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# Exploring the Intersection of Adolescents and Adults on the Autism Spectrum Enrolled in an Outdoor Behavioral Health Program

Denise K. Savidge

Clemson University, [denisesavidge@gmail.com](mailto:denisesavidge@gmail.com)

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EXPLORING THE INTERSECTION OF ADOLESCENTS AND ADULTS ON THE  
AUTISM SPECTRUM ENROLLED IN AN OUTDOOR BEHAVIORAL HEALTH  
PROGRAM

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A Dissertation  
Presented to  
the Graduate School of  
Clemson University

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In Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Philosophy  
Educational Leadership

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by  
Denise K. Savidge  
May 2018

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Dr. Robert C. Knoeppel, Committee Chair  
Dr. Russell Marion  
Dr. Diane Stutey  
Dr. Matthew Boyer

## ABSTRACT

This exploratory study examined an existing data set containing outcome scores of adolescents and adults on the autism spectrum who were enrolled in 18 different outdoor behavioral health programs in the United States, all of whom are members or cooperating programs of the National Association of Therapeutic Schools and Programs (NATSAP) Practice Research Network. The dataset contained demographic characteristics and self-reported psychosocial functioning of the participants at intake and again at discharge. Data suggest that the self-reported outcome scores for both adolescents and adults demonstrated statistically significant change after the intervention, but when examined for clinical significance, adolescent paired scores had a 49% probability of membership in the Clinical Change Categories of “Unchanged,” or “Deteriorated.”

Data were further analyzed to determine if clustering patterns between the variables under study could predict membership in one of the Clinical Change Categories. While some clustering effects were noted, results were inconclusive, but highlighted variables on which to focus for further analysis. Multinomial logistic regression results found that a model with the client-reported variables of *effort into the program*, *change in exercise* from before the intervention to after, *quality of the program*, and *problem abatement* (adolescents only) had significant p-values for predictability of the clinical change category membership of the individual.

Keywords: Outdoor behavioral health, wilderness therapy, autism, ASD

## DEDICATION

I dedicate this work to my parents, Lois and Harold Savidge, who encouraged me regardless of the wisdom of my choices. I am grateful for a dad who always said, “Get as much education as you can. Take every class they offer you. Get every certificate you can because that might be the one extra training you need to get you where you want to go,” and a mom who insisted, “You’re a good writer. You could be the next Erma Bombeck.”

I dedicate it to my children, Alyssa, Charlie, and Grace, who learned early on to do laundry and clean bathrooms while I was finishing assignments.

I dedicate it to my fiancé, Chuck Wiedenheft, who took care of the home front and ensured my children did not starve while I worked through dinner night after night.

Lastly, I dedicate it to Michael Solon, an extraordinary person and beloved principal who encouraged me through the process until his untimely and heartbreaking death in September 2015. Thank you for the friendly competition and Rest in Peace, old friend.

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I gratefully acknowledge the mentorship of two wonderful people, Beth Black and David LePere, who introduced me to the world of therapeutic schools and programs and demonstrated how to run one with the highest quality standards and integrity.

I also appreciate and acknowledge Mike Petree, a fellow researcher, who shared with me the rich database of information in the Program Research Network of NATSAP. I also wish to thank Dr. Michael Gass who looked a roomful of research students in the eyes at our annual NATSAP conference and told us how valuable and necessary our studies would be. His encouragement came at a crucial time for me.

I feel very fortunate to have been surrounded by so much encouragement on this journey. Thank you all.

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## CHAPTER ONE

### INTRODUCTION

#### **Background of the Study**

There are increased pressures on mental health providers to deliver evidence that their services are making a difference for patients (Gass, 2007<sup>a</sup>). High healthcare costs coupled with insurance companies' denials of coverage for mental health treatment make increased accountability a driving force for all medical professionals, however mental health providers are under particular scrutiny given that the absence or presence of mental health issues typically cannot be confirmed by a chemical test like their somatic illness cohorts (Frank & Glied, 2006).

The Mental Health Parity Act, requiring that dollar limits for mental health be no lower than those for medical and surgical benefits offered in large group health plans, has been in effect since 1996, however, insurers and employers found loopholes to limit, cap, and cancel mental health coverage (Shamash, 2011).

Congress passed the Mental Health Parity Act of 1996, and later the Mental Health Parity and Addiction Equity Act of 2008. Both of these acts constituted significant victories for mental health parity, but both ultimately failed to establish a comprehensive parity mandate for mental health services (Kessler, 2014, p. 164).

Statisticians in the Substance Abuse and Mental Health Services Administration (SAMHSA) indicate the prevalence of any mental health illness among United States

citizens age 18 or older is currently 18.3% of the U.S. population or 44.7 million, overall (SAMHSA, 2016, Population Data, Tables 10.1A and 10.1B). Additionally, SAMHSA statisticians indicate 3.6 million youth age 12-17 received mental health services in the previous year using Specialty Mental Health sources such as clinics, hospitals or therapists while 3.7 million more received non-specialty Mental Health Services via education, pediatrician, child welfare, or juvenile justice system (SAMHSA, 2016, Population Data, Table 11.1A).

The specific focus of this work, Autism Spectrum Disorder (ASD), is considered a neurodevelopmental disorder and is considered a serious mental illness category according to the Blue Cross/Blue Shield of Illinois website (BCBS, n/d, Serious vs Non-serious Mental Illness, para. 2). Seventy percent of ASD participants in a 2008 study had at least one comorbid disorder and 41% had two or more. The most common diagnoses were social anxiety disorder (29.2%) (Simonoff, Pickles, Charman, Chandler, Loucas, & Baird, 2008).

In his final months of office, President Obama signed Public Law 144-255, known as the 21<sup>st</sup> Century Cure Act. Within the law is the Helping Families in Mental Health Crisis Act that stipulates the integration of primary and mental health care and strengthens mental health parity enforcement. Federal agencies must collaborate to improve compliance with the parity law, report on federal parity investigations, and create plans to improve federal parity enforcement (NAMI, 2017) in order to follow The Cure Act requirements.

Strengthening the evidence base that mental health interventions are effective has been the focus of research as federal government members attempt to create laws of parity in coverage. Outdoor behavioral health programs, commonly known as “wilderness therapy,” are a relatively new option available to adolescents and young adults experiencing mental health issues, (Gass, 2007<sup>a</sup>).

To add to the growing body of research supporting Outdoor Behavioral Health (OBH) programs as an option for mental health issues, I explored the outcome scores of adolescents diagnosed with Autism Spectrum Disorder (ASD) who were enrolled in wilderness therapy.

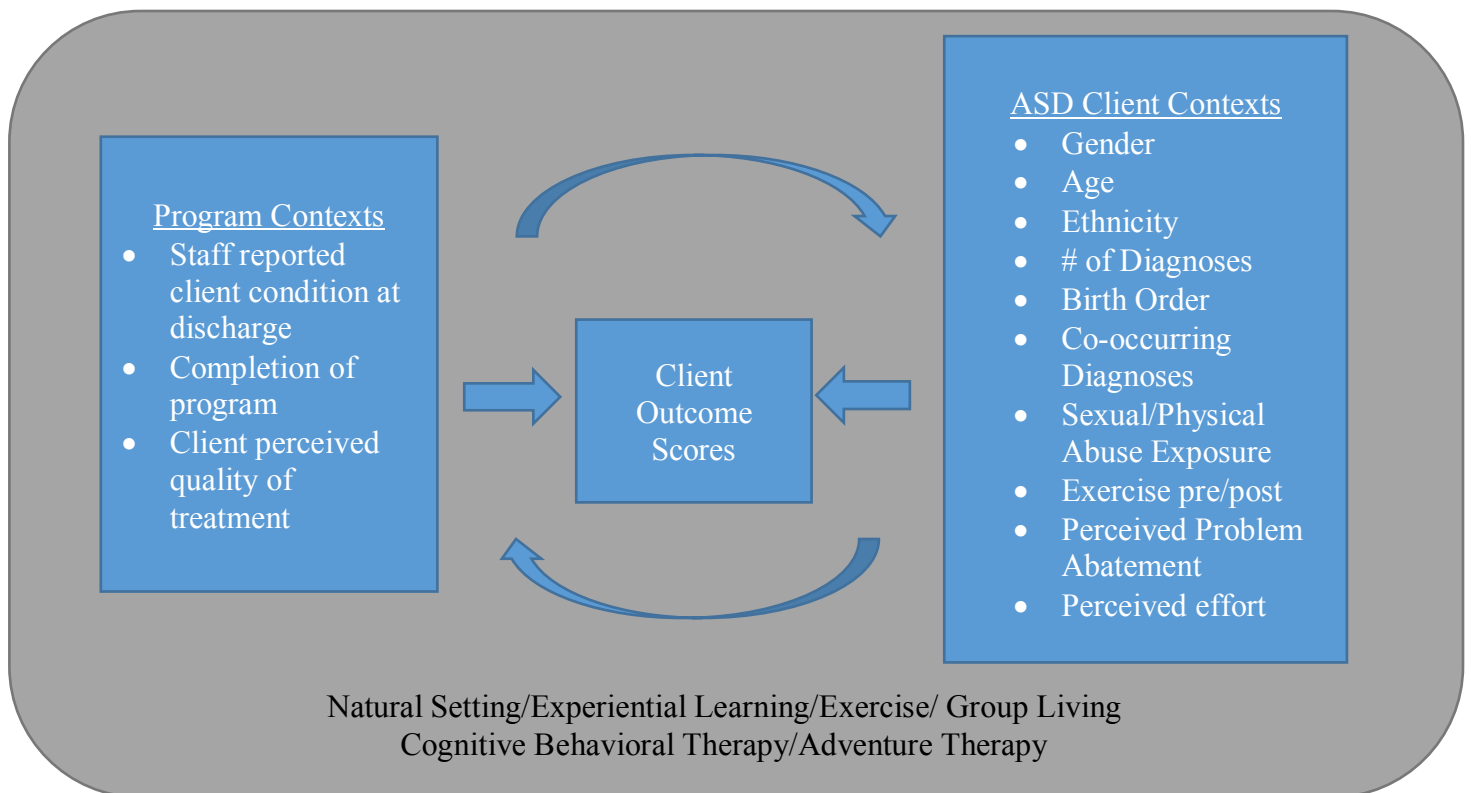
### **Theoretical Framework**

Since this study deals with the subject of mental health, I drew upon a postmodernist philosophical premise that the act of knowing is subjective and there is no objective reality or unequivocal truth to be agreed upon (Cloete, 2001). The foundation of most patient-centered types of therapy is based upon what the client perceives as his or her reality, or a constructionist view of reality. However, one role of therapy is to encourage clients to take a more constructivist view, reflecting back on his or her thoughts and behaviors and how they might be perceived in a socially-constructed reality. Family therapy, an integral part of the outdoor behavioral health program, focuses on how individuals are “interpreting, constructing, and storying his or her reality” (Phipps and Vorster 2011, p. 36).

As the theoretical framework for my study, I draw on the perspectives of multiple theories, including Adventure Therapy (Gass, Gillis, and Russell, 2012), Cognitive

Behavioral Theory (Beck, 1967; Ellis, 1962), and Experiential Theory (Kolb, 1984<sup>a</sup>; Kolb, 1984<sup>b</sup>). In addition, because the participants in the study are individuals who have impairments in their ability to communicate, I draw upon the assumptions that making meaning is done on an individual basis, or a constructionist view of reality.

In figure 1.1, I illustrate the conceptual framework for how variables under study affect the self-reported outcome scores of adolescents and young adults with autism spectrum disorder (ASD) who are enrolled in outdoor behavioral health programs. Other variables exist, but for the purpose of this research, only the variables shown in figure 1.1 are included in the study.



*Figure 1.1* Conceptual Framework of how Client and Program Contextual Variables, affect Client Self-Reported Outcome Scores for ASD individuals in Wilderness Therapy.

## **Statement of the Problem**

Examining the variables that exist among clients enrolled in outdoor behavioral health programs and self-reported outcome score changes of clients from admission to discharge helps build the case for evidence-based practices within the industry and helps determine whether outdoor behavioral health is an effective intervention choice. The additional data that can be gathered at 6-months and 12-months post-discharge generates evidence on the sustainability of recovery. Although in my study I focus only on intake and discharge scores, the PRN requires that 6- and 12-month data also be gathered by programs.

To date, researchers have conducted studies on the effects of length of stay (Magle-Haberek, Tucker & Gass, 2012), gender (Magle-Haberek et al., 2012; Tucker, Zelov & Young, 2011; Tucker, Javorski, Tracy, & Beale, 2013), family engagement in the process (Creighton and Mills, 2015; Dowle and Ogles, 2010), and age (Behrens & Satterfield, 2011), but few researchers address clients with ASD who are enrolled in these programs. Additionally, previous researchers have not explored the intersection of multiple contextual variables using hierarchical cluster analysis to find the most productive combinations that will affect clients' self-reported outcome scores. The adoption of the OQ-family of measurement tools for outcomes as indicators of program success took place when the NATSAP PRN formed in 2007 (Zelov, Tucker, and Javorski, 2013).

## **Purpose of the Study**

My purpose in this study is four-fold: To examine the difference in scores from intake to discharge for clients with ASD in an OBH; to explore what combinations of



demographics and contextual variables affect those outcomes score; to identify combinations of contextual variables allowing prediction for positive change in this subgroup; and to discuss implications for OBH programs who enroll adolescents with ASD into their milieu.

Since 2006, evidence-based practices have been the standard to which clinicians, counselors, and other mental health practitioners are being held in the United States and programs are expected to confirm that therapeutic interventions have been chosen using this standard (Bigden & Ogden, 2011). Challenges to the OBH therapy industry include lack of funding other than private pay for clients since most insurance plans refuse coverage of an individual's participation in these programs. My study is intended to add to the empirical base providing support that these wilderness programs do operate using evidence-based practices and are effective interventions.

### **Research Questions**

The following research questions guided this study:

1. Is there a statistically and clinically significant change for adolescent and young adult clients with ASD attending an OBH program; Is that change comparable to those in a generalized, nonspecific sample?
2. Do clusters allow us to predict outcome score categories for those individuals with autism who experience an outdoor behavioral health program intervention?

As I will discuss in Chapter Five, a third, post-hoc research question was added to clarify my findings in Chapter Four.

## **Overview of Design, Procedure, and Analysis**

In this study, I employed quantitative methodologies of secondary analysis on an existing dataset made available from the NATSAP Program Research Network. I used a multi-step process which resulted in post-hoc analyses to further explore the phenomena that emerged. First, network data on ASD clients were obtained and winnowed to exclude all data from residential treatment centers, therapeutic boarding schools, and after-care treatment programs who are also a part of the NATSAP association. Thus, only data from outdoor behavioral health programs were examined. Second, data from admission and discharge outcome scores underwent paired t-tests to determine change that occurred following the intervention and categorization into Clinical Change Categories that accommodated clinical significance. Third, the data were analyzed using agglomerative hierarchical cluster analysis (HAC) for identification of patterns within the clusters. Finally, data were analyzed for statistical and clinical significance using Chi Square tests and multinomial logistic regression.

## **Significance of the Study**

Very little has been written about the intersection of autism and outdoor behavioral health for two reasons: First, defining and diagnosing Autism Spectrum Disorder (ASD) has been the subject of much debate and change since the 1940s when it was first discovered; and second, Outdoor Behavioral Health (OBH), first introduced in the 1960s, is a relatively new intervention in psychological and mental health, particularly if one considers that the first known mention of psychotherapy was in the 10<sup>th</sup> Century (Alexander & Selesnik, 1966). Researchers have gathered evidence demonstrating OBH as an effective intervention to improve self-concept, gain social

skills, decrease substance abuse, alleviate depression, and improve general functioning for youth and their families (Gass, Gillis & Russell, 2012; Harper, Russell, Cooley, & Cupples, 2007; Norton, 2010; Norton, et al, 2014) as well as research on how adolescents with ASD respond to interventions aimed at improving these identical issues Butwicka et al., 2017; Jamison & Schuttler, 2017; Leaf et al, 2017).

Data collection on adolescents attending an OBH or other residential treatment program is also a relatively recent manifestation. NATSAP members began research collaboration with the University of New Hampshire in 2006 to gather data on program effectiveness in an effort to establish best practices and other research-based initiatives (Santa, 2016). Eleven years later, the database incorporates more than 18,000 clients, providing an important resource for researchers studying residential therapy options for adolescents.

In 2013, the editors of the DSM-V changed the diagnostic criteria of what is now known as Autism Spectrum Disorder, consequently moving a small percentage of adolescents in or out of the Spectrum diagnosis (Kim, et al., 2014). Following this change, coupled with the conflicting opinions of ASD families advocating whether to seek cure or comfort for their diagnosed individual, researchers appear to be trying to answer questions that continue to evolve and change faster than it can be produced. Consequently, the research on the intersection of ASD and OBH is sparse and more studies are needed to determine if outdoor behavioral health enrollment is an appropriate, evidence-based practice for helping individuals learn to navigate life with ASD abilities and challenges.

In my study, I will attempt to identify whether there are combinations of contextual variables that produce the most increase in outcome scores following an outdoor behavioral health placement for an individual with Autism Spectrum Disorder. Additionally, I intend to help clarify whether OBH is an effective therapeutic intervention for individuals with ASD as their primary or secondary diagnosis.

### **Assumptions and Limitations**

My study has several assumptions and limitations. I assume a relative similarity in the approaches to intervention between all 18 programs whose data were reported to the PRN. I made an assumption that the intake staff members for each program were familiar with and used standardized criteria for rating client behaviors they observed. I also assume that participants truthfully answered the self-reports used to measure change.

Limitations include the lack of information on which rating scale or tool was used to determine the ASD diagnosis of the individual prior to enrolling in the program. Another limitation is the changed criteria itself from the 2000 to 2013 *DSM* editions. Not only is knowledge of the criteria necessary, but there are studies showing how the changed criteria directly affected numbers of those diagnosed as well as caused a small percentage of individuals to lose their diagnosis following the changes (Kim et al., 2014). A common challenge and limitation to field-based outcome research overall is the variety of direct care staff interactions, constantly evolving group dynamics, differing challenges of experiential experience, and teachable moments encountered by each individual in a wilderness experience (Roberts, Stroud, Hoag, and Combs, 2016).

Due to time constraints, another limitation was my lack of interviews with staff to cross-validate interventions or gather information about each program in general. Instead,

I reviewed program websites for self-reported adherence to Gass's Research Rubric regarding Treatment/Intervention Fidelity (See Appendix K, pg. 2).

### **Definition of Terms**

The following terms and abbreviations are used throughout this study. Their definitions are provided to avoid confusion.

#### *Autism Spectrum Disorder (ASD)*

Defined in the most recent edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013), ASD notes:

A. Social communication and social interaction across multiple contexts. Patients must have deficits in all three of:

- 1) Deficits in social-emotional reciprocity
- 2) Deficits in nonverbal communicative behaviors used for social interaction.
- 3) Deficits in developing, maintaining, and understanding relationships.

B. Restricted, repetitive patterns of behavior, interests, or activities manifested in two of the following:

- 1) Stereotyped or repetitive motor movements, use of objects, or speech.
- 2) Insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior.

3) Highly restricted, fixated interests that are abnormal in intensity or focus.

4) Hyper- or hypo-reactivity to sensory input or unusual interest in sensory aspects of the environment.

C. Symptoms present in the early developmental period.

D. Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning. (APA, 2013, p. 50).

The diagnosis criteria have undergone significant changes since the disorder's simultaneous discovery in the mid 1940s in Austria and the United States, including the abolishment of its umbrella category, *Pervasive Developmental Disorders*, in favor of Neurodevelopmental Disorders.

#### *Asperger's Disorder*

A diagnosis along the Autism Spectrum which was included in the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 1994).

A. Qualitative impairment in social interaction manifested by at least two of the following: impairment in the use of multiple nonverbal behaviors such as eye contact; failure to develop peer relationships; a lack of spontaneous seeking to share enjoyment; lack of social or emotional reciprocity.

B. Restricted repetitive and stereotyped patterns of behavior, interests, and activities as manifested by at least one of the following: encompassing preoccupation with one or more stereotyped and restricted patterns of interest;

inflexible adherence to specific, nonfunctional routines or rituals; stereotyped and repetitive motor mannerisms; persistent preoccupation with parts of objects.

C. Significant impairment in social, occupational, or other areas of functioning.

D. No clinically significant general delay in language.

E. No clinically significant delay in cognitive development or self-help skills et al.

F. Criteria are not met for another Pervasive Developmental Disorder or

Schizophrenia (American Psychiatric Association, 2000, p. 75).

Asperger's Disorder required fewer criteria to be met for what is now known as ASD. Most patients with Asperger's Disorder meet criteria for Level 1 ASD in the *DSM-V* benchmarks.

#### *Comorbid, Comorbidity*

The presence of two or more symptomatically distinct psychiatric disorders that are present at the same time in an individual”(Orinstein, A., Tyson, K., Suh, J., Troyb, E., Helt, M., Rosenthal, M., et al. (2015).

#### *Social Communication (Pragmatic) Disorder (SCD)*

A diagnosis added to the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (APA, 2013). SCD differs from ASD in that it lacks the repetitive and restrictive behaviors criteria. Its criteria states:

A. Persistent difficulties in the social use of verbal and nonverbal communication as manifested by all of four criteria:

- 1) Deficits in using communication for social purposes.
- 2) Impairment in the ability to change communication to match context or the needs of the listener.

- 3) Difficulties following rules for conversation and storytelling.
  - 4) Difficulties understanding what is not explicitly stated and ambiguous meanings of language.
- B. Deficits resulting in functional limitations in effective communication, social participation and relationships, academic achievement, or occupational performance.
- C. Onset of symptoms in the early developmental period.
- D. Symptoms that are not attributable to another condition. (APA, 2013, p. 47)

#### *Residential Treatment Centers and Programs*

Residential treatment is mental health care therapy implemented in a setting in which the client also lives that is removed from his or her family residence. This might include residential treatment centers or hospitals, therapeutic boarding schools, or outdoor behavioral health settings. Throughout the literature reviewed, “programs” designates residential treatment that could take place indoors or outdoors. “Centers” typically referred to treatment occurring within a building.

#### *Outdoor Behavioral Health (OBH)*

Outdoor Behavioral Health refers to Wilderness Programs, Adventure Therapy Programs, Experiential Therapeutic Programs or other similarly named programs that, “Subscribe to a diverse treatment model that incorporates a blend of therapeutic modalities, but do so in the context of wilderness environments and backcountry travel” (NATSAP, 2017). The protocol used in most of these programs include an initial client assessment, developing a client’s individual treatment plan, the use of established psychotherapeutic practices in both individual and group setting, and the use of the outdoors as both setting and therapeutic intervention. According to the National



Association of Therapeutic Schools and Programs (NATSAP) website, OBH therapists and counselors employ therapy in the field, which contains the following key elements:

- The promotion of self-efficacy and personal autonomy through task accomplishment;
- A restructuring of the therapist-client relationship through group and communal living facilitated by natural consequences;
- The promotion of a therapeutic social group that is inherent in outdoor living arrangements (NATSAP, 2017)

*National Association of Therapeutic Schools and Programs (NATSAP)*

NATSAP is an organization formed in 1999 to, “Serve as a national resource for programs and professionals assisting young people beleaguered by emotional and behavioral difficulties” (NATSAP.org, 2017). NATSAP programs include, but are not limited to, Residential Treatment Centers (RTCs), Therapeutic Boarding Schools (TBSs), and OBH Programs.

*Practice Research Network of NATSAP (PRN)*

The NATSAP Board of Directors recognized the need to collect outcome data measuring the efficacy of programs that help youth and families facing behavioral and emotional challenges, and in 2007, created the Practice Research Network in partnership with the University of New Hampshire (Young and Gass, 2008). It is an ongoing research initiative in which participating programs track client data at intake, discharge, and post-discharge. The subsequent database is currently more than 18,000 clients who have consented to allow their anonymized outcome data to be used by researchers seeking to build the case for evidence-based practices.

### *Natural Setting*

For the purpose of this study, the term natural setting refers to the outdoor location for therapy that is common among all of the outdoor behavioral health programs that provided data for this study. While some were located in the woods and hills of the Appalachian Mountains and others were located on the high desert hills or canyons of the Rocky Mountains, the common element was that clients were living outdoors while the therapeutic interventions were applied. Research on these types of programs posits that the outdoor setting itself is part of the intervention.

### *Outcome Questionnaire 45.2®*

The OQ-45.2 is a 45-question questionnaire developed in 1996 by Michael J. Lambert and Gary M. Burlingame to measure symptom distress, interpersonal relations, and social role for clients 18 years and older. It is norm-referenced and considered a reliable and valid measuring tool within the NATSAP industry.

### *Research Designated Programs*

In 2016, NATSAP created the designation of a Research Designated Program (RDP) for NATSAP members agreeing to collect data from their clients and examine their programs with fidelity and adherence to requirements of the NATSAP Outcome Research Project (Santa, 2016).

### *Somatic Illness*

An illness with physical pain. Pertaining to the body, *soma*, as opposed to the *mind* (Collins, 2018).

### *Therapeutic Residential Care*

Adopted by the International Work Group for Therapeutic Residential Care at a 2016 summit to address the quality of care children receive when they must live away from their families, this definition is believed to be the most encompassing for the various forms of group care available to children around the world. It includes the necessary component of therapy, making *therapeutic residential care* a specialized segment of residential or group care services.

*Therapeutic residential care* involves the planful use of a purposefully constructed, multi-dimensional living environment designed to enhance or provide treatment, education, socialization, support, and protection to children and youth with identified mental health or behavioral needs in partnership with their families and in collaboration with a full spectrum of community-based formal and informal helping resources (Whittaker, Del Valle, & Holmes, 2014, p. 24)

### *Youth Outcome Questionnaire® 2.0*

The YOQ-2.0 was created to measure client functioning with regard to interpersonal distress; somatic; interpersonal relations; critical items; social problems; and behavioral dysfunction (Wells, Burlingame and Rose, 2005). The YOQ-2.0 was adopted as the standard of outcome measurement for all OBH program members of the NATSAP PRN in July 2010 (Tucker et al., 2016). The YOQ has a Self-Report (YOQ 2.1 SR), a Parent Report (YOQ 2.0 PR), and a clinician version that is recommended by

NATSAP for completion at intake, discharge, 6-months post-discharge, and 12-months post-discharge. It is used for clients under the age of 18.

### **Organization of the Study**

There are five chapters in this study. In Chapter 1, I include the background of the study, definition of terms, theoretical framework, statement of the problem, purpose of the study, research questions, overview of design, procedures, and analysis, the significance of the study, and assumptions and limitations. In Chapter 2, I present a comprehensive review of the literature which includes the history of both mental illness in the United States as well as the history of diagnosing Autism Spectrum Disorder. I include the subsequent changes in the *DSM* editions and the changes' effects on autism diagnoses, research-based therapeutic interventions for ASD adolescents, outdoor behavioral health outcomes for clients, and ASD's co-occurring diagnoses and behaviors. In Chapter 3, I describe the methodology utilized for this study. In Chapter 4, I present the study's findings and suggests additional analyses that needed to occur once those findings were made. Lastly, in Chapter 5, I provide a summary of the study, discussion of the findings, implications for OBH programs, recommendations for future research, reflections of the researcher, and conclusions.

## CHAPTER TWO

### REVIEW OF LITERATURE

#### **Introduction**

In the literature review, I provide insight on ASD's history by first examining the history of mental health in general in the United States and how Americans defined "good mental health" through the years. I give an overview of how society and the medical profession treated mentally ill patients as well as the conflicting issues on gathering data on this population's statistics. Next, I discuss the quality of care afforded to the mentally ill and the mental health policies and laws enacted to ensure its improvement. This will be followed by literature specifically on ASD's history and how its changing diagnostic criteria created conflict within the medical community as well as the community of those trying to get services for a loved one with the disorder. I will then focus on the growth of Outdoor Behavioral Health (OBH) programs and how the outdoors becomes a critical part of the intervention itself. This section is followed by literature outlining the oversight and research efforts of practices within an OBH and other therapeutic programs, including the tools for measuring change adopted for NATSAP research.

I will then review evidence-based interventions for adolescents and young adults with ASD, the comorbidities that can affect treatment, and the limited research previously examining an OBH intervention for these individuals. Finally, I will discuss Hierarchical Cluster Analysis as a method for exploring the multiple components of demographics, contextual variables, and program variables. Specifically, Chapter Two is organized into four main sections: 1. Significant Historical Literature; 2. Research on Evidence-based

Mental Health Practices; 3. Individuals with ASD and the OBH experience; and 4. Hierarchical Cluster Analysis.

