researchers, (c) utilize television advertising within the UND School of Medicine and Health Sciences, Memorial Union, and Residence Halls, (d) provide free consultation to the staff of the Student Success Center and Resident Assistants in order to allow them first-hand experience to articulate the purpose and value in the program to potential students, (e) request testimonials of students from the pilot study who found success in the knowledge

and ability to apply this program to their academic environments, and (f) pursue an article published on the UND website, Facebook, Instagram, or The Dakota Student in order to increase awareness of the service to UND students.

### **Session 1: Occupational Profile**

#### **Session overview.**

During this initial meeting of the therapist and the student, the therapist reviewed the referral form with the student. The student explained to the therapist in more detail some of the issues they were experiencing and gave the therapist insight into their current study habits or aspects of their environment that were inhibiting their academic success. The therapist created an occupational profile at the end of this session to guide the rest of the program process. The goal of this session was to establish rapport with the student to inform the rest of the program process and facilitate a collaborative relationship in order to assist with creation of an action plan during the education session (session 4).

#### **Participant data.**

The participants completed surveys at the end of this session and results are displayed in Table 6. Based on these results, participants felt that the purpose of the program was explained well, they were able to provide information they felt was necessary, and felt the session was necessary. Multiple participants commented that the session was quite short and were expecting it to be longer for the initial meeting.

Table 6

*Occupational Profile Evaluation Survey Results*

<b>Question</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>
The OT explained the purpose of the program well.	0	0	4
I was able to tell the OT everything I wanted.	0	0	4
This step was beneficial for the OT to understand my situation beyond the referral form.	0	0	4

**Therapist perspective.**

Session one data was collected from the therapist through the use of a journal.

The therapist used the following as a guide for journaling: Talk about what you expected to learn about the participants and additional information you obtained through this session. The following is a summary of the reflections by the therapist.

This session was noted for all participants to be short in duration (approximately 10-15 minutes). Specifically, during the first session, the therapist felt that the initial occupational profile eased the participant’s tension and allowed for the therapist to get to know them easily. The initial step of the program was easily completed; however, the therapist noted that it may be “be advantageous to keep this step in the process, but complete steps 1 and 2 together during the first session.”

The therapist did note that the step in itself was beneficial for learning about the client; however, she was anticipating obtaining more information. Observations within the session demonstrated that the incorporation of the occupational profile tended to decrease the hesitancy of individuals to participate as it was simply getting to know the therapist rather than being asked to complete assessments right away. Therefore, questions related to why students went into their profession, what aspects of school they

like and dislike, what they hope to gain from the program, and why they came to UND were noted as questions they would like to see if revised.

When reviewing therapist reflections, the researcher considered that the structure of the interview was rigid and did not allow for discretion of the therapist to complete the profile as the conversation continued. The occupational profile forms were reported to be too rigid and a novice therapist, as the therapist is, may require more structure whereas an experienced therapist may require less. For example, the therapist stated, “I didn’t feel like I learned much about them, but just about their knowledge of OT and the school things that they struggle with.” The therapist would have liked a structure that provided information about the student as a person first prior to discussing their knowledge of occupational therapy and the program itself.

Another aspect of this session noted to cause difficulty for the therapist was that there was no tool to assist the therapist in explanation of the program. A visual representation of the program process for both the therapist and student in the form of a worksheet was needed in order to provide an adequate explanation to students. The therapist felt that merely discussing the process was not sufficient for the student to understand each session goal and the components included within that session.

### **Recommendations.**

The first recommendation by the researcher for all participants included potential combination of the first and second sessions in order to complete the program in a timelier manner. College student’s schedules are quite hectic and time is precious; therefore, the program could be enhanced if this change were implemented as it would save the student time as well as allow for quicker turnaround of results for the student.

Formulation of a handout that would provide a visual representation for both the therapist and student outlining the process of the program in detail would be an asset for the therapist to demonstrate to the student what the goal of each session will be and what to expect in upcoming sessions. It is proposed this handout would be used at the beginning and conclusion of each session in order to provide guidance for the student participating. Based upon the results, it is recommended to keep the occupational profile within the program as the participants responded they felt it was beneficial. The researcher also reflected that this process promoted the establishment of rapport needed for the collaborative partnership to occur throughout the process. Additionally, compiling more questions within the occupational profile that address school related and non-school related questions could facilitate a better participant-therapist relationship and insight for the therapist about the student within the process. The order of the questions about the student should precede questions about the program and occupational therapy to first focus on the student rather than just the student within the program process. Questions specifically to identify two environments, one for studying and one classroom environment, are a necessary addition to the form as this data made it easier to complete the self-report and therapist analysis tools within the Environmental Profile (Brown, 2007) as found at the conclusion of the assessments administration session (second session) in the evaluation process. Lastly, it is recommended to make an occupational profile that is semi-structured and fluid in nature to allow for increased rapport building between the student and therapist.

Based on these recommendations, changes to the *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) manual were made. Please refer to Figure

1 in Chapter V for these provisions as well as within the *Studying With Successful Sensory Environments 2.0* (Kotta & Nielsen, 2015) found in Appendix Y.

## **Session 2: Assessments**

### **Session overview.**

The assessment process for this program consisted of both formal and informal assessments that utilize self-report and observation. The Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) was utilized within the initial evaluation in order to have an idea of the sensory processing needs of the individual. The therapist then had the student complete the Environmental Profile Self-Report Tool (Brown, 2007) to identify the student's perspective of their environment broken into the seven sensory categories on the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002). The Environmental Profile Therapists Analysis (Brown, 2007) was discussed with the student and the therapist was given the location, time, and dates they were permitted to observe.

### **Participant data.**

Table 7 presents the results of the participant surveys completed at the conclusion of this session. Participants responded that they felt the assessments were explained well enough to complete them in a confident manner. One participant commented that the assessment was "a good length of time and not too challenging." Other participants noted that the assessments were easy, self-explanatory, and straightforward. Feedback solicited by the therapist from the students led to the conclusion that the assessments were short enough to be completed in one sitting. The use of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and Environmental Profile Self-Report Tool (Brown, 2007) were not overwhelming based on the input of the participants.

Table 7

*Student Assessment Evaluation Survey Results*

<b>Question</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>
The assessment was explained well enough that I felt confident on completing it.	0	0	4
The assessments were given in a timely manner.	0	0	4
I was able to identify a study environment specifically for the environmental profile.	0	0	4

**Therapist perspective.**

With regard with the appropriateness of the assessments, the following journal prompts are summarized within this section based on the journal entries of the therapist at the conclusion of each session. The questions to guide journaling included: (a) Were the assessments chosen appropriate? (b) Did the information of the assessments add to the occupational profile? (c) How did it feel to administer the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and Environmental Profile Self-Report (Brown, 2007)? (d) How did it feel to administer the Environmental Therapist Analysis? (e) How useful was the Environmental Profile Therapist Analysis (Brown, 2007) if you were not able to observe in their academic setting? (f) Did you feel you obtained enough information? and (g) Are there other assessments that should be used in the future?

When reflecting on the appropriateness of the assessments the therapist stated, “the assessments use pretty friendly terminology that facilitates better participation and honest answers.” Therefore, these assessments were suited for the population being administered to college students who are more receptive to assessments that use language and examples that are easy to follow.

The therapist felt there was a disconnect between the information from the occupational profile and the assessment phases that requires additional consideration in the revision of the program. The information on the assessments added great depth to the occupational profile. As stated, the therapist felt that the occupational profile could be strengthened in order to gain more introductory information and establish rapport; therefore, information gathered on the assessments were insightful within the program process for all participants as information was lacking from the initial session. Also, as the assessments analyzed sensory processing information and sensory information in relation to the environment, information gathered on the assessments provides information “that could not be obtained through the occupational profile”, as written by the therapist.

All participants only required approximately 20-25 minutes in order to fill out the assessments as well as 10-15 minutes to complete the occupational profile. Therefore, it is recommended that these steps be combined to decrease the amount of sessions required for the participant as well as allow for greater rapport building and transition between the two sessions. In addition, one of the participants noted, “It just doesn’t make sense to have a college student meet for 15 minutes; you have to make it more worth their time with all of the scheduling hassles.” The therapist recorded that the creation of a more semi-structured occupational profile tool that facilitates more interaction would strengthen the initial session in order to enhance the administration of assessments by making the process more fluid. Thus, forms should be adapted to serve as a liaison between the profile and assessment administration for better flow through the sessions of the program.



The therapist noted that the administration of the assessments was very easy. They felt comfortable explaining it to the participants and commented it was “easy to tell them what to do.” All participants were observed to complete the assessments with ease and were satisfied with how short the assessments were when asked by the therapist.

The Environmental Profile Self-Report (Brown, 2007) was more difficult to administer than anticipated as the therapist reports that she was not as familiar with the assessment as it is unpublished and the manual provides limited instructions as to the process of administration. The participants solicited more guidance when filling out the Environment Profile Self-Report (Brown, 2007) as compared to the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002), which the therapist felt were more difficult to answer as no manual exists. In addition, when filling out the Environmental Profile Self-Report (Brown, 2007) the therapist poses whether the students should have the student self-report on their study environment while the therapist observes and analyzes the classroom environment if allowed. One participant completed the program in this manner as their study environment involved their home of which the student did not allow the therapist to observe. For the participant that completed the assessment in this manner, it was found to be beneficial to their understanding of their sensory processing patterns as well as within the creation of an action plan suited with multiple contexts in mind. Selecting both a study environment as well as classroom environment for the program could enhance the feasibility and adaptability of the program for the student within their action plan. It was reflected that “if the study and classroom environments are very different, the sensory response is different and adaptations required for successful learning could be one different extremes.”

The assessments chosen were easy to score; however, analysis of the Environmental Profile Self-Report (Brown, 2007) was novel to the therapist. Analyzing the correlation between the two assessments was rather difficult and required approximately 1-2 hours per participant; more time than originally anticipated by the therapist. However, when conversing with the supervising therapist, who was much more experienced, the analysis of the results was a fairly easy and efficient process. The therapist felt that this may also have been due to a lack of a tool used to guide the process of analysis of the results in comparing each assessment as well as providing the information to the student.

The therapist reflected that for each participant, discussing a place to observe for the Environmental Profile Therapist Analysis (Brown, 2007) was rather difficult leading to decreased rapport with the participant. In addition, the therapist during the program process was unable to assess the student's environment prior to dissemination of the results of the Environmental Profile Self-Report (Brown, 2007) and Adolescent/Adult Sensory Profile (Brown & Dunn, 2002). As this was not originally intended, a benefit of this was the therapist was able to analyze the environment with perspective of the participant's individual preferences to curtail the assessment of the environment. The therapist noted that this was an asset within the analysis process as the assessments were done simultaneously rather than separately. If the therapist tried to perform all three assessments prior to disseminating the results to the student it would subsequently overwhelm the student with a plethora of information at once, decreasing the potential for the student to retain the information to apply it later in the program. Also, the sensory preferences of the student would not have been held in perspective by the therapist at the

time of the Environmental Profile Therapist Analysis (Brown, 2007). The therapist noted that the lack of identification of an environment during the occupational profile for both study and classroom environments placed a detriment to the relationship of the therapist-student because the student was observed to be more apprehensive in selecting a classroom environment. The therapist reflected that instead of choosing the environment to observe, the choice of the student would then be changed to if they are willing to allow the therapist to observe. The environments would have already been identified through casual conversation in the occupational profile, making the process flow much more easily.

When not able to be in the actual environment for reporting on the therapist's analysis portion, they felt it was difficult to fill out the Environmental Profile Therapist Analysis (Brown, 2007). The therapist was able to observe in the actual environment for two of the four participants. The Environmental Profile Therapist Analysis (Brown, 2007) benefitted the therapist in the study as it allowed the therapist to view the environment with the student's specific preferences in mind in order to identify the critical aspects of that environment that facilitate or inhibit the student's ability to learn while within the classroom setting. This assessment tool facilitated the evaluation process of the environment for the therapist and was easy to use. Both observations lasted approximately 10-15 minutes total, with the therapist able to leave the large lecture at her leisure without disturbing the class session. Overall, the therapist found that this step added to the information gathered with the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and Environmental Profile Self-Report (Brown, 2007) to gain both subjective experiences of the student as well as the therapist of the same environment.

In the environments where the therapist was not able to observe due to confidentiality limitations for students with smaller sized classes, the student verbalized the environment to the therapist who completed the Environmental Profile Therapist Analysis (Brown, 2007). The therapist reflected that this approach to the assessment did not yield additional information as the information gathered mimicked information previously provided by the student with the Environmental Profile Self-Report (Brown, 2007) tool.

The therapist noted that she was able to obtain enough information to complete the program; however, additional information about the environment from the perspective of the students incorporating both their classroom as well as their studying environments would have been beneficial. The therapist points out that the two environments could be potentially very different, which means that their learning within as well as outside of the classroom requires different adaptations. It also would have provided additional insight into how they function in an environment that is more structured like a classroom versus an environment of their choosing for studying.

### **Recommendations.**

The duration of the assessments were well received by the participants as they were easy to administer, complete, and score. However, it is recommended to create a template to guide the analysis process, potentially stemming from the Ecology of Human Occupation (Dunn et al., 1994) to align with Dunn's Model of Sensory Processing (Dunn, 2001). Even though the therapist is facilitating the conversation through the Coaching Model (Graham, 2011), adequately presenting the results to the student needs to be accomplished prior to allowing him or her to engage in self-directed problem solving. As

the time to complete the assessments was rather short, it is also recommended to combine the first and second sessions with the support from both the participant and therapist feedback throughout the first and second session. In addition, creating a connection between the occupational profile and assessments by identifying two environments (study and classroom environments) is recommended. Lastly, providing the therapist with discretion to replace the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) with the Sensory Processing Measure (Parham & Ecker, 2010) if appropriate could be a feasible option for easier analysis of results.

With administration of the Environmental Profile Self-Report (Brown, 2007), the creation of an explanation through the use of a prompt on the worksheet for the therapist as well as for the participant may increase the consistency in the administration of the assessment and decrease the amount of questions by the participants. It would help to better explain the purpose of the assessment to both the participant and the therapist who could be a novice to the program. In addition, having the participant complete the self-report on their study environment while the therapist performs the therapist analysis aspect of the Environmental Profile (Brown, 2007) has been posed as an enhancement to the program.

Discussing the Environmental Profile Therapist Analysis (Brown, 2007) within the first session could be beneficial. Incorporating exposure gradually to this assessment as it was found to make participants apprehensive when introduced and scheduled within the same session would be one solution. This would give the participant time to consider if they are willing to allow the therapist to observe as well as which environment he or she would feel comfortable permitting the therapist to observe. Further, this would allow

or more time for scheduling when the therapist would conduct the assessment for the therapist to observe based on the participants scheduled classes. Identifying the environments where a student experiences the most difficulty within the occupational profile would have been more conducive to the administration of the assessment.

In the administration of the Environmental Profile Therapist Analysis (Brown, 2007), it is recommended that the process of this assessment would be three-fold. The process would go as follows: (a) during the first session (which now includes the occupational profile and self-report assessments) the therapist and student would discuss both study and classroom environments where they are experiencing difficulty during the occupational profile and pick the top in each category, (b) at the conclusion of the first session the therapist would articulate to the student the purpose of the assessment toward the ability to assist the student and ask them to decide if they would permit the therapist to observe a class session by the next session, (c) if the student decides to allow the therapist to observe, the student will provide the therapist with the location, time, and days of the class for the therapist to anonymously observe during a time that suits the therapist's schedule for the duration it takes to complete the assessment (approximately 10-15 minutes). If the student does not allow the therapist to observe, the therapist would omit this aspect of the evaluation as it was not shown to give additional information with verbalization of the environment from the participant, (d) the therapist would observe between the second and third sessions, (e) results of the Environmental Profile Therapist Analysis (Brown, 2007) would be given to the students prior to creation of the action plan during the session 3 of the revised program titled Environmental Analysis and Action Plan Creation (Kotta & Nielsen, 2015).

An additional assessment recommended by the researcher for use within the program is the Sensory Processing Measure (Parham & Ecker, 2010). This assessment is suggested as it allows for more categories of results for functioning and also aligns with Dunn's Model of Sensory Processing (2001) used as a foundation of the program. This was suggested in order to ensure that replication of the program is completed in a standardized fashion as analysis of the information requires less analysis by thoroughly looking through categories as the results are presented within the categories themselves on this assessment.

Based on these recommendations, changes to the *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) manual were made. Please refer to Figure 1 in Chapter V for these provisions as well as within the *Studying With Successful Sensory Environments 2.0* (Kotta & Nielsen, 2015) found in Appendix Y.

### **Session 3: Review of Assessments**

#### **Session overview.**

Prior to this session, scoring and analysis of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and Environmental Profile Self-Report Tool (Brown, 2007) is completed and analyzed with the occupational profile of the student. The goal of this session is to ensure the students understand their unique sensory processing patterns in order to utilize this information to not only adapt their current academic and study environments, but also to be able to do this with future academic or vocational environments, which further validates the use of the Coaching Model (Graham, 2011). Students were given a copy of their results as well as worksheets titled *Your Sensory Processing Patterns* (Kotta & Nielsen, 2014) to further process and analyze their results

for self-guided learning after the session. The therapist also completed the Environmental Profile Therapist Analysis (Brown, 2007) after session three and prior to session four for two of the participants who allowed the therapist to observe.

**Participant data.**

Participants felt during the review of assessments session that the forms presenting the results were easy to understand, the results correlated with their needs within the classroom, and having the physical results of their assessments was helpful. The *Your Sensory Processing Patterns* (Kotta & Nielsen, 2014) worksheets were provided at the conclusion of the session. Therefore, many participants solicited advice on what to place for an answer on the evaluation survey as they had not had a chance to complete these worksheets throughout the session. Table 8 presents these results.

Table 8

*Student Review of Assessments Evaluation Survey Results*

<b>Question</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>
The forms used to show me the results were easy to understand.	0	0	4
The results of the assessments reflect my sensory needs within the classroom environment.	0	0	4
The results sheets with my results of the Sensory Profile were helpful.	0	0	4
The results sheets with your results of the Environmental Profile (Brown, 2007) were helpful.	0	0	4
The <i>Your Sensory Processing Patterns</i> (Kotta & Nielsen, 2014) worksheets were beneficial?	0	3	1



Within the surveys for this session, qualitative data was also obtained from the participants using the following questions: (a) What did you like about the results sheet for the Adolescent Adult Sensory Profile (Brown & Dunn, 2002)? (b) What would you change? (c) What did you like about the results sheet for the Environmental Profile? and (d) What would you change?

Participants noted that they appreciated the detail within the assessment and felt it was thoroughly explained to them by the therapist and referred to within the session. One participant noted, “I like that they were specific to me”, while another responded, “I liked that it fit me”, when reflecting about the way that the therapist presented the results in a Word Document format outside of the Adolescent/ Adult Sensory Profile (Brown & Dunn, 2002) report sheet.

It was noted that having the results of the Environmental Profile Self Report (Brown, 2007) were beneficial in understanding the sensory preferences. In addition, one participant noted that as they had selected two environments for the therapist to analyze, it was beneficial to see how the environments they chose (their study environment) contrasted with an environment chosen for them (their classroom environment). When additional feedback was solicited from this participant by the therapist, the participant responded that understanding why she chose environments that suited her preferences without recognizing it allowed her to understand how the environments that she did not have control over affected adversely within her class sessions. Another participant responded that she enjoyed being able to formulate ideas with the therapist about why she does different things, such as chewing gum during class and problem solving different

strategies that may work for her in preparation for the next session with the therapist in a collaborative way.

**Therapist perspective.**

At the conclusion of the review of assessments session, the therapist completed a survey as well as a journal entry for each participant. The following journal prompts and survey are summarized within this session: (a) Did you feel the forms were helpful in explaining their sensory processing patterns? (b) What changes could be made to the forms? (c) What changes could be made to the result form for the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and Environmental Profile (Brown, 2007)? (d) Should this step have gone with the administration of the assessment? and (e) Additional comments?

The *Your Sensory Processing Patterns* (Kotta & Nielsen, 2014) worksheets were not completed within any of the sessions as the therapist felt that the students were not able to take in more information as most of the sessions lasted 30-60 minutes per student. It was recommended by the therapist to have the worksheets as a processing tool for students, which would allow for greater self-guidance by the student to find solutions in order to fully integrate the coaching philosophy further within the premise of the program.

It was suggested by the therapist to create a template to explain to the therapist how to analyze and type up the results of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) as well as the Environmental Profile Self-Report (Brown, 2007). Creation of such a tool would also ensure consistent dissemination of results. The therapist noted that a tool would assist in guiding to the therapist to both analyze the results and a flow or

process of how to share the results with the student. The therapist noted that the key to discussing the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) was to fully utilize the Coaching Model (Graham, 2011) through presenting the concept and letting the student determine strategies that would work. Situations where a specific sensory category also affects the students' studying, or different behaviors such as chewing gum that happen without the students' understanding until gaining the information as to why, was noticed within the feedback from multiple participants. Coaching facilitated greater discussion and application by the participants as noted by the therapist, which allowed for increased rapport with the student.

It was also noted that the therapist could leave the Environmental Profile (Brown, 2007) out of this step completely for students who have more complex results, meaning they demonstrated extremes for two or more quadrants and held those preferences within at least two different sensory categories to describe. This would allow for less information to be presented and decrease the possibility of overwhelming the student. The therapist suggested a funnel approach whereby the student would first be presented with the information detailing their sensory processing patterns in this session in order to understand the fundamental principles guiding their modifications and adaptations to a particular environment with examples and assistance of the therapist and the processing worksheets. Next, the therapist would discuss the specific environments analyzed through both parts of the Environmental Profile (Brown, 2007) to describe how those specific environments impact the participants learning. Lastly, combining the two environments in order to decide the best strategies to use or modifications for the student to make based on these results.

The therapist stated the following about session three: “This step is critical for the participant to understand and have time to ask questions and process as the concepts are highly rooted in neuroscience and are abstract that lay people will have a hard time comprehending at first.” Within another reflection, the therapist asserted, “absolutely not,” when asked if administration and review of assessments sessions should be combined. Analysis of the results was time consuming and reviewing the results lasted 30-60 minutes for each participant. Overall, the therapist felt it was appropriate to have this session dedicated solely to describing the results of the assessment with the student in a way that they can easily understand depending on their familiarity with the topic. This step was also noted to be the longest step within the program. Therefore, the review of assessments session (session three) should remain as an individual session with presentation of results as the sole purpose. This step could be broken down at the therapist’s discretion into multiple sessions to ensure that the student understands the material and does not become overwhelmed for more complex results.

A major finding within this session was stated by the therapist as, “This program is very flexible and allows for the therapist to contour the sessions towards the students’ knowledge and expertise, which is highly advantageous to a therapist.” In addition the therapist noted, “They (students) were able to discuss things that they already were doing in their environment and come up with specific idea options that may be useful to think about over the next few days before creating their plan. Students felt confident in what they had learned and seemed to demonstrate thorough understanding of the material through application of learning by problem solving potential application of strategies to

their own environments or lifestyle habits.” This step was noted by the research to have the students rationalize the “why” aspect of the things that they do in their everyday lives.

### **Recommendations.**

Based on participant’s feedback, they felt that it helped to have “concrete” examples both from the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) as well as the Environmental Profile Self Report (Brown, 2007) within one document to show how the two are related and talk about both assessments together, in order to fully understand their sensory preferences. As there was not standardized method for analyzing the results, the researcher created a template that they utilized consistently throughout the program, which was appreciated based on the participant’s responses. The researcher reflected, “Explicit instructions of how to go about analyzing the data systematically should be completed as a modification to the original program. In addition, the authors should put in portions of the study examples within the manual in order to give a concrete, real-world example.” Therefore, this tool is recommended in order to guide the assessment analysis process for the therapist and ensure that results are disseminated to the student in a standardized way. This tool promoted coaching methodology as it outlines the general information to facilitate greater discussion and collaboration between the therapist and the student, which the researcher stated was key for successful understanding and application for the participant.