Because there are many important components to consider in an individual's mental health care, in this literature review, I will examine numerous factors that affect making therapeutic decisions for someone diagnosed with ASD: From mental health's history to the present laws governing the protections afforded; from new interventions being studied to the outcome tools used; and from discussions of how setting becomes part of an OBH intervention to how comorbidities can influence all of the above. This literature review is by no means all-inclusive, but endeavors to be comprehensive while illustrating how these many topics have brought autism spectrum disorder treatment to its present-day state.

### **Significant Historical Literature**

At its core, the term *evidence-based practice* in the medical field describes when clinicians use the best evidence possible in order to make clinical decisions. Evidence-based practice “involves complex and conscientious decision-making based not only on the available evidence but also on patient characteristics, situations, and preferences” (McKibbin, 1998, p. 396). According to Frank and Glied (2008), for the practitioner, diagnosing and measuring a mental health issue can be problematic in that, “Defining who has an illness and who does not are far more difficult in the case of mental illness than in the case of most somatic illnesses, [because] few mental disorders have biological markers” (p. 8). Therefore, the quest for evidence-based practice in mental and developmental health care is especially arduous but incredibly necessary in the pursuit of a healthy population.

For therapists working with autism spectrum disorder (ASD) patients, there are many factors and possible comorbid diagnoses to consider when choosing an intervention or therapeutic theory. It is not as easy as choosing the best technique backed by research; the research on ASD continues to evolve at a fairly rapid rate with inconclusive and sometimes contradictory results. As well, the spectrum level, communication capabilities, and cognitive abilities of each client, coupled with the behaviors they exhibit, can impact theory and intervention choices. Another element impacting how doctors address ASD is the family's or clients' themselves, opinion on whether it is an "illness" requiring searches for a cure and external interventions or whether ASD is a personality dimension around which the rest of society should be educated and make efforts to accommodate. ASD's history includes very divisive views and there is still debate among the foundations supporting research into the disorder.

A broad examination of mental health history in the U.S. is important because it illustrates how societal opinions about mental health in general influenced the availability of the services and procedural treatments available for this population. Those who suffered from mental health disorders were once viewed as "entertainment" for the masses (Sudak, 2017), children were perceived as miniature adults and their treatment was not customized with child development in mind (Aries, 1965), the treatment of Veterans returning home was vastly different following World War II than from Vietnam (Greiger, 2018), and even as late as the 1970s, homosexuality was approved by the American Psychiatric Association as a mental illness (Green, 1972) .

The information age and advent of a world wide web has helped to enlighten and allow us to correct, or at least begin correcting, mental health marginalization throughout

history. At no other time has the ability to communicate with a global audience been more easily accomplished, serving to educate, though equally, to misinform. Rather than forget or dismantle uncomfortable moments in history such as eugenics, genocide, or the lobotomization of those with mental health issues, it is important to remember them so as not to be repeated.

### **Defining Mental Illness**

Defining mental illness has been an issue of controversy and debate in the medical community since first recognized. Through the early 1800s, mental illness was thought to be caused by a moral or spiritual failing, sometimes even demon possession, and so punishment and shame were often the treatment of the mentally ill and often their families as well (NIH, 2015, Diseases of the Mind: Highlights of American Psychiatry through 1900, para. 1).

According to Frank and Glied (2008) throughout American history, “[Mental health has] been the focus of philosophical debates about the nature of rationality, sociological debates about the meaning of deviance, and legal debates about the definition of criminal responsibility” (2008, p. 8). They also noted that the changing landscape in mental health definitions and policy can be attributed to “advances in social attitudes, scientific understanding, treatment modalities, and diagnostic technology ... over time” (Frank & Glied ( p. 8).

The field of mental health, and the topic of autism spectrum disorder specifically, is a thought-provoking intersection of the constructivist’s view of reality with the constructionist’s view of reality. While both theories focus on the subject’s view of determining reality, the constructivist posits that meaning and reality are socially



constructed and “only exists when it is perceived and defined as such” by the people interacting within it. Whereas the constructionist’s view of reality is something he or she creates individually (Marion & Gonzales, 2014, p. 319). The question that arises is what happens when someone suffering from a mental illness or disorder is incapable of making meaning of the social constructs? Moreover, what happens when the person suffers from a disability or disorder so severe that, while they are capable of understanding the social constructs, they cannot convey to society that they have that ability? There are individuals with ASD who have amazing cognitive abilities and understanding of societal rules and constructs, yet they are non-verbal and cannot demonstrate that understanding – a mute constructivist. There are also individuals with ASD who construct and inhabit their own reality who have neurotypical society members unable to communicate with them. While many advances in technology have provided new means of communicating, there is still much work to be done.

The definition of “good mental health” is socially constructed based upon societal norms and taboos and it is the psychiatrist’s job to help those who suffer from issues within it to find their way back to “good.” A psychiatrist is a medical doctor trained to study and treat illnesses of the mind. First coined in 1808 by Johann-Christian Riell, a German physician and university professor, he argued it should not be a branch of medicine, rather its own discipline with trained practitioners (Binder, Schaller, & Clusmann, 2000).

As the field of psychiatry grew, it faced a dualism that no other medical specialty had to endure: the union of psychological (those of the brain) and somatic (those of the body) elements. According to Grob (1991),

“Psychiatrists never abandoned the view that mental illnesses had a distinct biological component. At the same time, they insisted that mental disorders could be understood in psychological or functional terms; the inability of human beings to adapt to their environment could lead to aberrant behavioral signs” (p. 125).

Grob noted that when psychiatrists can find a clear causal relationship between pathology and behavior, the patient is inevitably transferred to the physician for physical treatments of the disease. What is left, mental diseases with no known cause, is under the jurisdiction of the psychiatrist.

Epidemiologists are those medical professionals who focus on the causes, developments, and spread of diseases. There are now three sets of constructs for epidemiologists to define who has a mental illness: 1) the signs and symptoms of the disorder manifested in the patient; 2) whether the difficulties impede the patient’s functioning at school, work, or home; and 3) whether treatment has been sought by the patient. (Frank & Glied, 2006)

With these three constructs, professionals delineate three levels of mental illness: 1) severe and persistently mental illness that impairs functioning to the point that patients require hospitalization; 2) symptoms that seriously impede a patient’s ability to live a happy and productive life (major depression and severe anxiety are an example); and 3) impaired ability because of external events (divorce or death of a close person) which often do not meet psychiatric diagnosis criteria, but would benefit from treatment (Frank & Glied, 2006). The “changing landscape” and “social attitudes” they point out have led to data crossover and some confusion when discussing the history of how many

individuals have mental health issues and in what manner they have been treated in the United States.

### **The U.S. History of Addressing Mental Health Issues**

Historically, raising or treating the euphemized “troubled” children in congregate settings apart from their families dates back in the U.S. more than 250 years and takes many forms – from orphanages to reformatories. The Quakers of Pennsylvania were the first to build public facilities for the mentally ill, in fact, Benjamin Franklin himself was part of the initial efforts to advocate care for those whom he termed “lunaticks” wandering the streets of Philadelphia in the mid-1700s. He and Dr. Thomas Bond, a fellow Quaker, spearheaded fundraising efforts to found The Pennsylvania Hospital in Philadelphia which opened in 1752 replete with shackles attached to the wall in its basement for its first six, mentally ill patients (Sudak, n.d., History of Pennsylvania Hospital, para 2.). It is the first known mental ward attached to a general hospital in the United States.

According to Sudak, 30 years later, Dr. Benjamin Rush, considered the father of psychiatry in the U.S., joined the faculty and put an end to the public engagements in which townspeople came to watch those chained to the basement walls as entertainment. He was the first to believe the mentally ill had a “disease of the mind” rather than demon possession, and prescribed recreational and occupational therapy. While this protocol was revolutionary in mental health therapies, he also included purging, bloodletting, and “twirling,” a therapy requiring fast rotation of the patient, as part of his recommendations (n.d., History of Pennsylvania Hospital, paras. 3 & 4).

In 1792, The New York Hospital administrators opened a mental ward for those they deemed “curable insane” and by 1808, a free standing medical facility was built nearby for the humane treatment of the mentally ill (NIH, 2015). The attitude toward those with mental illness in this era had shifted to care rather than fear of their debilitation.

Between the turn of the century and the Civil War, numerous eastern states had state-funded schools for housing and educating the deaf, blind, orphaned, “troubled” and “mentally retarded” (Schopler & Hennike, 1990, p. 292). According to Hilton (1987), public institutions in which mental and physical handicaps could be accommodated began to vary in function and title throughout history, going by such names as school, hospital, colony, asylum or even youth prison. Care for youth improved as well in the 19th century when society began to perceive children as vulnerable and in need of social protection (Wolins and Piliavin, 1964).

According to Gannon (2011), the first public school addressing the separate education of any handicapped in the United States was established in 1817. Known as the Connecticut Asylum for the Education and Instruction of Deaf and Dumb Persons in Hartford, Connecticut, it was followed a year later by the establishment of the New York Institution for the Instruction of the Deaf and Dumb in New York. The New England Asylum for the Blind, now known as the Perkins School for the Blind, opened in Watertown, Massachusetts in 1829 (Reynolds & Fletcher-Janzen, 2002). As the names imply, handicaps of both physical and mental nature were addressed together when it came to public provisions for residential placement and care. With each political, social,

and cultural shift through history, the roles and labels of these and other public institutions serving the handicapped changed (Cegelka and Prehm, 1982).

Up until the Civil War, there were increasing numbers of state-funded residential facilities for the deaf, blind, mentally retarded, and orphaned. In 1844, Dr. Thomas Story Kirkbride, head of The Pennsylvania Hospital, hosted a gathering of the 13 superintendents of the hospitals for the insane in the United States, leading to the creation of what is now known as the American Psychiatric Association, the nation's first sub-specialty medical society (Sudak, 2017). Kirkbride's instructions in the codebook for employees of the Pennsylvania Hospital for the Insane – the freestanding hospital that evolved from the mental ward established in 1752 – illustrate that, at this point in history medical treatment toward mental illness was focused on optimal care and treatment of the mentally ill. He specifically addressed respect for the patients and not shaming them for any of their levels of behavior or disabilities (Kirkbride, 1850).

The first private institution for educating the mentally retarded was established in 1848 and several other private, residential facilities quickly followed. In this era, residential centers were intended to educate and train the children and adolescents who were mild to moderately handicapped so they could contribute to society (Schopler & Hennike, 1990). But according to Schopler and Hennike, after the Civil War, residential these types of training institutions “fell into disfavor” (p. 292) and by the late 19<sup>th</sup> century, the cultural climate of caring for the mentally handicapped regressed from educating them to merely segregating them from society (Wolfensberger, 1975).

Despite the eventual differentiation of mental health issues from physical health issues in the 1800s, leading researchers affiliated with the U.S. National Institute of

Mental Health and other distinguished mental health agencies noted, “The concept of childhood mental illnesses did not arise until the late 19<sup>th</sup> century. These illnesses were typically not seen as unique to children or distinguishable from adult mental illnesses until the early part of the 20<sup>th</sup> century” (Hoagwood, Burns, Kiser, Ringeisen, & Schoenwald, 2001).

Residential treatment centers that were designed specifically for adolescent clients first appeared in the United States in the 1920s (Kolko, 1992). The prevalence of these centers grew from parents’ beliefs that they needed a trained specialist to care for their child (Shapiro, 2002). At this time, the concepts of a special needs student and the theory of *milieu therapy* were starting to emerge, promoting the development of public residential treatment centers for troubled children (Kolko, 1992).

According to Grob (1991), the concept of milieu theory was first introduced at the Belmont Hospital in 1947. The hospital’s Social Rehabilitation Unit admitted neurotic and early psychotic patients and was unique in that it encouraged “therapeutic culture” and “communication” among patients and staff. Patients “gained insight” and psychiatrists “learned to speak the patient’s language” (p. 141). Maxwell Jones, a British psychiatrist overseeing the care of post-war veterans at Belmont Hospital, had ushered in a new breed of hospital that merged the community environment and patient/staff communication into a new type of care that continues to the present day in the therapeutic community.

Zimmerman and Cohler (2000) noted the therapeutic milieu concept for adolescents was introduced by Bruno Bettelheim during his directorship at the University

of Chicago's Orthogenic School from 1944 to 1973. Bettelheim's experience in the Dachau and Buchenwald concentration camps, where he was imprisoned for 11 months, led him to the realization that environment could contribute to the destruction of personality (Shapiro, 2002; Silberman, 2015). His clinic was one of the first to have an atmosphere where professionals believed in less disciplinary control of youth and more environmentally facilitated change (Zimmerman & Cohler, 2000). According to Shapiro, Bettelheim and his therapeutic milieu concept helped promote the growth of private youth facilities through the 1950s and early 1960s when previously, troubled adolescents were viewed as "too aggressive or destructive for less restrictive inpatient treatment" (Shapiro, 2002, p. 155). Bettelheim was a popular, although medically un-credentialed, voice in the residential treatment of children with autism and will be discussed further in the ASD section of the literature review.

According to Schopler and Hennike, psychiatry as a medical field became more popular following the second World War when "the special needs of developmentally handicapped individuals once again [drew] political attention" (1990, p. 292). In addition, the concepts of battle fatigue and shell shock illuminated posttraumatic stress disorder and traumatic brain injury in returning veterans. The *Diagnostic and Statistical Manual (DSM-I)* was necessitated for clinicians to have uniform classification of returning soldiers' reactions to military service (Greiger, 2018).

According to Grob, "Between 1945 and 1960 therapeutic concepts and practices underwent a significant transformation. The simultaneous development of psychotropic drugs and milieu therapy—in addition to electroshock, lobotomy,

and psychotherapy—blurred the conventional distinction between psychological and somatic approaches” (1991, p. 124).

It is in this time period, following the war, that both Kanner’s and Asperger’s work on autism began to emerge and suddenly the tics and aberrant behavior common in individuals with autism were no longer viewed as symptoms of an incurable mental illness. For this reason, the discussion of history will continue in the autism spectrum disorder subheading and the next section will discuss the prevalence of mental health patients and whether mental health issues in the U.S. are increasing.

### **Conflicting U.S. Data on Mental Health**

Data on the historical numbers of young adolescents receiving medical assistance for mental health within residential settings are difficult to validate. According to Cegelka and Prehm (1982) at the turn of the 20<sup>th</sup> century, 2000 “handicapped” individuals were in institutions and that number had increased to 190,000 by 1969. Yet Whittaker cites evidence that by 1910, there were 1150 institutions serving 111,000 youth alone (Whittaker, 2004). Still other researchers note that the terminology and lack of consensus on definitions of residential treatment is part of the reason for conflicts in data (Lyman & Wilson, 1992; Frensch & Cameron, 2002).

Researchers agree variation in the data of those served for mental health can be attributed to the array of mental health service delivery systems, an issue not fully addressed until later in the 20<sup>th</sup> century by Stroul and Friedman (1988) when they developed the Systems of Care Model.



According to Frank and Glied (2006) using the three constructs recommended by epidemiologists can give a different estimate on the prevalence of U.S. population diagnosed with mental illness – anywhere from 20 percent to 30 percent over a 12-month period – based on which construct is used.

Yet another reason cited for conflicting data is the lack of serious attempts to assess mental health services for children and adolescents until the late 1980s (Hoagwood, et al., 2001) so there are questions as to whether this age group was included in earlier client counts. Grob asserts, though, in the peak years of doctors recommending residential facilities for the mentally ill, which occurred in the mid-20<sup>th</sup> century, they contained a resident population of more than 500,000 individuals (1991).

Whether the number of mental illness patients is rising is studied frequently and with numerous government agencies and their specialty committees to oversee data accumulation, coupled with computers to track patients, data have become more readily available for cross references between agencies as well as become more accurate in census. Statistics gathered by the Substance Abuse and Mental Health Services Administration (SAMHSA) indicate the prevalence of any mental health illness among United States citizens age 18 or older is currently 18.1 percent of the U.S. population or 43.6 million, overall (SAMHSA, 2014, Behavioral health trends in the United States, p. 28). Additionally, the Centers for Disease Control and Prevention's National Health and Nutrition Examination Survey found evidence that 13% of children age eight to 15 had a diagnosable mental disorder in the previous year (Klerman, et al., 1985).

Researchers indicate the numbers of those treated for depression is on the increase, but when examined in cross-cohort studies which factor in population increase

and recall bias, the extent of any increase over the last 50 years seems likely to be relatively small (Klerman, Lavori, Rice, et al., 1985; Wickramaratne, Weissman, Leaf, & Holford, 1989; Cross-national collaborative group, 1992; Simon & VonKorff, 1992).

The treatment and diagnosis rates for children and adolescents are, however, increasing rapidly. In one study, researchers reported a 24 percent increase in inpatient mental health and substance abuse admissions among children from 2007–2010 (Perou, et al., 2013). Researchers suggest these changes could be because clinicians are better able to recognize depression, ADHD, and other mental health issues rather than a true increase in prevalence (Frank & Glied, 2006).

Using a backward projection based on numbers from the National Center for Health Statistic website, it was estimated that between 15 and 30 percent of the U.S. population “had a diagnosable mental illness over a 12-month period” a smaller percentage, between five and seven percent, “experiences a significant functional impairment at any point, ” and that 1.7 percent have a “severe and persistent mental illness at any time.” (Frank & Glied, p. 24).

World Health Organization statisticians report that mental illnesses are a greater burden in established market economies than any other group of illnesses, including heart disease and cancer (World Health Organization, 2001). Additionally, mentally ill people account for up to 35 percent of those on public disability and 23 percent on welfare rolls worldwide (Loprest & Zedlewski, 1999).

In the United States alone, the cost of mental disorders among those age 23 and under, which included health care, special education, juvenile justice, and decreased

productivity, was estimated at \$247 to \$300 billion annually (Perou, et al., 2013; Center for Disease Control and Prevention (CDC), 2011).

In these statistics, researchers illustrate the staggering economic burden of mental health disorders and the importance of best practices to improve quality of care and, consequently, quality of the lives of those suffering from mental health disorders, so they can contribute to society to the best of their abilities.

### **Quality of Care**

Terminology, service delivery variations, constructs for diagnosing, and oversight of mental health in general make conclusive, historical mental health data difficult to obtain, but while numbers of patients served in the mental health sector may differ, there was little disagreement on the lack of quality care available through the 1950s.

According to Albert Deutsch, a social historian who researched and published prolifically on his perception of the conditions of mental health care institutions, people with severe mental illness wasted away in public mental hospitals and either completely lacked care or were treated with experimental and generally ineffective or painful therapies (Deutsch, 1937; Deutsch 1945). Following World War II, he focused his attention specifically on the conditions for veterans in the Veterans Administration hospitals (Deutsch, 1948; Deutsch, 1950).

A series of 11 articles on the conditions of VA hospitals and veteran care, which was written by Deutsch and published in *PM* newspaper, led to an inquiry by the House Committee on Veterans Affairs. Deutsch refused to reveal sources and the committee held him in contempt after the inquiry. Yet his descriptions and recommendations were later adopted by the Veterans Administration to initiate reform of the psychiatric care of

veterans, helping to issue in a new era of mental health oversight and service delivery (Rostker, 2013).

In retrospect, the quality of care for mental illness appeared inhumane and cruel into the first half of the 20<sup>th</sup> century. By the late 1700s, patients were unchained from basement walls, yet they were still the subject of experimental or misguided therapies through the mid-20<sup>th</sup> century.

According to Kolb and Vogel, more than 75,000 patients received some form of shock therapy as a patient in one of 305 mental hospital, both public and private through the middle of the 20<sup>th</sup> century (Kolb & Vogel, 1942). Grob (1991) notes that the growing respectability of lobotomy during the 1940s for treating schizophrenia led to a total of 18,608 individuals undergoing the psychosurgery between its introduction in 1936 and 1951. By the late 1950s, it was replaced by psychotropic drugs yet psychosurgery only came under public scrutiny in the late 1960s and early 1970s, long after psychiatrists abandoned it as a recommended treatment for mental illness (Grob, 1991).

In the 1950s, public mental hospitals, the main providers of mental health care, had fallen out of favor and come under intense legal scrutiny. (Grob, 2001; Frank & Glied, 2006) Also in the 1950s, two new concepts of treatment were introduced for patients that were far more humane and contributed to the evidence-based practices still in use today: the multi-disciplinary approach to treating mental illness known as “milieu therapy” which has been previously discussed, and psychotropic drugs that alleviated some of the symptoms of mental illness without surgery (Grob, 1991).

Advocates in the 1960s ushered in a growing awareness of mental health rights to compassionate care, driven by legal challenges to the system. These challenges resulted

in ballooning government oversight in health care in general, and many health care laws still in effect today.

### **Mental Health Policy and Law**

According to Schopler and Hennike (1990), parents and other advocates of developmentally handicapped persons used the judicial system to legally obtain their rights to treatment, to outlaw involuntary servitude of institutionalized individuals, and to ensure due process for them. Noted Frank and Glied (2006), legal challenges as well as changes in financing and policy effected a huge change in where patients obtained services from the 1960s into the early 2000s. A shift from institutionalized care to home, community and school-based approaches began to take form. Several of the laws effecting sweeping national changes to mental health care are discussed here.

Motivated in part by the judicial system's lead, officials in other branches of government began to address the delivery of mental health care. Following the Second World War, President Harry Truman signed the National Mental Health Act in 1946 which called for the establishment of the National Institute of Mental Health (NIMH, 2018). The Mental Health Study Act of 1955 recommended a "thorough, nationwide analysis and reevaluation of the human and economic problems of mental health" (NIMH, n/d, History section, para. 9) and led to a study sponsored by 36 organizations comprising what became known as the Joint Commission on Mental Illness and Health.

The commission's subsequent report, a 10-volume series which assessed mental health conditions and resources, was called *Action for Mental Health* (Joint Commission on Mental Illness and Health, 1961). Their recommendations led President John F. Kennedy to address mental health issues at the executive branch level for the first time in

1963 and Congress responded by passing the Mental Retardation Facilities and Community Mental Health Centers Construction Act. This law, Public Law 88-164, issued in a new era of federal support for mental health services. NIMH officials continued to establish centers to research mental illness and by 1965, a new Joint Commission on the Mental Health of Children was established using funds provided by the Social Security Amendments of 1965 (NIMH, 2018).

In addition to policy, changes in insurance and new federal funding for income supplementation were part of the shift to community-centered care for those diagnosed with mental health needs. According to Reed (1975), by the late 1960s, 92 percent of employer-sponsored health plans were offering some coverage for inpatient and outpatient mental health services. Federal funds allocated under the Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI), introduced in the 1960s and 1970s, expanded coverage to include psychiatric disability and disabilities for children. In 1990, following legal challenges to include more types of disabilities to its coverage, SSI expanded benefits to those with attention deficit hyperactivity disorder and other mental disorders in children. From 1989 to 1996, numbers of children receiving SSI almost quadrupled, reaching 1,000,000. These living expense programs helped families seek out mental health services they might not otherwise afford (Frank & Glied, 2006).

Title XIX, the Medicaid provision which passed in 1971, invoked further mental health reform by requiring the same review processes for institutions as those required for other handicapped services (Schopler & Hennike, 1990). Hilton's chapter of the Encyclopedia of Special Education (1987), documented a shift between the 1960s and 1980s to return handicapped individuals to their families and communities which resulted

in a decline of more than 50,000 institutionalized individuals. By the 1980s, the terms “deinstitutionalization,” “mainstreaming,” and “integration” became widely used and institutions became reserved for all but the most severe mentally handicapped individuals (Hilton, 1987; Whittaker, 2015).

In the late 1980s, workers in children’s mental health services still faced two serious issues: First, a recognition that services were scattered across organizations and systems that included child welfare agencies, pediatric health settings, juvenile corrections facilities and schools and second, evidence that fewer than 20 percent of children needing mental health services were receiving them (Burns, et al., 1995). This recognition led to a reworking of the entry points for children into the mental health system known as the system-of-care model developed by Stroul and Friedman (1988). The model called for

Values and principles centered on maintaining children in their communities, coordinating services, involving families centrally in delivery and planning of treatments and services, and instantiating attention to the cultural relevance of services” (Hoagwood, Burns, Kiser, Ringeisen, & Schoenwald, 2001, p. 1182).

In two studies on the system-of-care model, Bickman (1996, 2000) showed that coordinating services improved access as well as reduced hospitalization for children in need of mental health services. However, he also indicated that the clinical outcomes did not differ when the services were received through coordinated systems of care or the usual services (Bickman, 2000). His efforts ushered in a new focus on the quality of care

within the systems, including efficaciousness of treatments and demand for empirically supported research to support psychosocial treatments (Hoagwood, et al., 2001).

Outpatient Community Mental Health Centers that provided services while permitting a child to live at home became professionals' treatment centers of choice (Frank & Glied, 2006) while residential treatment became less common even, according to some research, counter-indicated (Courtney & Iwaniec, 2009).

Today, according to Frank and Glied (2006), state, county and veteran hospital facility numbers have diminished significantly. Measured in beds available, these three types of institutions' capacities were around 270 by the year 2000. Private sector hospitals now average around 100 beds available. More general hospitals offer psychiatric units, but those numbers have not fluctuated through the decades, remaining around 35 (Frank & Glied, 2006).

At present, "Research and funding priorities in the United States have, for the most part, settled on the development and testing of interventions that keep youth in their families and communities" (James, 2015). As well, there has been a rise in alternative methods of treatment, such as the OBH programs under study, which address aberrant behaviors, social skills, and mental health well-being with a prescribed amount of time out of the home, but with the ultimate goal of returning a child home.

### **ASD's History and Diagnostic Criteria Changes**

According to American Psychiatric Association editors,(APA) the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) contains the most widely accepted language used by clinicians and researchers for the classification of mental disorders. To define Autism Spectrum Disorder by today's criteria, one opens it to the section on



neurological developmental disorders but to understand it, one must have knowledge of its history, how the criteria have changed, and the influential researchers behind the changes.

**Autism's Discovery – Kanner and Asperger.** According to researchers, the discovery of autism was a simultaneous event on two continents by two physicians seemingly unaware of the other's work: Doctors Hans Asperger, a pediatrician in Austria, and Leo Kanner, a child psychiatrist in the United States (Smith, Schaefer-Whitby, & Mrla, 2017). Some historians claim Asperger was the first to speak on the subject in October 1938 when he presented a paper on four patients displaying precocious abilities in science and math who spoke in elaborate sentences, yet lacked any interest in play or friends (Silberman, 2015). He referred to his patients as chatty little professors and discussed a range of observed behaviors (Asperger, 1938). However, according to Silberman (2015), by the time Asperger's thesis on the topic was filed in October of 1943, his Austrian clinic had been bombed in the air raids of World War II and his work did not surface for decades. Asperger's written thesis, "Die 'Autistischen Psychopathen' im Kindersalter," remained untranslated from German until decades later when American clinical psychologist Uta Frith translated and made it available to the English-speaking world (Frith, 1991; Wing, 1991; Zager 2004).

According to Evans (2004) Asperger's speech on autism was delivered in a politically charged, pre-World War II atmosphere in which eugenics and murder of imperfect children were condoned and encouraged by Adolf Hitler. Within a month of Germany's invasion of Poland, Hitler had signed a secret authorization for Tiergartenstrasse 4, or T-4 as it was known, targeting the disabled for extermination and

providing legal permission for nurses and doctors to kill their patients (Evans, 2004) .

Historians document the murder of 789 infants and children in five years at Am Spiegelgrund, the institution in which Asperger's Heilpädagogik Klinik was located (Friedlander, 1995; Nicosia & Huener, 2002)

Silberman asserts that Asperger's descriptions of his patients, which highlighted their abilities and precociousness, was a deliberate attempt to spare them and others like them from the attention of his Nazi superiors. Yet these efforts to highlight their abilities overshadowed some of the other behaviors and deficits he observed that might have aligned his work more quickly with that of Kanner in the United States, including the ideas that patients had a broad range of communication abilities, that it was not at all rare, and that it was likely genetic (Silberman, 2015).

According to Silberman, two colleagues from Asperger's clinic, psychologist Anni Weiss and Chief Diagnostician George Frankl, fled Austria prior to the outbreak of the war to avoid the rise of the Nazi regime, and were working at Johns Hopkins University's Behavior Clinic, the same clinic where Leo Kanner was in residency. Kanner's work, first published in 1944, described 11, non-speaking patients who appeared to live in a private world of their own and he labeled the condition "early infantile autism," from the Greek *autos* meaning "self." Kanner spent decades proclaiming he had discovered this rare and unusual syndrome. Kanner's work with 11 patients, many non-verbal, was termed *classic autism*, or *infantile autism* (Eyal, 2013; Goldstein, Naglieri, & Ozonoff, 2009; Hill & Frith, 2003). Despite the shared colleagues, Kanner never acknowledged Asperger's work and in later years, a colleague wrote that it was taken for granted Kanner had no idea of Asperger's work despite Kanner and Frankl

working closely together (Van Krevelen, 1971). Of note, at the time, Kanner was serving as editor of the *Journal of Autism and Childhood Schizophrenia* in which Van Krevelen's article appeared (Vol. 1, Issue 1, 1971).

Autism's discovery played out on two continents, in vastly different ways, and it was late in the 20<sup>th</sup> century before the medical world would come to realize these two physicians were discussing the same disorder, but at inconsistent points on the spectrum. Yet in the U.S., it was Kanner's final comments in his article, "Autistic Disturbances of Affective Contact" that would influence the next decade of autism treatment. He noted,

In the whole group (of patients), there are very few warmhearted fathers and mothers. For the most part, the parents, grandparents, and collaterals are persons strongly preoccupied with abstractions of a scientific, literary, or artistic nature, and limited in genuine interest of people. Even some of the happiest marriages are rather cold and formal affairs ... The question arises whether or to what extent this fact has contributed to the condition of the children (Kanner, 1943, p.250).

Kanner, in effect, ushered in the "refrigerator mother" years of autism and the psychogenic approaches of Bruno Bettelheim.

**Bruno Bettelheim.** Through the early 1960s, Bruno Bettelheim became a major influence in autism treatment by blaming what he referred to as "toxic parenting," however his opinions were not published in scholarly, peer-reviewed journals. Rather, they were written in widely-read coffee table publications such as *Time*, *Harper's Bazaar*, *Redbook*, *The New York Times Magazine*, *Life*, and *Ladies'*

*Home Journal* (Silberman, 2015). His book, *The Empty Fortress*, became a best seller, his recommendations to remove children diagnosed with autism from their home, and away from their mother specifically, in favor of residential treatment centers like the Orthogenic School located at the University of Chicago became the predominant protocol (Silberman, 2015). Bettelheim was director of the Orthogenic School from 1944 to 1973 (Oschool, n/d/ History, para 3.)

Bettelheim influenced an entire decade of residential therapy for autistic children by advocating that the surroundings and staff were as important as the medical treatments themselves. Following his death in 1990, allegations of plagiarism, lack of any medical degree (though he claimed to have three doctorates and be friends with Freud himself), and abusive treatment of students were raised and later substantiated (Sutton, 1996).

**Bernard Rimland.** In the 1960s, Bernard Rimland entered the research field of autism after his son, Mark, was diagnosed with it. He dismissed the en vogue “refrigerator mother” theory promoted by Bettelheim and instead, researched his own book *Infantile Autism: The Syndrome and Its Implications for a Neural Theory of Behavior* in which he posited that autism had a biological and organic etiology and that training and pharmacological interventions could mitigate the difficulties experienced by individuals with autism (Rimland, 1964). Rimland was ahead of this time in this theory as there was not clinical evidence to back him up. He used observation, instinct, and his own research, including a checklist of behaviors he created, to understand autism. His methods and theories were groundbreaking for their time and he was extremely supportive of families, in direct contrast to the toxic parenting approach Bettelheim was advocating at the time (Volkmar, 2013). Rimland’s research validated Leo Kanner’s

assertions that doctors were, at that time, misdiagnosing autism in 90 percent of their patients (Rimland, 1971). He is credited with single-handedly advancing the idea that autism had multiple causes, bringing hope to thousands of families in which mother had been blamed for her child's autistic traits (Volkmar, 2013).

Rimland's E-2 checklist probed for savant skills in art, technology, memory, math, and music, and is credited with playing a factor in refocusing research toward a more Asperger-like autism theory, in direct opposition to the Kanner-like autism in which he originally believed (Rimland, 1971). Rimland later published an editorial claiming that vaccinations could be linked to autism, though organized medicine in the United States and elsewhere did not agree, however, his assertions led to parents refusing to vaccinate their children (Silberman 2015). Research has but not found any link between vaccinations (such as the measles, mumps, and rubella [MMR] vaccine) and autism (Taylor, Swerdfeger, & Eslick, 2014)

**Lorna Wing.** British psychiatrist Lorna Wing and her research partner, Judith Gould, are credited with defining what was originally referred to as the “autistic continuum” and eventually became the “autism spectrum.” Clinical accounts of patients who did not fit published criteria was published in 1981 under the title, “Asperger's Syndrome: A Clinical Account” (Volkmar, 2013) Following a study of 173 South London children who had tested below 60 on IQ exams or had autistic features, the Wing and Gould realized that while many of their patients fit the classic autism characteristics Kanner described, there were others who clearly did not. The study inspired them to introduce the concept of the “triad of impairments” in autism: deficits in social relations, communication, and imagination, which is a concept still used by diagnosticians today

(Volkmar, 2013). The *DSM-IV* added the diagnosis of “Asperger’s Syndrome” for those individuals who had some deficits in the triad, but were still considered high functioning (American Psychiatric Association, 1994).

Autism from the 1940s to the early 21<sup>st</sup> century has gone through radical changes in definition, caused heated and passionate disagreement in both public and medical personnel. There has been confusion, debate, recanted dialogue, and particularly since the emergence of the internet, a lot of misinformation. An historical review printed in 2012 summarized it as such,

“Contributing to the continuous state of confusion has been the frequent changes in terminology, starting with Bleuler’s term autism in reference to a symptom of schizophrenia, to Kanner’s early infantile autism to Asperger’s autistic psychopathy. The first (1952) and second (1968) editions of the American Psychiatric Association’s *DSM* used the term childhood schizophrenia. Autism was included as a separate condition in the third (1980) edition of the *DSM*, whereas the fourth edition (1994) provided five types of the current nosology of autistic spectrum disorders or pervasive developmental disorder: autistic disorder, pervasive developmental disorder not otherwise specified, Rett syndrome, Asperger syndrome, and childhood disintegrative disorder” (Greydanus & Toledo-Pereyra, 2012).

Yet there were more changes to the DSM which would affect the autism spectrum in a significant way.

## **Present Day Autism Spectrum Disorder – the DSM-V**

The current definition of Autism Spectrum Disorders (ASDs) includes deficits in social interaction and social communication across multiple contexts in addition to restricted repetitive patterns of behavior, interests or activities (American Psychiatric Association[APA], 2013, p. 50). According to the *DSM-5<sup>th</sup>* edition:

Individuals with well-established DSM-IV-TR diagnosis of autistic disorder, Asperger’s disorder, or pervasive developmental disorder not otherwise specified should be given the diagnosis of autism spectrum disorder. Individuals who have marked deficits in social communication, but whose symptoms do not otherwise meet criteria for autism spectrum disorder, should be evaluated for social (pragmatic) communication disorder (APA, 2013, p. 51).

Physicians are directed to specify whether the ASD has “accompanying intellectual impairment”, “accompanying language impairment”, a “known medical or genetic condition or environmental factor”, whether it is “associated with another neurodevelopmental, mental or behavioral disorder”, or if catatonia is present (APA, 2013, p. 51).

There are currently three severity levels for ASD, which are “Requiring very substantial support” (Level 3) “Requiring substantial support” (Level 2), or “Requiring support” (Level 1) (APA, 2013). Adolescents with ASD are often isolated, bullied, or excluded due to their inability to perceive and act upon social cues given by others in their peer groups (Blake, Lund, Zhou, Kwok, & Benz, 2012). One major strand of research continues to examine new treatment avenues that may improve the lives of

individuals diagnosed with ASDs rather than finding cause or a cure (Evans and Tissot, 2003).

According to researchers at the Center for Disease Control, current estimates of ASD diagnosis are 14.6 per 1000 children, or 1 in every 68 children, significantly higher than the 6.7 per 1000 reported when the CDC began accumulating data in 2000 (CDC, 2017). However, the autism diagnosis criteria have undergone two revisions in that time period, including a text revision in 2000 which corrected a significant error in criteria for diagnosing Autism and Asperger's Syndrome delineated in the *DSM-IV* (APA, 1994; APA, 2000).

In 2005, researchers argued that Asperger's and Autism, as defined in the *DSM-IV-Text Revision* was the best empirically-based diagnostic category among the complex psychiatric and developmental disorders in the edition, though it had taken decades for clinicians and researchers to reach a broad, general consensus (Volkmar & Klin, 2005). The publication of the *DSM-IV-TR* also corrected an error in the autism spectrum disorder section that had gone unnoticed for six years: the use of the word "or" instead of the word "and" when listing criteria to be met for an Asperger's or Autism diagnosis (APA, 1994, 2000). Once corrected, researchers praised the usefulness of its diagnostic approaches and the common language for its diagnosis, which provided a means for clear communication regarding this spectrum of disorders (Buitelaar, Van der Gaag, Klin, & Volkmar, 1999; Magnusson & Saemundsen, 2001; Woodbury, Volkmar & Klin, 2005).

Yet the *DSM-V*, published in 2013 completely redefined the concept of autism and omitted the diagnosis of Asperger's Disorder that Wing had worked so hard to have



included. It was named *Autism Spectrum Disorder* with three levels that encompassed autism, Asperger's disorder, childhood disintegrative disorder, Rett's disorder, and pervasive development disorder not otherwise specified. Editors added *social (pragmatic) communication disorder (SCD)*, a new condition involving persistent difficulties in the social uses of verbal and nonverbal communication. SCD is considered the "threshold" diagnosis of ASD because it does not require the restricted and repetitive behaviors criteria (American Psychiatric Association, 2013).

### **Prevalence and Co-morbidities of ASD**

According to researchers at the Centers for Disease Control and Prevention (CDC), about one in 68 children, or 1.5% of the population of the United States, have been identified with autism spectrum disorder. These statistics were gathered by the Autism and Developmental Disabilities Monitoring (ADDM) network which is comprised of a group of programs funded by the CDC to collect and analyze data from different areas of the United States (ADDM Network, 2016). Including a spike in over-diagnoses when the *DSM-IV* was printed with an error, these numbers have steadily increased since 2000 when the estimated prevalence was one in 150.

This increase in diagnoses is attributed to more accurate diagnostic criteria listed in the *DSM-IV-TR* and *DSM-V* editions published in 2000 and 2013 (American Psychiatric Association, 2000, 2013). ADDM researchers report ASD occurs in all racial, ethnic, and socioeconomic groups. It is about 4.5 times more common among boys than in girls. Worldwide studies indicate a prevalence of between 1 percent and 2 percent of the populations of Asia, Europe, and North America (ADDM, 2016). Additionally,

ADDM Network researchers report that between 2006 and 2008, one in six children in the United States had a developmental disability, ranging from mild impairments in speech and language to more serious disabilities such as intellectual disabilities, cerebral palsy, and autism (ADDM, 2016).

The cause of ASD is an important and prodigious focus for current research and there are numerous theories and routes being taken to identify its etiology. In a recent research study, a study e-published on the CDC website prior to its print publication, reported that,

Children conceived less than 18 months after their mother's previous birth or children conceived 60 or more months after their mother's previous birth were more likely to have ASD when compared to children conceived between 18 to 59 months after their mother's previous birth. The relationship is stronger in children with severe ASD symptoms. The linkage between birth spacing (the period of time between pregnancies) and having a child with ASD appeared to be unique to ASD, as there was no linkage found between birth spacing and having children with other developmental disabilities (Schieve, et al., 2017).

The researchers in this study confirm and expand upon a prior study in California linking closely spaced siblings and the occurrence of ASD (Cheslack-Postava, Liu, & Bearman, 2011) as well as a study in Sweden with similar findings (Gunnes, et al., 2013).

Researchers in previous studies have linked a small percentage of premature and low birth weight births to greater risk for having ASD (Pinto-Martin, et al., 2011).

Researchers also found advanced parental age has been correlated higher incidences of having a child with ASD (Durkin, et al., 2008; Weiser, et al., 2008; Wu, Wu, Ding, Bi, & Zhang, 2017).

Having autism, or any type of serious disability, increases the risk for other comorbid problems. For example, approximately 25% of individuals with autism develop a seizure disorder (Rutter, 1970; Volkmar & Nelson, 1990). They are found to have increased issues with gastro-intestinal and mucosal pathology (Hsiao, 2014; Gorrindo, et al., 2012; Chaidez, Hansen, & Hertz-Picciotto, 2014). Croen, Najjar and Ray (2006) found they are six times more likely to be psychiatrically hospitalized than children without ASD.

McGuire et al. (2015) note this is of particular concern given the number of specialized psychiatric units for children and adolescents with ASD or intellectual disability (ID), which requires them to be admitted to general child and adolescent psychiatric units. “Staff may have limited experience with this population, and the treatment approach and therapeutic milieu may not be well adapted to children with ASD or ID” (McGuire, et al., 2015). In contrast, research shows specialized units have been shown to improve behavioral functioning of children with ASD or ID two months after discharge (Siegel, et al., 2014) and to decrease readmission rates (Gabriels, et al., 2012). Thomas, Hovinga, Rai, and Lee (2017) found epilepsy co-occurred in 8.6 percent of ASD children in their sample of 85,248 children ages two to 17.

Researcher have found that many individuals with autism fall within the mentally retarded range when taking developmentally appropriate standardized tests (Rutter, Bailey, Bolton, & Le Couter, 1994). However, they have also found that about 44% of children with ASD have average or above average intellectual ability (Christensen, Baio, Braun, & et al., 2012).

ADDM network statisticians reported in 2016 that the co-occurrence of one or more non-ASD developmental diagnoses is 83 percent. The co-occurrence of one or more psychiatric diagnoses is 10 percent (ADDM network, 2016). Most common co-morbidities were attention deficit-hyperactivity disorder (ADHD), social anxiety, and oppositional defiant disorder (Orinstein, et al., 2015). According to a review conducted by Leitner (2014), the prevalence of ADHD in children with ASD is between 37 and 85 percent.

Anxiety and its related concerns are also one of the highest co-occurring issues for adolescents with ASD (Ghaziuddin, 2002). Of concern, if a child has anxiety disorder, it could intensify the social impairment that is one of the rule-in factors of ASD (White, Oswald, Ollendick, & Scahill, 2009). A common assumption is that individuals with ASD prefer little social contact and sometimes complete isolation, however, many of those diagnosed are aware of their occasionally awkward social skills and seem to wish it could be different therefore the social anxiety they feel promotes further isolation (Attwood, 2000; Myles, Barnhill, Hagiwara, Griswold, & Simpson, 2001). Specific practice of social skills is one of the primary focus interventions was found on most websites of programs included in this study (author review).

Researchers say social skills deficits are an impairment shared by all the ASD forms and is a targeted skill that improves in both individual therapy (Koegel and Frea, 1993; Matson et al. 2007) and group therapy settings (Barry et al., 2003; Kalyva and Avramidis, 2005) both of which occur in OBH settings. However, research shows transferring the skills from a formalized therapy intervention to a more natural environment can prove problematic for ASD children (Ozonoff & Miller, 1995; Rogers, 2000; Barry et al., 2003).

With more occurrences of anxiety, social skill deficits, and ADHD, it is not surprising that co-occurrences of suicide and attempted suicide are higher in those diagnosed with ASD than with peers developing in a neurotypical manner. A 2016 study with 8065 participants found that 28 percent of 8-year-olds with ASD had evidence of self-injurious behaviors co-occurring (Soke, et al., 2016). Numerous studies confirm a high incidence of co-occurring depression in individuals with ASD; specifically, De-la-Iglesia and Olivar (2015) found that in high-functioning ASD individuals, “The factors that present the greatest specific risk are higher cognitive functioning, self-awareness of deficit, capacity for introspection, stressful life events, adolescence, quality of social relationships, and alexithymia” (para. 1).

French researchers Huguet, Contejean, and Doyen (2015) found 21.3 percent of their study’s participants with ASD reported suicidal ideation, had attempted suicide or died by suicide. “Vulnerability complicating the diagnosis of comorbid depressive and anxiety disorders are major factors associated with suicidality” (p. 362). They found suicidal ideation and morbid preoccupation were particularly common in adolescents and young adults. A 2007 study found the consequences of adolescent mental health disorders

included disability and suicide and that these findings appeared to be worldwide rather than restricted to certain countries (Patel, Flisher, Hetrick, & McGarry, 2007).

The estimated annual cost of healthcare, childcare, and special education for an ASD diagnosed child is more than \$17,000 per year, of which \$8610 is allocated to elevated education costs (Lavelle et al., 2014). Reserachers also found that ASD youth age 12- to 21-years-old accessed emergency department services four times as often as non-ASD youth (Guodong, Pearl, Kong, Leslie, & Murray, 2017), affecting public safety costs for communities. In a recent study of nearly 130,000 participants in Sweden, researchers reported an almost doubled risk for substance abuse and related problems for ASD individuals, further elevating healthcare costs (Butwicka, Langstrom, Larsson, Lundstrom, Serlachius, Almqvist, Frisen, & Lichtenstein, 2017).

In the Strategic Plan of 2016-1027 published by the Department of Health and Human Service's Interagency Autism Coordinating Committee (IACC, 2017), researchers calculated that in 2015, research on ASD, funded by both federal and private funders, totaled \$342.6 million and included 1,410 research projects. In the prior eight years, autism research and funding showed an upward trend, increasing by 35 percent since 2008. Strategic Plan committee members list seven questions with aspirational goals and objectives associated with each. This study's intent is to provide evidence on an under-researched delivery model, the Outdoor Behavioral Health program, in order to address these objectives:

1. Improve/validate existing, or develop new tools, methods, and service delivery models for detecting ASD in order to facilitate timely linkage of individuals with ASD to early, targeted interventions and supports (IACC, 2017).
2. Improve service models to ensure consistency of care across many domains with the goal of maximizing outcomes and improving the value that individuals get from services (IACC, 2017).
3. Create and improve psychosocial, developmental, and naturalistic interventions for the core symptoms and co-occurring conditions in ASD (IACC, 2017).
4. Improve service models to ensure consistency of care across many domains with the goal of maximizing outcomes and improving the value that individuals get from services (IACC, 2017).

The last is especially pertinent as legal challenges against insurance companies, which have historically refused to cover outdoor behavioral health program services, continue to make their way through the court system. Should the results of this study show significant reduction in the self-reported outcome scores of individuals with ASD after the intense, OBH interventions, it will be further evidence that these program costs should be included in evidence-based treatment options and made available to more adolescents and young adults who could benefit from it.

There are abundant studies on therapeutic methods and interventions for ASD youth. Since the identification of autism in the United States more than 70 years ago, the research has had two distinct foci: cause/cure and interventions to help ASD individuals navigate a neuro-typical (non-ASD) world. Current researchers continue to focus on finding cause and cure, but greater emphasis is placed upon improving the quality of life

and educating the neuro-typical population toward a greater understanding and acceptance of the disorder (Evans and Tissot, 2003; Silberman, 2015). Prior to being identified and studied, almost simultaneously in the United States and Austria, the recommendation on both continents to parents of children exhibiting autistic-like symptoms was to admit their child to an asylum with few hopeful prospects for a productive life (Silberman, 2015). Modern prognosis and quality of life for ASD adolescents is far more optimistic given the growing list of interventions found to make a difference.

### **Evidence-Based Interventions for Individuals with ASD**

The National Autism Center (NAC) in 2015 completed Phase 2 of the National Standards Project which addresses the “need for evidence-based practice guidelines for autism spectrum disorder” (retrieved from NAC website, p. 1) Appendix B lists Established, Emerging, and Unestablished Interventions for Children, Adolescents, and Young Adults (Under age 22) from that study. Interventions were included on the Established list if there was conclusive, scientific evidence that the interventions increased targeted skills and decreased targeted behaviors. Interventions were included on the Emerging list if one or more studies suggested the intervention produced favorable outcomes, but that additional, high quality studies are still needed.

The NAC committee members’ conclusions were based upon a review of articles published between 2007 and 2012 in peer-reviewed journals. The four goals listed in the report were to update the NAC’s National Standards Project Phase 1 published in 2009; to extend the review of intervention outcomes to include adults; to incorporate relevant feedback from the NSP1 report; and to “assist parents, caregivers, educators, and service



providers in understanding how to integrate evidence-based interventions” into individual educational plans or behavioral plans (NSP2, 2015).

The 14 Established Interventions for individuals under age 22 identified in the National Standards Report, Phase 2 (2015) were:

- Behavioral Interventions
- Cognitive Behavioral Intervention Package
- Comprehensive Behavioral Treatment for Young Children
- Language Training (Production)
- Modeling
- Natural Teaching Strategies
- Parent Training
- Peer Training Package
- Pivotal Response Training
- Schedules
- Scripting
- Self-Management
- Social Skills Package
- Story-based Intervention (NSP2, 2015)

Many of these interventions were found on the websites of programs whose data were used in this study.

Beginning in the 1960s, Applied Behavior Analysis (ABA) was the predominant theory for working with individuals with ASD. Interventions within applied behavior analysis focus on antecedent and consequent events that can be used to alter behavior (Maher, Choutka, Doloughty, & Zirkel, 2004). On the NAC website, it is recommended that interventions for individuals over age 22 be selected from behavioral interventions, stating, “The Behavioral Intervention category consists of applied behavior analytic interventions to increase adaptive behaviors and decrease challenging behaviors” (NAC, 2015 Autism Interventions: What interventions are recommended?, para 5).

Researchers have shown applied behavioral strategies provide evidence of

enhancing patients' independence, increasing prosocial behaviors, and teaching methods of self-control and relaxation (Bregman et al., 2005). It has also been indicated to increase language, social skills, play, and academic skills, as well as decrease many of the behavioral problems that can be associated with autism (Schreibman, 2000).

In studies conducted in the 1980s, researchers found that social skill difficulties exhibited by ASD individuals with autism were due to biological issues of the child and not the parents, further refuting the “refrigerator mother” theories of Bettelheim, (Mundy, Sigman, Ungerer, & Sherman, 1986) and that specific training in these skills results in significant gains when targets behaviors are indicated. Numerous commercial programs are currently available to teach social skills strategies to adolescents. In these studies, researchers affirmed the intervention's positive effect on individuals with ASD include research using the SCORE Skills strategy (Webb, Miller, Pierce, Strawser, & Jones, 2004), the Superheroes Social Skills Program (Radley, Ford, B., Battaglia, & McHugh, 2014); the Skillstreaming program (Lerner & Mikami, 2012); SDARI intervention (Lerner & Mikami, 2012; Lerner, Mikami, & Levine, 2011); a virtual environment system (Cheng, Cheng-Li, & Chung-Sung, 2015); The Girls Night Out Model (Jamison & Schuttler, 2017); PEERS (Lordo, et al., 2017) and a Progressive ABA model (Leaf, et al., 2017). Social skills interventions are among the 14 NAC recommended interventions for adolescents and young adults with ASD and are an essential part of wilderness therapy as groups navigate life outdoors.

More recently, researchers demonstrated promising outcomes for a newly “Established” intervention, pivotal response treatment (PRT). Duifhuis, et al. (2017)

found positive results on reducing autism symptoms behavior and ); Verschuur, Huskens, Verhoeven, and Didden (2017) studied staff PRT training and its positive effect on question-asking opportunities for ASD students. PRT appeared on some websites as an intervention technique of the participating programs.

Both the United States and the United Kingdom are currently experiencing movements to provide services in mental health and psychology that are supported by scientific research (Berman & Davis-Berman, 2013). In 1993 American Psychological Association members adopted a report published by the Task Force on Promotion and Dissemination of Psychological Procedures which advocated for empirically validated treatment (Chambless, et al., 1993). In this report, they outlined two main categories of efficacy: well-established treatments and probably efficacious treatments. “Evidence-Based Practice in Psychology” is now the expectation of psychologists in the United States (American Psychological Association Presidential Task Force, 2006).

National Association of Therapeutic Schools and Programs members, in response to this push for finding evidence-based interventions, are striving to build the evidence for efficacy among member programs. With increasing pressures on residential treatment programs to support their use of evidence-based practices and that their services should be considered for coverage by insurance companies, NATSAP members placed a new focus on conducting studies with that mission in mind. One option in therapeutic programs is Outdoor Behavioral Health (OBH) programs, which is a relatively new and growing option in behavioral and mental health.

## **The Growth of Outdoor Behavioral Health Programs**

The research-based, theoretical foundations comprising outdoor behavioral health therapy are an integration of Adventure Therapy (Gass, Gillis, and Russell, 2012), Cognitive Behavioral Theory (Beck, 1967; Ellis, 1962), and Experiential Learning Theory (Kolb, 1984<sup>a</sup>; Kolb, 1984<sup>b</sup>). Additionally, there is some implementation of communication skills training, which varies by program. Researchers have also shown that a family systems approach, such as those recommended by Bowen (1966) and Kerr and Bowen (1988) is also essential to the success of OBH programs, however the family component was not part of this study.

### **Theoretical Foundations**

In Experiential Learning Theory, Kolb (1984) describes four stages of learning: first encountering a new experience, then reflecting upon the experience, then abstract conceptualization in which the learner applies the learning to a new idea, then active experimentation in which the learner tries it out. OBH requires outdoor living and group living, from setting up camp to cooking their own food – all of which are entirely new concepts to most adolescents and young adults who have had a family take care of them up to that point.

OBH also includes some aspect of talk therapy and a frequent choice in wilderness therapy is cognitive behavioral therapy, commonly attributed to both Ellis and Beck. Cognitive behavioral theory (CBT) is an umbrella term for several therapies, but generally assumes cognition (thought), feelings (emotion), and actions (behavior) area all interact together. Specifically, thoughts drive feelings and actions. In the adolescent and young adult developmental stages, thoughts are often skewed by misperceptions, or

cognitive distortions, so CBT therapists address their client's thoughts first. They then encourage them to develop alternate ways of perceiving a situation in order to change the feelings and actions that cause psychological distress (Ellis, 1957; Ellis, 1962; Beck, 1967).

Integrative Adventure Therapy (Gass, Gillis, & Russell, 2012) consists of adventure and experiential activity as a therapeutic tool to develop competence and create autonomous motivation. In essence, it takes the participant to unfamiliar, physical environments (nature), to experience positive stress while living in a small group, encountering new experiences to master and then teaching them to transfer the skills to home life. All while being guided by a solution-focused instructor on a daily life basis with visits from the therapist for prescribed sessions. Daily activities in adventure therapy typically include a hike, setting up camp, meal preparation, and social skill practice.

A model presented by Russell, Hendee, and Phillips-Miller (1999) added that Alone Time, Rites of Passage, Use of Metaphor, and Continuum of Care were important components of the wilderness experience as well. Continuum of care describes differing levels of care providing a spectrum of comprehensive services (Berman & Davis-Berman, 2013)

Unlike the American history of public facilities addressing mental illness which goes back to the 1750s, the outdoor behavioral health concept is a fairly new entry into the field of psychiatry and psychotherapy and defies an easy definition. An amalgamation of camping, therapy, education, and communication training, it has been called by a variety of names, including *Wilderness Therapy*, *Residential Camping*, *Adventure*

*Therapy, Therapeutic Adventure, Experiential Therapy, Outdoor Behavioral Healthcare, Therapeutic Camping, Boot Camps*, and others. According to the National Association of Therapeutic Schools and Programs, the operational definition of OBH is programs that, “Subscribe to a diverse treatment model that incorporates a blend of therapeutic modalities, but do so in the context of wilderness environments and backcountry travel” (NATSAP, 2017). The protocol used in most of these programs include an initial client assessment, developing a client’s individual treatment plan, the use of established psychotherapeutic practices in both individual and group setting, and the use of the outdoors as both setting and therapeutic intervention. As described on the NATSAP website, OBH therapists and counselors employ therapy in the field, which provide, 1) the promotion of self-efficacy and personal autonomy through task accomplishment, 2) a restructuring of the therapist-client relationship through group and communal living facilitated by natural consequences, and 3) the promotion of a therapeutic social group that is inherent in outdoor living arrangements (NATSAP, 2017, Program Definitions, para. 3).

In their text *Family Therapy with Adolescents in Residential Treatment: Intervention and Research*, editors Christenson and Merritts (2017) use the terms OBH and wilderness therapy to refer to programs with licensed clinical staff and a formal program for mental health. The same requirements will be understood for the discussion of the OBH programs in this study.