It is recommended that the therapist wait to complete the Environmental Profile Therapist Analysis (Brown, 2007) until after the review of assessments session (session three) as it provided greater depth of insight and analysis as well as postpone sharing information about this assessment with the students until they have had time to process

through their own sensory processing patterns in order to be able to apply them to the additional information. This will allow for decreased risk of overwhelming the student within the initial meeting session. In addition, splitting this session into two for results that are highly complex is recommended, especially in cases demonstrating more than two quadrants with two or more significant categories for each quadrant upon therapist analysis.

The *Your Sensory Processing Patterns* (Kotta & Nielsen, 2014) worksheets were not able to be utilized for the intended purpose of the original design as the researcher did not feel there was adequate time for the student to complete them. Due to this finding, the worksheets were used as a processing tool for the participants to use self-directed learning after the session was complete as they were formulating strategies to implement in their action plan. The participants commented that they were “eager” to try the worksheets on their own time in order to process through the information. Therefore, making the intended purpose of these worksheets for self-directed learning after the review of assessments session is recommended.

Based on these recommendations, changes to the *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) manual were made. Please refer to Figure 1 in Chapter V for these provisions as well as within the *Studying With Successful Sensory Environments 2.0* (Kotta & Nielsen, 2015) found in Appendix Y.

#### **Session 4: Education**

##### **Session overview.**

Prior to the education session (session four), the therapist analyzed the results of the Environmental Profile Therapists Analysis (Brown, 2002). The therapist discussed the

results of the Environmental Profile (Brown, 2007) (both the therapists analysis and self-report of the student) referencing the student’s sensory processing patterns at the start of the session. The goal of this session is to inform the students of how their environments relate to their sensory processing patterns as well as creation of a collaborative action plan between the student and therapist. In order to complete this session, the therapist coached the student when problem solving how to use the students’ sensory processing preferences within their classroom and study environments as well as when developing tools and strategies in the formulation of a plan.

**Participant data.**

Table 9

*Student Education Evaluation Survey Results*

<b>Question</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>
The researchers were able to articulate the results of your assessments so that I could understand.	4	0	0
It was a team effort between the therapist and me to create a plan.	4	0	0
The planning worksheets were beneficial to creating a plan based on my sensory processing patterns.	4	0	0
The therapist was helpful in thinking of strategies for adapting my environment.	4	0	0
The therapist was able to think of practical changes I felt were useful to help me be successful.	4	0	0
I would have been able to generate strategies on my own without the therapist.	2	2	0
I was able to come up with strategies on my own with the help of the worksheets.	4	0	0
I am satisfied with the plan that I developed with the therapist.	4	0	0
Which planning form did you use?	<b>A</b>	<b>B</b>	<b>C</b>
	0	2	2

Within the student surveys for the fourth session participants were asked to respond to two open-ended questions. The first question asked, would it have been easier to develop a plan with or without a guiding worksheet? The second read, what did you like about the planning worksheet? The responses are summarized in the following paragraph.

All participants responded that they felt that this step was easiest with a guiding worksheet in order to have a format to follow and a place to specifically write down their plan. All participants commented they liked that the worksheets facilitated a guide to the plan. The action plan worksheet allowed for structure while allowing them the choice of which form to use and how to use it based on their preference as stated by participants. The planning worksheet allowed for multiple ideas for the same sensory feature within the environment they were trying to suppress or exacerbate. Lastly, the action planning worksheet made students process and analyze things that they could actually do with the information they had learned, which participants felt they would not have been able to complete independently. When feedback on what to change about the planning forms was asked by the therapist, the participants responded they would not change anything.

#### **Therapist perspective.**

The therapist was asked to journal about the experience with each participant after the education session (session four) was complete. The information from journal entries is summarized in the following section. Questions guiding the therapist are as follows: (a) How useful were the *Your Sensory Processing Patterns* (Kotta & Nielsen, 2014) and what changes should be made to them? (b) What changes could be made to the result form for the Environmental Profile Therapist Analysis (Brown, 2007)? (c) Were you able



to articulate the results to the student? (d) Was the Coaching Model (Graham, 2011) useful to formulate a plan with the student? (e) Are there any changes you would make to this form? If not, would you recommend using this form again in the future? (f) Did you feel like the establishment of the plan was a collaborative process? and (g) Do you feel that the student was able to come to their own conclusions to formulate a plan?

The worksheets given to the students prior to this session were useful for three of the four participants who used them. Each participant generated at least one idea of a strategy with or without the use of the worksheets. Two participants felt that the worksheets allowed the student the ability to process through the information, which to the student felt was worthwhile. One participant stated the worksheets could use simpler terminology, they could be individualized for the participant's sensory preferences possibly into one worksheet, and the questions pertaining to things noticed within the environment specifically caused confusion on the worksheets.

Observations were not completed prior to this step in order to demonstrate the results of the Environmental Profile Therapist Analysis (Brown, 2007) and therefore, was not presented within the third session. The therapist found this to be appropriate as just learning about the sensory processing aspects of the results was difficult enough for the participants. Also, this would allow for the participant to focus on just the sensory processing patterns during this session and then adding the environment in during the next session to assist in the formulation of an action plan. Again, the therapist noted that formal assessment of the study environment and a classroom environment would assist in analyzing and comparing the results for the student's benefit. A few of the participants selected their home environment to be analyzed within the self-report, but a classroom

evaluation for their Environmental Profile Therapist Analysis (Brown, 2007), which allowed for increased examples and explanation of how the student is affected in an environment that they choose (their home or area of studying) versus an environment that is selected for the student (classroom environments).

The therapist felt comfortable articulating the results of the Environmental Profile Therapist's Analysis (Brown, 2007) to the student without using the actual results sheet. The therapist utilized the Coaching Model (Graham, 2011) within this by asking the student what they perceived to be the strengths and weaknesses of the environment when filling out their action plan worksheet. The therapist felt that the students had processed using the *Your Sensory Processing Patterns* (Kotta & Nielsen, 2014) worksheets and demonstrated understanding and application as three of the four participants either bought or found different things such as silly putty or a stress ball to facilitate muscle work and touch processing within their environments.

The therapist consistently asserted that the more she relied on the Coaching Model (Graham, 2011) during the process, the easier the sessions flowed, and the better the collaborative process unfolded. The therapist felt that the Coaching Model (Graham, 2011) provided a sense of ownership to the student throughout the process from choosing the worksheet that they wanted to use, asking what the strengths and weaknesses of the program included, and probing further to assist them to develop their own strategies. When completing the action plan the therapist described that when therapists form written plans with clients through a collaborative process, results are greater as it is more like a contract and ideas they are really interested in. The therapist always made note to the participant that this was their plan in order to provide that sense of control at the

initiation of the session, which may need to be stated and validated by research citations within the manual for the therapist to reference. Upon reflection of the Coaching Model (Graham, 2011) the therapist states, “I think that this model is fantastic because it allows for problem solving for the participant completely, allows for a great relationship with the therapist and student, and provides opportunities for light bulb or aha moments for the participant to occur while processing through the information themselves.”

Overall, the forms were appreciated as they provided that therapist and participant a guiding structure during this step of the process. The therapist validates the need for a structured, semi-structured, and loosely structured worksheet within the manual as it allowed for students to choose the style that worked best based on their preferences in planning. Allowing students to choose the form they wished to use also was not originally outlined in the manual; however, should be executed in this manner as it aligns with the coaching philosophy. Finally, the therapist comments the forms all contained a chart on the top of the page, which the therapist felt was not necessary as the student had already gone over these results. This chart however, would have been useful for the participant and therapist to use when discussing the results of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002), and therefore, could be added to the sensory profile results template instead. Also, going through the strengths and weaknesses of the environment prior to creation of the plan allowed for collaboration and the weaknesses flowed into the plan as problems to be addressed, were either put into a certain sensory category or the student decided which sensory system to use to help with the problem, and then a strategy was devised. The therapist also found that this systematic way of going through the action plan creation simulating a funnel from the start of the process

until the plan. It was posed that a funnel diagram for the therapist would allow the therapist an idea of how the sessions go from big to small concepts could be beneficial as the therapist found this insightful. Lastly, the therapist commented that having a copy of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) results specifically for the therapist was beneficial to have while creating the plan not only for the participant to refer back to, but also the therapist if they are conducting the program with several students at one time.

The therapist felt the process was collaborative and states it was “100% client-centered” when reflecting on one participant. The therapist felt that the student determined the direction of the session, but the therapist probed for more questions as well as provided guidance when solicited by the student. Overall, the therapist felt that the students were able to formulate their own strategies and conclusions as evidenced by the participants obtaining different items to trial as well as their ability to apply their sensory preferences to other environments or situations not addressed within the assessments. The therapist felt because she had established rapport, it was a safe environment where the students felt that they were able to provide their opinions and receive open and honest feedback from the therapist. The therapist also states, “although some of the participants processed through the information more than others, all participants at least thought about their environments and their preferences at some point between the two sessions and now view those environments or situations differently based on the conversations that we had.” Therefore, with the therapist probing the students as well as validating their ideas, the students were able to come up with their own conclusions with guidance in a way that suited their needs.

## **Recommendations.**

The *Your Sensory Processing Patterns* (Kotta & Nielsen, 2014) worksheets should remain as worksheets sent home with the participants based on the researcher and participant data. However, modifications to the worksheets, such as changing the questions to be simpler, are advised.

It was recommended based on the researcher's experience to note in the manual that the Environmental Profile Therapist's Analysis (Brown, 2007) result form is to allow the therapist to review the results more easily. This form was not actually shown to the participants as the students already knew the environment that they were in. Instead, the therapist discussed the results in a general format by soliciting information from the student about what the student thought about the environment the therapist observed and the therapist would then suggest other sensory components of the environment that were found during the observation period when creating the action plan.

The Coaching Model (Graham, 2011) was quite useful to the researcher and should remain as the approach to the intervention as it allowed for a collaborative partnership and facilitated student ownership of the process. Written information of research on the effectiveness of writing a plan with another person should be documented in the manual in order to provide resources for the therapist to discuss the purpose of the action plan to the participants.

The forms used within the process of this session were helpful, in not only guiding the session, but also provided a systematic way of getting to a solution as well as facilitated the coaching methodology. It is recommended to add the strengths and weaknesses to Form A as well as eliminate the chart from the top of all action plan forms

by moving it to the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) results template as this was not helpful at this stage in the process. In addition, a form showing the therapist the funnel effect of the process may be beneficial as the researcher noted in the reflection that all of the sessions flow together and build on each other while becoming more specified as the student learns more and problem solves with the therapist.

Based on these recommendations, changes to the *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) manual were made. Please refer to Figure 1 in Chapter V for these provisions as well as within the *Studying With Successful Sensory Environments 2.0* (Kotta & Nielsen, 2015) found in Appendix Y.

### **Session 5: Follow-up**

#### **Session overview.**

This session was designed to allow the student to bring back the action plan after one to two weeks of implementation (or for a period of time as the student's schedule allows for meeting). The therapist and student discussed how the plan was going, if there were any areas that still remained unclear, aspects of the environment not previously addressed, and creation of more strategies as well as elimination of strategies that did not facilitate enhanced focus or learning for the student. The session topics are determined by the students and facilitated by the therapist. The goal of this session was to provide guidance of how to modify the student's current plan and to further explain questions related to sensory processing or sensory aspects related to the environment.

### **Participant data.**

The following table outlines the results of the follow-up session (session five). Overall, participants felt that their plans worked for them. Two of the four participants required changes to their plans. Both participants had more complex sensory profile results. Participants thought this session was beneficial or were neutral in their response to this question. Additionally, it was reported participants were able to adjust their action plans independently according their understanding of their sensory preferences, which adheres to the ultimate goal for them within the program within multiple environments both inside and outside of the classroom. One participant verbalized, “she felt confident” because her ability to focus or concentrate within her environment was within her control. She further expressed that the concepts she felt were so simple and almost common sense; however, until this program, she had never fathomed that these simple concepts had such a large impact for her. Lastly she claimed she “liked the freedom to figure out how to solve the strategies that worked best for her,” because she gained ownership of her plan as well.

Table 10

#### *Student Follow-Up Evaluation Survey Results*

<b>Question</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>
My plan worked for me.	0	0	4
There were things that I needed to change during the follow-up.	2	0	2
I felt this follow-up session was beneficial.	0	2	2
I adjusted my plan throughout its use independently.	0	1	3
I was able to apply my sensory preferences to multiple environments involved in academics.	0	0	4

When asked on the open-ended response question, “what would you change about the follow up session?” participants had the following suggestions. One participant suggested to allow more time between the creation of the action plan (session four) and the follow-up session (session five) in order to allow them more time to adequately implement her plan within their environments to identify if it was effective or not. In addition, when asked about further comments on the session in general, one participant responded she found the knowledge of sensory processing to be really beneficial. She felt cognizant about her preferences and environment, and how she can adapt her environment to suit those preferences. One participant explained that she was happy to try the program because of the new knowledge she had gained. Prior to this program, the participant said, “I would just blame not being able to study or focus on being tired or bored, but now I think about what is around me that could be contributing and I am more aware of the things that I do such as avoiding certain places and has a reason for why I do them.” Further, she stated that the program provided her with a new perspective on learning and has given her valuable information to be more aware of her sensory preferences.

**Therapist perspective.**

Data for the follow-up session (session five) was collected through therapist journal reflections at the conclusion of each session. The following journal prompts were used to guide the reflections: a) Was this follow-up necessary? b) Do you feel like the timing of the follow-up was adequate? c) Would a worksheet have been useful in this process? and d) Do you feel like you gained any extra useful information from the



student? The response to these questions by the therapist are reflected in the following paragraphs.

When asked if the follow-up was necessary, the therapist felt that it was beneficial overall. It allowed the therapist and student time to talk about how things were going and if they worked well or did not work well. Even when participants overall felt the program was going well, the therapist was able to probe further about their plan to assist the participant in identifying specific parts of their plan that they did not recognize as ineffective until discussed. The therapist reflected that this session allowed for the student and therapist to analyze other types of strategies that can fill in the gaps of the unaddressed issues for the student. In a final comment the therapist notes, “it gives them pride telling me how they are doing and solidifies to the therapist the type of impact they are having. Also, it gives the student the opportunity to think about when and how they have been using the strategies to bring further awareness of why again.”

The therapist noted the student often forgot to bring their action plans for the follow up session. As the therapist did not retain a copy of this plan for their records, this made the session rather difficult and undermined the effectiveness of the session. Also, as the plans were written, it was difficult to edit the plan and did not require an agreement between the therapist and the student to adhere to the new plan as a contract. Also, the therapist reflected that allowing an alternative option of emailing the participant prior to the session to identify if they have changes could be another approach; however, this would not allow for the therapist to identify different gaps that were not identified in the plan by the students.

The therapist found that coaching was more difficult during this session as the participants had already brainstormed for the original strategies and often came up blank when probed by the therapist. This oftentimes was noted when complex knowledge of the sensory system modulations was required to formulate a conclusion of a strategy that would suit their specific environmental problem.

Timing of this session was an issue identified by the therapist. One participant had her follow-up session over two weeks after the creation of the initial action plan, but all other participants met less than two weeks from the creation of their plan in the education session (session four) due to scheduling. Therefore, the therapist felt that a two week recommendation should be implemented into the program in order to avoid this same response. The therapist felt that participants were not given adequate time to trial their strategies or identify new situations where they found it did not work. However, within the time restraints as they were, the therapist found that all participants were able to apply at least one strategy. For example, one participant learned to use their hair as a fidget, one found a rock to use, another completely changed study environments and utilized ear plugs, and the last, found chair push-ups beneficial. All of these examples demonstrated understanding and ability to implement changes within their action plan without the help of the therapist as indicated for their environment, which the therapist reflected was “fantastic.”

Worksheets created specifically for this session would not have been beneficial to the therapist. The therapist noted that having the participant’s action plan and their sensory processing results template resulted in enough paper. By the time of the follow-up session, sufficient rapport was developed between the therapist and participants and

therefore, an additional worksheet to guide the conversation is not warranted and would have added clutter to the discussion. The therapist further stated a worksheet at this point in the program may have detracted from the session rather than facilitate further self-exploration of their strategies.

Extra information gained through this session included information more beneficial to the therapist for the purposes of the study rather than the student. The therapist was able to see the value that the program provided the student through their new knowledge and application thereof. It was interesting for the therapist to see how quickly participants were able to grasp sensory concepts as the therapist noted when trying to discuss what systems might work when reorganizing a plan, the participants were able to quickly answer that they had tried the suggestion already. The therapist felt it was great for the therapist to be able to gain closure with the participant in order to identify which strategies that could be used with another participant based a previous participant's success.

### **Recommendations.**

The follow-up session was necessary in order to check-in with the student as well as for the therapist to gain external reinforcement of the impact that their efforts were making in the lives of the students. It is recommended that the timeline for this session be changed to no less than two weeks after the completion of the education session (session four) in order to provide adequate time for the student to trial the various strategies formulated within the previous session.

Even though a worksheet was not recommended based on the therapist reflections, the therapist did state that typing up the action plan during the education

session (session four) and then printing it and signing it with the student could have been beneficial not only to give the therapist and student their own copy, but also to be able to edit the plan during the follow up session (session five) more easily. This, along with the creation of a flowsheet in order to provide the student with guidance of what to expect, would enhance the program.

Lastly, allowing the therapist to email participants prior to the follow-up session (session five) may be warranted depending on the schedule of the participant. It should be noted in the manual that only in cases where the therapist feels that participant demonstrates nice understanding of the material and responds that they require no changes is this indicated. Otherwise, the therapist should conduct the session in person according to the original instructions.

## **Session 6: Check-up and Outcomes**

### **Session overview.**

This session was completed via email at the request and convenience of the participants. The goal of this session was to allow for contact between the student and the therapist to obtain results of their academic progress after the creation and implementation of their action plan over a period of time. Students were emailed a follow-up survey regarding academic self-reported progress and for overall program modifications or improvements for future implementation of the program. Additionally, the intent of this session is to resolve unanswered questions and allow students the opportunity to provide feedback as to the effectiveness of the program upon completion.

### **Participant data.**

The data collected within this session was obtained via email from the participant to the therapist. All participants were given the option to meet with the therapist face to face or via email and all chose the latter option presented. Table 11 presents the data from the outcome survey and table 12 presents data regarding the applicability and use of this survey to address the effectiveness of the program for the participant.

In summary, participants responded that they felt the adaptations to their sensory environment increased their test scores. All agreed or strongly agreed that they understand their sensory processing needs and all strongly agreed that they were able to apply those preferences to change their environment when it was found to be distracting. All participants noted that they get distracted within the classroom environment; however, are able to focus in class and understand how their sensory system impacts their classroom behavior.

Table 11

*Student Outcome Survey Results*

<b>Question</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
My test scores have increased due to changing my environment.		4		
I understand what my sensory processing needs are.	2	2		
I know how to change the environment if it is distracting.	4			
I can focus in class.	1	3		
I get distracted due to my environment in class.		3	1	
I understand how my senses impact my emotions when in class.	2	2		
I understand how my senses impact my behavior when in class.	1	3		
I am able to concentrate during class when in lecture halls.	2	2		
I understand how my senses impact my emotions when studying.	2	2		
I understand how my senses impact my behavior when studying.	2	2		
I can focus when studying by myself or with others.	2	2		
I do not get distracted due to my environment when studying.	1	1	2	

Table 12

*Student Outcomes & Check-Up Evaluation Survey Results*

<b>Question</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>
The end survey was reflective of the changes I was able to make through this program.	4		
I would recommend this program to others based on my experience.	4		
This program could help other students be successful at UND.	3	1	

Participants were also asked to respond to open ended questions within the session evaluation survey. Participants were asked a) What would you change about the follow up session? and b) What other insights have you had that you feel could improve this program/service for students? The responses from the participants based on qualitative data are presented within the following paragraphs.

When asked what they would change about the check-up and outcome session (session six), three participants had no comment. One participant noted that she felt the survey was good and felt it allowed her an opportunity to reflect on what she had learned throughout the program process. Changes to the program noted by the participants overall included allotting more time before the follow-up session (session five). One participant noted that she would have liked to have more time to know the effects of her plan prior to talking with the therapist, which was a common theme identified from the previous section.

When participants were asked about their general thoughts about the program, the following responses were given: (a) “this was a good program because it teaches a person how to focus better in class and learn their learning style”, (b) “the program helped me

learn how to be less distracted in my daily studying routine and in class”, (c) “helped me by helping me understand that there are things in the classroom that will distract me. Then the program helps me cope with the distractions and keeping me focused.”, (d) “easy to follow and didn't take much effort on my part”, (e) “changed my perspective on how I view my environment and how I interact with the environment based on my sensory preferences”, and (f) “At some level people realize they have sensory preferences, but this program brings that knowledge to the forefront.” Therefore, participants felt this program was valuable for numerous reasons and felt that it enhanced their academic performance at UND as well as their ability to understand and cope with different environments that may not align with their personal sensory processing patterns. Statements describing the program overall included: “I am glad I decided to participate in this study. Overall I think that this program benefitted me.” and “Overall, the program was a great combination of education and application of sensory preferences.” Additional comments included that the program was “very helpful!”, one participant noted that she felt much of the success within the program came from “applying the knowledge in everyday life”, and “emphasis on real life applications and coming up with different solutions/interventions” was reported as allowing for enhancement of her academic performance within the classroom.

### **Therapist perspective.**

The process of this session was conducted completely through email with the participants upon their request and to allow for greater flexibility. The therapist noted throughout this session that this may have allowed for greater information from students about their recommendations and opinions as they were not forced to engage in direct



conversation with the therapist. However, it was also presented by the therapist that a lack of face-to-face interaction did not provide the therapist the ability to probe further. Therefore, future implementation of this program could provide more insight into effectiveness of the program itself with this lived experience information. Also, this session was conducted prior to semester completion; therefore, future implementation on the effectiveness of the program should have the outcome and check-up session (session six) completed after the semester has ended or is nearing the end to allow students time to implement the program and declare it effective. The therapist noted that she felt the session may provide a nice wrap up face-to-face for both the therapist and the student, but due to the time constraints faced by college students at the end of their semester, she also addressed that the email option was nice and provided flexibility within the program. Lastly, the therapist commented that having the program promote more longevity in order to give students the opportunity to respond about the effectiveness after a longer time of implementation. In addition, the ability to answer survey questions related to academic progress after objective grades are entered after completion of the program could be beneficial.

### **Recommendations.**

Based on the therapist insight, it is recommended that the last session of the program be completed face-to-face; however, that an additional option of email could be solicited if time constraints or scheduling for the student are problematic. Additionally, allowing the option for the therapist to incorporate another session if they see fit as necessary for the student to refresh the goals of their plan or clarify sensory processing or environmental concepts they may have forgotten could be added to this step to allow the

therapist more individualization and flexibility within the program. The addition of this option would allow the therapist to continue this program beyond the six sessions to provide students assistance within semesters following program completion.

By speaking with a student once a semester in regards to their new environments if he or she were to drastically change, would further provide understanding and ownership of the ability to be academically successful within their classroom environments in particular. This approach to the session would also establish a therapeutic relationship where the student would be able to seek additional advice through the program should additional environmental concerns develop in the time following the original participation in the program. Therefore, it may be beneficial in future implementation of the program to have a student file of which the therapist would retain for the student to be able to return on a consultative basis when they feel their plan needs to be readjusted to meet their changing needs from semester to semester. Based on the participant feedback through qualitative and quantitative methods, no changes are recommended to the final survey form within the check-up and outcomes session (session six).

## **CHAPTER V**

### **CONCLUSION**

The purpose of this independent study was to evaluate the program *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) in order to further develop and refine the program for future use. The program evaluation was completed using Chen's (2005) Formative Evaluation Approach, which is a six step method to program evaluation. In conducting this independent study, the following research questions were addressed: (a) What is the overall effectiveness of the process of *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014)? and (b) What changes can be made to the protocol for *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) to use for future implementation? All four participants noted that the information gathered throughout the program protocol was beneficial in order to assist them in understanding the question of why they do things while sitting in class as well as their preference of environments to study. Chapter V includes presentation of summary of the findings, discussion, recommendations, and strengths/limitations.