Figure 2.1 depicts a Venn diagram illustrating the operational domains of a therapeutic wilderness program outlined in a dissertation by Blanchette (2010) that

accurately illustrates how OBH operates in relation to wilderness experience programs and traditional therapeutic programs.

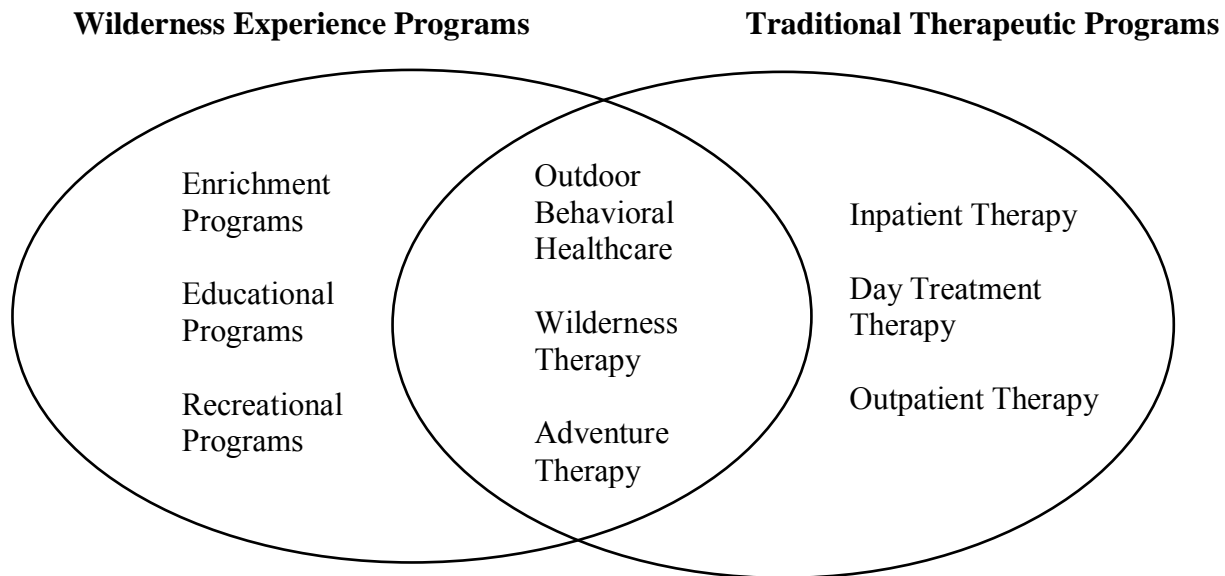


Figure 2.1 *Visual model of the operational domain of therapeutic wilderness programs* (Blanchette, 2010). Used with permission.

### **Historical Foundations**

The first known use of the outdoors as a component specifically for restoring health in the United States dates back to 1901 at the New York Asylum for the Insane when patients with tuberculosis were sent out to live in tents on the hospital grounds in order to reduce the spread of the disease (Roe, 2009). Physicians there are credited as having the first hospital to implement the concept of treatment in the outdoors but their goal of removing the patient from the community appears to be the sole attribute it had in common with modern wilderness therapy.

The concept of “camping” in the outdoors came about when Thomas Hiram Holding, commonly referred to as the “father of modern camping in the United States” advocated for adults and youth to take part in outdoor adventures. His 400-page tome

extolled the virtues of fresh air and being out in nature while giving pragmatic advice on recipes, the best fabrics for tents, and the quickest way to have hot water for shaving (Holding, 1903).

Camping programs for troubled youth began appearing in the mid-1900s, some of which included psychotherapeutic components. The University of Michigan Fresh Air Camp, which opened in 1921, served two purposes: giving “difficult youth” an outdoor venue to learn and grow and giving university students acting as counselors the opportunity to practice skills in social work, psychology, and education, (University of Michigan, n/d, Fresh Air Camp Records: 1922-1979, Para 1).

In 1921, Campbell Loughmiller founded what is now known as The Momentous Institute in Dallas, Texas. Originally titled The Salesmanship Club, his original camp included therapeutic wilderness components of “many real dangers and threats” and immediate natural consequences for behavior that were “immediate and intense” (Berman & Davis-Berman, 1994, p. 50). Loughmiller reportedly stated that successfully confronting danger, built self-esteem, and suffering natural consequences taught the real need for cooperation (Berman & Davis-Berman, 1994). The phrase, “natural consequences” continues in use to this day in the therapeutic industry to teach adolescents that there were no artificial ways of contriving the cause and effect of their actions. For example, failing to bring an umbrella will result in getting wet and is a natural consequence.

Camping clubs and experience-based programs started to appear in schools and universities beginning in the 1950s and their existence continued to grow into the 1970s



(Berman & Davis-Berman, 1994). Kurt Hahn's, founder of the Outward Bound program, was influential in both of these types of programs' development. The Outward Bound Program began in 1941 in Wales as a program to train sailors for their work on the sea rather than preparing them via books in a traditional school (Miner and Boldt, 1981; Outward Bound Organization, 2017). Hahn believed that it was essential to develop both the bodies and minds of students as well as to encourage them to serve within their communities (Miner & Boldt, 1981).

## **21<sup>st</sup> Century Outdoor Behavioral Health**

The current model of wilderness therapy remains an evolution of the Outward Bound program and The Colorado Outward Bound School is still in existence to this day. Outward Bound's goal, "to prepare students of all ages and circumstances with the strength of character and determination they need to thrive – in the classroom, in the workplace, in the family, and in the world" emphasizes challenge, self-efficacy, and leadership (Outward Bound Organization, 2017, para. 3).

Therapists in wilderness therapy, as a whole, focus on building self-efficacy in adolescents through experiential and challenging environments, while adding the component of psychotherapy. In research literature, it can be referred to as Outdoor Behavioral Health (OBH), Wilderness Education Programs, or Adventure Therapy. For the purposes of this study, OBH will be defined as programs that feature "therapeutic assessment, intervention and treatment of problem behaviors, and assessment of outcomes. It involves immersion in an unfamiliar environment, group-living with peers, individual and group therapy sessions, educational curricula and application of primitive

skills such as fire-making and backcountry travel (Russell, Hendee, & Phillips-Miller, 1999, p. 1).

The OBH term is also relatively new. Its official use began in 1996 when the Outdoor Behavioral Healthcare Industry Council (OBHIC) was formed (Russell, 2003; Outdoor Behavioral Healthcare Council, 2014). Three years later, the Council sponsored the creation of the Outdoor Behavioral Healthcare Research Cooperative (OBHRC) for the purpose of “continual evaluation of clinical and behavioral client outcomes to insure that program participants receive the best possible treatment” (Outdoor Behavioral Health Research Cooperative, 2014, para. 3).

Specifically, OBH programs include five components: 1. a group process for adolescents, 2. a series of challenges which increase in difficulty and appear risky to adolescents, 3. are conducted in an unfamiliar environment outdoors, 4. contains one-on-one therapeutic techniques for those involved, and 5. has varied lengths of participation (Russell, 2001, p. 2).

Russell and Hendee (2000) identified four structures of programs described here:

**Contained Expedition Programs.** This program refers to a moving wilderness expedition traveling a planned route. In this program, the clients and the treatment team remain together throughout the entire program. These are typically four weeks or fewer in duration and the guides and therapeutic staff remain with the group for most of the time (Russell & Hendee, 2000).

**Continuous Flow Expedition Programs.** These programs take place in a wilderness expedition format but the leaders and clients rotate periodically. Therapeutic personnel have a set rotation of several days on and then several off. Clients typically

stay in for about eight weeks with new clients joining the more experienced ones later in the program (Russell & Hendee, 2000).

**Base Camp Expedition Programs.** These programs use a structured base camp in a natural environment. Therapeutic activities take place at the base and clients participate in one to two week expeditions beginning and ending here. Typical duration of these programs is between three and eight weeks (Russell & Hendee, 2000).

**Residential Expedition Programs.** These programs are of a longer duration, sometimes lasting a year or more. They can originate in residential treatment centers, ranches, or schools that use the wilderness or outdoor settings for planned, therapeutic activities. Within the year, there are periodic expeditions lasting up to four weeks to address behaviors of the clients while at the center (Russell & Hendee, 2000).

While all part of the OBH programs, some of these models might be termed wilderness camps, challenge camps, or boot camps with the latter being residential placements serving as alternatives to traditional juvenile detention (Tarolla, Wagner, Rabinowitz, & Tubman, 2002). Boot camps, in general, remove offenders from the settings in which their law-breaking occurred in order for them to concentrate on themselves without the distractions and influences within that setting. Key components in “camps” for juvenile offenders include rock climbing, wagon train trips, overnight solo camping, family, group and individual counseling sessions, and group living outdoors (Roberts, 2004). Some programs discussed in this study may enroll juvenile offenders as part of their sentencing, however, boot camps typically implement a military model and, traditionally, use physical and psychological aggression against juveniles.

Researchers of OBH programs find that employing a more therapeutic model has shown mixed or promising results whereas evaluations of military-style boot camps have shown mixed results with less effectiveness in changing youths' behaviors and reducing recidivism back into the justice system (Roberts, 2004). The theoretical foundation behind these wilderness camps is to rehabilitate youth by concentrating on external locus of control, low self-esteem, and poor interpersonal skills while requiring participants to build upon their successes and achievements through the mastery of difficult, physical activities (Wilson & Lipsey, 2000).

To illustrate the prevalence of outdoor programs and the importance of exact definition and purpose of those encompassed in this study, a University of Idaho manuscript by Friese, Hendee and Kinziger (1998) identified more than 700 wilderness experience programs operating in the United States. This manuscript's total, however, included outdoor recreation, education, development, leadership and organizational development programs in addition to those concentrating solely on therapeutic goals.

A similar report estimated that only about 10 percent of all Wilderness Experience Programs were primarily therapeutic (Carpenter, 1998). At present, the NATSAP Directory lists 174 members, of whom 18 identify as being wilderness programs (National Association of Therapeutic Schools and Programs, 2017, Membership Directory).

All programs that were a part of the data collection in this study are either listed as a NATSAP program or as a member of Outdoor Behavioral Health Council in partnership with NATSAP's Practice Research Network (PRN).

Prior to the 1990s, most residential treatment programs would subscribe to one of six theories: psychodynamic/milieu, medical, behavioral, peer culture, emotional growth, or psychoeducational (Lyman, Prentice-Dunn, & Gabel, 1989; Zimmerman, 2004). Residential treatment programs, of which OBH is the outdoor component of those options, are typically not reliant on one theory and strive to provide many therapies and options for clients (Behrens, 2006). Within the industry, weaving multiple theories to produce optimal outcome is known as the “tapestry” approach (Fahlberg, 1990). Of the tapestry approach, Behrens noted, “... the efforts to be responsive to youth and family needs are laudable, [however] leaders in the residential treatment network have issued a call for coherent and up-to-date models of treatment” (Behrens, 2006, p. 33).

### **NATSAP’s Research Efforts**

Researchers on residential treatment have looked at many variables that were theorized to affect outcome. An early study by Hair (2005) on adolescents in residential treatment concluded that “individual characteristics such as diagnosis identified at admission appear to have a negligible association with successful discharge (p. 570).

In 2007, Gass and others announced the formation of the NATSAP Research and Evaluation Network designed to “address the pressure to collect outcome and evaluation data on educational and therapeutic programming (Gass, 2007). The project, funded by NATSAP, included the development of a de-identified aggregate network of data designed to facilitate evidence-based research. Currently, the database holds information on more than 18,000 clients, both adolescents and adults, who entered a NATSAP member program since 2007 (Personal correspondence with M. Petree, 2017). It is from this database that participants of this study were obtained.

The designation of a NATSAP Research Designated Program originated in 2016, to identify programs committed to research and collect data on clients and upload it to the database housed at the University of New Hampshire. Since 2006, with the *Journal of Therapeutic Schools and Programs*, *Journal of Experiential Education*, *Journal of Leisurability*, and the *Journal of Adventure Education and Outdoor Learning*, as vehicles for publishing peer-reviewed research, the number of research studies on alternative behavioral health venues and outcomes has increased.

An early study within the PRN was conducted by Behrens and Satterfield (2011) on 1027 adolescents enrolled in nine participating residential treatment programs. Their results, using the Youth Outcome Questionnaire - Self Report (Wells, Burlingame, & Rose, 1995) and the Child Behavior Check List (Achenbach, 2001) as measures, indicated a decline in youth problems from admission to discharge and for up to one year, post-discharge. The measurement scales measured anxiety/depression, withdrawal/depression, somatic complaints, social problems, thought problems, attention problems, rule breaking behaviors, and aggressive behaviors (Behrens & Satterfield, 2011). These researchers, as well as a study by Tucker, Smith, and Gass (2014) found that outcomes did not vary for participants when examining age. (A similar study by Russell (2002) reported similar reductions of behavioral and emotional symptoms using the YOQ parent and self-reports as a measurement tool and a follow-up study on the same sample of youth conducted two years later found the participants had maintained therapeutic progress (Russell, 2005).

Other studies measuring changes in suicidal ideation, anxiety, substance abuse, social conflict, sleep disruption, depression, violence, impulsivity, hostility, and defiance

were conducted in a coordinated program evaluation of wilderness programs and those researchers confirmed Russell's findings of statistically significant positive changes in both the initial and follow-up measures (Lewis, et al., 2007; Rogers, et al., 2007<sup>a</sup>; Rogers, et al., 2007<sup>b</sup>).

A 2016 study by Tucker, Paul, Hobson, Karoff, and Gass focused on family functioning after a member of the family attended an OBH program. Using the Family Assessment Device and the Youth Outcome Questionnaires for self-reporting and parent-reporting, Tucker et al. found that females in general rated themselves higher on scales prior to enrollment and showed greater change. Other correlations concluded that age was negatively correlated with length of treatment in the program. As YOQ scores improved, the mother's report on youth functioning increased as did family functioning ratings on the FAD. And finally, as youth functioning in treatment increased, family functioning increased regardless of whether mother, father, or youth filled out the rating scale (Tucker, et al., 2016).

Norton (2010) studied individuals who participated in a therapeutic wilderness experience and their outcomes related to depression and psychosocial development. Her findings indicated that after participation in a 28-day canoeing trip, scores of depression were reduced at statistically and clinically significant levels. Participants indicated peer-group counseling, family participation, "being in nature," "challenge and adventure," and personal reflection were the significant program components that helped them. Females participating in the intervention showed greater gains than males.

Wanting to confirm and extend the findings in OBH literature that adolescents change dramatically while in wilderness therapy, Hoag, Combs, Roberts, and Logan

(2006) added scales to measure outcomes related to hope and life effectiveness as well as treatment expectancy and credibility. Their findings showed that these too had significant improvements among participants. (Hoag et al., 2006). In their study, they too found females entered OBH rating themselves with higher levels of dysfunction and a showed a greater response to treatment than males. This phenomenon has been consistent in others' research as well (Magle-Haberek, Tucker, & Gass, 2012; Tucker, Zelov, & Young, 2011; Tucker, Javorski, Tracy, & Beale, 2013; Russell, 2003) however, Roberts, Stroud, Hoag and Combs (2016) found no statistically significant differences between males and females. They acknowledged a small sample of women (n=33) in their study.

Other studies in OBH are finding inconsistent results. Magle-Haberek, Tucker and Gass (2012) found no significant correlation between length of stay, program type, and decreased (improved) outcome scores. However, a second study focusing on both OBH and residential treatment centers found gender, intake functioning, and length of time engaging in adventure therapy in groups were significant predictors of improved scores (Tucker, Smith, & Gass, 2014).

While these researchers found that residential treatment center participants who had reported sexual abuse were more likely to achieve clinically significant improvements than those who had not, they also reported that 40.7% of those enrolled with a learning disability and 43.8% of those with ADD/ADHD did not report clinically significant improvements in residential treatment centers. Additionally, 54.5% of those with learning disability reported no clinically significant improvements in OBH (Tucker, Smith & Gass, 2014).



Bowen and Neill (2013) reviewed adventure therapy outcomes and found that mean age, sample source, race, gender, population, and presenting problem explained only 27% of the variance. These studies indicate the demographic and contextual independent variables in the present study do not appear to have significant effect on outcome scores when taken individually, however none of the previous studies focused on ASD clients specifically. Additionally, many studies listed limitations that prevented broad generalization of its findings.

### **Studies on the Intersection of ASD and Outdoor Camps or Experiences**

Autism Spectrum Disorder includes impairments in the ability to reciprocate social interactions, deficits in verbal and nonverbal communication, and restricted interest of activities and interests (American Psychiatric Association, 2013). Adolescents with ASD are often isolated, bullied, or excluded from group interaction due to their inability to perceive and act upon social cues given by others in peer groups. One major focus of research is to improve the lives of individuals diagnosed with ASDs (Evans & Tissot, 2003).

Social skills deficits are an impairment evident at all levels of the autism spectrum and is a targeted skill that improves in both individual therapy (Koegel and Frea, 1993; Matson et al., 2007) and group therapy (Barry et al., 2003, Kalyva and Avramidis, 2005). However, research shows transferring the skills from a formalized intervention to a more natural environment can prove problematic for ASD children (Ozonoff & Miller, 1995; Rogers, 2000; Barry et al., 2003).

The literature base is growing with examples of natural setting interventions that have proven effective for teaching social skills to ASD individuals that they can

internalize and transfer back to their home (Apel, 2007; Walker, Barry, and Bader, 2010; Brookman et al., 2003; Hung and Thelander, 1978) However the interventions in these examples were as short as four days and as long as only six weeks.

It became apparent there is a dearth of literature on the experiences of ASD adolescents attending any experiential camps after an exhaustive literature search using keyword terms of “autism,” “adventure therapy,” “ASD,” “Asperger’s Syndrome,” “pervasive developmental disorders,” AND “camps,” “outdoors,” “experiential,” “nature,” “outdoor behavioral health,” naturalistic, “or “wilderness, it is believed this is the first specifically examining the experience of individuals with ASD who enroll in any OBH program that is a member of the NATSAP PRN. The paucity of studies addressing this intersection is a curious phenomenon since wilderness programs offer a setting without media, lights, noise, or other sensory-disorienting distractions, allowing focused work on fostering independence, teamwork, and physical challenge necessitating intra-group interaction and communication peers as well as counselors and therapists.

OBH provides an opportunity for clinically-trained and licensed professionals to work with individuals on specific skills to mitigate maladaptive behaviors, including communication and social skills, group functioning, mindfulness/meditation, and other recommended evidence-based interventions within an individual or small group of peers.

According to Vice-Reshel (2017), the integration of Pivotal Response Therapy and Nature Therapy, which she termed *Integrated Nature Therapy*, led to four “themes,” but then stated she had inconclusive findings from her study. She found that of the three participating children who completed the study, all diagnosed with ASD, there was an

increase of desire to play outdoors, a decrease of maladaptive behaviors, and an increase in self-management skills. However, Vice-Reshel noted that there was a reoccurrence of behaviors once the Integrated Nature Therapy interventions ended. There were numerous confounding variables discussed in the study as well and results were inconclusive and non-generalizable with a sample size of three.

Schreiber implemented the Social Skills Improvement Scales – Student Rating Scales (SSIS-SRS) (Gresham & Elliott, 2008) to do pre- and post-test measurements for high functioning autism or Asperger syndrome diagnosed adolescents who participated in a four-day adventure therapy (Schreiber, 2009). She found increased perceptions of self-efficacy and social competency. While a four-day intervention is considerably shorter than the typical eight to 12-week wilderness therapy experience, she examined the concepts of teamwork, physical challenge, and independence theorized to facilitate acceptance of self and acceptance of others, all of which are part of an OBH program. Schreiber's participants were 14 to 18-year-old males, the demographic most represented in OBH enrollments.

Wenninger (2012) explored the effectiveness of an eight-week summer day camp for students diagnosed with ASD. The camp used applied behavioral analysis to decrease maladaptive behaviors and increase prosocial behaviors of the participants. Wenninger used direct observation of the five participants, who ranged in age from seven to nine years old. She found all of the students had decreased target behaviors and increased replacement behaviors, with 65 percent demonstrating moderate change in the intended direction during the eight weeks (Wenninger, 2012). The participants in this study were younger than the age accepted in the OBH programs in this study, but this group size was

comparable to the groups OBH participants are in while enrolled in a wilderness therapy program.

In Snell's (2011) study of 43 participants between the age of five and 18, participants were examined for the effects of a summer therapeutic activities program designed to teach social skills to adolescents with ASD using cognitive behavior therapy and targeting social awareness, motivation, communication, and cognition. Following the 30-day intervention, Snell used the Social Responsiveness Scale (SRS) to measure results and found clinically significant gains, however generalization and maintenance of the gains were not apparent 10 months in her follow-up report. Snell concluded the problem behaviors for many of the participants might be a function of context.

The summer camp studies included several more short-term interventions with moderate rates of success. Hung and Thelander (1978) conducted a three-week study on 18 children, nine of whom were nonverbal. They found 79 percent of them showed 15 percent improvement in the target behaviors.

Kobayashi, Murata, and Yoshinaga (1992) conducted a follow-up study with 201 young adults with ASD who had attended a therapeutic camp with the authors 20 years prior. The researchers' findings demonstrated that although 31.5 percent had shown deterioration in adolescence, 43.2 percent had shown improvement during the same period.

Walker, Barry, and Bader (2010) concluded their study provided preliminary evidence of the positive role summer camps may play in building social skills for children with ASD. Their participants were children age three to seven years old. (Walker, Barry, & Bader, 2010).

## Summary

In this chapter, I reviewed literature on the history of both mental illness in the United States as well as the history of diagnosing Autism Spectrum Disorder and the clinicians who contributed research toward its evolution. It included the subsequent changes to the *DSM* editions and their combined effect on autism diagnoses as well as co-occurring diagnoses and their prevalence. I then reviewed the quality of care in mental health as well as mental health policy and law. Literature on NATSAP, Practice Research Network, and the Outdoor Behavioral Health origins were discussed. Research-based therapeutic interventions for ASD adolescents and outdoor behavioral health outcomes studies were discussed.

In the next chapter, I will outline the design of the study and methodology of the study.

## CHAPTER THREE

### METHODOLOGY

#### **Introduction**

In Chapter Three, I present the analysis of data for this exploratory, quantitative research study based on the dataset of clients with autism spectrum disorder (ASD) enrolled in an outdoor behavioral health (OBH) program. This multi-step, secondary analysis design used data from 139 adolescents and 64 adults on a pre-existing dataset made available from the National Association of Therapeutic Schools and Programs (NATSAP) Practice Research Network (PRN). I examined the outcomes of ASD clients to discern growth scores and further analyzed 20 variables using cluster analysis to attempt identification of variables that affected outcome scores. This chapter is organized into four sections: (a) setting, (b) selection of participants, (c) data collection, (d) instrumentation, and (e) data analysis and attempts to answer the following research questions:

1. Is there a statistically and clinically significant change for adolescent and young adult clients with ASD attending an OBH program; is that change comparable to those in a generalized, nonspecific sample?
2. Do clusters allow us to predict outcome score categories for those individuals with autism who experience an outdoor behavioral health program intervention?

Following initial analysis, a third research question emerged necessitating post hoc analysis, that will be discussed in Chapter Five.

Specifically, I examined the clustering tendencies which occurred between demographic characteristics, co-occurring diagnoses reported as reasons for referral,

staff-reported percentage of program completion and benefit to client, increase or decrease in exercise pre-intake to discharge, and the client's perceptions regarding quality, effort, and problem abatement with regard to his or her experience.

Paired t-tests were performed to study the effect of an OBH intervention on individual's outcome scores as well as other intake and discharge questions indicating change from beginning to end of program were performed. Hierarchical agglomerative clustering (HAC) was then used to visually represent how nominal, continuous, and ordinal variables clustered to determine if there were patterns that emerged to best predict an individual's outcome score.

I selected exploratory research design because, when conducted, the researcher is willing to change direction as a result of revelation of new data and new insights (NIST, 2018). Additionally, I found little research on the intersection of OBH and ASD in my literature search, so an exploratory study of this intersection, rather than conclusive research, was more appropriate as a design.

There was a multi-step process utilized to examine the multiple types of variables available in the dataset. The steps taken included 1. cleaning data to determine age, disaggregate reasons for referral, calculate changes in exercise patterns, and partition scores into adult and adolescent groups, 2. performing paired t-tests to determine change in scores 3. uploading variables into JMP software's hierarchical agglomerative clustering analysis to examine patterns, 5. disaggregating clustering tendencies into Recovery, Improvement, No Change, and Deteriorated categories.

## **Settings**

The settings for this study were multiple outdoor behavioral health programs which identified “wilderness therapy” as their membership category in the directory of the National Association of Therapeutic Schools and Programs (NATSAP Membership Directory, 2017). There were 18 OBH programs with ASD adolescents and young adults enrolled who reported data to the NATSAP Practice Research Network (PRN) all of whom were located in the United States. Table 3.1 illustrates the specific locations, ages accepted, and gender/group arrangements of the individual programs which provided data.

Overall, there were two programs located in the northeast region of the United States, one located in the southeast, one in the midwest, and one a Pacific island. The remaining 10 were located in the western region – either north or south – but all located in or near the Great Basin geographical region.

This study was not meant to compare programs and their success rates, so individual programs will not be discussed from this point. However, each program’s website was compared to a 10-item rubric created by Dr. Michael Gass for identified best practices in research in the OBH industry (Gass, Gillis & Russell, 2012). The rubric can be found in Appendix K. Additionally, membership in the NATSAP organization requires review by an Ethics Committee comprised of multiple sites’ Executive Directors or other high-ranking program employees to ensure program fidelity to NATSAP’s Mission, Vision, and Ethical Principles (NATSAP Home Page, 2017).



Table 3.1

*Participating OBH Program Information*

Program	Ages of Population Served	Location	Genders and Group Arrangements
Alpha	0-26	Illinois	Male/female, unspecified grouping
Beta	12-31+	Arizona	Male/female in single gender groups
Gamma	13-28	Utah	Co-educational
Delta	11-17	Idaho	Male/female in single gender groups
Epsilon	12-18	Georgia	Male/female in single gender groups
Zeta <sup>1</sup>	13-YA	Utah	Adults co-educational, single gender boys age 13-17
Eta	13-30	Oregon and Utah	Co-educational
Theta	18-35	Utah	Male
Iota	12-25	Oregon	Male/female in single gender groups
Kappa	13-28	Colorado	Co-educational
Lambda	13-17	Utah	Co-educational
Mu	13-24	Hawaii	Co-educational
Nu	13-17	Utah	Co-educational
Xi	13-17	Utah	Male/female in single gender groups
Omicron	13-19	Maine	Co-educational
Pi	10-17	North Carolina	Male/Female in single gender groups
Rho	14-22	Vermont	Co-educational
Sigma	13-26	Oregon	Co-educational

<sup>1</sup> Program is not a NATSAP member, but is an OBHC member and participates in the NATSAP PRN

## **Selection of Participants**

For this Clemson Institutional Review Board (IRB) approved study, a convenience sample ( $N = 203$ ) was drawn from an existing data set gathered between February 2013 and November 2017 by the National Association of Therapeutic Schools and Programs (NATSAP) Practice Research Network (PRN). The PRN is maintained in partnership with the University of New Hampshire (Young and Gass, 2008). In February 2018, the database contained anonymized information for more than 18,000 clients who enrolled in a therapeutic program. At intake, these clients consented to their information being made available to researchers who requested use of the database.

The first step in selecting participants from the dataset was to search primary, secondary, and tertiary reasons for referrals to identify those patients who had a diagnosis associated with Autism Spectrum Disorder. Since data collection began in 2009, there were two editions of the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* each with significant changes in diagnostic criteria and coding from previous editions: the DSM-IV-Text Revision and the DSM-V (APA, 2000; APA, 2013).

I addressed these significant differences in the literature review, and it was important to be cognizant of those changes in selecting participants. In order to ensure all clients with ASD were found within the large database, the search terms I used were "social," "Asperger," "ASD," or "PDD," and the diagnostic codes "315.39," "299," "F80," and "F84" (American Psychiatric Association, 2013; American Psychiatric Association, 2000; World Health Organization, 2016).

In order to winnow data to only those clients, with Autism/Asperger's or Autism Spectrum Disorder (ASD), I ruled out Social Anxiety (DSM 300.23) or other elicitations of social issues symptoms, including "social anxiety," "social skill deficits," "social awkwardness," "social skill issues," "difficulty in social situations," "social exclusion or rejection," "social phobia," if there was no mention of Asperger's Disorder, Autism, or Autism Spectrum Disorder also indicated.

Notations of social skill issues with accompanying secondary or tertiary reasons for referral that included "rigid thinking" or "rigid behaviors" were included. Notations indicating "develop social skills" or "overcome social struggles" as reasons for enrolling the client, the client's data were excluded. While it was possible that these comments would indicate a client with an undiagnosed ASD diagnosis, they were excluded as participants for lack of specificity.

I next eliminated all data contributed from a therapeutic school, residential treatment center, aftercare program, or Educational Consultant member. This study only focused on participants enrolled in an Outdoor Behavioral Health program.

Once all possible participants were identified, I separated adolescent data from adult data for analyses. Adults in OBH programs answer an adult version of the instrument measuring outcomes scores while adolescents answer a youth version, therefore analyzing their scores in aggregate would have negatively affected the rigor of the study.

Finally, I excluded those participants who lacked a paired intake and discharge outcome score. With an initial participant count of 180, I made a second request for data from the NATSAP Program Research Network. In January 2018, a second dataset of

18,424 clients comprised of 767 with ASD indicated as a primary, secondary, or tertiary reason (4%) became available. Similar cleaning of this dataset resulted in 203 clients, including the 180 in the original dataset from 2017. The participants with paired admission and discharge scores included 139 adolescents and 64 adults, all of whom had a diagnosis of Autism, Autism Spectrum Disorder, or Asperger's Disorder, dependent upon the *DSM* version used at intake.

The demographic breakdown of participants were 82.8 percent males for Adults, 87.5 percent males for Adolescents. Ethnicity was 85.7 percent Caucasian in total.

### **Data Collection**

I employed quantitative methodologies of data collection and analysis and I performed a secondary analysis in this study. The data were obtained from OBH clients enrolled between January 2009 and January 2018. The outcome measures were gathered using a research-based, clinical tool used for tracking progress at intervals during an intervention and post-intervention to track sustainability of progress. In addition to these validated instruments, other data were collected using NATSAP PRN background questionnaires completed by staff at intake and discharge (e.g. reason for referral, gender, date of admission, date of departure, completion of program, sexual or physical trauma, and client condition at end of program). Clients also contributed data on a questionnaire at intake and discharge, (exercise habits, effort into program, problem abatement, program quality, birth order). Although some clients had post-discharge data available from six and/or 12 months after their discharge, only the intake (pre) score and discharge (post) score were used. Missing data points were left unknown; no effort was made to estimate possible values. Table 3.2 illustrates the 20 variables analyzed in this

exploratory study and its type, whether continuous, nominal, or ordinal, and the number of levels for each variable.

Table 3.2

*Variables analyzed in the Individuals with ASD enrolled in OBH programs dataset by type continuous (C), ordinal (O), and nominal (N), and number of levels. (n).*

Predictor Variable		Predictor Variable		Predictor Variable	
Age	O(7)	Anxiety Issues	N(2)	% Completion of program	O(5)
ADD/ADHD Diagnosis	N(2)	Client witness or experience Physical Abuse	N(2)	Change in Physical Activity while in Program	O(9)
Gender (Male, Female, No Indication)	N(3)	Client witness or experience Sexual Abuse	N(2)	Client perceived Quality of Treatment	O(5)
ODD	N(2)	Staff reported Client Condition at Discharge	N(5)	Client Perceived Effort into Program	O(5)
PTSD Diagnosis	N(2)	Depression or Mood Disorder Diagnosis	N(2)	Client Description of Problems Discharge to Admission <sup>1</sup>	O(5)
LD Diagnosis	N(2)	Alcohol/Substance Abuse Referral	N(2)	3 or More Diagnoses	N(2)
Ethnicity	N(7)	Birth Order	O(5)		

<sup>1</sup> Data unavailable for adult participants.

## **Client Demographic Data**

Participants' demographic data obtained from questionnaires at intake and used as predictor variables included age, ethnicity, gender, and birth order. These data were obtained at intake.

**Birth date/age – staff reported.** Using birth dates and date of admission, the age of the participant was computed as an ordinal value. Because there were two versions of Outcome Questionnaires utilized at programs, clients older than 18 were separated into an adult dataset. I checked for fidelity in the administration of the exams and found that even those clients who were only a few days away from their 18<sup>th</sup> birthday were administered the adolescent version. Data were then analyzed separately as an ordinal variable since the mean of their ages was not relevant in any of the analysis.

**Gender – staff reported.** Staff indicated whether the client was male or female. One participant left blank was designated “Unknown” for a third level.

**Birth order – client self-reported.** Clients were asked at intake the number of siblings they had and their birth order among the siblings. Birth order was included as an ordinal variable of study.

**Ethnicity.** Data on ethnicity of the client enrolling and the data were uploaded as demographic information. For adults, it was self-reported. For adolescents, the information was obtained from a parent(s) or staff questionnaire. There were three clients for whom conflicting or no data were entered who were subsequently placed in “unknown.”

## **Client Contextual Data from Surveys**

Data on participants that was contextual to their experience before or during the intervention were obtained from on both the staff and client questionnaires, either at intake, at discharge, or both. Variables and from whom the data were collected are described below.

**Exposure to physical or sexual abuse – staff reported.** Whether the client had been a witness to or had experienced two types of abuse, sexual or physical, was indicated on the intake survey completed by staff. It was not indicated whether the staff asked the client or a parent for the information. Three levels included yes, no, or unsure.

**Referring diagnoses – staff reported.** Staff noted on the intake questionnaire the reasons for referral, which included ASD as a primary, secondary or tertiary as well as other co-occurring *DSM* diagnoses of attention deficit disorder/attention deficit hyperactivity disorder (ADD/ADHD), anxiety issues, learning disability (LD), post traumatic stress disorder (PTSD), oppositional defiance disorder (ODD), depression or mood disorder diagnosis, alcohol or substance abuse by the client, or a choice of “Other.” An additional question on the staff intake questionnaire required a yes or no response to whether the client had three or more diagnoses total (ASD plus two or more others).

**Change in exercise pre-intake to discharge – client self-reported.** Participants were surveyed on the frequency of 30-minutes of physical activity they engaged in per week when considering the two months prior to intake. Response choices were “Never,” “Once a week or less,” “A couple of times a week,” “Most days of the week,” or “Every day” and considered ordinal data. Participants were again surveyed on the frequency at

discharge with the same responses. Change in categories was ranked from -4 to +4 to indicate decrease and increase in levels, for a total of nine levels.

**Quality of treatment – client self-reported.** Participants were asked about their satisfaction with the quality of treatment they received while in the program on their discharge surveys. Responses included “Very dissatisfied,” “Somewhat dissatisfied,” “Neutral,” “Somewhat satisfied,” or “Very satisfied.” Quality of treatment was an ordinal measurement.

**Effort into program – client self-reported at discharge.** At discharge, participants were asked about the amount of effort they put into the program. Their response choices were “No effort,” “Little effort,” “Average effort,” “Above average effort,” and “Maximum effort.” Effort was analyzed as an ordinal measurement.

**Description of problems – client self-reported.** At discharge, participants were asked to describe their problems in relation to when they began the program. Responses included “Much better,” “Somewhat better,” “The same,” “Somewhat worse,” and “Much worse.” Description of problems was an ordinal measurement.

### **Program Contextual Data**

Staff were surveyed at discharge on the participant’s percentage of completion of the program as well as the client condition at discharge. Responses were ranked as ordinal measurements. These variables were cross-checked for validity so that a client who completed less than 25 percent of his or her program was not indicated to have graduated.

**Percentage of program completed – staff reported.** The staff SQ-D surveyed whether the client completed the designated length of the program. Program contextual



data included the date of arrival, and date of departure for the participant, so exact length of stay could have been determined. However, since each program had varying typical lengths of treatment, the more reliable piece of information provided by staff was what percentage of the program each participant completed. Staff could indicate “less than 25 percent,” “25 percent,” “50 percent,” “75 percent,” or “100 percent” completion of program. These were considered ordinal measurements.

**Client condition at discharge – staff reported.** Staff were also asked about their perception of Client Condition upon discharge. Response choices included “Maximum benefit/graduation,” “Premature, against staff recommendation,” “Premature, with staff recommendation,” and “Transfer to another program.” Condition was analyzed as a nominal measurement.

### **Response Variable**

Since this was an exploratory study, the *predictor* or *factor* variables were analyzed and tested for their effect on the *response* variable. The response variable under study was the change in outcome score from pre-OBH intervention to discharge after intervention, obtained via paired t-test analysis. The response variable was analyzed as a nominal Clinical Change Category based upon a clinical cut-off score and the Reliable Change Index reported in the scoring manuals of the outcome questionnaires (Wells, Burlingame & Rose, 2003; Lambert, Kahler, Harmon, Burlingame, Shimokawa, & White, 2013) and derived by Jacobson and Truax (1991).

### **Instrumentation, Validity, and Reliability**

The research design used in the study was an exploratory design which included the use of outcome tools, surveys and JMP Software. JMP is a statistical discovery

software developed by SAS, a private research institution specializing in data analysis software (Sall, Lehman, Stephens & Creighton, 2014). Part of JMP's capabilities is to examine data, discovers patterns, and fit models to data for analysis, which is fundamental to exploratory analysis. In addition, JMP provided statistical testing models to determine effect size and make inferences from the sample to population.

### **Youth Outcome Questionnaire (YOQ-2.0-SR®)**

The YOQ-2.0-SR is a 64-item self-report completed by clients 12-18 who are receiving mental health treatment. It measures treatment progress for children and adolescents receiving a mental health intervention to track change in functioning. The YOQ-2.0-SR measures interpersonal distress, somatic, interpersonal relationships, social problems, behavioral dysfunction, and critical items. The range of scores for all subscales is negative 16 to 240 and high scores represent a more clinically distressed client (Burlingame, et al., 1999). The clinical cutoff score is 47 for this self-report inventory. As with the adult questionnaire, only the Total score change was analyzed. Although not discussed in the YOQ-2.0-SR Scoring manual, Jacobson and Truax's (1991) score classifications of Recovered, Improved, Unchanged, and Deteriorated were verified as applicable to this questionnaire as well (C. Bowers, personal communication, March 28, 2018).

**Validity and reliability.** The YOQ-2.0-SR is established as a valid and reliable measure of adolescent psychosocial functioning (Ridge, Warren, & Burlingame, 2009). Its reliability was tested using Chronbach's alpha on a sample of adolescents and the Total Score had an internal consistency estimate of .96 across three age groups (Wells, Burlingame, & Rose, 2003). Jacobsen and Truax's cutoff score formula and RCI apply to

this test as well, and the cutoff score is 47. The YOQ-2.0-SR was also tested for Sensitivity and Specificity and scored .66 and .74 using Chronbach's alpha respectively, however, the authors note it was not designed for nor should be utilized for screening to identify clinically significant patients, rather it should be considered a tool for measuring change (Wells, Burlingame, & Rose, 2003). Samples of YOQ-2.0-SR® questions can be found in Appendix C.

### **Adult Outcome Questionnaire (OQ-45.2)**

For adults entering a PRN wilderness program, the 45-item Outcome Questionnaire is filled out at intake and again at discharge by the client. The Outcome Questionnaire includes subscale measurements for Symptom Distress, Interpersonal Relations, and Social Role. Outcome measures have a central purpose of “defining normal functioning, dysfunction, and meaningful change (Lambert, Kahler, Harmon, Burlingame, Shimokawa, & White, 2013, p. 33). Clinically significant scores indicate that a patient's individual functioning changes meaningfully following a psychosocial or medical intervention. It is considered a valuable measurement in research due to its ability to classify each individual patient's status with regard to normative functioning as opposed to group averages or between-group comparisons (Lambert et al., 2013).

The range of scores for all three subscales is 0-180 with 63 being the cutoff score indicating a problematic number of symptoms, interpersonal difficulties, and dissatisfaction with quality of life. There are four critical items probing suicide, substance abuse, and violence that require a follow-up clinical interview for any answer other than zero (Lambert et al., 2013).

While the three subscales also have clinical cut-off scores and reliable change indices (RCI), only the total score change was used for this study.

**Validity and reliability.** The OQ-45.2 is established as a valid and reliable measure of adult psychosocial functioning (Beckstead, Hatch, Lambert, Eggett, Goates, & Vermeersch, 2003). Test-retest reliability was assessed using a sample of 157 students and found to be .84 using Pearson product-moment correlation coefficient (Cohen and Cohen, 1993). Internal consistence was also calculated on a sample of 298 patients and was found to be .93 using Cronbach's alpha (Cronbach, 1951).

Concurrent validity was calculated using Pearson product Moment Correlation Coefficients (Cohen & Cohen, 1983) and scored between .66 and .88 when compared to 11 other counterpart surveys (Lambert et al., 2013).

The proposal for clinically significant change was suggested by Jacobsen and Truax (1991) using a two-step criterion: first to determine a cutoff score determined by a weighted midpoint between the means of a functional and dysfunctional sample (Jacobson, Roberts, Berns & McGlinchey, 1999) then to determine a reliable change index computed from the difference between pre and post test scores divided by a standard error of difference formula, then multiplied by the z-value of the significance level desired. Beckstead et al. (2003) validated the cutoff scores by comparing concordance rates with cutoff scores based on other measures of psychotherapy outcome.

These two criteria classify individuals as "Recovered," (i.e. passed both cutoff and RCI criteria), "Improved," (i.e. passed RCI criteria but not the cutoff), "Unchanged," (i.e. passed neither criteria," or "Deteriorated," (i.e. passed RCI criteria but towards a worsening direction) (Lambert et al, 2013, p. 34). These classifications were used as

nominal categories for analysis. Table 3.3 summarizes the RCI and cutoff scores needed for nominal categories of adolescent and adult data. Sample questions for the OQ-45.2® are available in Appendix D.

Table 3.3

*Change scores and clinical change classification*

<b>Age</b>	<b>RCI</b>	<b>Cutoff Criteria</b>	<b>Clinical Change</b>
Adults (18+ years old)	RCI $\leq$ -14	63 or below	Recovered
Adult	RCI $\leq$ -14	64 or above	Improved
Adult	RCI 0-13	64 or above	Unchanged
Adult	RCI $\geq$ +1 or more	64 or above	Deteriorated
Adolescent ( $\leq$ 17 years old)	RCI $\leq$ -18	46 or below	Recovered
Adolescent	RCI $\leq$ -18	47 or above	Improved
Adolescent	RCI 0-17	47 or above	Unchanged
Adolescent	RCI $\geq$ +1 or more	47 or above	Deteriorated

**NATSAP PRN Adolescent, Adult, and Staff Questionnaires**

The NATSAP PRN Questionnaires were used to collect data from staff members and their clients who were enrolled in 18 OBH programs across the United States. The data were collected by staff on the Staff Questionnaire Intake and Discharge (SQ-I and SQ-D), the Adult Questionnaire Intake and Discharge (Adult-I and Adult-D), and the Adolescent Questionnaire Intake and Discharge (AQ-I and AQ-D). Sample questions from these data gathering tools are available in Appendices E-J.

**Validity and trustworthiness.** When using a self-report survey, the assumption is that all participants answer truthfully and that the data is valid and trustworthy given that assumption (Vogt, 2007). To potentially confound the issues of validity in self-reporting, all of the participating clients had a diagnosis of autism spectrum disorder which is often accompanied by inability to detect social cues and deficits in pragmatic language skills. This may be a limitation in the self-reported results. However, the surveys asked direct questions of the clients and avoided vague terminology that might cause errors, such as *think* or *might*, which increased the likelihood of comprehension of the questions on the survey.

### **Data Analysis**

Quantitative methodologies of data analysis included paired t-tests, hierarchical agglomerative cluster analysis, and visualizations for observation of clustering tendencies, and statistical analysis using Chi-Square tests. There were several steps required for data analysis and additional analyses were added post hoc as results from initial probes and a 2018 research study became available (Curtis, Briggs & Behrens, 2018).

The first step was preprocessing the data, which included determining age at admission for each of the clients, partitioning information on their co-occurring diagnoses into Yes or No responses, and calculating an increase or decrease in exercise pre- and post-admission. The next step was organizing the resulting variables for comparison to Clinical Change Categories. However, obtaining client-reported change in scores for assignment to a category was necessary and occurred via paired t-tests.

### **Paired t-tests and Chi-Squared tests**

Calculating change in exercise required a non-randomized, single group design using paired t-tests (pre-post) to analyze exercise data on the Adult Q-I and Q-D and Adolescent Q-I and Q-D. T-tests were also used to analyze outcome data (pre-post) on the YOQ-2.0-SR and the OQ-45.2 from intake to discharge. A Chi-squared test to find statistical significance of change on the outcome scores was then applied.

**Change in physical activity.** Using the responses on the amount of physical activity clients engaged in during the two months prior to intake and the amount of activity the clients engaged in during the OBH intervention, change scores were calculated between the levels. The increase or decrease was included as an ordinal variable of study with a range of -4 to +4, indicating an increase or decrease in movement between levels of responses (i.e. A change of +2 might indicate a change from “once a week or less” to “most days of the week.”)

**Outcome scores.** To determine change in Total Score on the two outcome questionnaires, participants were administered one at admission and one at discharge from the program. Change in score was calculated, whether positive or negative, and scores were compared to Jacobson and Truax’s clinical cutoff scores to determine a growth category of change. Possible categories to be assigned were discussed above in table 3.3

### **Hierarchical Cluster Analysis**

Used as an initial analysis technique, hierarchical clustering analysis is capable of forming clusters using high numbers of multivariate data in nominal, ordinal, continuous,

or binary form. Given its utility in analyzing large datasets, 20 variables were included for exploring clustering tendencies by Clinical Change Categories.

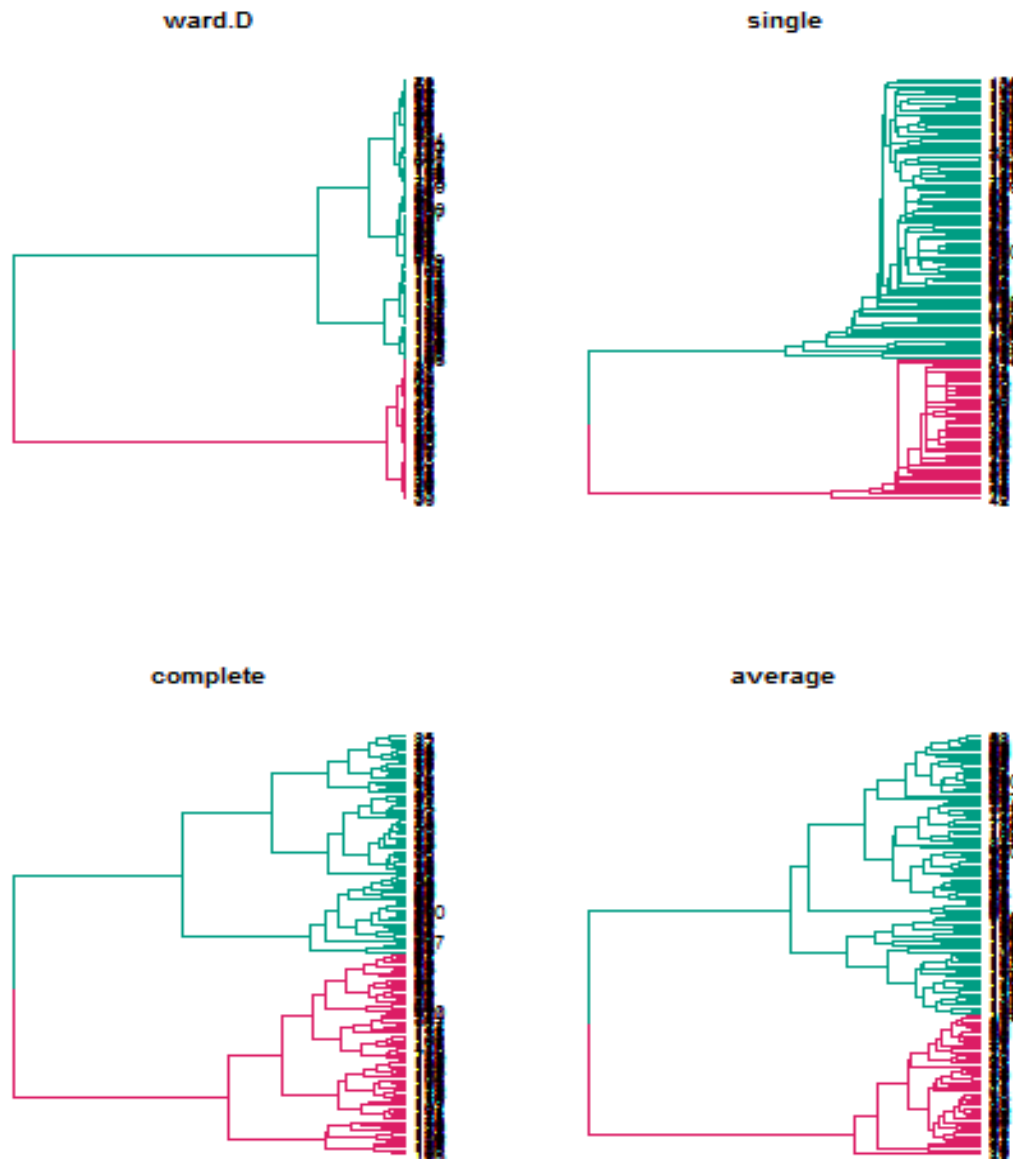
Cluster analysis is a technique for multivariate comparison that groups data into clusters of shared similar traits. According to Bridges, “Hierarchical cluster analysis produces a unique set of nested categories or clusters, by sequentially pairing variables, clusters, or variables and clusters ... that pair producing the highest average inter-correlation within the trial cluster is chosen as the new cluster” (Bridges Jr., 1966). Concisely, “The purpose of cluster analysis is to discover a system of organization observations where members of the group share specific properties in common” (Yim & Ramdeen, 2015, p. 8) The goal of clustering is to partition data into clusters so that the contextual variables within a group are as similar as possible to each other, and as dissimilar as possible to the observations in other groups.

**Visualizations.** Hierarchical cluster analysis was first introduced in the sciences by biologists and ecologists interested in analyzing similarities and differences among organisms (Bridges Jr., 1966; Sokal & Sneath, 1963). The pair-group method, introduced by Sokal and Michener (1958) displays nested categories in a tree graph, or dendrogram. Figure 3.1 is an example of four dendrogram visualizations on animal characteristics using different types of Linkage methods. Linkage methods will be discussed further in Distance Measures, but this figure demonstrates the variation in dendrograms that can result using different distance measure options.

**Applications.** In an article on the practice of cluster analysis, Kettenring (2006) reviewed 2000 studies to discuss the range of applications for cluster analysis. Its utility



has spread over the past 35 years and there are many specialty books on cluster analysis, including applications in ecology, geohydrology, archaeology, deoxyribonucleic acid



*Figure 3.4* Examples of dendrograms on the same dataset using Ward D, Single, Complete, and Average Linkage methods. Retrieved from:  
[https://cran.rproject.org/web/packages/dendextend/vignettes/Cluster\\_Analysis.html](https://cran.rproject.org/web/packages/dendextend/vignettes/Cluster_Analysis.html) #similaritydifference-between-various-clustering-algorithms

(DNA) testing, and data mining in business applications. As Kettenring explains, “The focus is on characterizing group differences and assigning ‘unknowns’ to one of the known groups (2006, p. 4). Kettenring’s review yielded a range of diverse applications, including classifying and clustering aquatic plants (Kim, Shin, and Choi, 2003), disease co-occurrences in American Indian elders (John, Kerby, and Hennessy, 2003), media usage patterns and their audience in the Dutch population (van Rees & van Eijck, 2003), chromatography which reduced complex mixtures to their basic components (Le Mapihan, Vial, and Jardy, 2004; Borges, Lope, Pereira, Cabrera-Vique, & Seiquer, 2017), archaeology to identify similarities in pottery sherds from six sites in Japan (Hall, 2004), and genetic similarities in purebred domestic dogs (Parker et al., 2004).

The study in behavioral sciences examining juvenile offender personality traits had similarities between behaviors of its participants and those in my study, including disruptive behaviors, social behaviors, depression, and anxiety (Stefurak, Calhoun, and Glaser, 2004). Three studies with extremely high numbers of data included one on personality traits from 36 cultures around the world that analyzed 28,000 responses (Allik and McCrae, 2004), a study on human embryonic stem cell similarities with more than 10,000 profiles (Sperger et al., 2003), and one using data from NASA’s Earth Observation with millions of data points (Braverman, Fetzer, Eldering, Nittel, & Leung, 2003), all illustrating that cluster analysis was capable of analyzing large databases with mixed types of variables.

Yim and Ramdeen (2015) observed that “Although [cluster analysis] has been employed in the social sciences, it has not gained the same widespread popularity as it has in the natural sciences” (p. 9).

For early cluster analysis to occur, each individual’s data would be plotted onto an x,y plot with interval-scaled variables on objective quantities. Next, the Euclidian distances between the objects would be calculated and transferred to a matrix of dissimilarity. At this point, successive pairings of all the plotted objects would occur to join existing clusters or create new clusters – all by using an algorithm seeking out the nearest neighbor from the data on the matrix (Kaufman & Rousseeuw, 1990)

**AGNES.** Agglomerative clustering begins with individual cases and finds homogeneous qualities to cluster them together (Wilmink & Uytterschaut, 1984). An example of agglomerative clustering or nesting (AGNES) would be tens of thousands of individual male and female students with differing ages and sexes, heading to their first morning class. Using AGNES, these students could first be combined in groups by teacher, then grade, then school, then district, then state, with each step adding a variable that each member possesses, until all participants belong to one group.

**DIANA.** Conversely, divisive hierarchical analysis (DIANA) begins with every case in one large cluster and separates the groups into clusters until each case is an individual (Wilmink & Uytterschaut, 1984). This method is used to determine components of a solution and other similar analyses seeking to identify parts of a whole.

Both agglomerative and divisive hierarchical cluster analysis are unique among data reduction techniques because they have the ability to identify groups without prior knowledge of what the group membership will be, how many possible groups will be

formed, or to how many individual classifications the original group can be divided (Yim & Ramdeen, 2015).

The methodology which allowed me to iteratively pair 203 clients with 20 variables then group them into homogeneous groups that differ from each other until all are merged into one group was *agglomerative hierarchical cluster analysis* or HAC. Agglomerative clustering provides an “interpretable visualization of the algorithm and data” and has gained popularity as a useful summarization tool (Blei, 2008, Slide 7). Two caveats on HAC are that “different decisions about group similarities can lead to vastly different dendrograms” and that the dendrogram will impose a hierarchical structure on all data, even on data for which structure is not appropriate (Blei, 2008, Slide 11). For these reasons, I implemented several iterations of HAC to test which visualization provided the most obvious clustering on its heat map in order to identify variables for further analyses.

The process for HAC is performed in three steps: 1. preprocessing the data, 2. choosing the algorithm to assist in identifying clusters, and 3. assessing the results (Bridges, 1966). The preprocessing of data was discussed earlier in this chapter. To complete step two, modern, software-analyzed agglomerative HAC requires the researcher to make two algorithmic choices: the measurement of distance between cases and the type of linkage between clusters (Bratchell, 1989).

**Distance metrics.** Within HAC, a researcher decides which statistic will be used to calculate distance, or similarity, between the elements in the study. These formulas will influence clustering because elements or variables may be close to one another using

one distance measurement and farther away in others. The resulting dendrogram visualization changes accordingly.