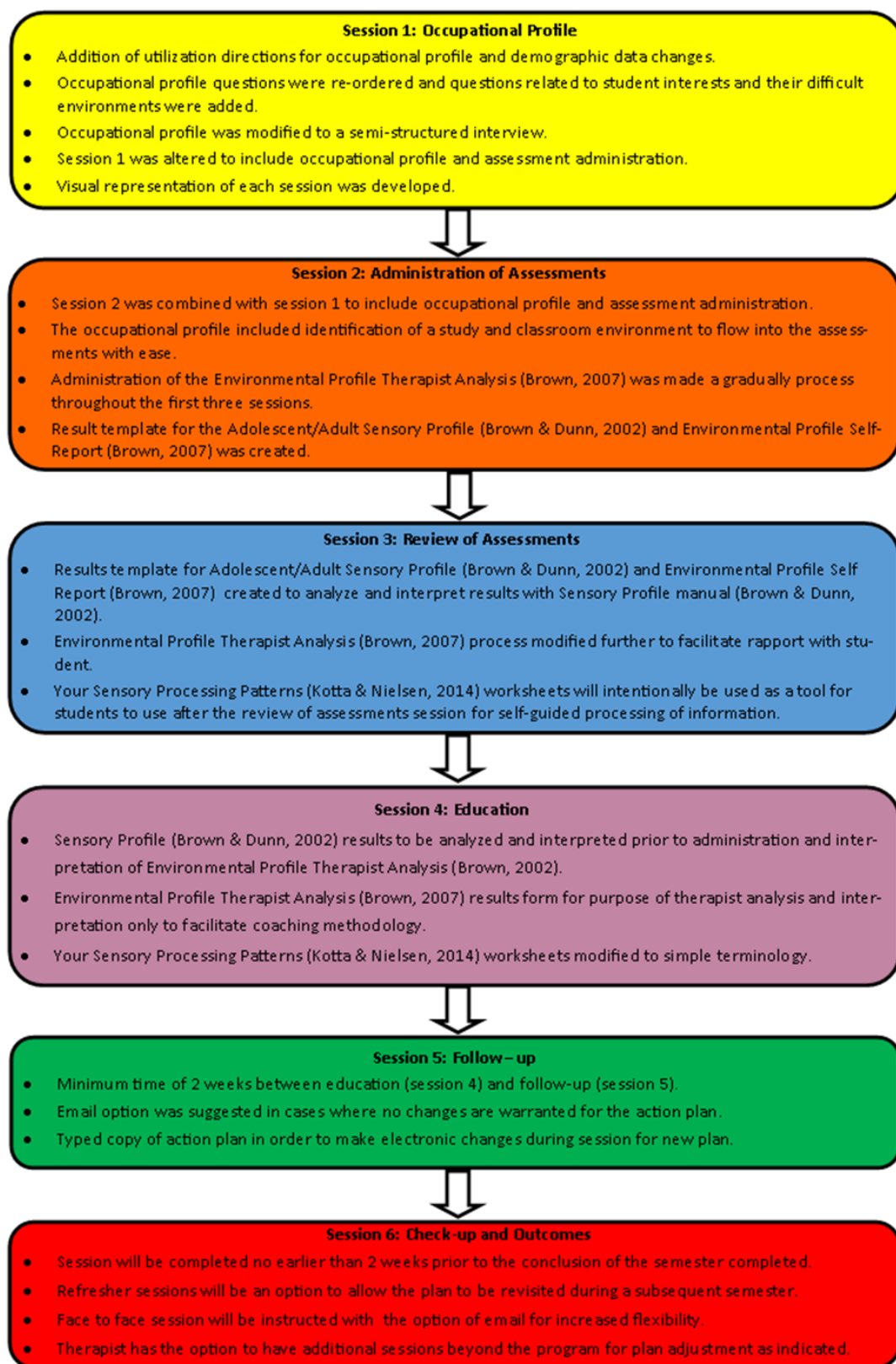
#### **Summary of Findings**

Specific modifications to the program were made as recommended by the researcher upon analysis of the results of the participants' feedback, therapist journals, and therapist surveys. The changes to the protocol for *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) can be found on Figure 1 below. In addition, recommendations of how to incorporate further marketing strategies for more successful

use of referral sources can be found within the previous chapter (Chapter IV Results). Major changes to the entire structure of the program include: (a) the change from a 5-step process to a 6-step process by combining the first and second sessions, (b) the addition of both a program flow chart and sensory profile results template for analysis and dissemination of the assessment results, (c) changes in the administration of the Environmental Profile Therapist Analysis (Brown, 2007), and (d) slight modifications to the intended purpose and content of worksheets utilized within the protocol. Figure 1 outlines the changes for each session made to the original manual of *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) and can be found within *Studying With Successful Sensory Environments 2.0* (Kotta & Nielsen, 2015) found within Appendix Y.

Within the experience in using the coaching approach, it was recorded numerous times that the researcher found this philosophy to aid the process for collaboration and problem-solving. The student researcher completed a pediatric fieldwork prior to this independent study where she gained experience in providing suggestions based on a child's sensory processing patterns. However, this approach was contrary to the clinical experience as the therapist facilitated solution-focused thinking with the student rather than for the student, which was commonly experienced within the medical setting. Therefore, a major factor in the success of the program was the effective use of the coaching model to allow the student to engage in self-directed learning within the application of their sensory processing patterns within their environment.

Figure 1  
*Summary of Studying With Successful Sensory Environments Manual Changes*



## Discussion

### Chen's (2005) Formative Evaluation Method

Chen's (2005) Formative Evaluation Method provided an efficient and fluid way to conduct a program evaluation. This approach gave a six step process for the researcher to utilize throughout the process and allowed for results within the time constraints of the study. This method allowed the researcher flexibility with the process as the steps were simple, yet could be individualized to suit the needs of the program. Identification of assumptions, an outline and process to follow in order to identify problems, and guidelines for dissemination of results assisted in determining changes to be made to *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014).

#### **1. Review of documents and assumptions.**

Within this step the researcher was able to manage researcher bias prior to conducting the student as well as become familiar with the documents. This would be warranted for future research on this program as the program materials are flexible and variable for the student, therefore, need to be well understood by the therapist in order to utilize the documents appropriately as indicated for the step. Identification of assumptions prior to conducting the study was a benefit in order to have written confirmation of the researcher's prior assertions.

#### **2. Identify critical elements and barriers to implementation.**

This step was a key asset to the program evaluation as it allowed the researcher to specifically focus on areas that were critical to success. Evaluating the different materials as well as knowledge necessary to implement the program was an integral step to anticipating different steps that may warrant more attention than others. For instance, the

researcher noted that recruitment of participants was going to be the most strenuous aspect of the program. This was a correct assumption, which ultimately led to the finding that unless the program is established within a college or university, efforts towards a marketing strategy should be employed for effective sources of referral to be evaluated. In addition, critical element identification allowed the researcher to focus on certain aspects of the program such as having a skilled understanding of sensory processing, obtaining participants dedicated to completing the entire program, approval of study by the institutional review board, knowledge of the coaching model, and adequate communication between the researcher and her supervising therapist. As indicated previously, the coaching model was determined to be the most critical factor for the success of student application of the material as was the therapists' working knowledge of the material in order to assist the student.

### **3. Select data collection methods.**

Data collection methods were chosen based on a literature review of program evaluation and was determined to be effective in evaluation of the *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014). Surveys and researcher reflections contributed to the results and the rich qualitative data was most useful towards the creation of recommendations for modifications to the program manual outlined in Figure 1. For future studies, evaluation tools to determine the overall effectiveness of the program outcomes is warranted using the *Studying With Successful Sensory Environments 2.0* (Kotta & Nielsen, 2015) found in Appendix Y.

#### **4. Identify problems.**

In order to identify the problems within the program process, the data was analyzed by the researcher conducting the participant sessions. Each session was analyzed separately to obtain results of the participants, researcher, and recommendations associated based on the information acquired. The data was analyzed for trends or commonalities of the program from both the participant surveys and researcher journals. The most significant problems that resulted in modifications of the program included: (a) identification of problems related to the referral process in its entirety, (b) how to provide structure to both the therapist and student of what to expect during each session of the program, (c) the need to develop a tool for disseminating the results of the assessments to the student, and (d) a solution of how to administer and introduce the Environmental Profile Therapist Analysis (Brown, 2007).

#### **5. Probe for problem sources.**

Within the journals, the researcher often noted how the problem could be remediated, which assisted in step five of Chen's (2005) Formative Evaluation Approach. Therefore, when analyzing the results, the researcher had unknowingly been providing solutions while identifying the problems and the sources of those problems. For instance, when identifying that the administration of the Environmental Profile Therapist Analysis (Brown, 2007) needed modification, the therapist had talked about the negative effect on the therapeutic relationship. The therapist further reflected this was due to not identifying the environments that the student was having trouble within in the occupational profile as well as a lack of a visual representation of the program process in order to describe how the assessment was going to be used. This then allowed the researcher to formulate a



solution after analyzing the results of the journal reflections to restructure the administration of the assessment for increased rapport, which was the main problem identified by the reflective journaling process.

#### **6. Submit findings and document changes.**

Findings of this program evaluation are listed in Chapter IV as well as in Figure 1 located in Chapter V. Modifications to the *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) manual were completed and can be found in *Studying With Successful Sensory Environments 2.0* (Kotta & Nielsen, 2015) in Appendix Y. Figure 2 provides a side by side comparison of the program process changes between the two editions of the manual.

Figure 2  
Program Comparison

Studying With Successful Sensory Environments  
(Kotta & Nielsen, 2014)

Session	Objective
<b>1. Student Discussion</b>	The therapist and student will discuss the referral form with the student and obtain starting information about what the student is experiencing difficulty with.
<b>2. Evaluation &amp; Assessment</b>	Based upon the discussion and the referral form, the therapist will conduct the appropriate assessment.
<b>3. Review of Assessment</b>	The therapist will discuss the results of the assessment with the student and will provide handouts to them with the results for their records.
<b>4. Education</b>	The therapist will discuss the results of the assessment with the students to educate them on their sensory processing patterns and create a plan for academic success.
<b>5. Follow up</b>	The therapist and student will discuss how the plan is working and make modifications to the plan as necessary.
<b>6. Check-up and Outcomes</b>	The therapist and student will either meet to check for progress.

Studying With Successful Sensory Environments 2.0  
(Kotta & Nielsen, 2015)

Session	Objective
<b>1. Occupational Profile and Assessment</b>	The therapist and student will discuss the referral form with the student and obtain an occupational profile. Based upon screening and referral previously, the therapist will conduct the appropriate assessments. If the Environmental Profile (Brown, 2007), the therapist will initiate a conversation about the therapist analysis environment based on the students' decision to allow them to observe.
<b>2. Review of Assessment and Observation of Environments</b>	The therapist will discuss the results of the assessment with the student through use of the template within Appendix F. The <i>Your Sensory Processing Patterns</i> will be given to the student in order to further process the information upon conclusion of the session.
<b>3. Environmental Analysis and Action Plan Creation</b>	The therapist and student will discuss how their sensory processing patterns are impacted by their environments and create an action plan for adapting or modifying their study or classroom environments.
<b>4. Follow up</b>	The therapist and student will discuss how the implementation of the plan is going and make modifications to the plan as necessary.
<b>5. Check-up and Outcomes</b>	The therapist and student will either meet or correspond over email in order to check for progress after use of the plan over time.

## **Comparison To Other OT Programs**

Limited research is available on programs similar to *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014). Colorado State University (CSU) has implemented a program titled *Opportunities for Postsecondary Success* (OPS), which is operated under the United States Department of Education and costs \$75.00 an hour (Koethe, 2015). *Opportunities for Postsecondary Success* is operated under the occupational therapy department at CSU similar to *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) operated through the occupational therapy department at UND. *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) is a free services at this time for the UND student population that is funded with printing of program and marketing materials through the UND Occupational Therapy Department. CSU requires a diagnosis to participate in their program whereas *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) does not require the student to report a disability as sensory processing as noted by Dunn (2001) is not a problem to be fixed, but rather to be acknowledged for appropriate modifications to be made. The program at UND is based on the subjective responses of the student primarily with therapist observation for environmental analysis, whereas, CSU works with the student within their home environment to assist them (Koethe, 2015). Lastly, *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) aims to educate the student through coaching principles in order to allow them to apply principles of sensory processing to their education environments; however, *Opportunities for Postsecondary Success* aims to aid students with time management, studying strategies, effective communication, and social participation that is influenced by their diagnosis (Koethe, 2015).

## **Recommendations For Future Application**

Application of this program could be enhanced by conducting more studies on the effectiveness of the program. The program evaluation focused on effectiveness of process, therefore, limited data was gathered on outcomes related to effectiveness of a student changing or modifying environments and the related academic outcomes. Future studies should consider using a larger sample size for generalizability of results and broaden the location of the study to other college campuses. Specifically starting in North Dakota and expanding through the Midwest after additional studies have demonstrated effectiveness for students and feasibility of running the service is recommended. In order to accomplish this, future research should include a strategic marketing plan for obtaining the sample based on the recommendations found within Chapter IV. Additionally, much of the research that was foundational to the study based on sensory processing and coaching principles is based out of pediatric therapy, therefore, this program could also be utilized within high school or middle school populations as well. Utilizing this program with adolescents and young adults within the mental health populations both inpatient and partial hospitalizations could potentially be beneficial when returning to academia as well.

## **Study Strengths**

There are numerous strengths that were analyzed by the researcher for this study. First, the researcher and advisor for the study were both the original developers of the manual for *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014). According Chen's (2005) Formative Evaluation Approach, it was recommended for the researcher to be familiar with the program being study, which was well represented for

the purposes of this pilot study. In addition, the researcher created a chart of assumptions, which can be found in Table 3 titled “Underlying Program Assumptions” in Chapter III, in order to eliminate researcher bias prior to conducting the study. One researcher also conducted all of the sessions within the study with the participants, which increased reliability in the program procedure as it was consistently administered to the participants. In addition to reliability, validity of results was maintained through triangulation of the data. Quantitative methods of survey design as well as qualitative methods of open-ended participant’s responses and therapist journal entries were utilized. This allowed for multiple types of data as well as sources of data within the program evaluation.

Within the study, the program exhibited two noteworthy strengths: flexibility for individualization and ease of administration. Even though the same researcher completed all of the sessions, she was diligent to maintain individualization of the program as necessary such as curtailing the program to the student. She was able to articulate the results differently based on the major of study of the participant. For instance, she was able to use more medical terminology with pre-health majors whereas with an engineering major, terminology was simplified. This strengthened the program as it was flexible in nature for the purposes of the student to provide valuable insight.

### **Study Limitations**

While strengths were demonstrated within this independent study, the researcher notes several limitations, which could be strengthened within future research. First, as previously stated the researcher and advisor were the original developers of the program, which was identified as an asset; however, was also a limitation of the study. The

researcher knew the program well as they had created it, but in conducting the study, researcher bias was highly probable as they researcher had invested time into the success of the program. Bias was limited through using Chen's (2005) Formative Evaluation Approach as stated previously; however, could not be fully eliminated within this pilot study within the qualitative data through reflection.

As the researcher utilized Chen's (2005) Formative Evaluation Approach the methodology of evaluation was formative rather than summative. In essence, this study sought to identify problems within the protocol in order to modify it for future use rather than obtaining statistical results of effectiveness of the student's success after the implementation of this program. The researcher obtained a slight amount of outcome information based on the program protocol; however, this was not the intended purpose for the pilot study and outcome measures of the program itself were not used.

This independent study was the first time that *Studying With Successful Sensory Environments* (Kotta & Nielsen, 2014) was implemented, therefore, the nature of this as the initial pilot was a limitation of the study. The study incorporated only four participants, a low sample size, which did not allow for generalizability of results within the population. The gender distribution was also three females to one male, which does not represent the overall gender distribution at UND. In addition, the time constraints of the study may have had an effect on the results of the study as participants were not recruited from a referral source, but rather through intentional recruitment. Therefore, an additional limitation was an inability of this study to identify the effectiveness of the referral sources. The timeline of the study being in the Fall semester of 2015 rather than the spring did not allow for freshman students who were struggling to participate as they

would not have completed midterms by the time of the last participant initial meeting, thus recruitment was ended to follow Institutional Review Board protocol.

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## **Appendix A**

### **Studying With Successful Sensory Environments Referral Tool**

**Studying with Successful Sensory Environments  
Referral Tool**

**Referral Source: Self-Referral or Department (please list):** \_\_\_\_\_

**Student Name:** \_\_\_\_\_

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

**Date:** \_\_\_\_/\_\_\_\_/\_\_\_\_

**Please describe the reason for the referral.**

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**Please check the following boxes that apply.**

- I am easily distracted by visual stimuli (paintings, pictures, windows) when conversing with someone.
- I have trouble focusing on the person talking to me when other noises are present.
- I am unable to focus when there are bright colors around me or multiple people.
- I become overwhelmed when I smell certain scents
- I do not hear my name called in the waiting room with other people talking.
- I always have headphones in my ears to listen to music.
- I comment frequently that noise bothers me.
- I am unorganized and have trouble prioritizing tasks.
- I am emotional (anger, sadness, low frustration tolerance)
- I seek out movement (leg twitches, constant bodily movement, swivels or rocks in chair)
- I have poor balance when walking.
- I whistle, hum, or sing frequently.
- I frequently ask for information to be repeated.

**Please provide any additional information below that you feel would be beneficial when addressing your academic performance.**

---

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**To make an appointment please forward the referral form to the University of North Dakota Occupational Therapy Department at Stop 7126 or contact Dr. Sarah Nielsen ([sarah.k.nielsen@med.und.edu](mailto:sarah.k.nielsen@med.und.edu) or 701-777-2208). Upon completion, please bring this form to the occupational therapist for the first appointment, who will complete the formal assessment procedures.**

## **Appendix B**

### **Studying With Successful Sensory Environments: Referral Process Survey**

**Studying With Successful Sensory Environments: Referral Process Survey**

<b>Question</b>	<b>Agree</b>	<b>Disagree</b>	<b>Neutral</b>
The presentation was beneficial in explaining the referral process to your staff.			
The materials provided for the referral process were beneficial to your staff.			
My staff was able to identify students who could benefit from this program.			
The referral process was explained clearly on the form.			
The referral process was easy for my staff to use.			
The referral process was efficient for my staff to use.			

What could have been added to the referral form? Explain.

Is there anything you would omit from the referral form? Explain.

Are there any additional comments you would like to share about the referral process?

## **Appendix C**

### **Studying With Successful Sensory Environments: Student Referral Form Survey**

**Studying with Successful Sensory Environments: Student Referral Form Survey**

Question	Agree	Neutral	Disagree
The referral forms were accessible.			
The referral form was helpful to determine if I needed this service.			
The referral process was explained clearly on the form.			
The referral sources assisted me in getting connected to the occupational therapy department.			
The researcher made contact with me in a timely manner after submitting my request for services.			

What could have been added to the referral form? Explain.

Is there anything you would omit from the referral form? Explain.

Are there any additional comments you would like to share about the referral process?



## **Appendix D**

### **Studying with Successful Sensory Environments Promotional Flyer**

# Struggling with focusing in class or studying?

## WE CAN HELP!

### Who?

- UND students who is struggling focusing or performing in class or within their study environments.

### When?

- There are six sessions (an hour or less each) in this program that will be held with an occupational therapy student and the participant on appointment basis around the participants' schedule. The program will take place in the Fall semester of 2015.

### How?

- A program called *Studying With Successful Sensory Environments*. This pilot study will be conducted in the Fall of 2015 to help students understand their sensory processing patterns in order to adapt their academic environments to be successful at UND.

### Where can I sign up?

- Brochures and forms are located at the Student Success Center (Memorial Union 2<sup>nd</sup> floor) and the Occupational Therapy Department (Hyslop 2<sup>nd</sup> floor)



## Interested?

Contact us today!

Phone: 701.777.2208

Email:

[katrina.kotta@my.und.edu](mailto:katrina.kotta@my.und.edu)

Visit:

UND Occupational Therapy  
Department

2751 2nd Avenue North Stop  
7126

Grand Forks, ND 58202

## **Appendix E**

### **Studying with Successful Sensory Environments Promotional Brochure**

YOUR LOGO  
HERE

## Program Information

A program designed for students to help them achieve academic success through an individualized sensory program created just for them! This process is collaborative where the student decides the techniques that best suit their needs and preferences. The occupational therapist educates the student on how to use those techniques in their academic environments in order to have future success.

*Studying With  
Successful  
Sensory  
Environments*

**UND Occupational  
Therapy**

School of Medicine & Health Sciences  
501 N. Columbia Rd. Stop 9037  
Grand Forks, ND 58202-9037

**UND Occupational  
Therapy Department**

Tel: 701-777-2209

## What is occupational therapy?

Occupational therapy is an entity of the allied health medical field. Occupational therapy has the mission of “achieving health, well-being, and participation in life through engagement in occupation” (AOTA, 2014, p. 52). “Occupational therapy practitioners use their knowledge of the transactional relationship among the person, his or her engagement in valuable occupations, and the context to design occupation-based intervention plans that facilitate change needed for successful participation” (AOTA, 2014, p. 51). Therefore, occupational therapists are suited to enhance the educational environment for a student to help them successfully engage in the occupation of education.

### What is sensory processing?

Sensory processing seeks to engage students in self-directed, purposeful activity that involves the use of proprioceptive, vestibular, tactile, gustatory, and auditory sensations to stimulate an adaptive response (Clark & Pierce, 1998). Sensory processing, a subset of sensory integration, is defined as, “receiving, organizing, and interpreting of sensory stimuli using the seven sensory systems” (O'Donnell et al., 2012, p. 586). Therefore, occupational therapists look at the sensory information that a student obtains from their environments and how the student responds to those inputs.

## Program Information

### Overview

This program includes six individual sessions (approximately 1 hour each) with an occupational therapy student in order to analyze a student's sensory processing patterns and formulate a plan on how to use that information to adapt their educational environments. This research pilot program will begin in the Fall of 2015 at UND.

### Purpose

This process is collaborative and aimed to educate the student so that they can adapt any environment to meet their sensory processing patterns in order to be academically successful.

### Cost

This program is completely **free** to UND students.

### How do I sign up?

Request a referral form from Disability Services for Students or the Student Success Center. Contact the UND Occupational Therapy Department if you would like to have a form emailed to you.

## Session Overview

Session	Objective
1. Student Discussion	The therapist and student will discuss the referral form with the student and obtain starting information about what the student is experiencing difficulty with.
2. Evaluation & Assessment	Based upon the discussion and the referral form, the therapist will conduct the appropriate assessment.
3. Review of Assessment	The therapist will discuss the results of the assessment with the student and will provide handouts to them with the results for their records.
4. Education	The therapist will discuss the results of the assessment with the students to educate them on their sensory processing patterns and create a plan for academic success.
5. Follow up	The therapist and student will discuss how the plan is working and make modifications to the plan as necessary.
6. Check-up and Outcomes	The therapist and student will either meet to check for progress.

## **Appendix F**

### **Studying with Successful Sensory Environments Occupational Profile**

**Studying With Successful Sensory Environments**  
**Occupational Profile**

**Name:**

**Major:**

**Year in School:**

**Age:**

**Have you heard of occupational therapy before?**

**Have you heard of sensory processing or sensory integration?**

**If not, what do you think this means?**

**Why did you decide to be in this study?**

**What issues have you noticed when coming to college at UND with your classrooms?**

**Was there anything not asked on the referral form you would want to add?**

**Do you have any questions or concerns about the program?**

**What still remains unclear?**

**Appendix G**  
**Student Screening and Occupational Profile Survey**



**Studying With Successful Sensory Environments**

**Student Screening and Occupational Profile Survey**

Is there anything you would change about this initial meeting with the occupational therapist?