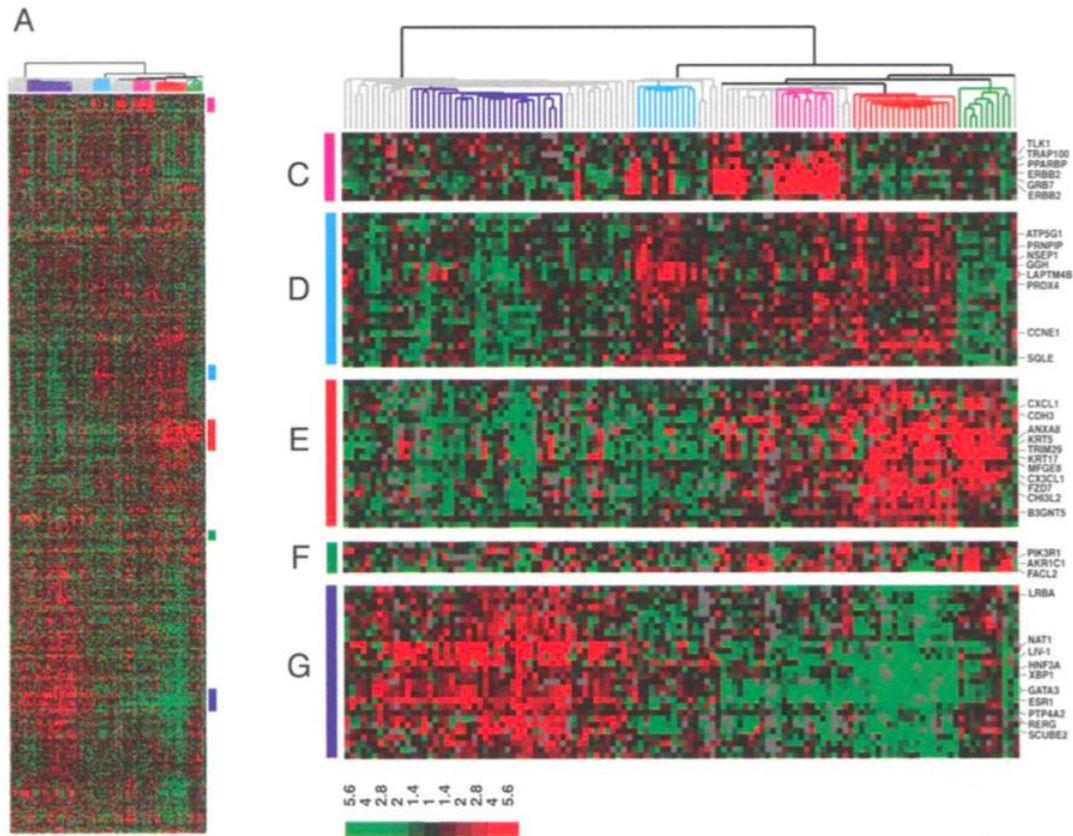
Commonly used metrics for hierarchical clustering, those formulas measuring the distance between the elements, include Euclidean distance, Squared Euclidean distance, Manhattan distance, or Maximum distance. For non-numeric data, the Hamming distance or Levenshtein distance are often used. For health psychology research, Euclidean distance or the squared Euclidean distance are common (SAS, 2015). The JMP® software chose distance method without prompting and it likely defaulted to GOWER method because of its ability to handle all levels of measurements, nominal or numerical (SAS, 2015, p. 2298).

**Complete linkage method.** Complete linkage defines the distance between two clusters by determining the largest distance that can be found between pairs of cases. As such, it can also be referred to the furthest neighbor or maximum method.

Since cluster analysis categorizes a set of objects into subsets using exploratory and unsupervised learning, it was useful to overlay the categorical labels suggested by Jacobsen and Truax (1991) with regard to the RCI and cutoff scores. To assume there was a clinical effect, the OQ 45.2 intake to discharge Total Score needed to decrease by 14 or more points and for the YOQ-2.0-SR, the Total Score needed to decrease by 18 or more points. For both adults and adolescents, all 20 variables were uploaded in aggregate and results were disaggregated by Category for comparison. This will be explained further in Chapter Four.

**Heat maps.** Another step I used to identify clusters within data was the application of heat maps to the dendrogram visualizations. This step further highlighted

clustering tendencies in the analysis. An example of a heat map applied to samples of 115 malignant breast tumors and their 534 expressions of DNA of breast tumor is shown in Figure 3.2 and clearly shows clusters of genes in red areas for each type of tumor (Sorlie, Tibsharani, Parker, Hastie, Marron, & Nobel, et al, 2003)



*Figure 3.5* Sample visualization of a heat map enhancing a dendrogram in a hierarchical analysis study that enabled researchers to identify breast tumor subtypes by biologically distinct disease entities (Sorlie et al., 2003). Clusters of green and red helped researchers identify those entities.

### Statistical Analysis

The final stage of analysis required was inferential statistics. Though hierarchical analysis has become a popular choice for exploring large datasets and producing

excellent visual representations of clustering using nearest neighbor techniques, it is not as useful to assess the statistical significance of a hierarchical partition. Kimes, Liu, Hayes, and Marron (2017) proposed a Monte Carlo based approach for testing statistical significance in hierarchical clustering which addressed these issues, however, JMP's capabilities do not extend to this new analysis.

The dendrograms were useful in highlighting variables that clustered together within score categories, however, I determined another type of analysis would be necessary to further examine variables which appeared to cluster in order to determine the statistical significance and prediction value of each variable. A post hoc analysis was added to my study using multinomial logistic regression to compare categorical variables and will be discussed in Chapter Five.

### **Summary**

In this chapter, I restated the purpose of this research and presented the methodology for answering the research questions. The variety of settings of the wilderness programs were discussed. The types, validity and reliability of the instruments were presented. I then discussed the data collection procedures and responses. Next, paired t-tests, Chi-squared tests, agglomerative hierarchical cluster analysis, the dendrogram, and heat map visualizations were explained. Finally, statistical analyses methods employed to determine effect and significance of variables upon outcome scores were introduced. In the following chapter, I will present the results of that analysis and the addition of a clarifying research question to the study.

## CHAPTER FOUR

### PRESENTATION OF FINDINGS

#### **Introduction**

This chapter is organized into four sections: (a) descriptive statistics, (b) AGNES and HAC visualizations (c) HAC summary and (d) chapter summary for this study that explored to what extent co-occurring attributes of those with Autism Spectrum Disorder who were enrolled in an Outdoor Behavioral Health Program affected outcome scores following the intervention. Specifically, I examined what effects demographic variables (i.e. age, sex, birth order, and ethnicity), client contextual variables (i.e. referring diagnoses, effort into program, change in exercise habits, and perceived quality of the program), and program contextual variables (i.e. percentage of program completion and staff reported benefit) had on discharge scores of the YOQ-2.0-SR for adolescents completing the programs and the OQ-45.2 for young adults completing the programs. In this chapter, I present the findings for these research questions:

1. Is there a statistically and clinically significant change for adolescent and young adult clients with ASD attending an OBH program; is that change comparable to those in a generalized, nonspecific sample?
2. Do clusters allow us to predict outcome score categories for those individuals with autism who experience an outdoor behavioral health program intervention?

In Chapter Four , I will discuss the findings of the analyses and why, upon obtaining those results, more questions than answers emerged and in the spirit of exploratory research, I chose to add a third research question and conduct additional tests to make sense of the findings.



## **Descriptive Statistics**

Seven hundred sixty-seven clients with a diagnosis of autism spectrum disorder (ASD), Asperger's Disorder, or Autism as a reason for referral to a wilderness, or outdoor behavioral health (OBH) program, were part of a dataset examined as a secondary analysis for this study. Of those, there were 64 young adults and 139 adolescents who had paired intake and discharge questionnaires surveying mental health symptoms in addition to paired intake and discharge questionnaires surveying their perceptions on changes that occurred while taking part in the intervention and program qualities. Additionally, staff who worked with the clients also completed surveys at intake and discharge regarding the clients' demographic and contextual variables. Participant and staff surveys can be found in Appendices E through J. Hierarchical agglomerative clustering (HAC), paired t-tests and Chi-squared tests for significance were conducted using JMP® Pro software, Version 13 of the SAS System for Mac OS High Sierra (SAS Institute, 2016) on a dataset available from the National Association of Therapeutic Schools and Programs Program Research Network (NATSAP-PRN)

In Table 4.1, I present demographic and reasons for participant referral to one of the 18 OBH programs. The decision to use data from multiple sites was made to apply findings beyond any one program.

Table 4.1

*Outdoor Behavioral Health Participants*

<b>Adolescent Sample</b>			<b>Adult Sample</b>		
	<b>N</b>	<b>%</b>		<b>N</b>	<b>%</b>
<b>Age (M=15.25; SD=1.56)</b>	<b>139</b>		<b>Age (M=20.51; SD=1.84)</b>	<b>64</b>	
11	32	23.0%	18	16	25.0%
12	41	29.5%	19	13	20.3%
13	28	20.1%	20	14	21.9%
14	23	16.5%	21	6	9.4%
15	2	1.4%	22	7	10.9%
16	9	6.5%	23	5	7.8%
17	32	23.0%	24	2	3.1%
			25	1	1.6%
<b>Gender</b>			<b>Gender</b>		
Male	120	86.3%	Male	53	83%
Female	17	12.2%	Female	11	17%
Unspecified	2	1.4%	Other		
<b>Reasons for Referral</b> (Totals will exceed 100% due to more than one reason indicated)			<b>Reasons for Referral</b> (Totals will exceed 100% due to more than one reason indicated)		
Alcohol/Substance Abuse	22	15.8%	Alcohol/Substance Abuse	11	17.2%
ADD/ADHD	39	28.1%	ADD/ADHD	12	18.8%
Anxiety	54	38.8%	Anxiety	28	43.8%
Autism Spectrum Disorder	139	100.0%	Autism Spectrum Disorder	64	100.0%
Depression/Mood Disorder	61	43.9%	Depression/Mood Disorder	29	45.3%
Learning Disability	12	8.6%	Learning Disability	6	9.4%
Oppositional Defiance/Conduct Issues	28	20.1%	Oppositional Defiance/Conduct Issues*	4	6.3%
PTSD	5	3.6%	PTSD	2	3.1%

\* Although ODD/Conduct was listed as a reason for referral on NATSAP's adult questionnaire, the *DSM-V* further defines adult behaviors regarding conduct and personality with diagnoses such as Antisocial Personality Disorder and Borderline Personality Disorder, among others. It is assumed adult individuals with these diagnoses could be included here.

Table 4.1

*Outdoor Behavioral Health Participants (cont.)*

<b>3 or More Diagnoses</b>			<b>3 or More Diagnoses</b>		
Yes	93	66.9%	Yes	25	39.1%
No	45	32.4%	No	35	54.7%
Unknown	1	0.7%	Unknown	4	6.3%
<b>Birth Order</b>			<b>Birth Order</b>		
First	55	43.0%	First	23	35.9%
Second	55	43.0%	Second	20	31.3%
Third	13	10.1%	Third	9	14.1%
Fourth	4	3.1%	Fourth	1	1.6%
Fifth	1	0.0%	Fifth	2	3.1%
Missing	11	7.9%	Sixth	1	1.6%
			Missing	8	12.5%
<b>Ethnicity</b>			<b>Ethnicity</b>		
African-American	1	0.1%	African-American	0	0.0%
Asian-American	3	3.5%	Asian-American	4	6.3%
Hispanic	4	2.8%	Hispanic	1	1.6%
Native American	0	0.0%	Native American	0	0.0%
Caucasian	119	85.6%	Caucasian	55	85.9%
Other	3	2.1%	Other	3	4.7%
Missing Data	7	5.0%	Missing Data	1	1.6%

To answer Research Question One, data were analyzed by paired t-tests of intake and discharge scores derived from the Youth Outcome Questionnaire 2.0 – Self Report (YOQ 2.0-SR) and the Outcome Questionnaire 45.2 (OQ-45.2) (Burlingame et al., 1999). A reduction in clinical and behavioral symptoms results in a negative change score. An increase in outcome score indicates an increase in clinical behavior or symptoms.

#### **Paired t-test of Adult Outcome Scores**

The average decrease in outcome scores for young adults with ASD attending an OBH (M= -23.6, SD= 21.5) was found statistically significant;  $t(63) = -8.81, p < .0001$ ,

$d=.91$ . Mean Total Scores ( $M= 48.41$ ,  $SD=26.34$ ) were below the cutoff score of 63. However, since the Reliable Change Index (RCI) identifies whether the magnitude of change is clinically significant and statistical significance does not always equate to clinical significance (Jacobson & Truax, 1991), the distributions of categorical results are shown in Table 4.2

Test scores among the four categories, with two categories indicating positive gains, one indicating no gains, and the fourth indicating negative gains, revealed a distribution as shown in Figure 4.1. The RCI requirement to be considered “Recovered” was a total score of 63 or less and a paired t-test score of negative 14 or less. An “Improved” rating indicated a total score decreased by at least 14 points, but remain at 64 or above. Those in the “Unchanged” category had score changes between zero and negative 13. Finally, those in the “Deterioration” category had scores that increased, indicating an increase in symptomology from intake to discharge (Jacobson & Truax, 1991).

The ASD adult participants in this study had a 67 percent probability of scores showing positive gains, a 20 percent probability of no change, and 13 percent probability of deteriorated scores.

Table 4.2

*Adult ASD participants' Probability of Membership in Clinical Change Categories*

<b>Age</b>	<b>RCI<sup>1</sup></b>	<b>Cutoff Criteria<sup>1</sup></b>	<b>Clinical Change Category</b>	<b>Probability of Membership</b>
Adults (18+ years old)	RCI $\leq$ -14	63 or below	Recovered	0.59
Adult	RCI $\leq$ -14	64 or above	Improved	0.08
Adult	RCI 0-13	64 or above	Unchanged	0.20
Adult	RCI $\geq$ +1 or more	64 or above	Deteriorated	0.13

**Paired t-tests of Adolescent Outcome Scores**

The average decrease in outcome scores for adolescents with ASD attending an OBH (M= -15.8, SD= 32.07) was found statistically significant;  $t(138) = -5.83$ ,  $p < .001$ ,  $d = .91$ ). Mean Total Scores (M= 44.77, SD=32.01) were below the cutoff score of 47.

The “Recovered” category required a total score of 46 or less and a paired t-test score of negative 14 or less. An “Improved” rating indicated a total score lowered by at least 14 points, but remaining at or above the cutoff of 47 or above. Those in the “Unchanged” category had score changes between zero and negative 13. Finally, those in the “Deterioration” category had scores that increased, indicating an increase in symptomology from intake to discharge (Jacobson & Truax, 1991).

The ASD adolescent clients in this study had a 49 percent probability of scores showing positive gains, a 22 percent probability of no change, and 29 percent probability of deteriorated scores.

Table 4.3

*Adolescent ASD participants' Probability of Membership in Clinical Change Categories*

<b>Age</b>	<b>RCI<sup>1</sup></b>	<b>Cutoff Criteria<sup>1</sup></b>	<b>Clinical Change Category</b>	<b>Probability of Membership</b>
Adolescent (≤17 years old)	RCI ≤ -18	46 or below	Recovered	0.12
Adolescent	RCI ≤ -18	47 or above	Improved	0.37
Adolescent	RCI 0-17	47 or above	Unchanged	0.22
Adolescent	RCI ≥ +1 or more	47 or above	Deteriorated	0.29

Mean scores of both groups demonstrated that adolescents and young adults with ASD benefit from participation in an outdoor behavioral health intervention. However, the mean for adolescents in both total scores and RCI scores, plus the 51% chance of membership in a category showing a lack of growth, suggest that further analysis is warranted to explore possible explanations or causes.

Table 4.4

*Outcome Scores and Comparisons for ASD Clients attending OBH programs*

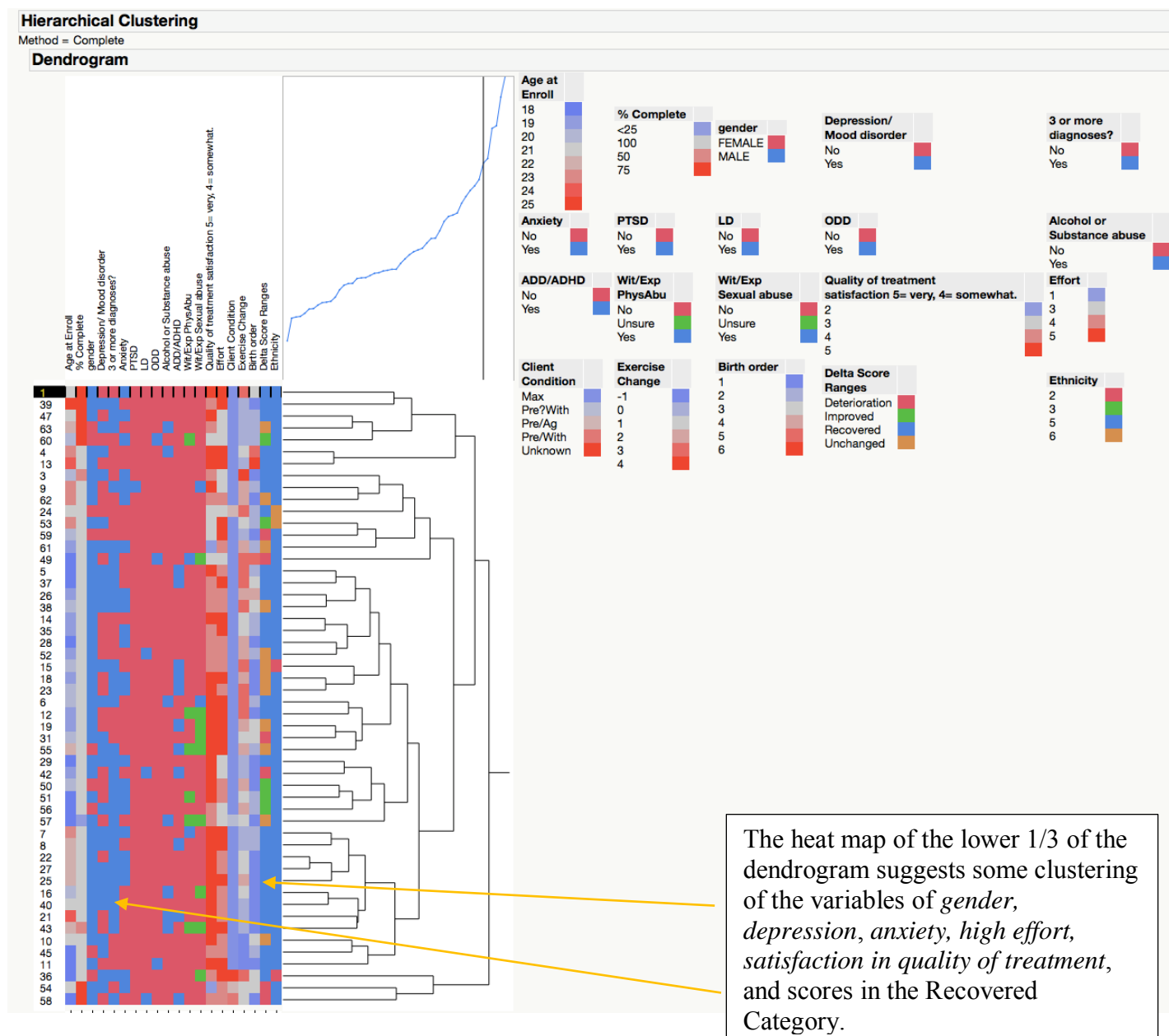
	<b>Mean Score</b>	<b>Cutoff Score</b>	<b>Mean RCI</b>	<b>RCI Score</b>	<b>Probability of Deterioration or No Change</b>
Adults	48.41	63	-23.6	-14	0.33
Adolescents	44.70	46	-15.8	-18	0.51

### **AGNES for Clustering Tendencies**

In order to answer Research Question Two, the paired YOQ-2.0-SR and OQ-45.2 were again used with RCI and clinical cutoff scores applied to determine Clinical Change Category. (Refer to Tables 4.2 and 4.3) Variables and their corresponding data points were uploaded into JMP®'s agglomerative hierarchical clustering software program which formed clusters by measuring the Euclidian distance between data points and pairing them iteratively until they eventually were members of one group. This process is known as AGNES, or agglomerative nesting. The visualizations produced in the process were overlaid with a heat map to help identify clusters by color. The process then transferred cluster marks back to the rows of the original data spreadsheet for more detailed numerical or nominal level comparisons.

### **Adult Clinical Change Categories Analysis using HAC**

How the 19 independent variables clustered when combined with the dependent variable of Clinical Change Category is illustrated in Figure 4.1. The initial heat map shows a clustering of variables related to gender, depression, anxiety, satisfaction with the quality of treatment, effort put into treatment, and scores in the Recovered category of clinical change. However, clustering did not occur into groups recognizable by change categories, therefore disaggregating scores by category to observe more specific individual dendrograms and heat maps was the next step of analysis I applied.



**Figure 4.1** The dendrogram and heat map of 19 variables of study available for adults with Clinical Change Categories included as a variable.



Clustering for the six clients whose growth scores were Deteriorated from intake to discharge is illustrated in Figure 4.2. To reiterate, the Deteriorated category indicates participants whose symptoms or behaviors increased following the intervention. By disaggregating scores into their Clinical Change Category, the dendrogram illustrated that two of the six adult clients had 3 or more diagnoses as well as co-occurring diagnoses of a learning disability and ADD/ADHD.

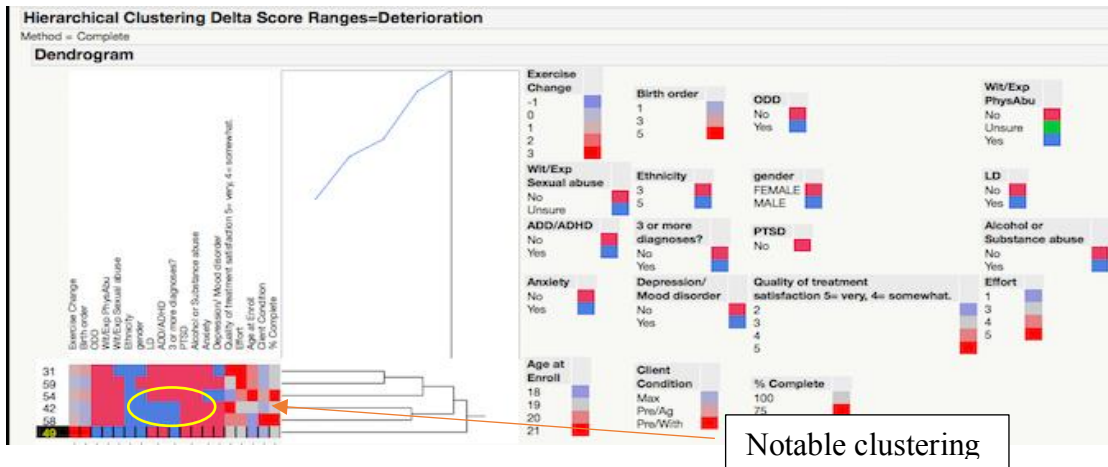


Figure 4.2 Adult Deterioration Clinical Change Category Dendrogram and Heat map

A dendrogram and heat map for the Unchanged Clinical Change Category (N=12) illustrates a clustering of referring diagnoses in Figure 4.3. PTSD, ODD, and LD have little representation while depression, anxiety, and ADD/ADHD are well represented.

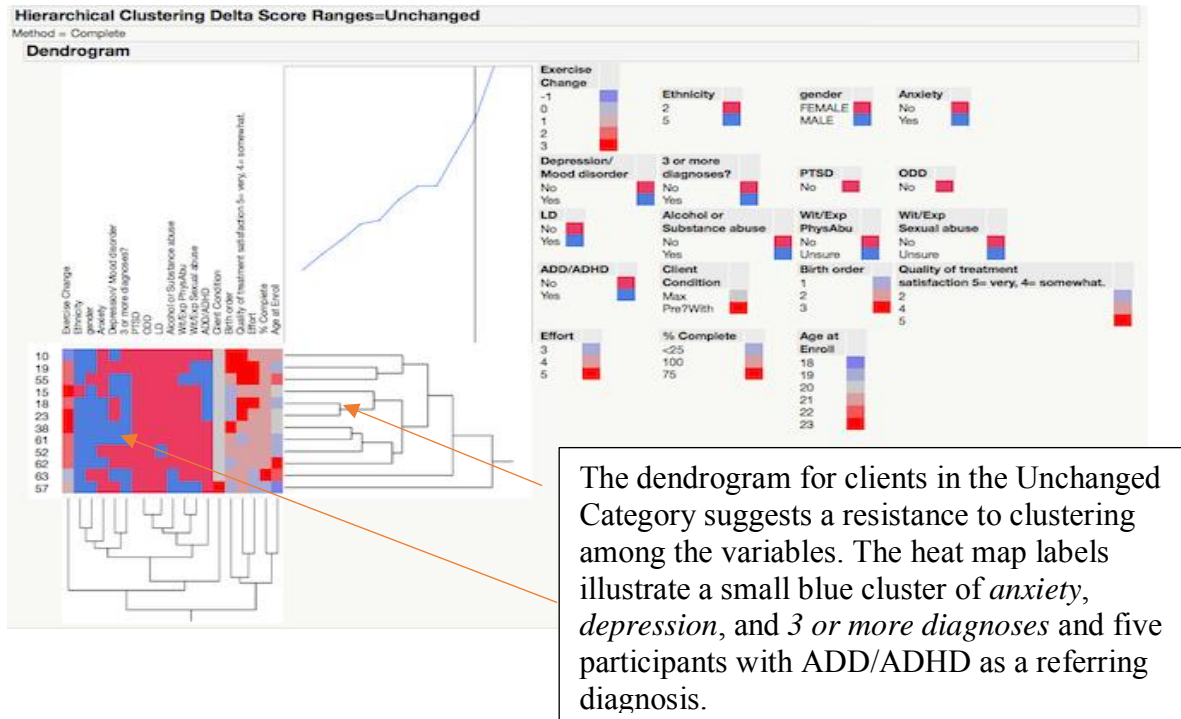


Figure 4.3 Adult Unchanged Clinical Change Category Dendrogram and Heat map

Initially, the adult HAC visualizations suggested a pattern around *anxiety*, *depression*, and *number of diagnoses* as clustering variables among clients who did not show positive gains scores. However, for participants in the Improved and Recovered Clinical Change Categories, these three variables continued to cluster. These clusters may be explained by the probability of clients enrolling with anxiety (38.8%), depression (43.9%), and three or more diagnoses (66.9%).

The visualizations for the Recovered and Improved categories did, however, highlight two phenomena: the absence of a learning disability diagnosis among any of these clients and the lack of variation regarding the client's satisfaction with high program quality (particularly in the Recovered category). This suggests these may be two variables that impact growth scores.

Dendrograms and heat maps for clients showing positive growth following the OBH intervention are displayed in Figures 4.4 and 4.5.

### **Adult HAC Summary**

Hierarchical clustering analysis provided visualizations to focus further analysis, however, it is not a definitive analysis to answer Research Question Two for adults. Areas to focus upon for additional analysis include the presence of co-occurring diagnoses (reasons for referral) in combination with the ASD diagnosis all participants share.

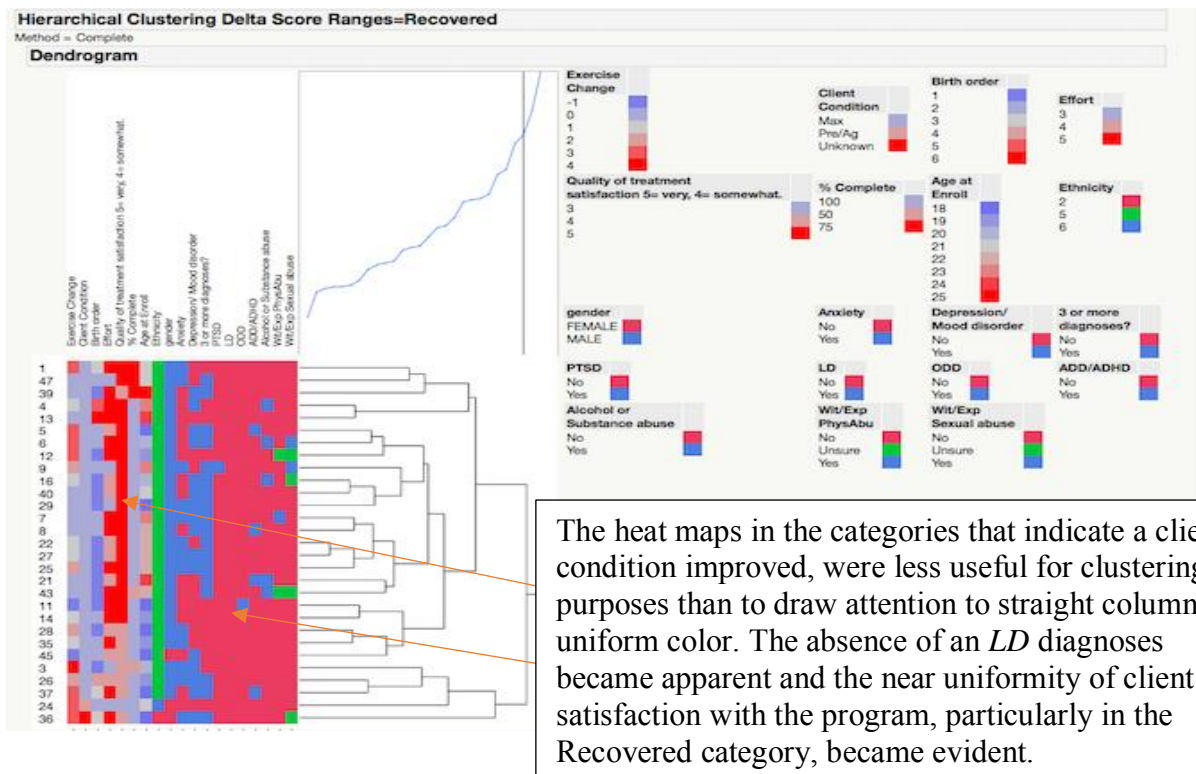


Figure 4.4 Adult Recovered Clinical Change Category Dendrogram and Heat map

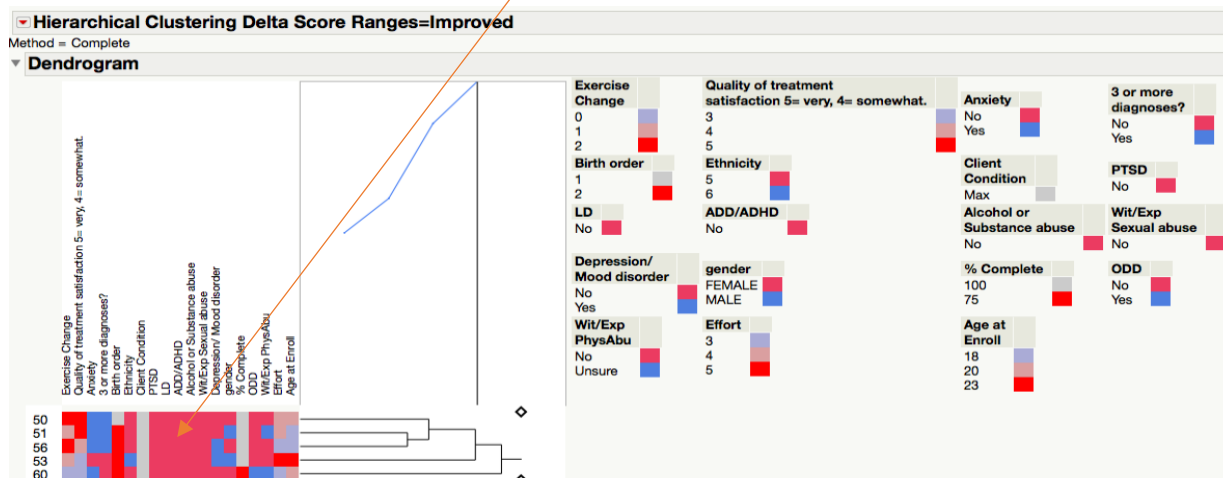


Figure 4.5 Adult Improved Clinical Change Category Dendrogram and Heat map

## **Adolescent Clinical Change Categories Analysis Using HAC**

When analyzing adolescent reported scores, the additional data of the participant's perception of changes to his or her problem was available for study. For this variable, participants were asked to compare their problems at discharge compared to when they entered the program. Answer choices were "Much better," "Somewhat better," "The same," "Somewhat worse," or "Much worse." This became the 20<sup>th</sup> variable added for HAC procedures and the figures below include the visualizations of dendrograms and heat maps JMP® produced when asked to cluster them by similarities. In this first cluster attempt, Clinical Change Categories were added to observe whether clusters formed naturally around them. Figure 4.6 illustrates the variability in all columns and small clusters appearing in physical or sexual abuse exposure. Depression, anxiety, and three or more diagnoses also clustered in the adolescent data as they did in the adult data.

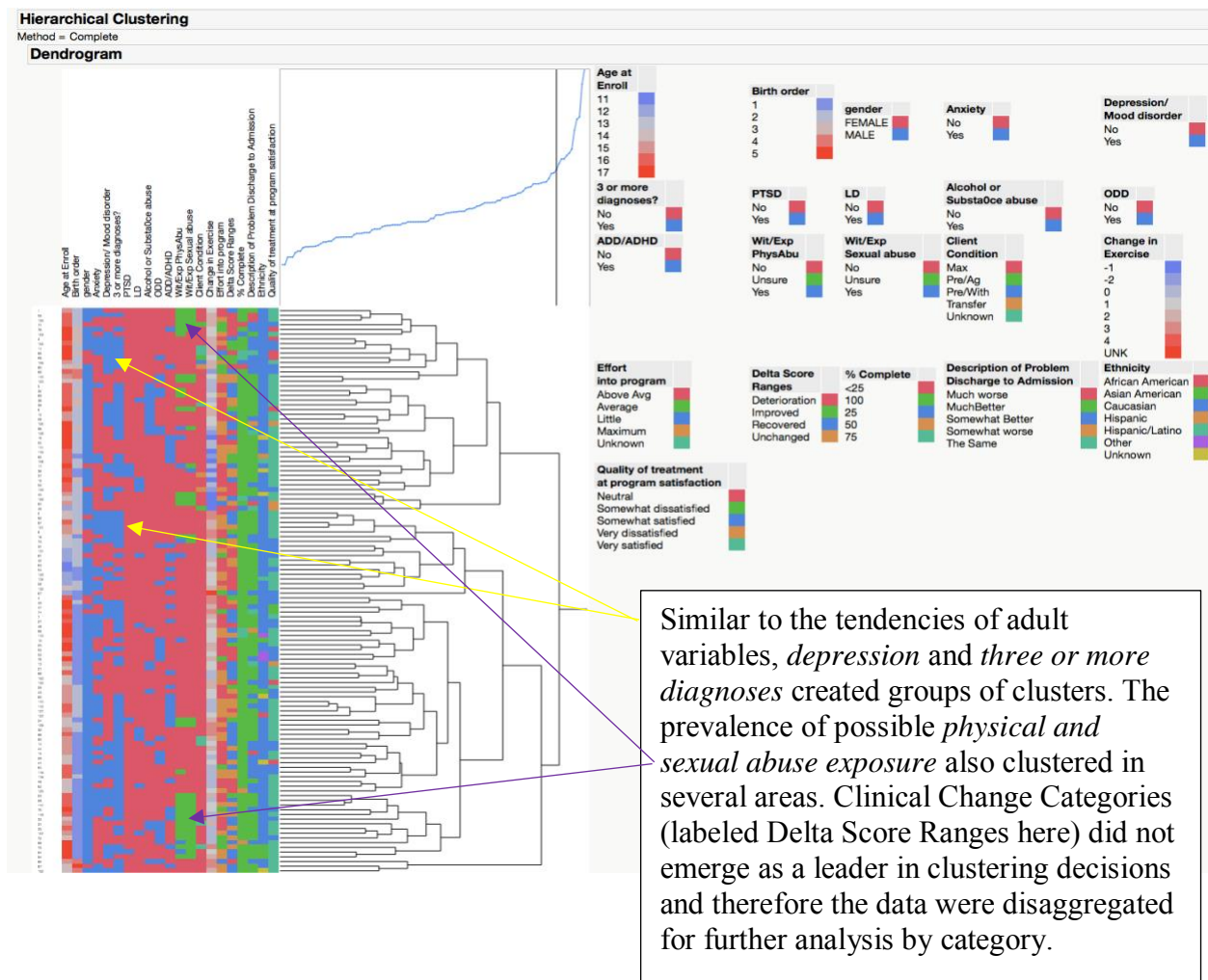


Figure 4.6 The dendrogram and heat map of 20 variables of study available for adolescents with Clinical Change Category included as a variable.

In the Clinical Change Category of Deteriorated scores, in which participant outcome score paired t-tests indicated symptoms and behaviors were worse after a wilderness intervention than at admission. The HAC visualization I included here suggests a lack of clustering and much more variability in columns that indicate a client's perceived quality of treatment, effort he or she put into the program, and problem abatement from before entering the program. In figure 4.7, I noticed a wide variability of answers for clients in the Deterioration Change Category. These variables are

worthy of further statistical significance investigation to determine if any have an impact on outcome scores that is not evident in the visualization.

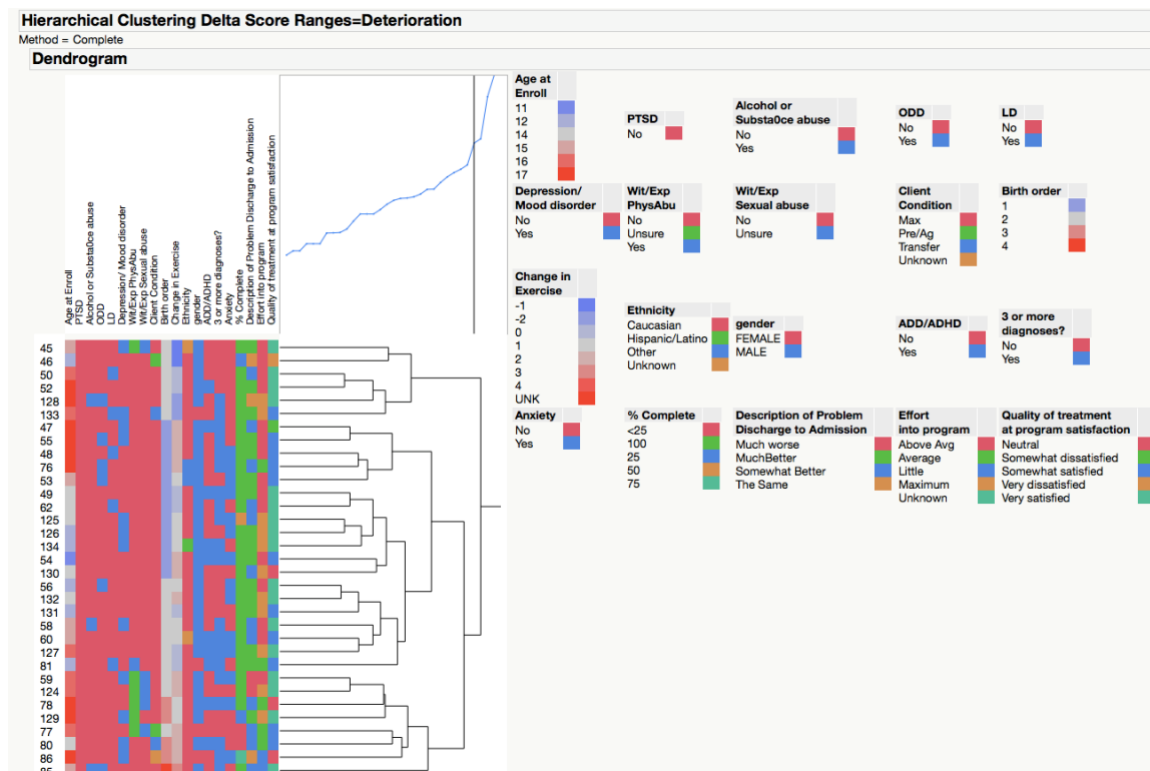


Figure 4.7 The Adolescent Deteriorated Clinical Change Category Dendrogram and Heat map

In Figure 4.8, I observed the Unchanged Category for adolescents again had the possibility of witnessing or experiencing physical or sexual abuse clustered into small groups. This group also reported a tendency toward high *satisfaction* with the quality of treatment in the program, *maximum* to *above average* effort put into the program, and *much better* to *somewhat better* descriptions to their problems, despite their outcome scores not meeting cutoff for the Reliable Change Index. The outcomes for this category also warrant further investigation to explain significance.

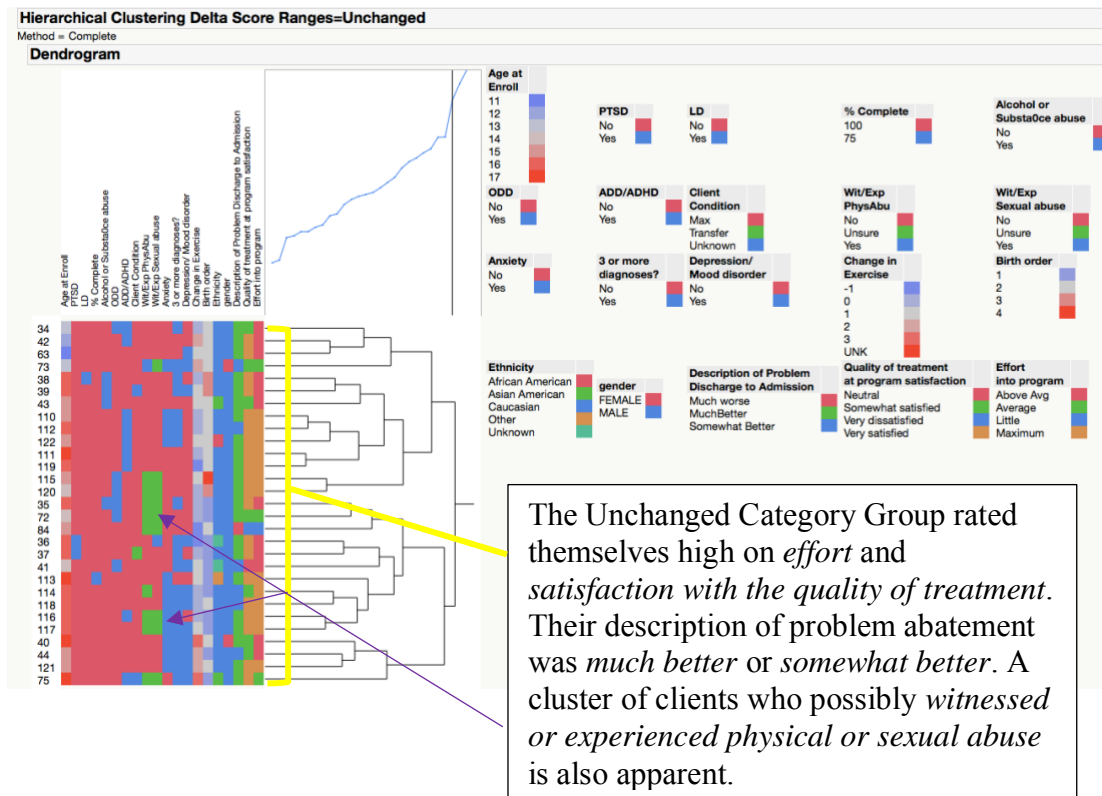


Figure 4.8 Adolescent Unchanged Clinical Change Category Dendrogram and Heat map

In Figures 4.9 and 4.10, I noted the clustering tendencies for variables of clients who reported positive gains in an OBH program and are members of either the Recovered or Improved category. The visualizations suggest positive attitudes toward the program, their effort, and problem abatement. *Three or more diagnoses* appears with enough frequency to create solid spans of color within its column. *Oppositional Defiance Disorder* visually appears to have more of a presence in these categories and becomes a variable to examine further as well.



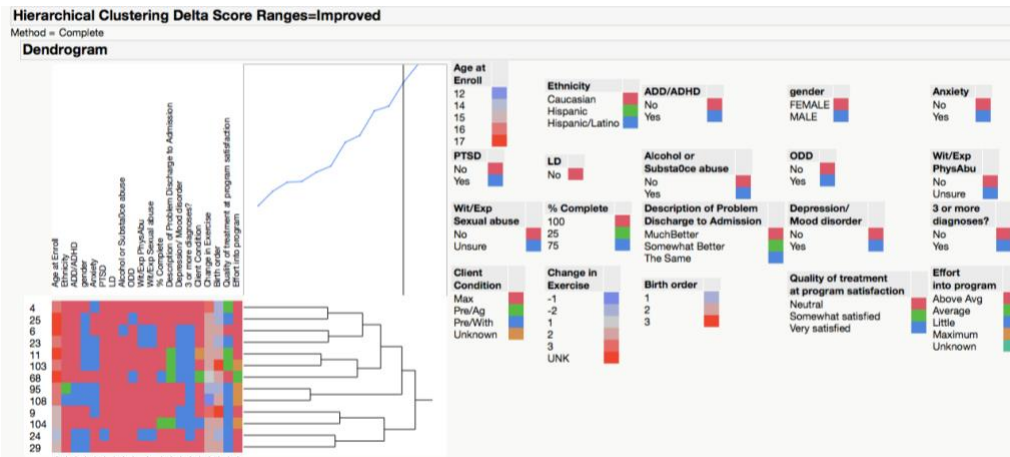


Figure 4.9 Adolescent Improved Clinical Change Category Dendrogram and Heat map

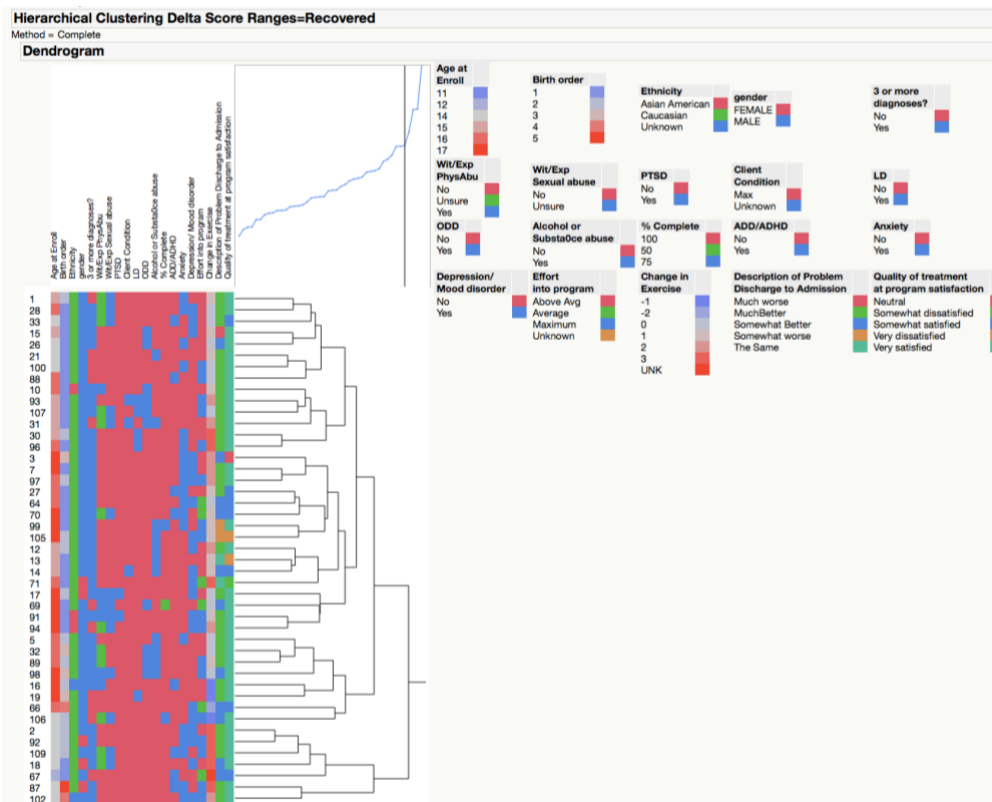


Figure 4.10 Adolescent Recovered Clinical Change Category Dendrogram and Heat map

## **Adolescent HAC Summary**

In summary, the visualizations of HAC and JMP®'s ability to highlight rows for a researcher to quickly find and gather descriptive statistics on those rows helped me to narrow the focus to specific variables for further study. HAC was a critical and powerful tool for visualizing the clients within categories, however, because of lack of clear clustering and its inability to provide probabilities or statistical analyses to indicate the significance of variables that did group within a category, multinomial logistic regression was implemented as a post-hoc analysis and will be discussed in Chapter Five.

### **Summary**

In chapter four, I discussed the findings when outcome scores from the YOQ-2.0-SR and OQ-45.2 were analyzed several ways: First as paired t-tests to determine change in score with a Chi-Square group scores into Clinical Change Categories. This final step disaggregated scores for participants who experienced positive change (Recovered or Improved), No Change, or Deteriorated after the intervention.

Second, 19 (adult) or 20 (adolescent) independent variables underwent agglomerative hierarchical cluster analysis to create visualizations of dendrograms and heat maps to illustrate clustering tendencies among them. I entered the IVs first for analysis with the response variable of Clinical Change Category to determine if they naturally clustered by categories. When I observed they did not cluster in this manner, I again ran HAC, adding a request that the variables be clustered, then displayed separately by Change Category.

In the second set of visualizations, I noted that clustering occurred most frequently with co-occurring diagnoses as a lead variable as well as where client beliefs

about the program and their efforts were reported. HAC currently does not provide the inferential statistics to address causation or prediction, so to fully answer Research Questions 1 and 2, I chose to apply two final analyses seeking to clarify results. That discussion and post-hoc analyses follow in Chapter Five.

## CHAPTER FIVE

### RESULTS, CONCLUSIONS, AND RECOMMENDATIONS

#### **Introduction**

The purpose of this study was to explore the outcomes of adult and adolescent clients with Autism Spectrum Disorder who took part in an Outdoor Behavioral Health (OBH) program in the United States. In the previous chapters, the review of literature, the methodology, and the analysis of the data were presented. In chapter five, I present the results and their fit into the existing body of research as well as to the theoretical framework surrounding the argument for OBH intervention in general. The research questions will be answered and conclusions made based upon the findings, recommendations for future research and OBH programs, and implications, assumptions, and limitations of the study will be discussed.

This chapter is organized into the following sections: (a) summary of the study, (b) discussion of findings and fit of existing literature, (c) answering the research questions, situating in literature, and implications (d) adding a research question, post hoc analyses and situating in literature, (e) researcher conclusions, (f) recommendations, (g) recommendations for future OBH research, (h) recommendations for OBH practice, (g) assumptions and limitations (h) reflection and researcher as instrument.

#### **Summary of the Study**

In this study, I quantitatively examined the outcome scores of those individuals with Autism Spectrum Disorder who were enrolled in an Outdoor Behavioral Health Program as well as to what extent additional variables known before admission or obtained at

discharge correlated with outcome scores obtained after the intervention. Specifically, I examined what effects demographic variables (i.e. age, gender, birth order, and ethnicity), client contextual variables (i.e. co-occurring diagnoses, effort into program, change in exercise habits, and perceived quality of the program), and program contextual variables (i.e. percentage of program completion and staff reported benefit) had on discharge scores of the YOQ-2.0-SR for adolescents completing the programs and the OQ-45.2 for young adults completing the programs. The following questions guided and directed me in this study:

1. Is there a statistically and clinically significant change for adolescent and young adult clients with ASD participating in an OBH program; is that change comparable to those in a generalized, nonspecific sample?
2. Do clusters allow us to predict outcome score categories for those individuals with autism who experience an outdoor behavioral health program intervention?

Seven hundred sixty-seven clients with a diagnosis of autism spectrum disorder (ASD), Asperger's Disorder, or Autism as a reason for referral to a wilderness, or outdoor behavioral health (OBH) program, were part of a dataset examined as a secondary analysis for this study. Of those, there were 64 young adults and 139 adolescents who had paired intake and discharge questionnaires surveying mental health symptoms in addition to paired intake and discharge questionnaires surveying their perceptions on changes that occurred while taking part in the intervention and program qualities. These surveys can be found in Appendices G to J. Additionally, staff who enrolled clients also completed surveys at intake and discharge regarding the clients'

demographic and contextual variables. Their surveys can be found in Appendices E and F.

### **Discussion of Findings and Fit of Existing Literature**

The NATSAP PRN is still in its infancy relative to general mental health organizations studying the population's issues and outcomes in the United States. There were studies on outcomes conducted very recently on both adolescent and young adult samples for comparison to the current study. While my first research question sought to answer whether ASD clients reported significant change following an OBH intervention, it also asked how clients with ASD would compare to generalized, neuro-typical (non-ASD) samples.

My results indicated that both adults and adolescents with ASD benefit from a wilderness intervention when measuring statistical significance. However, the mean scores of the adolescent group were close to both the cutoff score and reliable change index (RCI) that Jacobson and Truax (1991) calculated for significant clinical change, which is equally important, if not more so, in mental health research. My study found the Categories of Clinical Change indicating "positive" results (Recovered and Improved) compared to the categories that show "not positive" results (Unchanged or Deteriorated), resulted in only 49% odds of adolescents reporting a positive outcome. These findings for adolescents are significantly lower than most previous studies on general, neurotypical samples. Adults in the study had greater odds of reporting positive change, 67%, had membership in the Recovered or Improved category. These probabilities for adolescent ASD clients raised concerns me, therefore I added another step to more closely review past study results for OBH participants.

## **Previous Studies on Adult OBH Participant Outcome Scores**

Researchers within the NATSAP PRN membership have found significant statistical and clinical change for adults when using admission and discharge OQ-45.2 data. While not all the studies reported complete demographic information or standard deviation scores for exact comparison, each one used scores from a single program or multiple programs that were associated with the NATSAP PRN. Therefore, it was reasonable to assume they were comparable. In Table 5.1, I summarize the findings of the comparable studies.

Curtis, Briggs and Behrens (2018) reported positive trends in self-reported outcomes. Demographic comparisons between this study and mine indicated the two samples were similarly comprised and that 3.7% of the sample indicated autism as the primary reason for referral. Primary reasons for referral in Curtis et al.'s study included alcohol/substance abuse (36%), anxiety (20.6%) and depression/mood disorder (25.7%). Because the participants in this study were in OBH programs between 2009 and 2017, it is reasonable to assume all but those clients discharged between February 2017 and March 2018 were included in both studies.

The mean change of -34.37 from admit to discharge on the OQ-45.2 was statistically and clinically significant ( $F_{1, 216}=204.00, p<.001$ ). As in my study, this study noted large standard deviation scores ( $SD=23.94_{\text{admit}}, 23_{\text{discharge}}$ ). While mean scores between Curtis et al.'s study and mine were within three points, mean change in scores were more than 10 points apart. A factor that may have affected a higher mean change in scores is that this study had twice the percentage of females as participants as mine. This may have been a contributing factor given that researchers find prevalence of ASD

around 1:4.5 in females versus males (ADDM, 2016). Some studies have found that females have a greater tendency to self-report higher ratings of dysfunction at intake than males, resulting in greater change at discharge (Magle-Haberek et al, 2012; Russell, 2003; Tucker, Javorski, Tracy and Beale, 2011). Curtis et al.'s study was also performed on a multi-site sample, similar to the current study.

Bettmann, Tucker, Behrens and Vanderloo (2017) conducted a study on late adolescents' and young adults' outcomes whose most common diagnoses included depression (64.4%), substance abuse (63.7%) and anxiety (45.2%). Their focus was to study outcomes on mental health as well as attachment relationships and psychological individuation from parents. Similar to my study, all Axis I reasons for referral were included, so totals are above 100%. Bettmann et al.'s study also found clinical and statistical significance on OQ-45.2 scores from intake to discharge;  $t(136)=10.74$ ,  $p<.001$ ,  $d=1.70$ . This study also included nearly more than double the number of female participants, although its mean change scores were closest to those found in the current study.

Hoag, Massey, Roberts, and Logan (2013) conducted a three-year, longitudinal study on young adult participants in OBH. Age and gender demographics on their sample were similar to those in this study. Though primary reasons for referral and ethnicity were not stated, it is reasonable to assume they are similar since the choices of reasons for referral were the same on the intake questionnaires and the majority of OBH participants are Caucasian. Their findings indicated statistically and clinically significant change on the OQ45.2 from admit to discharge;  $t(147)=16.87$ ;  $p<.001$ ;  $d=1.36$ , however, they also implemented multiple iterations of the OQ-45.2 during the wilderness



intervention in order to narrow down when change began to occur within the clients. Their findings indicated that week five was a critical point of change in regard to their client's clinically functioning.

Roberts, Stroud, Hoag and Combs (2016) studied the constructs of age, gender, primary diagnosis, therapist assignment, and length of stay to determine their effect on wilderness outcomes. They found that reported outcome scores showed no significant variation in scores regardless of these variables, although this was a single-site study and therapists were similarly trained, used the same resources, and had similar, extensive experience in the field. They did not report exact discharge scores, however a graph indicating mean scores within a 5-point range provided scores for visual comparison to scores in this study.