<b>Question</b>	<b>Agree</b>	<b>Neutral</b>	<b>Disagree</b>
The OT explained the purpose of the program well.			
I was able to tell the OT everything I wanted.			
This step was beneficial for the OT to understand my situation beyond the referral form.			

Any additional comments?

## **Appendix H**

### **Environmental Permission For Use of Environmental Profile**

RE: Environmental Profile Assessment

✕ DELETE   ← REPLY   ← REPLY ALL   → FORWARD   ⋮



Brown, Catana <cbrown2@midwestern.edu>

Mark as unread

Tue 10/21/2014 3:45 PM

Thesis

To: Kotta, Katrina;

■ You replied on 10/21/2014 4:47 PM.

📎 2 attachments



Contextual Profile-Ther...  
63 KB



Contextual Profile.doc  
42 KB

Download all

Bing Maps

Action Items

+ Get more apps

Dear Katrina, The measure was never published. Deborah Waltermire has actually done a lot more work with it than I have. I have attached the forms I developed. You can see they are a rough version. There is a self-report and a therapist assessment. The self-report items are followed by the words low or high. This refers to whether or not that item represents an environmental feature that would challenge a low or high threshold person. You might want to remove those words when administering it. I'm OK with you using it, just please acknowledge me as the developer and don't share it with others. Also, I would like for you to share the study results with me. Tana

Catana Brown PhD, OTR, FAOTA  
Associate Professor  
Midwestern University  
College of Health Sciences  
19555 N. 59th Avenue  
Glendale, AZ 85308  
623.572.3663  
[cbrown2@midwestern.edu](mailto:cbrown2@midwestern.edu)

**Appendix I**  
**Student Evaluation/Assessment Survey**

## Studying With Successful Sensory Environments

### Student Evaluation/Assessment Survey

Question	Agree	Neutral	Disagree
The assessment was explained well enough that I felt confident on completing it.			
The assessments were given in a timely manner.			
I was able to identify a study environment specifically for the environmental profile.			

What were your general thoughts regarding the assessments?

Any additional comments?

**Appendix J**  
**Occupational Therapist Evaluation/ Assessment Summary**

### Occupational Therapist Evaluation/Assessment Survey

Question	Strongly Disagree	Disagree	Agree	Strongly Agree
Were the assessments chosen appropriate?				
Did the assessment add to the information you gained during the occupational profile?				

How did it feel to administer the Adolescent/ Adult Sensory Profile?

How did it feel to administer the Environmental Profile?

Are there additional assessments that should have been performed? Please list.

Any additional comments?

**Appendix K**  
**Environmental Profile Self-Assessment Reporting Form**



**Environmental Profile Self-Report Assessment Results**

**Environment:**

**Primary things done in environment:**

For each of the following categories please place a checkmark next to the questions/statements that the student indicates on the form.

**A. Taste/Smell**

Question	Student Identified With Statement	Threshold Challenged
1.		Low
2.		Low
3.		High
4.		High
5.		Low
6.		High
7.		Not Applicable

**Comments:**

**B. Movement**

Question	Student Identified With Statement	Threshold Challenged
1.		High
2.		High
3.		High
4.		Low
5.		High
6.		Low
7.		Low
8.		High

**Comments:**

**C. Visual Processing**

Question	Student Identified With Statement	Threshold Challenged
1.		Low
2.		High
3.		Low
4.		Low
5.		High
6.		High
7.		High
8.		Low
9.		Low

**Comments:**

**D. Touch Pressing**

Question	Student Identified With Statement	Threshold Challenged
1.		Low
2.		High
3.		Low
4.		Low
5.		Low
6.		Low
7.		Low
8.		Low
9.		High

**Comments:**

**E. Auditory Processing**

Question	Student Identified With Statement	Threshold Challenged
1.		Low
2.		Low
3.		Low
4.		Low
5.		High
6.		High
7.		High
8.		Low
9.		High
10.		Low

Comments:

Additional notes:

**F. Activity Level**

Question	Student Identified With Statement	Threshold Challenged
1.		Low
2.		Low
3.		High
4.		High
5.		Low
6.		High
7.		Low
8.		High

Comments:

## **Appendix L**

### **Environmental Profile Therapist's Analysis Assessment Results**

## Environmental Profile Therapist's Analysis Assessment Results

### Environment:

Please list the number indicated for each category and criteria listed below.

#### A. Auditory

Criteria	Low End Description	High End Description	Number Indicated
Intensity	Soft	Loud	
Amount	Silent	Many sounds	
Repetition	Rhythmic	Haphazard	
Competing stimuli	Relevant stimuli all you hear	Background noise interfere	
Predictability	All sounds anticipated	Lots of startling sounds	
Familiarity	All sounds recognizable	Lots of unknown sounds	
Speed	Slow	Fast	
Detection	Clear	Muffled	

#### B. Visual

Criteria	Low End Description	High End Description	Number Indicated
Intensity – lighting	Dim	Bright	
Intensity – colors	Neutral	Vivid	
Amount	Bare	Lots of objects	
Repetition	Pattern/symmetry	Disarray	
Competing stimuli (static visual)	Clear view	Clutter	
Competing stimuli (movement)	Still	Many moving objects/people	
Predictability	Organized	Disorganized	
Familiarity	Objects recognizable	Objects are unknown	
Speed (of moving stimuli)	Slow	Fast	
Detection	Distinguishable	Blurry/unclear	

### C. Tactile

<b>Criteria</b>	<b>Low End Description</b>	<b>High End Description</b>	<b>Number Indicated</b>
Intensity – comforting	Deep pressure	Light touch	
Amount of Body Surface Affected	None	Full body	
Repetition	No pattern	Rhythmic	
Competing stimuli-ambient	No distractions	Wind, temperature extremes	
Predictability	All touch anticipated	Lots of unexpected touch	
Familiarity	All touch recognizable	Lots of unknown feelings	
Detection	Touch is obvious	Difficult to notice	

### D. Taste

<b>Criteria</b>	<b>Low End Description</b>	<b>High End Description</b>	<b>Number Indicated</b>
Intensity	Bland	Spicy/pungent/strong flavor	
Amount	No opportunity	Lots of tastes available	
Repetition	All tastes the same	Lots of different types	
Competing stimuli	Foods kept separate	Flavors are mixed	
Familiarity	All foods are known	Many unknown foods	

### E. Smells

<b>Criteria</b>	<b>Low End Description</b>	<b>High End Description</b>	<b>Number Indicated</b>
Intensity	No smells	Strong smells	
Competing stimuli	No obvious smells	Many different smells in the same space	
Predictability	Smell is constant	Smell comes and goes	
Familiarity	All smells recognizable	Lots of unknown smells	
Detection	Present but not noticeable	Smells are identifiable	

**F. Movement – Vestibular/Proprioceptive**

<b>Criteria</b>	<b>Low End Description</b>	<b>High End Description</b>	<b>Number Indicated</b>
Intensity	Soft, easy movement	Strong/pounding movement	
Amount	Movement not supported	Lots of movement required	
Repetition	No pattern to movement	Rhythmic/patterned	
Competing stimuli	No barriers to movement	Many barriers to movement	
Predictability	All movement anticipated	Unanticipated movement requires	
Familiarity	All movements are known	New movements required	
Speed	Slow	Fast	
Detection	Supports body awareness	Interferes with body awareness	

**Most critical sensory features that could affect the student’s ability to function within this environment?**

**Appendix M**  
**Student Review of Assessment Survey**

## Studying With Successful Sensory Environments

### Student Review of Assessment Survey

Question	Agree	Neutral	Disagree
The forms used to show me the results were easy to understand.			
The results of the assessments reflect my sensory needs within the classroom environment.			
The results sheets with my results of the Sensory Profile were helpful.			
The results sheets with your results of the Environmental Profile were helpful.			
The <i>Your Sensory Processing Patterns</i> worksheets were beneficial?			

What did you like about the results sheet for the Sensory Profile? What would you change?

What did you like about the results sheet for the Environmental Profile? What would you change?

What did you like about the *Your Sensory Processing Patterns* worksheets? What would you change?

Any additional comments?



**Appendix N**  
**Occupational Therapist Review of Assessments Survey**

**Occupational Therapist Review of Assessments Survey**

<b>Question</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Agree</b>	<b>Strongly Agree</b>
The forms were helpful in explaining the students' sensory processing patterns.				
This step would have been more beneficial if it was combined with the assessment session.				

What changes could be made to the result form for the Sensory Profile?

What changes could be made to the result form for the Environmental Profile?

Are there any changes you would make for the Review of Assessments step? Explain.

**Appendix O**  
***Your Sensory Processing Patterns Worksheets***

## ***Your Sensory Processing Patterns: Low Registration (High Scores)***

### **What does this mean?**

This means that sensory stimuli in the environment is not noticed by you. Changes such as lighting, different noises, and different textures are not something that distracts you from attention. However, you also do not always get the stimulation that your brain and body requires, which can cause your mind to wander because there are no inputs helping you maintain attention.

### **What are some situations where I have noticed some of these feelings?**

### **What types of behaviors occur as a result of these feelings?**

**What are some of the sensory features in my academic environment? What changes could I make to suit my preferences?**

**How can I apply my sensory preferences to my study environments?  
(ex: increase the contrast or intensity of stimuli or slow down the amount of stimuli given at the same time)?**

## ***Your Sensory Processing Patterns: Low Registration (Low Scores)***

### **What does this mean?**

This means you rarely miss sensory stimuli introduced in your environment. This is not the same as being sensitive to stimuli, but indicates that you acknowledge there was a sensory input given within a particular environment. This is important, because noticing the different sensations can detract your attention for a short amount of time, but frequently if there is a large amount of input given within your environment.

### **What are some situations where I have noticed some of these feelings?**

### **What types of behaviors occur as a result of these feelings?**

**What are some of the sensory features in my academic environment? What changes could I make to suit my preferences?**

**How can I apply my sensory preferences to my study environments?  
(ex: decrease the amount of stimuli in the environment or strategies to screen out background stimuli)**

## ***Your Sensory Processing Patterns: Sensation Seeking (High Scores)***

### **What does this mean?**

This indicates that your body seeks sensory input within your environment. You continuously want to have visual stimulation (bright colors), auditory input (music), and proprioceptive input (hugging or jumping) to name a few and find pleasure in having lots of things going on in the environment at once. This can cause you to become bored if your environment does not give you enough stimulation to hold your attention, therefore, you need to create stimulation before and during tasks in under stimulating environments.

### **What are some situations where I have noticed some of these feelings?**

### **What types of behaviors occur as a result of these feelings?**

**What are some of the sensory features in my academic environment? What changes could I make to suit my preferences?**

**How can I apply my sensory preferences to my study environments?  
(ex: offer to “do” during academics (walk, hand out papers, etc.) or use fidgets or other tools to get the input when it is not present in an environment)**

## ***Your Sensory Processing Patterns: Sensation Seeking (Low Scores)***

### **What does this mean?**

This indicates that you do not actively try to create stimuli in environments with limited sensory opportunities. However, you do not seek to avoid the environment either; therefore, strategies to explore your environment could be helpful for you when you are not receiving the input you need to maintain attention.

### **What are some situations where I have noticed some of these feelings?**

### **What types of behaviors occur as a result of these feelings?**

### **What are some of the sensory features in my academic environment? What changes could I make to suit my preferences?**

### **How can I apply my sensory preferences to my study environments? (ex: Identify new sensory experiences specific to certain senses that are available in the environment by changing your everyday routine or habits used)**

## ***Your Sensory Processing Patterns: Sensory Sensitivity (High Scores)***

### **What does this mean?**

This indicates that you become uncomfortable or highly distractible when you have to pay attention to many things in an environment. You notice each different stimulus and pay attention to it. You have a high ability to discern between different types of stimuli and can attend to detail.

### **What are some situations where I have noticed some of these feelings?**

### **What types of behaviors occur as a result of these feelings?**

### **What are some of the sensory features in my academic environment? What changes could I make to suit my preferences?**

### **How can I apply my sensory preferences to my study environments? (ex: eliminate stimuli in the environment or make environments calm, repetitive, and familiar to lessen the introduction of new stimuli that requires your attention)**



## ***Your Sensory Processing Patterns: Sensory Sensitivity (Low Scores)***

### **What does this mean?**

You do not become overwhelmed or distracted by sensory inputs. You fully intake the input from your environment, but do not let it hold your attention. You are able to maintain focus despite sensory opportunities.

### **What are some situations where I have noticed some of these feelings?**

### **What types of behaviors occur as a result of these feelings?**

### **What are some of the sensory features in my academic environment? What changes could I make to suit my preferences?**

### **How can I apply my sensory preferences to my study environments? (ex: Increase the intensity of stimuli when bored or distracted or increase the spontaneity of stimuli of specific senses when bored or distracted)**

## ***Your Sensory Processing Patterns: Sensation Avoiding (High Scores)***

### **What does this mean?**

This indicates that you are bothered and distracted by environments with high sensory stimuli and you actively try to reduce the amount of input your body receives. You enjoy being in environments with less people and are able to create structure to control the environment.

### **What are some situations where I have noticed some of these feelings?**

### **What types of behaviors occur as a result of these feelings?**

### **What are some of the sensory features in my academic environment? What changes could I make to suit my preferences?**

**How can I apply my sensory preferences to my study environments?  
(ex: consistent and predictable environments are recommended to decrease the amount of new sensory experiences or create opportunities to take a break from over stimulating environments)**

## ***Your Sensory Processing Patterns: Sensation Avoiding (Low Scores)***

### **What does this mean?**

This indicates that you do not become overwhelmed by sensory stimuli and do not let the fact that there are different sensory inputs within the environment limit your ability to maintain attention. You do not try to reduce the stimuli and do not find it distracting.

### **What are some situations where I have noticed some of these feelings?**

### **What types of behaviors occur as a result of these feelings?**

### **What are some of the sensory features in my academic environment? What changes could I make to suit my preferences?**

### **How can I apply my sensory preferences to my study environments? (ex: decrease the amount of stimuli if you get distracted and know what types of stimuli you need to eliminate first if distracted)**

**Appendix P**  
**Student Education Survey**

## Studying With Successful Sensory Environments

### Student Education Survey

Question	Agree	Neutral	Disagree
The researchers were able to articulate the results of my assessments so that I could understand.			
It was a team effort between the therapist and I to create a plan.			
The planning worksheets were beneficial to creating a plan based on my sensory processing patterns.			
The therapist was helpful in thinking of strategies for adapting my environment.			
The therapist was able to think of practical changes I felt were useful to help me be successful.			
I would have been able to generate strategies on my own without the therapist.			
I was able to come up with strategies on my own with the help of the worksheets.			
I am satisfied with the plan that I developed with the therapist.			

Which planning form did you use (please circle): A   B   C

Would it have been easier to develop a plan with or without a guiding worksheet?

What did you like about the planning worksheet?

What would you change?

Any additional comments?

**Appendix Q**  
**My Action Plan**  
**Form A**

**My Action Plan  
Form A**

**Name:** \_\_\_\_\_

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

This chart outlines the results of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002). Indicate the category for the student by marking the correct box with an “X”.

<b>Category</b>	<b>Low Registration</b>	<b>Sensation Seeking</b>	<b>Sensory Sensitivity</b>	<b>Sensation Avoiding</b>
<b>Taste/Smell</b>				
<b>Movement</b>				
<b>Visual</b>				
<b>Tactile/Touch</b>				
<b>Activity Level</b>				
<b>Auditory</b>				

**Recommendations for adapting my sensory environment include (please refer to Appendix A of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) for examples and reproducible charts):**

**Student Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Therapist Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Appendix R**  
**My Action Plan**  
**Form B**



**My Action Plan  
Form B**

**Name:** \_\_\_\_\_

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

**Environment Description:**

This chart outlines the results of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002). Indicate the category for the student by marking the correct box with an “X”.

<b>Category</b>	<b>Low Registration</b>	<b>Sensation Seeking</b>	<b>Sensory Sensitivity</b>	<b>Sensation Avoiding</b>
<b>Taste/Smell</b>				
<b>Movement</b>				
<b>Visual</b>				
<b>Tactile/Touch</b>				
<b>Activity Level</b>				
<b>Auditory</b>				

**Strong Sensory Strengths (sensory stimuli that I seek or calms me that I can use to my advantage):**

**Sensory Annoyances (sensory stimuli that distracts me that I can try to reduce or avoid by using my sensory strengths):**

**Potential Problems:** Please describe the potential sensory problems you see in your environment based on the results of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and Environmental Profile (Brown, 2007) results. List the potential over or under stimulation present and what strategy or modification you will use if you find it is preventing you from accomplishing a task or maintaining attention. Please refer to Appendix A of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) for examples and reproducible charts.

Category	Description of Problem	When this happens I will...
Taste/Smell		
Movement		
Visual		
Tactile/Touch		
Activity Level		
Auditory		

**Student Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Therapist Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Appendix S**  
**My Action Plan**  
**Form C**

**My Action Plan  
Form C**

**Name:** \_\_\_\_\_

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

**Environment Description:**

This chart outlines the results of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002). Indicate the category for the student by marking the correct box with an “X”.

<b>Category</b>	<b>Low Registration</b>	<b>Sensation Seeking</b>	<b>Sensory Sensitivity</b>	<b>Sensation Avoiding</b>
<b>Taste/Smell</b>				
<b>Movement</b>				
<b>Visual</b>				
<b>Tactile/Touch</b>				
<b>Activity Level</b>				
<b>Auditory</b>				

**Strong Sensory Strengths (sensory stimuli that I seek or calms me that I can use to my advantage):**

**Sensory Annoyances (sensory stimuli that distracts me that I can try to reduce or avoid by using my sensory strengths):**

**Potential Problems:** Please describe the potential sensory problems you see in your environment based on the results of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and Environmental Profile (Brown, 2007) results. Then list how the student will apply a sensory system as a solution to compensate for another and the specific interventions they will do to increase or decrease their sensory experiences. Please refer to Appendix A of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) for examples and reproducible charts.

<b>Description of Problem</b>	<b>When this happens I will apply...(choose a sensory system you will stimulate or modulate)</b>	<b>By doing... (list what actions you will take to reduce the sensory problem)</b>
	<input type="checkbox"/> Taste/Smell <input type="checkbox"/> Movement <input type="checkbox"/> Visual <input type="checkbox"/> Tactile/Touch <input type="checkbox"/> Activity Level <input type="checkbox"/> Auditory	
	<input type="checkbox"/> Taste/Smell <input type="checkbox"/> Movement <input type="checkbox"/> Visual <input type="checkbox"/> Tactile/Touch <input type="checkbox"/> Activity Level <input type="checkbox"/> Auditory	
	<input type="checkbox"/> Taste/Smell <input type="checkbox"/> Movement <input type="checkbox"/> Visual <input type="checkbox"/> Tactile/Touch <input type="checkbox"/> Activity Level <input type="checkbox"/> Auditory	
	<input type="checkbox"/> Taste/Smell <input type="checkbox"/> Movement <input type="checkbox"/> Visual <input type="checkbox"/> Tactile/Touch <input type="checkbox"/> Activity Level <input type="checkbox"/> Auditory	
	<input type="checkbox"/> Taste/Smell <input type="checkbox"/> Movement <input type="checkbox"/> Visual <input type="checkbox"/> Tactile/Touch <input type="checkbox"/> Activity Level <input type="checkbox"/> Auditory	

**Student Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Therapist Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Appendix T**  
**Student Follow-Up Survey**

## Studying With Successful Sensory Environments

### Student Follow-Up Survey

Question	Agree	Neutral	Disagree
My plan worked for me.			
There were things that I needed to change during the follow-up.			
I felt this follow-up session was beneficial.			
I adjusted my plan throughout its use independently.			
I was able to apply my sensory preferences to multiple environments involved in academics.			

What would you change about the follow up session?

Any additional comments?

**Appendix U**  
**Student Progress Reporting Form**



**Studying With Successful Sensory Environments  
Student Progress Reporting Form**

**Name:** \_\_\_\_\_

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

**Date:** \_\_\_\_/\_\_\_\_/\_\_\_\_

**Please rate each question in the table by marking the correct column.**

Question	Strongly Agree	Agree	Disagree	Strongly Disagree
My test scores have increased due to changing my environment.				
I understand what my sensory processing needs are.				
I know how to change the environment if it is distracting.				
I can focus in class.				
I get distracted due to my environment in class.				
I understand how my senses impact my emotions when in class.				
I understand how my senses impact my behavior when in class.				
I am able to concentrate during class when in lecture halls.				
I understand how my senses impact my emotions when studying.				
I understand how my senses impact my behavior when studying.				
I can focus when studying by myself or with others.				
I do not get distracted due to my environment when studying.				
I am able to use the strategies that I developed through occupational therapy in everyday life				

**Appendix V**  
**Student Outcomes & Check-up Survey**

## Studying With Successful Sensory Environments

### Student Outcome & Check-up Survey

Question	Agree	Neutral	Disagree
The end survey was reflective of the changes I was able to make through this program.			
I would recommend this program to others based on my experience.			
This program could help other students be successful at UND.			

Is there anything that you would have changed on the final outcome survey?

What other insights have you had that you feel could improve this program/service for students?

Any additional comments?

## **Appendix W**

### **Studying With Successful Sensory Environments Therapist Guiding Questions**

## **Studying With Successful Sensory Environments Therapist Prompts**

### **Session 1:**

OTS/Clinician: The OTS will journal prior to analyzing the results of the surveys. The OTS will journal about the process of the meeting, application of the occupational profile worksheet, and their general thoughts about the usefulness of this step. The OTS will also talk about what they expected to learn and what they actually found out from the participants.

### **Session 2:**

OTS/Clinician: The OTS/Clinician will complete the journal prior to analyzing the results of the survey for this step. The OTS will journal about their thoughts towards this step. Questions to guide the journaling process include:

- Were the assessments chosen appropriate?
- Did you feel you obtained enough information?
- Did the information of the assessments add to the occupational profile?
- How did the administration of the Adolescent/Adult Sensory Profile go?
- Were you able to observe the actual academic environment during the Environmental Profile?
- Describe the impact on the view of the student.
- How useful was the Environmental Profile if you were not able to observe in their academic setting?
- Are there other assessments that should be used in the future?

### **Session 3:**

OTS/Clinician: The OTS/Clinician will complete the journal prior to analyzing the results of the survey for this step. The OT will journal about their thoughts towards this step. Questions to be addressed in this journal include:

- Did you feel the forms were helpful in explaining their sensory processing patterns? What changes could be made to the forms?
- Are there any changes you would make for the review of assessments step?
- Should this step have gone with the administration of the assessment?

**Session 4:**

OTS/Clinician: The OTS/Clinician will complete the journal prior to analyzing the results of the survey for this step. The OT will journal about their thoughts towards this step after the completion of the step for each participant. Questions to be addressed in this journal include:

- Were you able to articulate the results to the student?
- Was the coaching model useful to formulate a plan with the student?
- Which planning worksheet did you utilize?
- Are there any changes you would make to this form? If not, would you recommend using this form again in the future?
- Did you feel like the establishment of the plan was a collaborative process?
- Do you feel that the student was able to come to their own conclusions to formulate a plan?

**Session 5:**

OTS/Clinician: The OTS/Clinician will complete the journal prior to analyzing the results of the survey for this step. The OT will journal about their thoughts towards this step after the completion of the step for each participant. Questions to be addressed in this step include:

- Was this follow-up necessary?
- Do you feel like the timing of the follow-up was adequate?
- Would a worksheet have been useful in this process?
- Do you feel like you gained any extra useful information from the student?

**Session 6:**

OTS/Clinician: The OTS/Clinician will complete the journal prior to analyzing the results of the survey for this step. The OT will journal about their thoughts towards this step after the completion of the step for each participant. Journaling will include general thoughts about completion of the program and any adjustments that they see fit.

**Appendix X**

**University of North Dakota Institutional Review Board Approval**

**Institutional Review Board**  
Twamley Hall, Room 106  
264 Centennial Dr Stop 7134  
Grand Forks, ND 58202-7134  
Phone: 701.777.4279  
Fax: 701.777.6708

April 8, 2015

<b>Principal Investigator:</b>	Katrina Kotta
<b>Project Title:</b>	Studying With Successful Sensory Environments: A Pilot Study
<b>IRB Project Number:</b>	IRB-201504-314
<b>Project Review Level:</b>	Expedited 7
<b>Date of IRB Approval:</b>	04/01/2015
<b>Expiration Date of This Approval:</b>	03/31/2016
<b>Consent Form Approval Date:</b>	04/01/2015

The application form and all included documentation for the above-referenced project have been reviewed and approved via the procedures of the University of North Dakota Institutional Review Board.

Attached is your original consent form that has been stamped with the UND IRB approval and expiration dates. Please maintain this original on file. **You must use this original, stamped consent form to make copies for participant enrollment. No other consent form should be used.** It must be signed by each participant prior to initiation of any research procedures. In addition, each participant must be given a copy of the consent form.

Prior to implementation, submit any changes to or departures from the protocol or consent form to the IRB for approval. No changes to approved research may take place without prior IRB approval.

You have approval for this project through the above-listed expiration date. When this research is completed, please submit a termination form to the IRB. If the research will last longer than one year, an annual review and progress report must be submitted to the IRB prior to the submission deadline to ensure adequate time for IRB review.

The forms to assist you in filing your project termination, annual review and progress report, adverse event/unanticipated problem, protocol change, etc. may be accessed on the IRB website:  
<http://und.edu/research/resources/human-subjects/>

Sincerely,



Michelle L. Bowles, M.P.A., CIP  
IRB Coordinator

MLB/jle

Enclosures

Cc: Dr. Sarah Nielsen



**THE UNIVERSITY OF NORTH DAKOTA  
CONSENT TO PARTICIPATE IN RESEARCH**

**TITLE:** *Studying With Successful Sensory Environments: A Pilot Study*

**PROJECT DIRECTOR:** *Katrina Kotta, OTS and Dr. Sarah Nielsen, Ph.D./OTRL*

**PHONE #** *701-777-2208*

**DEPARTMENT:** *University of North Dakota Occupational Therapy*

**STATEMENT OF RESEARCH**

A person who is to participate in the research must give his or her informed consent to such participation. This consent must be based on an understanding of the nature and risks of the research. This document provides information that is important for this understanding. Research projects include only subjects who choose to take part. Please take your time in making your decision as to whether to participate. If you have questions at any time, please ask.

**WHAT IS THE PURPOSE OF THIS STUDY?**

You are invited to be in a research study that works to educate students on his/her sensory processing patterns to be able to adapt their academic environments because you are experiencing difficulty in your academic endeavors.

The purpose of this independent study is to evaluate the program Studying With Successful Sensory Environments and to determine its effectiveness on the University of North Dakota campus. This program aims to implement consultation occupational therapy services for students on the UND campus to increase students' awareness of sensory stimuli that may exist in their educational environments adversely affecting their ability to learn.

**HOW MANY PEOPLE WILL PARTICIPATE?**

Approximately 4 people will take part in this study at the University of North Dakota.

**HOW LONG WILL I BE IN THIS STUDY?**

Your participation in the study will last up to one semester. You will need to complete six sessions at appointments decided between you and the researcher. Each visit will take about 1 hour.

Approval Date:	APR 1 2015
Expiration Date:	MAR 31 2016
University of North Dakota IRB	

Date: \_\_\_\_\_  
Subject Initials: \_\_\_\_\_

### WHAT WILL HAPPEN DURING THIS STUDY?

The procedure includes six individual sessions that will be approximately one hour in length each. Here are the outlines for each session:

1. In the first session, the therapist and student will discuss the referral form with the student and obtain an occupational profile.
2. Based upon screening and referral previously, the therapist will conduct the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and Environmental Profile (Brown, 2007).
3. This session consists of discussing the results of the assessment with the student using the *Your Sensory Processing Patterns* worksheets.
4. The therapist will discuss the results of the assessment with the students to educate them on their sensory processing patterns and will work with the student through a collaborative partnership to develop a plan to modify or adapt their environments based on their sensory processing patterns.
5. Two weeks after implementing the plan, the therapist and student will discuss how the implementation of the plan is going and make modifications to the plan as necessary.
6. The therapist and student will either meet in order to check for progress after use of the plan over time.

A survey pertaining to each session in order to improve the program will be done at the conclusion of each session. The surveys will be given to the student separate from the session and they are free not to answer any questions they choose.

### WHAT ARE THE RISKS OF THE STUDY?

There are no anticipated financial, emotional, or physical risks associated with this study. However, if an individual struggles to understand and apply information learned in sessions they may experience frustration.

### WHAT ARE THE BENEFITS OF THIS STUDY?

You will benefit personally from this study by obtaining knowledge about the way you process sensory information and gaining strategies to use in order to be more effective within your academic environments. However, we hope that, in the future, other people might benefit from this study because it will create occupational therapy consultative services on college and university campuses to assist students.

### WILL IT COST ME ANYTHING TO BE IN THIS STUDY?

You will not have any costs for being in this research study.

Approval Date:	APR 1 2015
Expiration Date:	MAR 31 2016
University of North Dakota IRB	

Date: \_\_\_\_\_  
Subject Initials: \_\_\_\_\_

**WILL I BE PAID FOR PARTICIPATING?**

You will not be paid for being in this research study.

**WHO IS FUNDING THE STUDY?**

The University of North Dakota and the research team are receiving no payments from other agencies, organizations, or companies to conduct this research study.

**CONFIDENTIALITY**

The records of this study will be kept private to the extent permitted by law. In any report about this study that might be published, you will not be identified. Your study record may be reviewed by Government agencies, the UND Research Development and Compliance office, and the University of North Dakota Institutional Review Board.

Any information that is obtained in this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. You should know, however, that there are some circumstances in which we may have to show your information to other people. For example, the law may require us to show your information to a court or to tell authorities if we believe you have abused a child, or you pose a danger to yourself or someone else. Confidentiality will be maintained by means of each participant will be assigned a numerical code when informed consent is received. The informed consent forms will be stored separate from the response surveys. No names will be directly written on the survey forms. If we write a report or article about this study, we will describe the study results in a summarized manner so that you cannot be identified.

**IS THIS STUDY VOLUNTARY?**

Your participation is voluntary. You may choose not to participate or you may discontinue your participation at any time without penalty or loss of benefits to which you are otherwise entitled. Your decision whether or not to participate will not affect your current or future relations with the University of North Dakota. If you decide to leave the study early, we ask that you call the researchers at 701-777-2208.

**CONTACTS AND QUESTIONS?**

The researcher conducting this study is Katrina Kotta, Master of Occupational Therapy Student. You may ask any questions you have now. If you later have questions, concerns, or complaints about the research please contact Sarah Nielsen at 701-777-2208 during the day

Approval Date:	APR 1 2015
Expiration Date:	MAR 31 2016
University of North Dakota IRB	

Date: \_\_\_\_\_  
Subject Initials: \_\_\_\_\_

If you have questions regarding your rights as a research subject, you may contact The University of North Dakota Institutional Review Board at (701) 777-4279.

- You may also call this number about any problems, complaints, or concerns you have about this research study.
- You may also call this number if you cannot reach research staff, or you wish to talk with someone who is independent of the research team.
- General information about being a research subject can be found by clicking "Information for Research Participants" on the web site:  
<http://und.edu/research/resources/human-subjects/research-participants.cfm>

**I give consent for my quotes to be used in the research; however I will not be identified.**

**Please initial:**       Yes       No

Your signature indicates that this research study has been explained to you, that your questions have been answered, and that you agree to take part in this study. You will receive a copy of this form.

Subjects Name: \_\_\_\_\_

\_\_\_\_\_  
Signature of Subject

\_\_\_\_\_  
Date

I have discussed the above points with the subject or, where appropriate, with the subject's legally authorized representative.

\_\_\_\_\_  
Signature of Person Who Obtained Consent

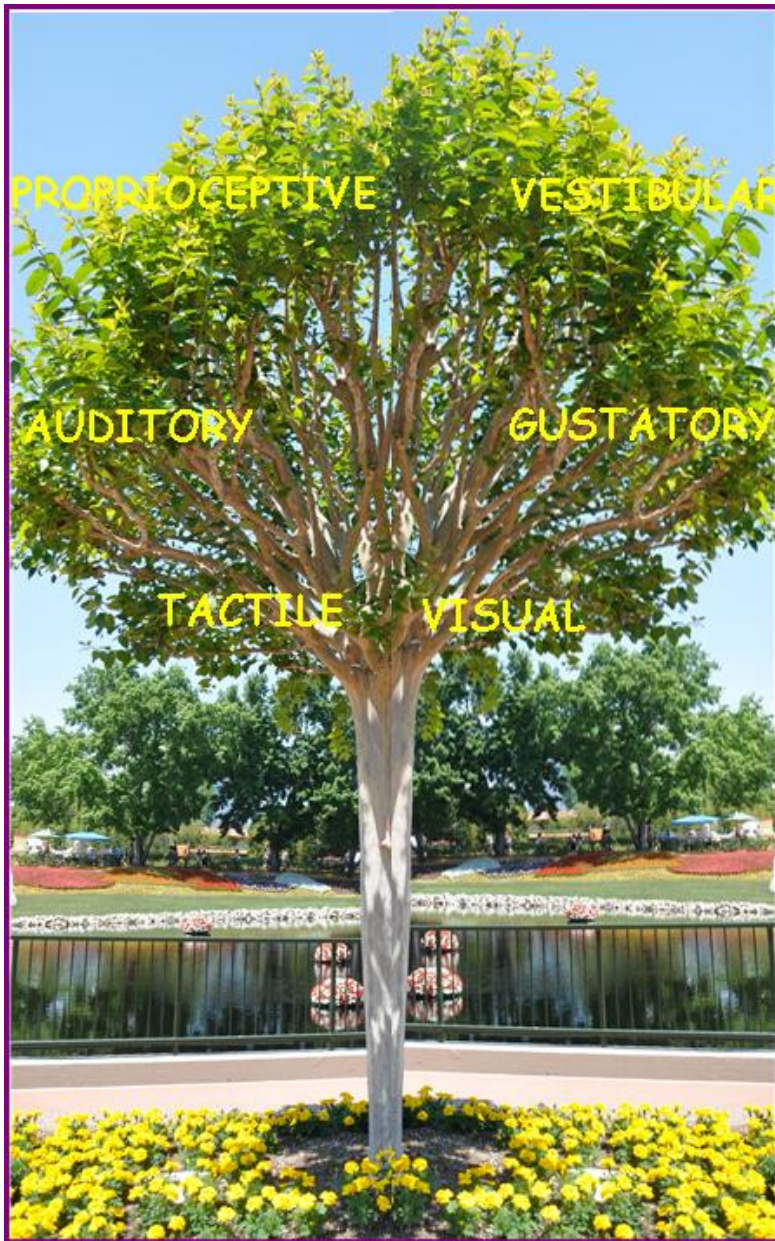
\_\_\_\_\_  
Date

Approval Date:	APR 1 2015
Expiration Date:	MAR 31 2016
University of North Dakota IRB	

Date: \_\_\_\_\_  
Subject Initials: \_\_\_\_\_

**Appendix Y**  
**Studying With Successful Sensory Environments 2.0**

# Studying With Successful Sensory Environments 2.0



Completed by: Katrina Kotta, Master of Occupational Therapy Student

Advisor: Sarah Nielsen, Ph. D, OTR/L

University of North Dakota

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## **Problem Statement**

The University of North Dakota (UND) has put in place several initiatives in recent years in order to increase retention rates. Some examples include the incorporation of the Student-Centered Active Learning Environment for Undergraduate Programs (SCALE-UP) classroom, living-learning communities (LLC), and special programming by the Student Success Center during the first part of the semester focused on academic tips to success in college. While these initiatives are excellent, another individual student-focused intervention that could assist students with more effective engagement in the classroom and study environments is a program based on sensory processing theory. Occupational therapists are trained to help students understand their individual sensory processing to adapt his or her educational environments to assist them to be successful at UND. This program aims to implement consultation occupational therapy services for students on the UND campus to increase students' awareness of sensory stimuli that may exist in their educational environments adversely affecting their ability to learn.

## **Target Population**

Students attending UND who have had difficulty academically or who may have an identified or potential Sensory Processing Disorder, and may be struggling on the college campus in a variety of daily life activities, such as the classroom, study environments, and dining halls. While these students would not need an identified disability to be referred to this program, some populations may include: students with Sensory Processing Disorder (SPD), Autism Spectrum Disorder (ASD), learning disabilities (LD), Attention Deficit Hyperactivity Disorder (ADHD), Generalized Anxiety Disorder (GAD), Post-Traumatic Stress Disorder (PTSD), and mood disorders such as Major Depression or Bipolar Disorder. Program referrals would be anticipated from the Student Success Center or Disability Services for Students.

## **Overarching Program Goal**

The overall goal of Studying With Successful Sensory Environments is to educate students on how to apply tools necessary to modulate their sensory experiences, through environmental adaptation or sensory strategies, in order for them to be academically successful on the UND campus.

## **Desired Outcomes**

1. Students will be able to adapt or implement strategies within the educational and study environments based upon their sensory processing patterns.

Measurement: Students will be able to identify at least two ways they have successfully adapted their educational or study environment.

2. Students will increase their academic success following implementation of their sensory modulation program.

Measurement: This will be reflected by self-reported grades on exams and written assignments, perception of their ability to focus in class, and input (written or verbal) received by the student from their peers or professors.

### **Guiding Framework**

Dunn's Model of Sensory Processing (1997) was used to guide the development of this program proposal. Dunn's Model stems from Ayres Model of Sensory Integration and focuses heavily on the neurological aspects of sensory processing within the brain (Ayres, 1979). While Dunn's Model of Sensory Processing utilizes the basic premise of Sensory Integration theory, which is "the organization of sensation for use" (Ayres, 1979, p. 5). Dunn states, "this model of sensory processing is meant to provide a framework for studying, interpreting, and gaining insights into the nature of sensory processing, including all of its complexities, and the impact of sensory processing on daily life" (Dunn, 2001, p. 612). Primary features of Dunn's Model of Sensory Processing include: "(a) consideration of one's neurological thresholds, (b) consideration of one's responding or self-regulation strategies, and (c) consideration of the interaction among thresholds and responding strategies" (Dunn, 2001, p. 611).

### **Neurological Thresholds**

Neurological thresholds are defined as the amount of stimuli needed to trigger a response by the central nervous system (Cole & Tufano, 2008; Dunn, 1997). Dunn focused her approach with a heavy basis in neuroscience with the theoretical foundation outlining that the brain has neurological thresholds that determine how a person will respond to sensory input, which can be observed through the adaptive behavioral response initiated (Cole & Tufano, 2008; Dunn, 2001).

### **Responding Strategies**

There are four different responses outlined by Dunn (2001) for responses to neurological thresholds, which include: low registration, sensory seeking, sensory sensitivity, and sensory avoiding.

#### **Low registration.**

This indicates that a student contains a high level of neurological thresholds and passively responds to stimuli (Parham & Mailloux, 2010; Cole & Tufano, 2008; Dunn, 2001; Dunn, 1997). This means that in order for the neurons to fire the student will require a high level of sensory input. Therefore, these students will not notice changes to the environment and will be the people who have their name read multiple times before

responding. Additionally, these students are often described as either easy going or withdrawn, unmotivated, self-centered, or inattentive (Dunn, 1997).

### **Sensory seeking.**

This indicates the student has a high threshold for sensory stimulation with an active response (Parham & Mailloux, 2010; Cole & Tufano, 2008; Dunn, 2001; Dunn, 1997). They are actively in trying to obtain sensory experiences. They will engage in bodily movement with climbing and swinging as well as sensory stimuli of scents of perfume, touching objects, or humming due to the auditory sensation as well as the vibration feeling in the lips. Also, they are often considered exuberant and become distracted easily (Dunn, 1997).

### **Sensory sensitivity.**

Students who have sensory sensitivity have low thresholds, which cause them to become distracted easily and have a harder time remaining focused for long periods of time (Parham & Mailloux, 2010; Cole & Tufano, 2008; Dunn, 2001). These students notice smells, movements, textures, and temperatures frequently and passively respond to the stimuli. Often, these students are seen as meticulous or particular because they experience discomfort with numerous different sensory stimuli (Dunn, 1997). Low thresholds in terms of sensory processing indicate that the student is sensitive to noticing sensory stimuli (Parham & Mailloux, 2010; Cole & Tufano, 2008; Dunn, 2001).

### **Sensation avoiding.**

Sensory avoiders hold a low threshold for sensory stimuli, but react to the stimuli in an active manner (Parham & Mailloux, 2010; Cole & Tufano, 2008; Dunn, 2001). Therefore, they will often remove themselves from a room where there are various people or objects in motion and will generate a daily routine in order to minimize possible sensory surprises. Typically, these students are seen as reserved or shy and avoid environments with excessive stimuli such as carnivals or theme parks (Cole & Tufano, 2008; Dunn, 1997).

Although these four areas are outlined within Dunn's Model of Sensory Processing (Dunn, 2001), it is important to remember that a student can fall anywhere on the continua and may have a different threshold for different senses.

### **Interaction of Thresholds and Responding Strategies**

Dunn (2001) analyzed the relationship between a students' neurological thresholds and their strategies to self-regulate their behavior by creating continua (Cole & Tufano, 2008; Engel-Yeger et al., 2013). The neurological threshold continua is made up of habituation or high thresholds (the simplest form of learning where the central nervous

system recognizes a stimuli familiar to it and uses less cells to transmit the signal) and sensitization or low thresholds (where the stimulus is identified by the central nervous system as important or harmful and generates a heightened response) (Dunn, 1997). Based on the students' neurological thresholds for each quadrant, the occupational therapist will analyze the relationships between the threshold and effective strategies to regulate their response. After obtaining their results, the therapist will collaborate with the student to help them interpret and understand the meaning behind their results to help them problem-solve how to use strategies within the classroom or student environment.

### **Coaching**

In order to for the occupational therapist to complete the intervention for this program they need to be comfortable with the technique of coaching. Coaching has been implemented in a variety of areas such as business models, early intervention therapy models, and adult education learning contexts (Dunn et al., 2012; Ellinger & Kim, 2014; Graham, 2011). Coaching is defined as, “a collaborative, solution-focused, result-oriented systematic process, in which the coach facilitates the enhancement of the coachee’s life experience and performance in various domains and foster self-directed learning, personal growth, and goal attainment of the coachee” (Grant, 2001 as cited in Fazel, 2013, p. 386). Coaching is a therapy approach that is solution-centered that incorporates psychological, behavioral, and cognitive strategies (Ellinger & Kim, 2014). The main competencies of coaching include, “building rapport, active listening, ask powerful questions, positive feedback, encourage the coachee in order to help coachee to establish SMART (specific, measurable, achievable, realistic, timed) goals” (O’Conner & Lages, 2007 as cited in Fazel, 2013, p. 386).

The Coaching Model is utilized by occupational therapists to educate clients through a collaborative partnership on how to problem-solve and identify elements they can adapt throughout their daily routine, which for the purposes of this program, would be educating students on their individual sensory preferences and watching them form solutions (Dunn et al., 2012; Fazel, 2013; Rush & Shelden, 2008). Coaching has been used throughout the literature with the parents of children with Autism Spectrum Disorders (Kientz & Dunn, 2012; Dunn et al., 2012). Dunn et al. (2012) found that the Coaching Model was an effective approach to use to help parents adapt an environment with their children with ASD. In early intervention, occupational therapists using coaches have ensured that parents of the clients “receive consistent, unduplicated, timely, evidence-based, individualized, and comprehensive information and support” (Rush & Shelden, 2008, p. 2). This has been compared to adult learning by Graham (2011) who states “adult learning principles, enablement perspectives of disability and models of occupation underpin therapists’ use of reflection, questioning, modelling and demonstration within the approach” (p. 41), which indicates that occupational therapy

can apply coaching principles previously implemented in early intervention for the adult population as well.

Through the Coaching Model, the therapists role is not instructing, but a guiding approach that helps clients form solutions to their own problems. Within this approach, therapists are asked to use strategic questioning or open-ended questioning to help the client analyze their problem themselves to formulate an appropriate solution. Therapists seek to learn what the client already knows and the solutions they have tried in order to create a joint plan through support from the therapist to reach their goals (Rush & Sheldon, 2008). As discussed by Fazel (2013), adults within the college atmosphere seek to be self-directed in their learning; therefore, it is essential to create a collaborative, equal partnership where the therapist is merely a guide to help them identify their motivations and strengths in finding solutions that are directly applicable to their situation. The therapists role in the implementation of this program is to assess the client using the Environmental Profile (Brown, 2007) and the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and discuss those results with the student. From there, the therapist is going to coach the client on how to problem solve through their environments within the academic setting in order for them to generalize the skill throughout their college career at UND.

There are four basic steps within the Coaching Model that should be followed: initiation, observation, action, and reflection (Graham, 2011). The therapist will be referred the clients, therefore, initiation will be completed prior to working with the client. Observation consists of evaluating the client through the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and Environmental Profile (Brown, 2007) as outlined later in this program. Third, the therapist will actively promote the problem solving process with the client by going over the results of the assessments and coaching on how they will use that information within the academic environment. Reflection will be done through an email, grade self-reports, or a follow up consultation visit as it is preferred by the client. Please see the attached worksheet for further clarification of the process as well as some guiding questions used within the Coaching Model located in Appendix A. The result of this process should include: 1) active participation by the participant to acknowledge the adaptations or modification to their environment they need to make in order to be successful, 2) self-reflection and refinement of their skills to act based on their sensory processing patterns, and 3) use the knowledge they have to be more academically successful on the UND campus in the hopes that greater academic success will allow the student to stay at UND.

### Proposed Process

The chart listed below is a proposed schedule and all five steps are described in-depth within the following paragraphs. The therapist will follow the proposed session schedule in order to implement referral, assessment, consultation, and recommendations as they would according to the occupational therapy process.

#### Proposed Session Schedule

<b>Referral</b>	Students at the University of North Dakota can either be referred from different on campus services such as the Student Success Center and Disability Services for Students or by self-referral.
<b>Session</b>	<b>Objective</b>
<b>1. Occupational Profile and Assessment</b>	The therapist and student will discuss the referral form with the student and obtain an occupational profile. Based upon screening and referral previously, the therapist will conduct the appropriate assessments. If the Environmental Profile (Brown, 2007), the therapist will initiate a conversation about the therapist analysis environment based on the students' decision to allow them to observe.
<b>2. Review of Assessment and Observation of Environments</b>	The therapist will discuss the results of the assessment with the student through use of the template within Appendix F. The <i>Your</i> Sensory Processing Patterns will be given to the student in order to further process the information upon conclusion of the session.
<b>3. Environmental Analysis and Action Plan Creation</b>	The therapist and student will discuss how their sensory processing patterns are impacted by their environments and create an action plan for adapting or modifying their study or classroom environments.
<b>4. Follow up</b>	The therapist and student will discuss how the implementation of the plan is going and make modifications to the plan as necessary.
<b>5. Check-up and Outcomes</b>	The therapist and student will either meet or correspond over email in order to check for progress after use of the plan over time.

## **Referral**

Students can be self-referred or will be referred to this program by the Student Success Center or Residence Hall Staff. Students will be informed about the program through the utilization of a flyer to introduce the services to the student. After reviewing the information with a professional, the student will be given the option to participate in the program. If the student is receptive to receiving assistance, the referral form located in Appendix B will be filled out by the student in order to give the therapist information about their qualifications for services within the program. Prior to the initial meeting with the student, the therapist should prepare a 3-ring binder with the materials located in the appendices of this program. This is to ensure that worksheets and forms are easily accessed and contained for each student participating. The same binder is permissible for use for multiple students with the use of dividers for each participant.

### **1. Occupational Profile and Assessment**

During this initial meeting of the therapist and the student, the therapist will review the referral form with the student. The therapist should review the referral prior to the meeting. The student will tell the therapist in more detail some of the issues they are experiencing and will give the therapist insight into their current study habits or aspects of their environment that inhibit their academic success. The therapist should refer to the flowsheet of the program overview and provide this to the student during the start of the session. Please refer to Appendix D. The therapist should create an occupational profile at the end of this session to guide the rest of the program process. An semi-structured interview worksheet is located in Appendix C. The goal of this session is to establish rapport with the student to inform the rest of the program process and facilitate a collaborative relationship to assist with creation of an action plan later in the program process.

The assessment would begin after the initial referral was turned into the therapist and occupational profile was complete. The assessment process for this program will consist of both formal and informal assessments that utilize self-report and observation. The Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) will be utilized within the initial evaluation in order to have an idea of the sensory processing needs of the individual. The therapist will then have the student complete the Environmental Profile Self-Report Tool (Brown, 2007) to identify the student's perspective of their environment broken into the seven sensory categories on the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002). It is recommended to have the student complete the Environmental Profile Self-Report Tool of both their study and classroom environments, unless contraindicated. These environments should have been previously identified through the occupational profile.

The therapist will then introduce the Environmental Profile Therapist Analysis (Brown, 2007). They will inform the student that observation of the environment by the therapist will provide insight as to some of the sensory features that the student may not



be aware of depending on their unique preferences. The therapist will discuss the two environments previously identified as having difficulty for the student and provide the student with the option to allow the therapist to observe. The therapist should also provide the option of verbalizing the environment or having the therapist look at the environment when the student is not in class if the class size is small or the student does not permit therapist observation. The student will be given the duration between the first and second sessions to provide the therapist an answer of either a/an environment(s) they will allow the therapist to observe, provide a location for the therapist to observe independent of the class session, or verbalize the environment for the therapist to analyze. The student will provide the therapist the location, time, and dates they are permitted to observe and the therapist will attend the class without the students' knowledge to be able to remain in their role as an observer. Keep in mind that verbalization of the classroom environment has not been shown to gather additional information for the therapist as results were similar to that of the self-report previously filed by the student participating.

Permission to use the Environmental Profile (Brown, 2007) was granted by Catana Brown. It may not be utilized for any other purposes or replicated without permission, which is indicated in Appendix E. The Adult Sensory Profile (Brown & Dunn, 2002) and the Environmental Profile (Brown, 2007) must be completed for each client; however, additional assessments are permitted to gain additional information as the therapist sees fit. The following table provides possible assessments to be used.

**Adolescent/Adult Sensory Profile (Brown & Dunn, 2002)**

Purpose	Type	Pros	Cons
This assessment is used to evaluate how sensory experiences are affecting the everyday behavior of an individual.	Self-Report – This evaluation consists of a series of questions evaluating the different sensory experiences with the individual rating the questions from 5 (almost always) to 1 (almost never)	<ul style="list-style-type: none"> <li>-Focuses on everyday behaviors</li> <li>-self-report to include the individual into the intervention synthesis</li> <li>-can be used for people with or without disabilities</li> <li>-quick administration</li> <li>-in-depth interpretation and intervention guide is included with assessment materials</li> <li>-easy to comprehend to non-health professional</li> <li>-based on Dunn's Model of Sensory Processing</li> </ul>	<ul style="list-style-type: none"> <li>-Does not include <i>every</i> behavior involved with sensory experiences in everyday life</li> <li>-self-report may not be valid if the participant is not able to fully engage in answering the questions</li> </ul>

		<ul style="list-style-type: none"> <li>-can apply to any context</li> <li>-links sensory processing to everyday life</li> <li>-in-depth research for validity and reliability of assessment</li> </ul>	
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**Environmental Profile (Brown, 2007)**

Purpose	Type	Pros	Cons
<p>Identifies the different sensory components of the environment and the traits of sensation (frequency and intensity). It was developed as a companion to the Sensory Profile in order to compare the two assessments to identify incongruities that exist within the environment for the individual.</p>	<p>Self-Report – This assessment allows the client to look at their environment to identify barriers and facilitators. The client indicates if a statement refers to them. Each statement has a high or low after the statement, which refers to whether the statement addresses an environment challenge for someone with either a high or low neurological threshold.</p> <p>Therapist Analysis– occupational therapists are specifically trained to observe the environments to assess what types of environmental modifications could be made as</p>	<ul style="list-style-type: none"> <li>-examines the sensory components of an environment</li> <li>-is a cross-reference tool with the sensory profile to look for incongruities</li> <li>-self-report is a simple checklist that is easy to fill out by the client</li> <li>-focuses on observation and analysis by OT, which they are specifically trained to do</li> <li>-allows the therapist to view the environment in a non-invasive manner</li> </ul>	<ul style="list-style-type: none"> <li>-does not address <i>every</i> area of sensory processing within the self-report tool</li> <li>- self-report may not be valid if the participant is not able to fully engage in answering the questions</li> </ul>

	well as performing task analysis.		
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**Sensory In Praxis Test (SIPT) (Ayres, 1989)**

Purpose	Type	Pros	Cons
Aims to assess the sensory processing patterns and praxis and function in <i>children</i> . The concepts include body schema, the relationship between sensory perception and movement, body position, sequencing, translation of verbal directions, and two and three-dimensional construction.	Therapist administers the 2 hour test to assess: processing of vestibular, proprioceptive, tactile, visual, kinesthesia, and praxis systems within 17 sub-tests.	<ul style="list-style-type: none"> <li>-most comprehensive test in area of sensory integration</li> <li>-administered by the occupational therapist, thus, increasing the validity and reliability of the results obtained.</li> <li>-heavy research base on the standardization, reliability, validity, and scoring process</li> <li>-based on Ayres' Sensory Integration</li> </ul>	<ul style="list-style-type: none"> <li>-have to be certified to give this assessment (can be obtained through Sensory Integration International)</li> <li>-does not assess <i>every</i> aspect of a person's sensory processing pattern</li> <li>-was originally designed for children</li> <li>-does not specifically look at context of sensory dysfunction</li> </ul>

**Sensory Processing Measure (SPM) (Parham & Ecker, 2010; Kuhaneck et al., 2010)**

Purpose	Type	Pros	Cons
Measures functioning in home, school, or community settings related to their sensory processing abilities in context. Used for intervention planning within a specific environment.	Self-report – depending on the environment, a teacher, parent, or someone who had close contact with the client can fill out the form within the school, home, or community setting.	<ul style="list-style-type: none"> <li>-filled out by someone who knows the client well</li> <li>-based on Ayres' Sensory Integration</li> <li>-large emphasis on environmental contributors</li> <li>-assesses whether the environment is contributing to the performance deficit</li> </ul>	<ul style="list-style-type: none"> <li>-originally designed for children (5-12)</li> <li>-self report may not be accurate information due to possible limited knowledge of sensory processing</li> </ul>

## 2. Review of Assessment and Observation of Environments

Prior to this session, scoring and analysis of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and Environmental Profile Self-Report (Brown, 2007) is completed and analyzed with the occupational profile of the student. In order to analyze the results of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and Environmental Profile Self-Report (Brown, 2007), please refer to the template found in Appendix F as well as the case study in Appendix N in order to present the results to the student. Two copies of the results sheet should be printed in order to allow the therapist a copy for the rest of the session while the student retains their copy for personal use. The goal of this session is to ensure that the student understands their unique sensory processing patterns in order to utilize this information to not only adapt their current academic and study environments, but also to be able to do this with future academic or vocational environments, which further validates the use of the coaching model.

For information on how to explain the various sensory processing preferences, please refer to the Adolescent/Adult Sensory Profile User's Manual (Brown & Dunn, 2002, p. 35-42). These interventions should be given to the student in written format as general idea for them to individualize to their specific environments during this session. The process of this session would include (Waltermire et al., 2010):

1. Educate the student about what sensory processing is and how it applies to academic success. Included is a handout to help guide the discussion with the student in Appendix F.
2. Education for the student about the results of the assessments as it relates to their sensory processing needs.
  - The therapist should provide a copy of the results of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and the Environmental Profile (Brown, 2007) to the student. Please see the worksheet in Appendix G and H to describe the results to the student for the Environmental Profile (Brown, 2007). A case study is provided in Appendix N as an example of how to fill out the forms included.
  - The therapist should utilize the *Your* Sensory Processing Guides worksheet located in Appendix I (as appropriate) to familiarize the student with the types of sensory processing they have an assist in coaching them to problem solve through their environments. The therapist will give these to the student at the conclusion of this session in order to allow them time to process through their Sensory Profile (Brown & Dunn, 2002) results. Please refer to the case study example provided in Appendix N.

For additional information about how to implement coaching techniques please refer to the handout from the University of Kansas located in Appendix A or go to <http://www.kskits.org/ta/Packets/UsingPrimaryService/Implementing.pdf>.

To conclude this session, the therapist will inquire about the student's decision of completion of the Environmental Profile (Brown, 2002). This assessment is most appropriate if the therapist is able to observe within this environment. The therapist is able to fill out the assessment if the student verbalizes the environmental characteristics, however, has been found to contain less helpful information if not used through observation in the natural context. The therapist will utilize the Environmental Profile (Brown, 2007) by taking one of three possible actions: 1) observe the student in their natural academic environment (the environment they have the most trouble or the environment the student is willing to allow the therapist to observe), 2) have the student describe their academic study and classroom environments and provide pictures if applicable, 3) have the student get a written or verbal account of their student environment and their behaviors within that environment from a reliable source, such as a professor or friend in the same major. The environmental assessment of the student can take place in the classroom or study environment (such as their dorm room, library, or the Memorial Union), depending on the needs of the client and the areas that are identified by the client as the most debilitating.

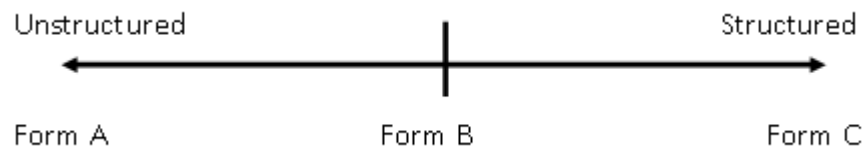
### **3. Environmental Analysis and Action Plan Creation**

Prior to this session, the therapist should analyze the results of the Environmental Profile Therapists Analysis (Brown, 2002). The therapist should discuss the results of the Environmental Profile (both the therapists analysis and self-report of the student) referencing the student's sensory processing patterns at the start of the session. It is helpful to also have the Sensory Profile results when discussing the results with the student for reference. The goal of this session is to inform the student of how their environments relate to their sensory processing patterns as well as creation of a collaborative action plan between the student and therapist. In order to complete this session, the therapist will complete the last two steps as recommended by Waltermire et al. (2010):

3. Coaching the student on how to utilize the information in their classrooms or study areas at UND.
  - Appendix J, K, and L include worksheets designed to facilitate coaching with the student when creating the sensory action plan. All worksheets outline a quick summary for the student of their sensory preferences; however, there are various plan formats to meet various needs of students. Please refer to the case student in Appendix N for an example of how to use worksheet A, B, and C. Worksheet A is best suited to meet the needs of students who prefer a more creative planning process that does not fit into a certain structure and is simplified. Worksheet B provides a chart for the student to easily fill out during and after the session and is more comprehensive. Worksheet C is intended for students who have potential

sensory problems that could be modulated by stimulating a different sensory system. The therapist should ask the student which type of form they prefer through use of the coaching model. In addition, please refer Appendix A in the Sensory Profile (Brown & Dunn, 2002), which includes reproducible charts outlining different examples of interventions for each category.

- Action Plan form continuum:



4. Develop sensory tools and strategies to modify their environment to increase their ability to learn or study new information.

- Sensory tool examples include the use of a fidget, earplugs, or sunglasses.
- The therapist acts as the facilitator in this discussion, allowing adequate time for the student to problem solve solutions for their sensory needs through use of the coaching model.
- For suggestions of interventions or modifications based on sensory preferences, please refer to the Adolescent/Adult Sensory Profile User's Manual (Brown & Dunn, 2002, p. 35-42).

#### **4. Follow-up**

This session is designed to allow the student to bring back the action plan after 2 weeks or more of implementation (or for a longer period of time pending the student's schedule). The therapist and student will discuss how the plan is going, if there are any areas that still remain unclear, aspects of the environment not previously addressed, and creation of more strategies as well as elimination of strategies that did not facilitate enhanced focus or learning for the student. This session is facilitated by the therapist, but lead by the student based on their needs. The goal of this session is to provide guidance of how to modify their current plan and to further explain questions related to sensory processing or sensory aspects related to the environment. If indicated for the student, the therapist may use discretion based on the students feedback to create a new plan if the previous plan was not facilitating academic success by focusing on new strategies of the same problems through use of a different sensory system or focusing on other environmental aspects that were found to be more of an immediate concern for the student. In addition, emailing the participants who demonstrates understanding of the material and its application is permitted to identify if this session must be conducted in

person. If the participant responds that they require no changes is this indicated as they have previously exhibited the ability to apply their sensory preferences to their environment during the previous session.

### **5. Check-up and Outcomes**

Upon discharge, the student will be provided a copy of the results of his or her assessments as well as the strategies used to modify the environment in typed format if not previously given. The student will be given contact information of the therapist in order to contact them at the end of the semester for a follow-up visit evaluating the students' academic progress. This session is recommended to be conducted on a face-to-face visit; however, if the student schedule does not allow, completion of the session via email is acceptable. The student will be mailed or emailed a copy of the Student Progress Reporting Form located in Appendix M to bring to the follow-up visit as a guide for discussion of the student's perceived progress. The therapist should clear up any further questions from the student and request additional feedback from the student pertaining to their experience of the program as well as their ability to adapt their environments based on the information learned within the program. Timing of this session is recommended to be approximately 2 weeks prior the end of the semester or can be completed after the semester has concluded. Refresher consultation appointments can be scheduled at the discretion of the therapist providing the service as indicated or as future plan changes are necessary due to changing of classroom environments.

## **Appendices**



## **Appendix A**

### **Coaching Implementation Guideline**

**Please refer to the attached PDF from Kansas University or go to  
<http://www.kskits.org/ta/Packets/UsingPrimaryService/Implementing.pdf>**

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Katrina,

You are welcome to use the informational materials we developed for your project. As you noted all we would ask is the appropriate citation be made.

Good luck with your project.

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David P. Lindeman, Ph.D.  
Director, KU Life Span Institute/Parsons  
Senior Scientist  
University of Kansas  
2601 Gabriel  
Parsons, Kansas 67357  
620.421.6550 x 1713 (phone)  
620.421.0671 (fax)  
lindeman@ku.edu

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**From:** <Stroup-Rentier>, Vera Stroup-Rentier <[vlsrent@ku.edu](mailto:vlsrent@ku.edu)>  
**Date:** Saturday, November 8, 2014 at 3:09 PM  
**To:** Lindeman <[lindeman@ku.edu](mailto:lindeman@ku.edu)>, Peggy Kemp <[pmiksch@ku.edu](mailto:pmiksch@ku.edu)>  
**Subject:** FW: Permission to use "Implementing a Primary Service Provider/Coaching Model"

Hi **Dave and Peggy**,

**Please let me know how you would like me to respond to Katrina or if you would rather respond to her. Thanks!**

Vera

---

**From:** Kotta, Katrina [[katrina.kotta@my.und.edu](mailto:katrina.kotta@my.und.edu)]  
**Sent:** Saturday, November 08, 2014 12:11 PM  
**To:** Stroup-Rentier, Vera Lynne  
**Subject:** Permission to use "Implementing a Primary Service Provider/Coaching Model"

Ms. Vera Stroup-Rentier,

My name is Katrina Kotta and I am currently a second year student in the Occupational Therapy Program at the University of North Dakota (UND). I am working on my scholarly project program in order to implement an independent study, which involves consultation services on the UND campus. Students would be evaluated and educated about their sensory processing patterns as it relates to their academic success in order to improve their academic performance. I have seen the PDF online that you have titled *Implementing a Primary Service Provider/Coaching Model* along with Dr. David Lindeman and Ms. Peggy Miksch. I was wondering if you and your colleagues would allow me to include your resource in my program? The resource will be cited properly and used for the purpose of informing the occupational therapist using my program about how to use the coaching technique, that you and your colleagues outline, to assist students in problem-solving how to adapt their educational environment to suit their sensory needs. If this is a possibility please let me know. Thank you for your time and I look forward to hearing from you!

**Katrina M. Kotta**



## Using Primary Service Providers & Coaching in Early Intervention Programs

### **Implementing a Primary Service Provider/Coaching Model**

Implementing a primary service provider/coaching model is a process that includes many facets. It is important to start with a cross disciplinary team that wants to improve their skills, try new approaches, resolve challenges and build collegial relationships. This same team needs to be willing to meet on a regular basis, be able to schedule co-visits with their colleagues, when appropriate, and receive feedback from each other. There are several options for starting the process: a team can begin with newly referred children only, they can try this model on a handful of families currently enrolled in the program, use the model only on the families currently enrolled or a combination of any of these options. Lastly, as the team implements the primary service provider/coaching model questions may arise as to what to do now if team members are no longer "playing with the children", "using their hands the majority of the visit", and "bringing their toys". Their role now is to facilitate participation between the caregiver(s) and the child and in so doing use "their hands" to help figure out what works with the child and model/teach to share new ideas with learners in their environment, with their toys.

Vera Lynne Stroup-Rentier, M.Ed.,  
David P. Lindeman, Ph.D. & Peggy Miksch, M.S.

June 2007

Kansas Inservice Training System  
Kansas University Center on Developmental Disabilities  
2601 Gabriel, Parsons, KS 67357

620-421-6550 ext 1618 or

1-800-362-0390 ext 1618

<http://kskits.org>



## Components of the Coaching Process

### Initiation

- Identify coaching opportunities
- Clarify the purpose and outcomes of coaching
- Identify and address any barriers to making the coaching process effective
- Clarify the ground rules

### Observation

- Coach observes the learner in some type of action or practice
- Learner observes the coach modeling some type of action or activity
- Learner observes him- or herself (self-observation)
- Coach and/or learner observe aspects of the environment

### Action

- Coach models a skill for the learner
- Learner practices using an existing or new skill discussed with the coach
- Learner experiences a behavior, issue, or situation that precipitates a discussion with the coach
- Learner anticipates a behavior, issue, or experience to discuss with the coach prior to the event

### Reflection

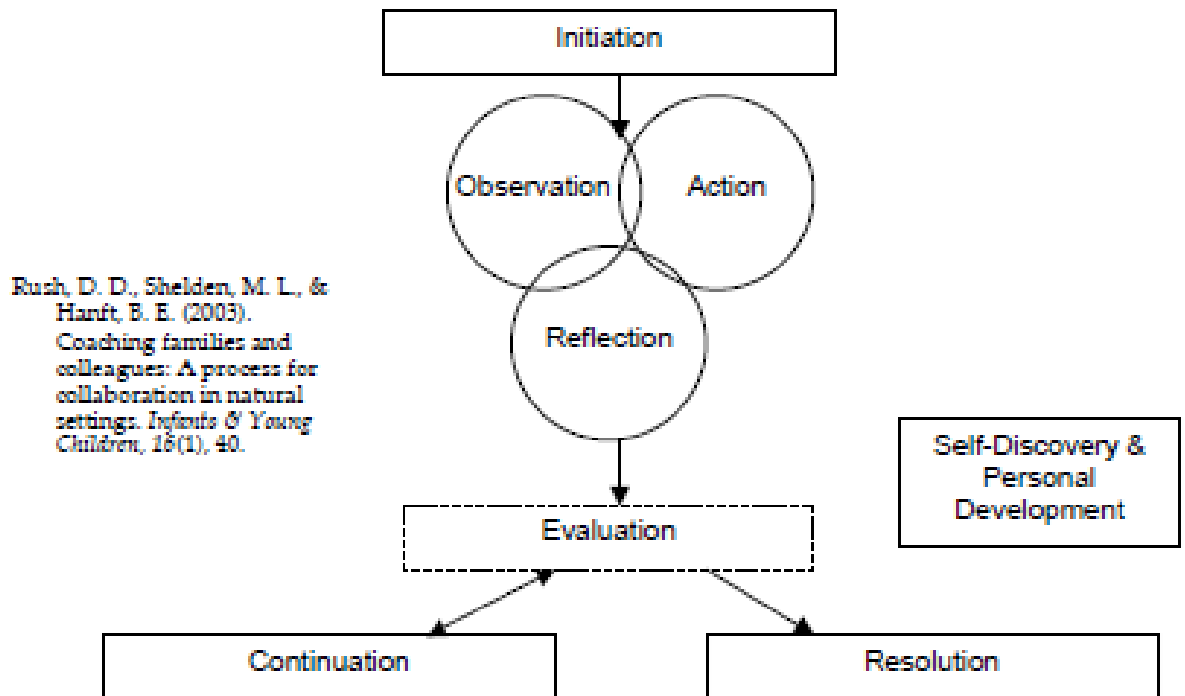
- Assist the learner in discovering what he or she already knows or needs to discover by asking the right questions in the right way
  - What's happening now? What happened?
  - What do you want to accomplish?
  - How did you decide where to focus?
  - What have you tried? What did you do?
  - How could you do it differently?
  - How will you know when you are successful?
- Provide feedback on observation and/or action
- Share information, resources, and supports (as necessary)
- Confirm understanding of the learner
- Review what has been accomplished
- Plan new observations and/or actions or strategies to implement between coaching conversations

### Evaluation

- Review the coaching process
  - Continuation
  - Resolution

Hanft, B. E., Rush, D. D., & Sheldon, M. L. (2004). *Coaching families and colleagues in early childhood* (p. 60). Baltimore: Paul H. Brookes. Reprinted with permission.

## The Coaching Process



Kinlaw (1999) defined coaching as a shared conversation between two individuals who each have information and skills to gain from interacting with each other. Professionals have skills and specific intervention strategies to share about children's growth and development. Families and other caregivers have the most information about child's routines, daily activities, likes, dislikes, strengths and needs. Together, the families and the professionals can begin to examine: 1) what is already happening that works for this child; and 2) what other natural learning opportunities exist for the child when the coach (professional) is not present, thus initiating the coaching process that is depicted in the above diagram.

The specific components of the coaching process include: 1) initiation, 2) observation, 3) action, 4) reflection, and 5) evaluation. Although the diagram above may suggest coaching is a linear process, it is not. Observation, action and reflection are interwoven and important to the process being meaningful to the learning but can occur anytime during the coaching relationship. Actually, during the coaching process the learner and the coach may move in and out of these interwoven components several times. The initiation and the evaluation phases bind the process together so ultimately the learner and coach can jointly develop goals and address those same goals.

Harft, B. E., Rush, D. D., & Shelden, M. L. (2004). *Coaching families and colleagues in early childhood* (p. 31-33). Baltimore: Paul H. Brookes.



## The Coach's Goal

The early childhood coach's goal for the learner is sustained excellent performance in which the learner has the competence and confidence to engage in self reflection, self correction, and generalization of new skills and strategies to other situations as appropriate.

Coaches consider multiple factors when initiating a relationship with a learner including motivation, self-direction, critical thinking skills, integration of new information and learning styles. The chart below assists coaches in understanding learners who have visual, auditory, kinesthetic (active) needs by giving examples of what these learners might be doing during the coaching process.



## Learning Styles for Coaching

Visual	Auditory	Kinesthetic
Caregiver observes therapist	Caregiver summarizes feedback from therapist	Caregiver keeps journal
Caregiver observes others	Caregiver narrates actions from a video	Caregiver practices actions
Caregiver watches video	Caregiver listens to audiotape	Caregiver demonstrates actions to others
Caregiver reads an article and/or looks at illustration	Caregiver calls another caregiver	Caregiver joins support group or visits another caregiver

Hanft, B. E., Rush, D. D., & Shelden, M. L. (2004). *Coaching families and colleagues in early childhood* (p. 176). Baltimore: Paul H. Brookes. Reprinted with permission.

Kansas Inservice Training System, [kkitc.org](http://kkitc.org)



# Coaching Worksheet

The coaching worksheet outlines both the components of the coaching process and elements within these same components. This tool can be used before, during and after any coaching conversation. The coach and/or learner as a way to document observations, actions and reflections that occur between or during coaching conversations may complete the worksheet. Both parties at the conclusion of a coaching visit can also complete it jointly. A separate worksheet can be used multiple times or one worksheet can be used across multiple coaching conversations. (Example included in the "Activity" section of this packet.)

Learner: \_\_\_\_\_ Coach: \_\_\_\_\_ Date: \_\_\_\_\_

## INITIATION

Coaching opportunity observed or presented	
The purpose of the coaching relationship is	
Intended learner outcomes resulting from the coaching relationship	
Barriers to the coaching process	Strategies to address barriers
Ground rules	

## OBSERVATION

What/where

When

	What/where	When
Coach observes learner's actions and interactions		
Learner observes coach model actions		
Learner observes self		
Coach/learner observe environment		

**ACTION**

What/where

When

Coach models for learner (coach present)		
Learner practices an action (coach present/absent)		
Learner describes experience (coach absent)		
Coach/learner observe environment		

**REFLECTION**

Description

Learner reflects on action or observation			
Coach gives feedback about observation or action following reflection			
Learner uses resources (e.g., print, video, peer)			
Coach confirms learner's understanding and summarizes			
Coach/learner plan next steps	Who	What	When
Observations			
Practice			
Resources			





## **EVALUATION**

### Coach Self-Reflection

1. Is the learner accomplishing his or her goals?
2. What changes, if any, do I need to make in the coaching process?
3. Should I continue as this learner's coach? (If not, who would be more effective?)

### Coach Asks Learner

1. Shall we continue coaching or have your goals been accomplished (continuation)?

If continuing coaching:

- What changes need to be made in the coaching plan?
- What observations and/or actions should take place between coaching sessions?
- How will we communicate in between sessions?
- Do we have a plan for the next session?

2. If goals have been reached (resolution):

- Is the learner committed to and capable of self-assessment, self-correction, and self-generation?
- Has a plan for reinstating coaching been discussed?

Hanft, B. E., Rush, D. D., & Shelden, M. L. (2004). *Coaching families and colleagues in early childhood* (p. 62-64). Baltimore: Paul H. Brookes. Reprinted with permission.

**Appendix B**  
**Sensory Processing Referral Tool**

**Studying with Successful Sensory Environments  
Referral Tool**

**Referral Source (please circle): Self-Referral or Other (please list):** \_\_\_\_\_

**Student Name:** \_\_\_\_\_

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

**Date:** \_\_\_\_/\_\_\_\_/\_\_\_\_

**Please check the following boxes that apply.**

- I am easily distracted by visual stimuli (paintings, pictures, windows) when conversing with someone.
- I have trouble focusing on the person talking to me when other noises are present.
- I am unable to focus when there are bright colors around me or multiple people.
- I become overwhelmed when I smell certain scents
- I do not hear my name called in the waiting room with other people talking.
- I always have headphones in my ears to listen to music.
- I comment frequently that noise bothers me.
- I am unorganized and have trouble prioritizing tasks.
- I am emotional (anger, sadness, low frustration tolerance)
- I seek out movement (leg twitches, constant bodily movement, swivels or rocks chair)
- I like to chew gum during class and cannot concentrate when I don't have it.
- I have poor balance when walking.
- I whistle, hum, or sing frequently.
- I frequently ask for information to be repeated.

**Please describe the reason for the referral.**

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**Please provide any additional information below that you feel would be beneficial when addressing your academic performance.**

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**To make an appointment please forward the referral form to the University of North Dakota Occupational Therapy Department at Stop 7126 or contact Dr. Sarah Nielsen ([sarah.k.nielsen@med.und.edu](mailto:sarah.k.nielsen@med.und.edu) or 701-777-2208). Upon completion, please bring this form to the occupational therapist for the first appointment, who will complete the formal assessment procedures.**

**Appendix C**  
**Occupational Profile Semi-Structure Interview**

## Occupational Profile

This occupational profile worksheet is intended to be a *semi-structured* interview guide. All information within this worksheet should be addressed, however, it is the therapists' discretion as to how to word, phrase, or conduct the occupational profile. Refer to the flowsheet to facilitate interaction with the student and explain the overall program process. The goal of the occupational profile is to facilitate a collaborative process through establishment of rapport with the student.

**Name:**

**Are you between the ages of 18-25?** Yes                      No

**(Only for the purposes of the Sensory Profile scoring; if no, inquire when providing the assessment)**

**Year in School (circle):** Freshman              Sophomore              Junior              Senior  
Graduate Student

**Major:**

**Why did you decide to go into this profession?**

**What are some aspects about school that you enjoy?**

**What are some aspects about school that you least enjoy?**

**What are things you enjoy doing outside of the classroom?**

**Have any of your classes or study habits changed within the past year?**

**Where do you typically study? If more than one place, which ones are most difficult for you to be productive?**

**Where do most of your classes take place on campus? If multiple locations, which classroom environments do you have the most difficulty with?**

**Have you heard of occupational therapy before?**

**Have you heard of sensory processing or sensory integration?**

**If not, what do you think this means (explain if this question is answered)?**

**Do you have any questions or concerns about the program?**

**Additional comments:**

**Appendix D**  
**Studying With Successful Sensory Environments Flowsheet of Program Process**

# Studying With Successful Sensory Environments

## Session 1: Occupational Profile and Assessment

- Discuss referral form and review flowsheet for program overview
- Get to know therapist and learn about the study with an opportunity for questions
- Complete Sensory Profile
- Complete Environmental Profile Self-Report Tool (identify 2 environments to focus on)
- Discuss locations and purpose of Environmental Profile Therapist Analysis



## Session 2: Review of Assessment and Observation of Environments

- Discuss the assessment results of Sensory Profile.
- Schedule observation or describe environment for Environmental Profile Therapist Analysis.
- Provide *Your Sensory Processing Patterns* worksheet(s).



## Session 3: Environmental Analysis and Action Plan Creation

- Go through worksheets from previous session and answer remaining questions.
- Discuss results of Environmental Profile
- Talk about how sensory processing patterns relate to the environment.
- Select an action plan form and create plan with therapist.



## Session 4: Follow Up

- Discuss how the plan is going and brainstorm with therapist on different environmental considerations not previously addressed if needed.
- Make modifications, alterations, or omit strategies that were not successful.



## Session 5: Check-up and Outcomes

- Discuss how the plan is going with the modifications and additional concerns
- Complete outcome survey and discuss impact of program to therapist.
- Provide additional suggestions to therapist for improvement



**Appendix E**  
**Environmental Profile: Self-Report and Therapist Analysis**  
**Unpublished Assessment by Catana Brown (2007)**  
**Used with permission of Catana Brown. It may not be utilized for any other purpose**  
**or replicated without permission.**

RE: Environmental Profile Assessment

✕ DELETE   ← REPLY   ⇐ REPLY ALL   → FORWARD   ⋮



Brown, Catana <cbrown2@midwestern.edu>

Mark as unread

Tue 10/21/2014 3:45 PM

Thesis

To: Kotta, Katrina;

■ You replied on 10/21/2014 4:47 PM.

📎 2 attachments



Contextual Profile-Ther...  
63 KB



Contextual Profile.doc  
42 KB

Download all

Bing Maps

Action Items

+ Get more apps

Dear Katrina, The measure was never published. Deborah Waltermire has actually done a lot more work with it than I have. I have attached the forms I developed. You can see they are a rough version. There is a self-report and a therapist assessment. The self-report items are followed by the words low or high. This refers to whether or not that items represents an environmental feature that would challenge a low or high threshold person. You might want to remove those words when administering it. I'm OK with you using it, just please acknowledge me at the developer and don't share it with others. Also, I would like for you to share the study results with me. Tana

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**Appendix F**  
**Adolescent/Adult Sensory Profile Results Template**

## Sensory Processing Results Analysis

In order to complete this step, this sheet outlines a guiding framework for analyzing the sensory profile and environmental profile. Within this sheet, an example of the process has been provided. In order to analyze the results, the therapist must be proficient in analyzing the sensory profile individual categories of processing. Modifications can be made to the formatting of the document for readability and to suit the expertise of the therapist, however, information listed on the guideline needs to be included for the benefit of the student as this will be used in order for the student to process through the material independently between program sessions. An example of the template can be found within the case study at the end of the manual in Appendix N. Here is the general guideline for analyzing the Sensory Profile:

### Sensory Profile Results

Within this section you will list the results of the Sensory Profile for the student. This will help guide the conversation with the student in order for them to write on this worksheet and have the information in an organized fashion. Only processing categories that are significant should be included that are related to academic performance. In addition, all quadrants should be listed for the participant with the one that is most extreme listed first.

Category	Low Registration	Sensation Seeking	Sensory Sensitivity	Sensation Avoiding
<b>Taste/Smell</b>				
<b>Movement</b>				
<b>Visual</b>				
<b>Tactile/Touch</b>				
<b>Activity Level</b>				
<b>Auditory</b>				

- **Quadrant Category (High/Low Score)** – Brief description from the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) manual about the quadrant and what this indicates about their sensory processing patterns.
  - Specific sensory processing category (ie: auditory processing, smell/taste processing, movement processing, etc.)
    - Specific statements that scored 4 or 5 (frequently or almost always) on the profile

- **Suggested Strategies (keep title here for reference for student)**
  - Type in the general strategies listed in the Adolescent/Adult Sensory Profile to guide the conversation. These are going to allow you to give the student a general guide for helping the student problem solve strategies that they are already doing that may or may not be working as well as additional ways they can curtail different strategies to their studying or learning.

### **Environmental Profile Results**

Within this section you place the sensory processing categories that the student listed on the profile and list the most important aspects of their environment. This is based on the Environmental Profile Self-Report that the student fills out.

- Place the specific processing category here
  - List the statement that they circled on the assessment
    - **Strategies (to guide the student about what they are reading)**
      - List strategies that you feel could be beneficial from experience or ones that align from the Adolescent/ Adult Sensory Profile Manual (Brown & Dunn, 2002)

**Appendix G**  
**Environmental Profile Self-Assessment Reporting Form**

**Environmental Profile Self-Report Assessment Results**

**Environment:**

**Primary things done in environment:**

For each of the following categories please place a checkmark next to the questions/statements that the student indicates on the form.

**A. Taste/Smell**

Question	Student Identified With Statement	Threshold Challenged
1.		Low
2.		Low
3.		High
4.		High
5.		Low
6.		High
7.		Not Applicable

**Comments:**

**B. Movement**

Question	Student Identified With Statement	Threshold Challenged
1.		High
2.		High
3.		High
4.		Low
5.		High
6.		Low
7.		Low
8.		High

**Comments:**

**C. Visual Processing**

Question	Student Identified With Statement	Threshold Challenged
1.		Low
2.		High
3.		Low
4.		Low
5.		High
6.		High
7.		High
8.		Low
9.		Low

**Comments:**

**D. Touch Pressing**

Question	Student Identified With Statement	Threshold Challenged
1.		Low
2.		High
3.		Low
4.		Low
5.		Low
6.		Low
7.		Low
8.		Low
9.		High

**Comments:**

**E. Auditory Processing**

<b>Question</b>	<b>Student Identified With Statement</b>	<b>Threshold Challenged</b>
<b>1.</b>		<b>Low</b>
<b>2.</b>		<b>Low</b>
<b>3.</b>		<b>Low</b>
<b>4.</b>		<b>Low</b>
<b>5.</b>		<b>High</b>
<b>6.</b>		<b>High</b>
<b>7.</b>		<b>High</b>
<b>8.</b>		<b>Low</b>
<b>9.</b>		<b>High</b>
<b>10.</b>		<b>Low</b>

**Comments:**

**Additional notes:**

**F. Activity Level**

<b>Question</b>	<b>Student Identified With Statement</b>	<b>Threshold Challenged</b>
<b>1.</b>		<b>Low</b>
<b>2.</b>		<b>Low</b>
<b>3.</b>		<b>High</b>
<b>4.</b>		<b>High</b>
<b>5.</b>		<b>Low</b>
<b>6.</b>		<b>High</b>
<b>7.</b>		<b>Low</b>
<b>8.</b>		<b>High</b>

**Comments:**



**Appendix H**  
**Environmental Profile Therapist's Analysis Assessment Results**

## Environmental Profile Therapist's Analysis Assessment Results

### Environment:

Please list the number indicated for each category and criteria listed below.

#### A. Auditory

Criteria	Low End Description	High End Description	Number Indicated
Intensity	Soft	Loud	
Amount	Silent	Many sounds	
Repetition	Rhythmic	Haphazard	
Competing stimuli	Relevant stimuli all you hear	Background noise interfere	
Predictability	All sounds anticipated	Lots of startling sounds	
Familiarity	All sounds recognizable	Lots of unknown sounds	
Speed	Slow	Fast	
Detection	Clear	Muffled	

#### B. Visual

Criteria	Low End Description	High End Description	Number Indicated
Intensity – lighting	Dim	Bright	
Intensity – colors	Neutral	Vivid	
Amount	Bare	Lots of objects	
Repetition	Pattern/symmetry	Disarray	
Competing stimuli (static visual)	Clear view	Clutter	
Competing stimuli (movement)	Still	Many moving objects/people	
Predictability	Organized	Disorganized	
Familiarity	Objects recognizable	Objects are unknown	
Speed (of moving stimuli)	Slow	Fast	
Detection	Distinguishable	Blurry/unclear	

### C. Tactile

<b>Criteria</b>	<b>Low End Description</b>	<b>High End Description</b>	<b>Number Indicated</b>
Intensity – comforting	Deep pressure	Light touch	
Amount of Body Surface Affected	None	Full body	
Repetition	No pattern	Rhythmic	
Competing stimuli-ambient	No distractions	Wind, temperature extremes	
Predictability	All touch anticipated	Lots of unexpected touch	
Familiarity	All touch recognizable	Lots of unknown feelings	
Detection	Touch is obvious	Difficult to notice	

### D. Taste

<b>Criteria</b>	<b>Low End Description</b>	<b>High End Description</b>	<b>Number Indicated</b>
Intensity	Bland	Spicy/pungent/strong flavor	
Amount	No opportunity	Lots of tastes available	
Repetition	All tastes the same	Lots of different types	
Competing stimuli	Foods kept separate	Flavors are mixed	
Familiarity	All foods are known	Many unknown foods	

### E. Smells

<b>Criteria</b>	<b>Low End Description</b>	<b>High End Description</b>	<b>Number Indicated</b>
Intensity	No smells	Strong smells	
Competing stimuli	No obvious smells	Many different smells in the same space	
Predictability	Smell is constant	Smell comes and goes	
Familiarity	All smells recognizable	Lots of unknown smells	
Detection	Present but not noticeable	Smells are identifiable	

**F. Movement – Vestibular/Proprioceptive**

<b>Criteria</b>	<b>Low End Description</b>	<b>High End Description</b>	<b>Number Indicated</b>
Intensity	Soft, easy movement	Strong/pounding movement	
Amount	Movement not supported	Lots of movement required	
Repetition	No pattern to movement	Rhythmic/patterned	
Competing stimuli	No barriers to movement	Many barriers to movement	
Predictability	All movement anticipated	Unanticipated movement requires	
Familiarity	All movements are known	New movements required	
Speed	Slow	Fast	
Detection	Supports body awareness	Interferes with body awareness	

**Most critical sensory features that could affect the student’s ability to function within this environment?**

**Appendix I**  
**Quick Guides to *Your* Sensory Processing Patterns**

## ***Your Sensory Processing Patterns: Low Registration (High Scores)***

### **What does this mean?**

This means that sensory stimuli in the environment is not noticed by you. Changes such as lighting, different noises, and different textures are not something that distracts you from attention. However, you also do not always get the stimulation that your brain and body requires, which can cause your mind to wander because there are no inputs helping you maintain attention.

### **What are some situations where I have noticed this?**

### **What types of behaviors occur as a result? (What do I do about it?)**

### **What are some of the different things within my environment that affect me?**

**What types of strategies can I apply to my study environments for the things that bother or distract me? What can I do when I can't focus or pay attention? (ex: increase the contrast or intensity of stimuli or slow down the amount of stimuli given at the same time)?**

## ***Your Sensory Processing Patterns: Low Registration (Low Scores)***

### **What does this mean?**

This means you rarely miss sensory stimuli introduced in your environment. This is not the same as being sensitive to stimuli, but indicates that you acknowledge there was a sensory input given within a particular environment. This is important, because noticing the different sensations can detract your attention for a short amount of time, but frequently if there is a large amount of input given within your environment.

### **What are some situations where I have noticed this?**

### **What types of behaviors occur as a result? (What do I do about it?)**

### **What are some of the different things within my environment that affect me?**

**What types of strategies can I apply to my study environments for the things that bother or distract me? What can I do when I can't focus or pay attention?  
(ex: decrease the amount of stimuli in the environment or strategies to screen out background stimuli)**

## ***Your Sensory Processing Patterns: Sensation Seeking (High Scores)***

### **What does this mean?**

This indicates that your body seeks sensory input within your environment. You continuously want to have visual stimulation (bright colors), auditory input (music), and proprioceptive input (hugging or jumping) to name a few and find pleasure in having lots of things going on in the environment at once. This can cause you to become bored if your environment does not give you enough stimulation to hold your attention, therefore, you need to create stimulation before and during tasks in under stimulating environments.

### **What are some situations where I have noticed this?**

### **What types of behaviors occur as a result? (What do I do about it?)**

### **What are some of the different things within my environment that affect me?**

**What types of strategies can I apply to my study environments for the things that bother or distract me? What can I do when I can't focus or pay attention?  
(ex: offer to "do" during academics (walk, hand out papers, etc.) or use fidgets or other tools to get the input when it is not present in an environment)**



## ***Your Sensory Processing Patterns: Sensation Seeking (Low Scores)***

### **What does this mean?**

This indicates the you do not actively try to create stimuli in environments with limited sensory opportunities. However, you do not seek to avoid the environment either therefore, strategies to explore your environment could be helpful for you when you are not receiving the input you need to maintain attention.

### **What are some situations where I have noticed this?**

**What types of behaviors occur as a result? (What do I do about it?)**

**What are some of the different things within my environment that affect me?**

**What types of strategies can I apply to my study environments for the things that bother or distract me? What can I do when I can't focus or pay attention?  
(ex: Identify new sensory experiences specific to certain senses that are available in the environment by changing your everyday routine or habits used)**

## ***Your Sensory Processing Patterns: Sensory Sensitivity (High Scores)***

### **What does this mean?**

This indicates the you become uncomfortable or highly distractible when you have to many things that require attention in an environment. You notice each different stimuli and pay attention to it. You have a high ability to discern between different types of stimuli and can attend to detail.

### **What are some situations where I have noticed this?**

### **What types of behaviors occur as a result? (What do I do about it?)**

### **What are some of the different things within my environment that affect me?**

### **What types of strategies can I apply to my study environments for the things that bother or distract me? What can I do when I can't focus or pay attention?**

**(ex: eliminate stimuli in the environment or make environments calm, repetitive, and familiar to lessen the introduction of new stimuli that requires your attention)**

## ***Your Sensory Processing Patterns: Sensory Sensitivity (Low Scores)***

### **What does this mean?**

You do not become overwhelmed or distracted by sensory inputs. You fully intake the input from your environment, but do not let it hold your attention. You are able to maintain focus despite sensory opportunities.

### **What are some situations where I have noticed this?**

### **What types of behaviors occur as a result? (What do I do about it?)**

### **What are some of the different things within my environment that affect me?**

### **What types of strategies can I apply to my study environments for the things that bother or distract me? What can I do when I can't focus or pay attention?**

**(ex: Increase the intensity of stimuli when bored or distracted or increase the spontaneity of stimuli of specific senses when bored or distracted)**

## ***Your Sensory Processing Patterns: Sensation Avoiding (High Scores)***

### **What does this mean?**

This indicates that you are bothered and distracted by environments with high sensory stimuli and you actively try to reduce the amount of input your body receives. You enjoy being in environments with less people and are able to create structure to control the environment.

### **What are some situations where I have noticed this?**

### **What types of behaviors occur as a result? (What do I do about it?)**

### **What are some of the different things within my environment that affect me?**

### **What types of strategies can I apply to my study environments for the things that bother or distract me? What can I do when I can't focus or pay attention?**

**(ex: consistent and predictable environments are recommended to decrease the amount of new sensory experiences or create opportunities to take a break from over stimulating environments)**

## ***Your Sensory Processing Patterns: Sensation Avoiding (Low Scores)***

### **What does this mean?**

This indicates that you do not become overwhelmed by sensory stimuli and do not let the fact that there are different sensory inputs within the environment limit your ability to maintain attention. You do not try to reduce the stimuli and do not find it distracting.

### **What are some situations where I have noticed this?**

**What types of behaviors occur as a result? (What do I do about it?)**

**What are some of the different things within my environment that affect me?**

**What types of strategies can I apply to my study environments for the things that bother or distract me? What can I do when I can't focus or pay attention?**

**(ex: decrease the amount of stimuli if you get distracted and know what types of stimuli you need to eliminate first if distracted)**

**Appendix J**  
**My Action Plan**  
**Form A**

**My Action Plan  
Form A**

**Name:** \_\_\_\_\_

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

**Strong Sensory Strengths (sensory stimuli that I seek or calms me that I can use to my advantage):**

**Sensory Annoyances (sensory stimuli that distracts me that I can try to reduce or avoid by using my sensory strengths):**

**Recommendations for adapting my sensory environment include (please refer to Appendix A of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) for examples and reproducible charts):**

**Student Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Therapist Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Appendix K**  
**My Action Plan**  
**Form B**



**My Action Plan  
Form B**

**Name:** \_\_\_\_\_

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

**Environment Description:**

**Strong Sensory Strengths (sensory stimuli that I seek or calms me that I can use to my advantage):**

**Sensory Annoyances (sensory stimuli that distracts me that I can try to reduce or avoid by using my sensory strengths):**

**Potential Problems:** Please describe the potential sensory problems you see in your environment based on the results of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and Environmental Profile (Brown, 2007) results. List the potential over or under stimulation present and what strategy or modification you will use if you find it is preventing you from accomplishing a task or maintaining attention. Please refer to Appendix A of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) for examples and reproducible charts.

Category	Description of Problem	When this happens I will...
Taste/Smell		
Movement		
Visual		
Tactile/Touch		
Activity Level		
Auditory		

**Student Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Therapist Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Appendix L**  
**My Action Plan**  
**Form C**

**My Action Plan  
Form C**

**Name:** \_\_\_\_\_

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

**Environment Description:**

**Strong Sensory Strengths (sensory stimuli that I seek or calms me that I can use to my advantage):**

**Sensory Annoyances (sensory stimuli that distracts me that I can try to reduce or avoid by using my sensory strengths):**

**Potential Problems:** Please describe the potential sensory problems you see in your environment based on the results of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and Environmental Profile (Brown, 2007) results. Then list how the student will apply a sensory system as a solution to compensate for another and the specific interventions they will do to increase or decrease their sensory experiences. Please refer to Appendix A of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) for examples and reproducible charts.

<b>Description of Problem</b>	<b>When this happens I will apply...(choose a sensory system you will stimulate or modulate)</b>	<b>By doing... (list what actions you will take to reduce the sensory problem)</b>
	<input type="checkbox"/> Taste/Smell <input type="checkbox"/> Movement <input type="checkbox"/> Visual <input type="checkbox"/> Tactile/Touch <input type="checkbox"/> Activity Level <input type="checkbox"/> Auditory	
	<input type="checkbox"/> Taste/Smell <input type="checkbox"/> Movement <input type="checkbox"/> Visual <input type="checkbox"/> Tactile/Touch <input type="checkbox"/> Activity Level <input type="checkbox"/> Auditory	
	<input type="checkbox"/> Taste/Smell <input type="checkbox"/> Movement <input type="checkbox"/> Visual <input type="checkbox"/> Tactile/Touch <input type="checkbox"/> Activity Level <input type="checkbox"/> Auditory	
	<input type="checkbox"/> Taste/Smell <input type="checkbox"/> Movement <input type="checkbox"/> Visual <input type="checkbox"/> Tactile/Touch <input type="checkbox"/> Activity Level <input type="checkbox"/> Auditory	
	<input type="checkbox"/> Taste/Smell <input type="checkbox"/> Movement <input type="checkbox"/> Visual <input type="checkbox"/> Tactile/Touch <input type="checkbox"/> Activity Level <input type="checkbox"/> Auditory	

**Student Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Therapist Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Appendix M**  
**Student Progress Reporting Form**

## Student Progress Reporting Form

Name: \_\_\_\_\_

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

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

**Please rate each question in the table by marking the correct column.**

Question	Strongly Agree	Agree	Disagree	Strongly Disagree
My test scores have increased due to changing my environment.				
I understand what my sensory processing needs are.				
I know how to change the environment if it is distracting.				
I can focus in class.				
I get distracted due to my environment in class.				
I understand how my senses impact my emotions when in class.				
I understand how my senses impact my behavior when in class.				
I am able to concentrate during class when in lecture halls.				
I understand how my senses impact my emotions when studying.				
I understand how my senses impact my behavior when studying.				
I can focus when studying by myself or with others.				
I do not get distracted due to my environment when studying.				
I am able to use the strategies that I developed through occupational therapy in everyday life				

**Appendix N**  
**Case Study Example: Sue Smith**



**Case Study: Sue Smith**

Sue Smith is a 21-year-old female attending the University of North Dakota (UND). She is currently a senior (as noted by her fourth year attending UND) studying biology, pre-medicine, and hoping to apply to medical school this fall. Sue was informed about the program through Disability Services for Students and filled out the referral form in order to be considered for the Studying With Successful Sensory Environments program. Sue is currently seeking services due to difficulty paying attention in class, a decreased tolerance to sit in class for her two hour classes, and overall feelings of exhaustion when trying to focus on a task until completion. Sue is successful in her academic performance as it relates to tests and standardized assessments, because she is able to attend to details. However, she is having difficulty with assignments that are group-oriented or demand attention to the overall broad concepts.

**The following forms outline the referral, assessment, interpretation, and consultation with the student.**

**Studying with Successful Sensory Environments  
Referral Tool**

**Referral Source Self-Referral or Department:** Disability Services For Students

**Student Name:** Sue Smith

**Email:** suzanne.smith@my.und.edu

**Date:** 9/28/14

**Please check the following boxes that apply.**

- X I am easily distracted by visual stimuli (paintings, pictures, windows) when conversing with someone.
- X I have trouble focusing on the person talking to me when other noises are present.
- X I am unable to focus when there are bright colors around me or multiple people.
  - I become overwhelmed when I smell certain scents
  - I do not hear my name called in the waiting room with other people talking.
  - I always have headphones in my ears to listen to music.
- X I comment frequently that noise bothers me.
  - I am unorganized and have trouble prioritizing tasks.
  - I am emotional (anger, sadness, low frustration tolerance)
  - I seek out movement (leg twitches, constant bodily movement, swivels or rocks in chair)
  - I like to chew gum during class and cannot concentrate when I don't have it.
  - I have poor balance when walking.
  - I whistle, hum, or sing frequently.
  - I frequently ask for information to be repeated.

**Please describe the reason for the referral.**

I want to be able to pay attention in class for long periods of time so that I do not get distracted by noises and different things in the room instead of learning. Also, I struggle to work in groups because I cannot maintain attention due to various people speaking and the amount of people near us who create noise.

**Please provide any additional information below that you feel would be beneficial when addressing your academic performance.**

Most of my difficulties happen because I can't pay attention with lots of noise around me and struggle when there are things moving when I am trying to listen to during lecture. I also struggle with having to sit through lectures that are two hours because I get anxious because I need to move around, but am not allowed to do so unless there is a bathroom break or I have to move to complete group work

**To make an appointment please forward the referral form to the University of North Dakota Occupational Therapy Department at Stop 7126 or contact Dr. Sarah Nielsen ([sarah.k.nielsen@email.und.edu](mailto:sarah.k.nielsen@email.und.edu) or 701-777-2208). Upon completion, please bring this form to the occupational therapist for the first appointment, who will complete the formal assessment procedures.**

### Adolescent/ Adult Sensory Profile (Brown & Dunn, 2002)

#### Scores

Sue filled out the *Self Questionnaire* on the Adolescent/Adult Sensory Profile under the supervision of the occupational therapist. Sue has very high scores (Much More Than Most People) in the Sensory Sensitivity quadrant, which indicates that she is easily distracted by sensory stimuli due to a low neurological threshold and actively seeks to eliminate the stimuli in order to decrease discomfort. She has moderately high scores (More Than Most People) in the Sensation Avoiding quadrant, which means that she avoids situations where there may be an increased amount of sensory stimuli or seeks to develop predictability or structure within her environments. She had “normal scores” (Similar To Most People) in the Low Registration and Sensation Seeking classifications, which notes that Sue is obtaining enough stimuli from the environment to be able to function on a daily basis. Closer inspection and analysis of the processing patterns revealed that she is sensitive to auditory and visual stimuli. These categories stand out because most of the responses were frequently or almost always in the Sensation Avoiding or Sensory Sensitivity categories. Sue self-reported that she finds it hard to pay attention when there are multiple conversations taking place within the same room or when there are other sounds around her when she is studying such as music with lyrics. Sue reports that she finds it hard to adjust to visual stimuli such as bright lights, colors, and movement of peoples’ hands or feet when she is trying to pay attention to class.

Here is her results page written according to the template for results analysis:

Category	Low Registration	Sensation Seeking	Sensory Sensitivity	Sensation Avoiding
Taste/Smell			X	
Movement		X		
Visual			X	X
Tactile/Touch		X		
Activity Level		X		
Auditory			X	X

## Sensory Profile Results

- **Sensory Sensitivity (High Scores):** Readily respond to things around you which causes difficulty in your ability to focus. Tend to notice everything in the room and have a high awareness of the environment and can remember details, but they may not be the most important details.
  - Touch Processing
    - Dislike having back rubbed
    - Uncomfortable wearing certain fabrics
    - Don't like particular food textures
      - Strategies
        - If you find a texture you do like this could help balance your dislike of movement and make you more alert when studying.
        - Use deep-pressure touch
        - Wear clothes that are heavy
        - Wrap yourself in blankets/use heavier blankets
  - Activity Level
    - Find it hard to concentrate for the whole time when sitting in a long class or meeting
      - Strategies
        - Incorporate breaks and time-outs
        - Look for smaller, less crowded, more organized areas
        - Use self-cues to stay focused – talk aloud or to yourself
        - Break tasks down into smaller parts
        - Put materials in sequential order
        - check things off of your list when you complete them
        - identify the things that you must do and need to pay attention to before starting
        - pair up with someone to keep you on task
  - Auditory Processing
    - Distracted if there is a large amount of noise around me
    - Find it difficult to work with background noise
      - Strategies
        - Avoid adding extra noise within the classroom such as not sitting by the clock, near the front wall, or near the dance studio
        - Limit the amount of steps at one time
        - Reduce the volume or amount of stimuli
        - Participate in discussion in a group setting to maintain focus
        - Have someone give you cues if it appears you are not paying attention

- **Sensation Avoiding (high scores):** Overwhelmed or bothered by sensory stimuli. **Actively** engage with your environment to reduce the stimuli surrounding you. Use routine and ritual to increase the predictability of the environment.
  - Visual Processing
    - Keep the shades down during the day when I am at home
    - Choose smaller shops because I am overwhelmed
    - Limit distractions when I am working
      - Strategies
        - Periodically close eyes to decrease visual stimulation
        - Use dim or natural lighting
        - Get rid of clutter
  - Touch Processing
    - Avoid activities that will make my hands messy
    - I move away when others get too close
    - Avoid standing in lines or standing close to others
      - Strategies
        - Tell others your need of other getting too close
        - Do not stay near vents or fans
        - Wear gloves during tasks that get the hands dirty
  - Activity Level
    - I find time for myself
    - I stay away from crowds
    - I avoid situations where unexpected things might happen
      - Strategies
        - Avoid traffic-congested areas, crowds, busy times
        - Try to reduce disruptions
        - Establish routines that are comfortable
        - Find quiet places for alone time
        - Give yourself permission to be alone
        - Limit large-group exposure

## **Environmental Profile**

- Movement Processing
  - Few opportunities to move around
  - Feel confined
  - Don't have a chair that allows me to move
    - Strategies
      - Find time prior to class to move about getting good joint input such as walking up stairs or working out.
- Visual Processing
  - Lots of movement around me making it difficult to follow what is going on
    - Strategies
      - Sit towards the front of the classroom or providing input that makes our muscles work also helps with this.
      - Eliminate computers or clutter views that might be distracting by the things that others do
- Touch Processing
  - People bump into me or I have to be too close to others
    - Strategies
      - Try having a chair between you and others or having someone to consistently sit next to you who you can communicate your preferences to
- Auditory Processing
  - Background Noises that distract me

## **Interpretation**

Sue's results on the Adolescent/Adult Sensory Profile indicate she is experiencing difficulty with auditory and visual stimuli within her environments. The auditory sensitivity and visual avoidance both contribute to Sue's lack of ability to focus while in class, in spaces filled with people, or in rooms that are filled with numerous types of stimuli. Specifically, as noted by Sue in her self-report, the bright colors of the wall hangings, PowerPoints, and flooring detract from her ability to learn along with the ticking of the clock and base from the music in the rooms surrounding her classroom. These stimuli distract her from learning and make her uncomfortable frequently while she is trying to concentrate in class for long periods of time. The time and energy she is spending during class actively trying to decrease the amount of visual and auditory stimuli is causing her to become fatigued more rapidly than usual. Her inability to decrease the symptoms of the stimuli cause her to have a decrease in tolerance for attending her two hour long lectures.

## ***Your Sensory Processing Patterns: Sensation Avoiding (High Scores)***

**What does this mean?**

This indicates that you are bothered and distracted by environments with high sensory stimuli and you actively try to reduce the amount of input your body receives. You enjoy being in environments with less people and are able to create structure to control the environment.

**What are some situations where I have noticed this?**

Some situations where I have noticed these feelings are when I am trying to take a test or listen in class and there is the music base coming from behind the wall or the ticking clock, I have tried to cover my ears or fidget with something to detract from the noise. I also noticed I avoid sitting close to the clock because I can't stand it.

**What types of behaviors occur as a result? (What do I do about it?)**

I get really agitated when I have lots of noises around me and I tend to make snarky comments to others or roll my eyes, when it was nothing that they did to make me irritated.

**What are some of the different things within my environment that affect me?**

The ticking clock, music, and multiple conversations going on at once during breaks and group discussions. I can use my proprioceptive sensory seeking techniques to downplay this distraction to get that type of sensory input that I need (The therapist would have coached Sue to come to this conclusion).

**What types of strategies can I apply to my study environments for the things that bother or distract me? What can I do when I can't focus or pay attention?**

**(ex: consistent and predictable environments are recommended to decrease the amount of new sensory experiences or create opportunities to take a break from over stimulating environments)**

I will try to sit in the same spot for each class period to limit the amount of spontaneous noise that I get during class. I will also use ear plugs during exams so that I cannot become distracted by the ticking clock or my classmates, and will try to sit away from the source of the music to muffle the noise.

**\*NOTE: The therapist should provide the student with this worksheet at the completion of the second session after explanation of their sensory processing patterns. Only one form was filled out for the purposes of this example, however, it is recommended that the therapist pull each main sensory processing sheet that the student is having difficulty with in order to coach them through each individual sensory preference.**

**Environmental Profile Self-Report Assessment Results**

**Environment: Classroom**

**Primary things done in environment:**

1. Talk with my classmates
2. Eat lunch during noon hour meetings
3. Have 2-hour lectures
4. Listen to guest speakers/presenters
5. Gather supplies from the closets on the right side of the room

**For each of the following categories please place a checkmark next to the questions/statements that the student indicates on the form.**

**A. Taste/Smell**

Question	Student Identified With Statement	Threshold Challenged
1.		Low
2.		Low
3.		High
4.		High
5.	X	Low
6.		High
7.		Not Applicable

**Comments:** Strong smells are distracting

**C. Visual Processing**

Question	Student Identified With Statement	Threshold Challenged
1.	X	Low
2.		High
3.	X	Low
4.		Low
5.		High
6.		High
7.		High
8.		Low
9.	X	Low

**Comments:** Low threshold makes her distracted by visual stimuli.

**B. Movement**

Question	Student Identified With Statement	Threshold Challenged
1.		High
2.	X	High
3.		High
4.		Low
5.		High
6.		Low
7.		Low
8.		High

**Comments:** Not much opportunity to move during class

**D. Touch Pressing**

Question	Student Identified With Statement	Threshold Challenged
1.		Low
2.		High
3.		Low
4.		Low
5.		Low
6.		Low
7.		Low
8.	X	Low
9.		High

**Comments:** Chairs uncomfortable

**E. Auditory Processing**



Question	Student Identified With Statement	Threshold Challenged
1.	X	Low
2.	X	Low
3.	X	Low
4.		Low
5.	X	High
6.		High
7.		High
8.	X	Low
9.		High
10.	X	Low

**Comments:** Low thresholds makes auditory stimuli distracting. Cannot figure out which auditory inputs to pay attention to when there are multiple inputs.

**Additional notes:**

Visual and auditory sensitivities found within the Adult/Adolescent Sensory Profile have been confirmed based on this self-report. Also, lack of movement, which is a stronger sense for Sue, is hindering her ability to obtain a calming stimulus during class lectures.

**F. Activity Level**

Question	Student Identified With Statement	Threshold Challenged
1.	X	Low
2.	X	Low
3.		High
4.		High
5.		Low
6.		High
7.		Low
8.		High

**Comments:** High academic and campus involvement demands cause her additional stress.

**Environmental Profile Therapist's Analysis Assessment Results  
(Brown, 2007)**

**Environment: Classroom**

**Please list the number indicated by the student for each category and criteria listed.**

**A. Auditory**

<b>Criteria</b>	<b>Low End Description</b>	<b>High End Description</b>	<b>Number Indicated</b>
Intensity	Soft	Loud	5
Amount	Silent	Many sounds	5
Repetition	Rhythmic	Haphazard	4
Competing stimuli	Relevant stimuli all you hear	Background noise interfere	5
Predictability	All sounds anticipated	Lots of startling sounds	1
Familiarity	All sounds recognizable	Lots of unknown sounds	4
Speed	Slow	Fast	1
Detection	Clear	Muffled	1

**B. Visual**

<b>Criteria</b>	<b>Low End Description</b>	<b>High End Description</b>	<b>Number Indicated</b>
Intensity – lighting	Dim	Bright	2
Intensity – colors	Neutral	Vivid	5
Amount	Bare	Lots of objects	5
Repetition	Pattern/symmetry	Disarray	5
Competing stimuli (static visual)	Clear view	Clutter	4
Competing stimuli (movement)	Still	Many moving objects/people	5
Predictability	Organized	Disorganized	2
Familiarity	Objects recognizable	Objects are unknown	1
Speed (of moving stimuli)	Slow	Fast	3
Detection	Distinguishable	Blurry/unclear	1

### C. Tactile

<b>Criteria</b>	<b>Low End Description</b>	<b>High End Description</b>	<b>Number Indicated</b>
Intensity – comforting	Deep pressure	Light touch	3
Amount of Body Surface Affected	None	Full body	3
Repetition	No pattern	Rhythmic	5
Competing stimuli-ambient	No distractions	Wind, temperature extremes	2
Predictability	All touch anticipated	Lots of unexpected touch	1
Familiarity	All touch recognizable	Lots of unknown feelings	1
Detection	Touch is obvious	Difficult to notice	1

### D. Taste

<b>Criteria</b>	<b>Low End Description</b>	<b>High End Description</b>	<b>Number Indicated</b>
Intensity	Bland	Spicy/pungent/strong flavor	3
Amount	No opportunity	Lots of tastes available	1
Repetition	All tastes the same	Lots of different types	3
Competing stimuli	Foods kept separate	Flavors are mixed	3
Familiarity	All foods are known	Many unknown foods	3

### E. Smells

<b>Criteria</b>	<b>Low End Description</b>	<b>High End Description</b>	<b>Number Indicated</b>
Intensity	No smells	Strong smells	3
Competing stimuli	No obvious smells	Many different smells in the same space	3
Predictability	Smell is constant	Smell comes and goes	3
Familiarity	All smells recognizable	Lots of unknown smells	3
Detection	Present but not noticeable	Smells are identifiable	5

**F. Movement – Vestibular/Proprioceptive**

<b>Criteria</b>	<b>Low End Description</b>	<b>High End Description</b>	<b>Number Indicated</b>
Intensity	Soft, easy movement	Strong/pounding movement	3
Amount	Movement not supported	Lots of movement required	2
Repetition	No pattern to movement	Rhythmic/patterned	3
Competing stimuli	No barriers to movement	Many barriers to movement	4
Predictability	All movement anticipated	Unanticipated movement requires	2
Familiarity	All movements are known	New movements required	2
Speed	Slow	Fast	3
Detection	Supports body awareness	Interferes with body awareness	1

**Most critical sensory features that could affect the student’s ability to function within this environment?**

This environment has a high amount of auditory and visual stimuli, which Sue is most sensitive to according to the Adolescent/Adult Sensory Profile. There is little movement within the environment and tactile inputs are well controlled and predictable.

**My Action Plan  
Form A**

**Name:** \_\_\_\_\_ Sue Smith \_\_\_\_\_

**Email:** \_\_\_\_\_ suzanne.smith@my.und.edu \_\_\_\_\_

**Environment:** Classroom

**Strong Sensory Strengths (sensory stimuli that I seek or calms me that I can use to my advantage):**

- Proprioceptive (movement)
- Activity level

**Sensory Annoyances (sensory stimuli that distracts me that I can try to reduce or avoid by using my sensory strengths):**

- Auditory
- Visual

**Recommendations for adapting my sensory environment include (please refer to Appendix A of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) for examples and reproducible charts):**

**Auditory:**

- Sitting on the side of the room opposite of the clock
- Sitting farthest away from the East wall, which is closest to the gym and base music
- Wear earplugs during tests and quizzes in order to drown out noises
- Study in quiet controlled environments with minimal sounds present

**Visual/Activity Level:**

- Sit in the front row to decrease amount of people in view
- Sit where the banners are not in line of sight
- Take a walk during breaks to get reprieve from over stimulating classroom environment
- Refrain from playing on phone or engaging with other visual stimuli during class breaks to get a sensory break
- Study in organized environment with minimal wall decorations
- Ask people around you to stop moving if they are distracting
- If professors are moving too much, listen to the lecture and follow with your notes rather than look at the professor

**Student Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Therapist Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

## My Action Plan

### Form B

Name: \_\_\_\_\_ Sue Smith \_\_\_\_\_

Email: \_\_\_\_\_ suzanne.smith@my.und.edu \_\_\_\_\_

**Environment Description: Classroom**

**Strong Sensory Strengths (sensory stimuli that I seek or calms me that I can use to my advantage):**

- Proprioceptive (movement)
- Activity level

**Sensory Annoyances (sensory stimuli that distracts me that I can try to reduce or avoid by using my sensory strengths):**

- Auditory
- Visual
- I have trouble paying attention in class for long durations of time
- Bright wall decoration distractions
- People moving during class which distracts me
- Become distracted during class
- Music is loud
- Clock is ticking
- Too many conversations at once that I can't focus on mine

**Potential Problems:** Please describe the potential sensory problems you see in your environment based on the results of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and Environmental Profile (Brown, 2007) results. List the potential over or under stimulation present and what strategy or modification you will use if you find it is preventing you from accomplishing a task or maintaining attention. Please refer to Appendix A of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) for examples and reproducible charts.

<b>Category</b>	<b>Description of Problem</b>	<b>When this happens I will...</b>
<b>Taste/Smell</b>	Not applicable	
<b>Movement</b>	I have trouble paying attention in class for long durations of time	use a fidget to keep my hands moving take a walk before each lecture will do pushups in my chair when I begin to lose focus
<b>Visual</b>	Bright wall decoration distractions People moving during class which distracts me	Look at my own notes or move so they are not in my field of vision Sit beside instead of across from them or turn my body so they are out of my line of vision
<b>Tactile/Touch</b>	Become distracted during class	Play with the material of my shirt, a button, or a zipper Play with my hair if it is down
<b>Activity Level</b>		
<b>Auditory</b>	Music is loud Clock is ticking Too many conversations at once that I can't focus on mine	Move away from the east wall Move away from the clock Turn my body to the person I am trying to talk to Put an earplug in one ear to block out the noise from the direction it is coming from

**Student Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Therapist Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**My Action Plan  
Form C**

**Name:** \_\_\_\_\_ Sue Smith \_\_\_\_\_

**Email:** \_\_\_\_\_ suzanne.smith@my.und.edu \_\_\_\_\_

**Environment Description: Classroom**

**Strong Sensory Strengths (sensory stimuli that I seek or calms me that I can use to my advantage):**

- Proprioceptive (movement)
- Activity level

**Sensory Annoyances (sensory stimuli that distracts me that I can try to reduce or avoid by using my sensory strengths):**

- Auditory
- Visual
- I have trouble paying attention in class for long durations of time
- Bright wall decoration distractions
- People moving during class which distracts me
- Become distracted during class
- Music is loud
- Clock is ticking
- Too many conversations at once that I can't focus on mine



**Potential Problems:** Please describe the potential sensory problems you see in your environment based on the results of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) and Environmental Profile (Brown, 2007) results. Then list how the student will apply a sensory system as a solution to compensate for another and the specific interventions they will do to increase or decrease their sensory experiences. Please refer to Appendix A of the Adolescent/Adult Sensory Profile (Brown & Dunn, 2002) for examples and reproducible charts.

<b>Description of Problem</b>	<b>When this happens I will apply...(choose a sensory system you will stimulate or modulate)</b>	<b>By doing... (list what actions you will take to reduce the sensory problem)</b>
I have trouble paying attention in class for long durations of time	<input type="checkbox"/> Taste/Smell <input type="checkbox"/> Movement <input type="checkbox"/> Visual <input type="checkbox"/> Tactile/Touch <input type="checkbox"/> Activity Level <input type="checkbox"/> Auditory	use a fidget to keep my hands moving take a walk before each lecture will do pushups in my chair when I begin to lose focus
Bright wall decoration distractions People moving during class which distracts me	<input type="checkbox"/> Taste/Smell <input type="checkbox"/> Movement <input type="checkbox"/> Visual <input type="checkbox"/> Tactile/Touch <input type="checkbox"/> Activity Level <input type="checkbox"/> Auditory	Look at my own notes or move so they are not in my field of vision Sit beside instead of across from them or turn my body so they are out of my line of vision
Become distracted during class	<input type="checkbox"/> Taste/Smell <input type="checkbox"/> Movement <input type="checkbox"/> Visual <input type="checkbox"/> Tactile/Touch <input type="checkbox"/> Activity Level <input type="checkbox"/> Auditory	Play with the material of my shirt, a button, or a zipper Play with my hair if it is down
	<input type="checkbox"/> Taste/Smell <input type="checkbox"/> Movement <input type="checkbox"/> Visual <input type="checkbox"/> Tactile/Touch <input type="checkbox"/> Activity Level <input type="checkbox"/> Auditory	
	<input type="checkbox"/> Taste/Smell <input type="checkbox"/> Movement <input type="checkbox"/> Visual <input type="checkbox"/> Tactile/Touch <input type="checkbox"/> Activity Level <input type="checkbox"/> Auditory	

**Student Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Therapist Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

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