Table 5.1

*Comparison of Adult ASD Client demographics and OQ-45.2 scores to previous studies of OBH client outcome scores.*

Author	Year published	Ethnicity	Age Mean (SD)	Gender	Mean Admit Score (SD)	Mean Discharge Score (SD)	Mean Change in Score (SD)
Curtis et al. N=217	2018	Caucasian 89%	20.39 (1.96)	M=65.9% F=34.1%	79.89 (23.95)	45.52 (23)	- 34.34 (*)
Bettmann et al. N=157	2017	Caucasian 94.8%	20.2 (2.3)	M=64.7% F=36.3%	79.5 (21.9)	57.2 (17.2)	- 24.3 (*)
Hoag et al. N=115	2013	*	20.2 (*)	M=73% F=27%	67.32 (21.6)	38.83 (20.2)	- 28.49 (*)
Roberts et al. N=186	2016	*	20.3 (2.59)	M=82.3% F=17.7%	71 ** (*)	≅ 42** (*)	≅ - 29** (*)
<b>ASD N=64</b>		<b>Caucasian 85.9%</b>	<b>20.51 (1.84)</b>	<b>M=83.0% F=17.0%</b>	<b>72.04 (25.55)</b>	<b>48.41 (26.34)</b>	<b>- 23.6 (21.5)</b>

\*Not Reported, \*\*Approximations retrieved from graph with 5-point intervals.

When comparing the mean discharge scores and mean changes in score, there is indication that adult ASD clients appear to have a similar experience as that of the generalized, neurotypical samples, though there are some scores that would merit investigation for future studies.

### **Previous Studies on Adolescent OBH Participant Outcome Scores**

Zelov, Tucker, and Javorski (2017) conducted a NATSAP PRN study of outcomes for adolescents attending OBH programs which utilized the YOQ-SR 2.0 as outcome measurement. The dataset was accumulated between December 2007 and May 2012 and resulted in clinically significant changes following treatment;  $t(73) = 7.94$ ,

$d=1.31$ ,  $p<.001$ . The relatively small number of participants was a factor of changing measurement tools from the YOQ 30-item questionnaire to the more comprehensive, 64-question YOQ-SR 2.0 in July 2011. Presenting issues of the entire database accumulated since 2007, including those with paired admit-discharge scores and those without, indicated 49.8% male clients, a mean age of 15.8 years ( $SD=1.6$ ), and predominant presenting issues of depression and attention issues (24.4%), learning disabilities (15.9%) and anxiety (1.3%).

An earlier study by Tucker, Zelov, and Young (2011) which utilized the YOQ-30, resulted in similar outcome trends ( $M=40.0$ ,  $SD=16.5_{\text{admit}}$ ;  $M=23.4$ ,  $SD=15.2_{\text{discharge}}$ ) and statistical significance ( $F=97$ ;  $p<.001$ ).

One of the largest and earliest studies on adolescents in wilderness therapy (Russell, 2003) examined 523 youth enrolled between May 1, 2000 and December 1, 2000. Statistically significant change between YOQ-SR scores from intake to discharge was reported;  $t(522)=14.38$ ,  $p<.0001$ . This study did not use the YOQ-2.0-SR, but its predecessor, the YOQ-SR. Though Russell reported clinically significant change with mean change scores at  $-21.59$ , only 43% of participants in their self-reports and 46% of parent-reported scores were below the normal range functioning cutoff score of 47.

Hoag, Combs, Russell, and Logan (2016) studied 118 adolescents who completed at least five weeks of a wilderness program and analyzed intake and discharge scores by several demographic factors, including gender, parents' marital status, previous treatment and ethnicity. They found statistically significant differences in scores at discharge if parents were married;  $t(79)=-2.23$ ,  $p=0.029$ ,  $d=-0.495$  and scores approaching statistical significance for gender, with females reporting scores 12 points higher than males;  $t(78)$

= 1.76,  $p=.082$ . Overall, the sample's reported intake ( $M=58.9$ ,  $SD=32.8$ ) and discharge ( $M=20.7$ ,  $SD=27.8$ ) scores demonstrated clients reporting significant clinical and statistical change;  $t(79) = 11.75$ ;  $p<.001$ ,  $d=1.3$ . Hoag et al.'s study reflected a gender pattern that has appeared in other studies (Magle-Haberek et al., 2012; Russell, 2003; and Tucker, et al., 2011) in which females scored themselves higher for dysfunction at intake and had a greater response to treatment than males.

Table 5.2 summarizes adolescent demographic information, admission scores, and discharge scores of previous studies to compare whether outcomes reported by ASD students enrolled in OBH are similar.

Table 5.2

*Comparison of adolescent ASD Client demographics and YOQ-SR scores to previous studies of OBH clients.*

Group	Year Published	Primary Ethnicity	Age Mean (SD)	Gender	Mean Admit Score(SD)	Mean Discharge Score (SD)	Mean Change in Score (SD)
Zelov et al. N=74	2017	*	15.8 (1.6)	M=49.8% F= 50.2%	70.5 (38.6)	36.9 (32.3)	- 33.6 (*)
Russell N=523	2003	*	Reported 83% were age 15-19	M=64.7% F= 35.3%	70.53 (32.85)	48.95 (32.23)	- 21.59 (*)
Hoag et al. N=54	2016	*	15.9 (*)	M=69.5% F= 30.5%	58.9 (32.8)	20.7 (27.8)	- 38.2 (*)
<b>ASD N=139</b>		<b>Caucasian 85.6%</b>	<b>15.25 (1.56)</b>	<b>M=87.6% F= 12.4%</b>	<b>60.61 (32.28)</b>	<b>44.77 (32.01)</b>	<b>- 15.85 (32.07)</b>

\* Not reported

### **Answering the Research Questions, Situating in Literature, and Implications**

#### **Research Question One**

*Question 1: Is there a statistically and clinically significant change for adolescent and young adult clients with ASD attending an OBH program; is that change comparable to those in a generalized, nonspecific sample?*

For the first research question, I examined the results of paired t-test scores for an age-appropriate outcome tool in the OQ family of measures as a means to determine whether participants met a clinical cutoff score and a Reliable Change Index (See Tables 4.2 and 4.3). The scores they reported placed them in Clinical Change Categories indicating whether they had “Recovered,” “Improved,” had “No Change,” or “Deteriorated.” To answer the first part of RQ1, I found results that adults reported 59% attained Recovered change and 8% attained Improved change, combined for a 67%

probability of OBH having a positive effect on their presenting concerns. The adolescent reported results were not as positive, with less than 50% reporting positive effects and attaining membership in the Recovered (12%) or Improved (37%) categories. When comparing their mean change scores to other mean scores of previous studies, adults reported results consistent with previous research, but adolescents did not.

**Situating and Implications of the Findings.** In a meta-analysis on treatment outcomes measured by the Y-OQ and Y-OQ-SR, Gillis et al. (2016) found that “treatment programs for youth using these instruments are indicating strong and positive effects from pre to post testing” (p. 851). The effect sizes for the self-report;  $g=.98$ , 95% CIs (.71, 1.26), were obtained from 11 studies, all using the SR version. Comparing the current study on ASD participants to previous studies of neuro-typical clients raises some concerns about the resulting mean change scores. The variance of 5.74 to 22.35 points between adolescent ASD scores and the other studies includes the -18 change score necessary to be considered a Reliable Change (Jacobson & Truax, 1999), however the mean change for adolescents with ASD is below the RCI. Using these descriptive statistics, it is evident the number of female participants in the ASD sample is half or less than those in the prior studies, which may have influenced change scores. Gender effects are prominent in many studies (Hoag et al. 2016, Magle-Haberek et al., 2012; Russell, 2003; Tucker, et al., 2011) with females rating themselves higher in dysfunction at intake, resulting in greater change scores.

Additionally, research has demonstrated uneven cognitive development in individuals with ASD (Joseph, Tager-Flusberg & Lord, 2002; Melling & Swinson, 2016; Goldstein, Allen, Minshew, Williams, Volkmar, Klin, & Schultz, 2008, et al.) which may

have negatively impacted either the treatment itself or comprehension of the questions asked on the outcome measures.

The Administration and Scoring Manual for the Y-OQ-SR 2.0 acknowledges the cut-off scores recommended are based “on large, diverse samples. If special populations are being assessed, however, it may be more appropriate to construct new normative samples and compute new cut-off scores for that particular group (Wells, Burlingame, and Rose, 2003, p. 6). There was no indication that accommodations were made for the ASD populations or for those with learning disabilities while answering any of the outcome questionnaires, so the assumption is that none were give.

The differences in reported outcome results implies that, for adolescents in particular, further investigation of intervention technique variance between programs is needed. Additionally, more examination of the measurement possible explanations for the YOQ measurement tool for its appropriateness in application to the ASD population is warranted.

### **Research Question Two and the addition of Question Three**

*Question 2: Do clusters allow us to predict outcome score categories for those individuals with autism who experience an outdoor behavioral health program intervention?*

The second research question was analyzed by uploading 19-20 independent variables obtained from staff and client questionnaires filled out at admission to and discharge from an OBH program. Demographic information, was obtained on gender, age, birth order and ethnicity at intake. Client contextual data on co-occurring diagnoses, sexual and physical abuse exposure, and the presence of three or more reasons for referral

were obtained at intake. Staff were queried at discharge on whether clients received maximum benefit from the program and what percentage of the program they had completed. Client perceptions on their change in physical activity, the quality of treatment they received, their reported effort into the program, and (adolescents only) how their problems changed from admission to discharge were obtained on their discharge questionnaire. Taken together, these variables were uploaded into an agglomerative hierarchical cluster analysis for comparison to their Clinical Change Category. The cluster analysis provided excellent visualizations indicating potential variables to focus upon for further analysis, however it was limited in its ability to report any statistical significance to the research. Recent research by Kimes, Liu, Hayes, and Marron (2017) proposed a Monte Carlo approach to address reporting significance, but JMP® software does not yet have this capability. For this reason, I added a research question to try to make sense of the small cluster groups I could detect in the resulting visualizations.

*Question 3: Are there variables that can facilitate predicting outcomes for clients with ASD who attend a wilderness (OBH) program?*

The dependent variable (outcome scores) could be studied categorically for clinical significance or numerically on a continuous scale for statistical significance. As previously noted, a statistically significant score might not also be clinically significant (Jacobson & Truax, 1991; Lambert et al., 2013). Knowing the Clinical Change Category was equally important for predicting how the independent variables would affect the dependent variable of reported outcome scores, I focused on the categories rather than actual scores. Unlike logistic regression and Ordinary Least Squares methods of



regression which limit analysis to dichotomous or binomial DVs, multinomial logistic regression allows three or more categories of DVs to be examined (Vogt, 2007).

According to Vogt (2007), this analysis is applicable when there are categorical IVs and DVs. “[Discriminant analysis] was once the method of choice, [when the DV was categorical]. Today LR [is] more widely seen in the published research literature in most fields” (Vogt, 2007, p. 211).

Logistic regression analyzes odds, rather than probabilities, of being a member of the DV category and can fit a curve rather than a straight line. LR’s units of measurement are expressed in units of the odds’ logarithmic transformations, or logits. However, JMP® has also added p-values to report significance (Sall, Lehman, Stephens & Creighton, 2014) which are more widely recognized in research and are reported here.

In order to answer Research Question Three and calculate odds of membership in a category, I conducted a post-hoc multinomial logistic regression and chi-square goodness of fit test.

Knowing that variables can have an effect on one another, I grouped them for analysis by Demographics, Co-Occurring DSM-V Axis Diagnoses, Experience with Abuse prior to Admission, Client’s Discharge Reports on Efforts, and Staff Reported Client Benefit. Table 5.3 reports the chi-square, p-values, and degrees of freedom found for predicting membership in a Clinical Change Category.

Table 5.3

*Results of Analyses Predicting Membership in Clinical Change Category*

Variable	Adolescents			Adults		
	$X^2$	$p$ -value	df	$X^2$	$p$ -value	df
<b>Demographic Data</b>						
<b><u>Whole Model</u></b>	<b><u>59.59</u></b>	<b><u>0.19</u></b>	<b><u>51</u></b>	<b><u>55.26</u></b>	<b><u>0.22</u></b>	<b><u>48</u></b>
Age	23.77	0.16	18	25.28	0.24	21
Birth Order	5.88	0.46	12	15.94	0.39	15
Ethnicity	25.15	0.12	18	9.60	0.38	9
Gender	4.83	0.18	3	5.65	0.13	3
<b>Co-Occurring Axis Diagnoses</b>						
<b><u>Whole Model</u></b>	<b><u>34.63</u></b>	<b><u>0.54</u></b>	<b><u>36</u></b>	<b><u>22.64</u></b>	<b><u>0.54</u></b>	<b><u>24</u></b>
ADD/ADHD	0.67	0.88	3	4.64		3
Alcohol or Substance Abuse	4.82	0.18	3	3.09	0.38	3
Anxiety	0.63	0.89	3	2.11	0.55	3
3 or more diagnoses	1.17	0.76	3	0.88	0.83	3
Depression/Mood Disorder	0.84	0.84	3	0.34	0.95	3
LD	5.23	0.16	3	2.52	0.47	3
ODD	0.50	0.92	3	3.26	0.35	3
PTSD	1.33	0.72	3	0.93	0.81	3
<b>Client Exp. With Abuse</b>						
<b><u>Whole Model</u></b>	<b><u>14.21</u></b>	<b><u>0.29</u></b>	<b><u>12</u></b>	<b><u>13.90</u></b>	<b><u>0.74</u></b>	<b><u>18</u></b>
Witness or Exp. Phys Abuse	7.18	0.30	6	7.38	0.29	6
Witness or Exp. Sexual Abuse	5.05	0.54	6	8.10	0.23	6

*Results of Analyses Predicting Membership in Clinical Change Category (cont.)*

	Adolescents			Adults		
	$X^2$	$p$ -value	$df$	$X^2$	$p$ -value	$df$
<b>Client Reported Efforts/Satisfaction</b>						
<b><u>Whole Model</u></b>	<b><u>77.33</u></b>	<b><u>0.04*</u></b>	<b><u>57</u></b>	<b><u>53.92</u></b>	<b><u>0.01*</u></b>	<b><u>33</u></b>
Effort into Program	11.80	0.46	21	10.66	0.30	9
Change in Physical Activity	36.87	0.02*	21	29.86	0.01*	15
Problem Abatement	14.43	0.27	12	N/A	N/A	N/A
Satisfaction with Quality of Treatment	13.96	0.30	12	24.04	0.004*	9
<b>Discharge Staff Information</b>						
<b><u>Whole Model</u></b>	<b><u>29.32</u></b>	<b><u>0.21</u></b>	<b><u>24</u></b>	<b><u>13.90</u></b>	<b><u>0.74</u></b>	<b><u>18</u></b>
Staff reported Client Benefit	14.77	0.25	12	10.48	0.57	12
% of Program Completed	7.8	0.80	12	2.80	0.83	6

\*Values reported are statistically significant predictors  $p \leq .05$

**Situating and implications of findings.** These findings indicate that some groups of variables have significant prediction value for which Clinical Change Category an ASD client will be a member of following an OBH intervention. The model testing client-reported efforts into program, change in their physical activity levels, perceived problem abatement, and satisfaction with the quality of treatment had significant prediction capability for both adolescents and adults regarding outcome category. Change in physical activity for both adults and adolescents was a variable with significant prediction value as well ( $p < .02$  adolescents;  $p < .01$  adults). For adults, the satisfaction

with the quality of treatment they received had a significant p-value, ( $p < .004$ ) but for adolescents this was not the case. Interestingly, staff reported client benefit (i.e. whether a client got maximum benefit from participation in the program) was not a significant predictor of outcome despite this being a question asked at discharge. Situating these findings in OBH research cannot occur due to the gap in literature on the ASD and OBH experience to date; however, research on the theoretical foundations of OBH as well as the recommended interventions for individuals with ASD provides some insight into the findings of why client-centered questions are better predictors of Clinical Change Categories than demographics or staff reported constructs.

The intolerance of uncertainty (IU) includes the “tendency to react negatively on an emotional, cognitive, and behavioral level to uncertain situations and events” (Buhr & Dugas, 2009, p. 216) and is found to be prevalent in individuals with ASD, causing higher levels of anxiety for them (Rodgers, Glod, Connolly, & McConachie, 2012). However there is currently no treatment available targeting IU in ASD (Rodgers, Hodgson, Shields, Wright, Honey, & Freeston, 2017).

As Gass, Gillis, and Russell (2012) explain, outdoor behavioral health combines adventure and experiential activity as a therapeutic tool to develop competence and create autonomous motivation. It takes the participant to unfamiliar, physical environments in nature to experience positive stress while living in a small group, encountering new experiences to master and then teaching them to transfer the skills to new situations. Additionally, their experiences are guided by solution-focused instructors in daily life basis with visits from the therapist for prescribed sessions that challenge their cognitive distortions, permitting them to view situations from a different perspective (Ellis, 1957;

Ellis, 1962; Beck, 1967). For participants to face and seemingly overcome their IU, or at minimum anxiety, toward change for a period of time would likely induce feelings of empowerment.

Increased physical activity during an OBH intervention typically includes a daily hike while setting up camp, meal preparation, and social skill practice within a group setting are often new experiences upon which they can act, reflect, apply to abstract concepts, and actively experiment upon in a new situation (Kolb, 1984). The combination, or “tapestry” of experiences is aimed at creating self-efficacy, self-confidence, teamwork, trust, and overall life effectiveness for individuals (Fahlberg 1990; Cason & Gillis, 1994; Hattie, Marsh, Neil, & Richards, 1997). This empowerment of the individual following an OBH intervention (Shellman & Ewert, 2010; Ewert, 1983) could be influencing their answers on discharge questionnaires asking them to rate both their experiences and their symptom or behavioral distress abatement immediately upon discharge. For this reason, additional measurements at six and 12 months post-discharge can aid in tracking the sustainability of the empowered feelings.

OBH also incorporates many of the Established Interventions for Adolescents and Young Adults with ASD found in Appendix B. Specifically, behavioral interventions (i.e. both natural and logical/enforced consequences), cognitive behavioral interventions, natural teaching strategies, peer training, self-management, schedules, and/or social skills, all established interventions endorsed in the National Standards Project Review (NSPR, 2015) were mentioned specifically on the majority of websites of the participating programs (researcher review). Though exercise is still considered an Emerging intervention, studies outside of OBH link increased exercise with abatement of

depression and anxiety symptoms in particular (Cooney, Dwan, & Mead, 2014; Mead, Morley, Campbell, Greig, McMurdo, & Lawlor, 2009; Byrne & Byrne, 1993).

### **Researcher Conclusions**

In the interest of exploratory research, I came into this study with no null hypotheses to reject or fail to reject and was open to adding analyses post hoc when results prompted further questions. Some of these pos- hoc additions clarified answers to my research questions, and some did not.

After analyzing the study's findings, it became clear that adolescents with ASD do experience gains following an outdoor behavioral health intervention. Mean changes in score were statistically significant for both adolescents and adults. However, further investigation into the cutoff scores and Reliable Change Indices for the groups affected my initial conclusion that wilderness was a good choice for ASD clients in general. I found that adolescents do not have as high a probability of reporting results in the Recovered or Improved Category of Change when considering clinical change in addition to statistical change. This raised more questions about the reasons behind the finding. After reviewing more research suggesting that chronological and developmental age can differ in individuals with autism as they experience developmental delays, I surmised this could be part of the reason for these findings. A review of the interventions used in outdoor behavioral health indicate they are appropriate for ASD clients; in fact, several of them are considered "Established" interventions for these individuals following the National Standards Project review by the National Autism Center conducted in 2015. Therefore, interventions that the programs listed on their websites as being part of their therapy methods did not appear inappropriate for ASD clients. Follow-up interviews

might clarify any discrepancies in website content and actual implementation or illuminate additional interventions that they might make for an ASD client.

I concluded that more research on the tools for measuring outcomes may also be necessary as the creators of the questionnaires themselves note in the scoring manual that they are not intended for a subgroup and that additional norms may be needed for certain populations. (Lambert, et al., 2004).

I found that clustering alone did not illuminate variables that affect clinical or statistical change on outcome measurements apparent nor did they help determine what characteristics, diagnoses, lack of diagnoses, or demographics were necessary for a typical ASD participant to do well in outdoor behavioral health. However, after adding multinomial logistic regression and a third research question, I found that the whole model of client-reported variables collected at discharge can be a predictor of category of change membership. This leads me to believe that client satisfaction and the perceived effort they put into the program may influence their outcome scores. After further review of research on the feelings of empowerment participants can experience when they have completed adventure or wilderness therapy, I concluded that empowerment is also a variable worthy of further investigation for ASD participants.

### **Recommendations for Future OBH Research**

The goal of this study was to explore the experiences of individuals with Autism Spectrum Disorder who had enrolled in an Outdoor Behavioral Health program as an intervention for treating mental health issues they were experiencing. As an exploratory study, there were no a priori hypotheses generated to test, and the direction of investigation was changed as findings became available. Data were collected between

2013 and 2018 at the time of the participants' intake and discharge from the program using either the Youth Outcome Questionnaire – Self Report or the Outcome Questionnaire – 45.2 as well as on NATSAP Intake and Discharge questionnaires completed by the participant or staff. Although the study revealed significant findings in the descriptive statistics of outcome scores, future studies are recommended to examine the variances in scores obtained for ASD adolescents in particular. Additionally, the study could be expanded to more closely examine the variables for prediction values when paired or grouped with other variables. A significant contribution to future research would be conducting investigation into the combination of ASD and Learning Disability variables which appeared to cluster in the HAC visualizations, yet did not demonstrate statistical significance in multinomial logistic regression.

Finally, this study could be expanded by conducting follow-up surveys with therapists at wilderness programs regarding their knowledge about established and emerging interventions for ASD individuals and how their intervention choices might change when working with an ASD client. Time constraints permitted only a review of websites for this study and a qualitative study using interviews and coding regarding the changes they observe specifically in ASD clients would further illuminate findings. This type of follow-up interview would broaden the knowledge base on what interventions are present or missing in OBH that might affect the 51% of adolescents who do not score in the Recovered or Improved categories.

### **Recommendations for OBH Practices**

My findings in this study identified variables that have impact on outcome scores for students with ASD who engage in an OBH intervention for a period of time. Through



examination of descriptive statistics, I noted that self-reports of adolescents had less than a 50% probability of achieving scores for membership in the Improved or Recovered categories of change whereas self-reports of adults 18 and older had a 67% probability of doing so. Since OBH is typically a short-term intervention when compared to other residential care options, the recommendations for OBH practice are more frequent monitoring of adolescent progress while in OBH, adjusting the intervention to address the symptoms and behaviors that are not reported as decreasing mid-intervention, and ensuring comprehension of the questions that are asked on the outcome questionnaires will help to ensure reporting is adequately measured and maximized. Additionally, making appropriate recommendations for next steps after the intervention are critical to increase the odds of Recovered or Improved change beyond OBH.

Outdoor Behavioral Health is gaining traction for its positive effects on individuals with a wide range of symptoms. In a recent study, DeMille, et al. included a Treatment As Usual (TAU) control group and found sustained positive effects for youth who attended the program versus those who did not as reported by their parents (Demille, Tucker, Gass, Javorski, VanTanagen, Talbot & Karoff, 2018). It is the first to have included the TAU group in an OBH program study and is an important addition to the empirical evidence in support of the OBH intervention.

The national average of ASD individuals is currently 1.5% of the population whereas the enrollments in OBH reflect 3.7% of the individuals have ASD. Clearly parents are choosing this option as an intervention for their child or young adult, and more research on how to meet to their needs is recommended.

## **Assumptions and Limitations**

The study has several assumptions and limitations. It assumes a relative similarity in the approaches to intervention between 18 programs whose data were reported to the NATSAP PRN. An assumption is the intake staff members for each program were familiar with and used standardized criteria for rating client behaviors they observed. The assumption is that participants truthfully answered the self-reports used to measure change. There was also an assumption that the YOQ-SR and the YOQ-SR-2.0 outcomes would be comparable after revision had been made so that studies using either measurement tool could be compared.

Limitations include the lack of information on which rating scale or tool was used to determine the ASD diagnosis of the individual prior to enrolling in the program. Another limitation is the changed criteria itself from the 2000 to 2013 *DSM* editions. Not only is knowledge of the criteria necessary, but there are studies showing how the changed criteria directly affected numbers of those diagnosed as well as caused a small percentage of individuals to lose their diagnosis following the changes (Kim et al., 2014).

Using only OQ tools to evaluate well-being may also limit ways in which positive experiences were reported by the participants, particularly when considering that self-efficacy and empowerment could be effects influencing discharge ratings after the OBH intervention. The mismatch in outcome scores to positive feelings about the program, effort into the program, and problem abatement ratings – particularly in the adolescent sample – warrants further investigation in regard to those feelings of empowerment and achievement.

This study is limited by the lack of racial and ethnic representation. Predominately, participants were Caucasian and it is believed this is reflective of the larger population of adolescents and young adults in NATSAP programs because other studies have found in the body of research related to NATSAP programs (Behrens, 2011; Bettman et al., 2016; Russell, 2005, Tucker et al., 2016). Additionally, the conflicting answers on the ethnicity question caused some participants to be labeled as “unknown” rather than their true ethnicity.

Missing paired t-tests for intake and outcome limited the number of participants in the study, which is an additional limitation to the study. Although there were more than 1000 individuals with ASD found in the NATSAP dataset representing all options of residential treatment, only 203 had matched intake and outcome while enrolled in an OBH program.

Finally, time constraints added another limitation of inability to conduct interviews with program staff which would have permitted cross-validating the interventions or at least gathering information about how each program meets the needs of its ASD population in general. Instead, program websites were reviewed for self-reported adherence to Gass’s Research Rubric regarding Treatment/Intervention Fidelity (See Appendix K, pg. 2).

### **Reflection and Researcher as Instrument**

I have been an educator since in 1992 but was not introduced to autism until 10 years later as the owner of a preschool. One of my students was a three-year-old little girl whose favorite pastime was to quote lines from Disney movies and sing Disney princess songs. At the time, it seemed adorable and I was impressed with her ability to remember

dialogue and lyrics with such accuracy. I did not occur to me that Disney was all she talked about. It was not a hobby or interest, it was the world in which she lived.

Her mother recognized the repetition and rigidity in her daughter's thinking first and asked that I be observant for repetitive and sensory-stimulating behaviors, including twirling the swing chain up to spin around or swinging as high as she could for that moment when the chains slacked and gave a moment of thrill. When I began to confirm the behaviors to her mother, she started focused and systematic internet research to try to find therapies that might bring her daughter out of "her world," and help to increase her interactions with her surrounding world. It was at this time, the internet began exploding with parents sharing information about Asperger's Syndrome, and she found swim therapy and equine therapy in which to enroll her daughter for this mysterious disorder.

Although the preschool did not last beyond a year and she moved on, I stayed aware through the parental network that these early interventions helped her daughter immensely and her mother was her biggest advocate when it came time to build an Individualized Education Plans in public school. She was my first autistic student and evidence that early intervention makes a difference.

Since then, I have met and taught many children at all levels of the autism spectrum – some who were completely non-verbal and using a picture system to organize their day and handle transitions to new activities, some who were highly gifted, twice-exceptional, and just seemed a little odd in conversations, and some whose other presenting issues masked their autism completely. My interest in how best to meet their learning needs through the explicit teaching of social skills and other interventions led me to this study.

I began the study looking through the therapeutic lens with the oft-repeated phrase of our business, “There is no magic pill.” In other words, therapy does not help everybody and there is no formulaic, one-size-fits-all way to get there if it does. Some behaviors are too ingrained, some family patterns are too firmly set, some diagnoses in combination with other diagnoses are better served through hospitalization. Residential treatment programs are expensive and, as I discussed in Chapter One, insurance companies have succeeded in denying coverage for more than 20 years under the objection that it is not yet “Evidence Based Practice.” Yet each study gets OBH and other options one step closer.

As Hoag et al. (2014) stated, “Even with [the] growth of research, the evidence and literature within this field still lacks depth and methodological sophistication and has been limited in the scope of what it has examined” (p. 383). This study intended to explore the experiences of those on the autism spectrum disorder who were enrolled in an outdoor behavioral health program and then to compare them to those of a general sample. In my position at a therapeutic school, one step lower than OBH on the continuum of care, I began the study under the assumption wilderness therapy benefitted everyone. In my daily experience, new students who have completed several weeks in an OBH program have a head start on learning procedures, understanding social constructs, and the therapeutic relationship between all employees and the students. My findings did not completely concur and resulted in more questions than answers.

With the ASD enrollment in OBH programs reported most recently at 2.9 percent and 3.7 percent for adults and adolescents respectively (Curtis, Briggs, & Behrens, 2018), higher than the national percentage of 1.5 across the nation, it is clear parents are

choosing OBH programs as an option for their adolescent or adult child with ASD.

Whether that choice was made to alleviate their anxiety, abate their depression or mood disorder, curb their substance abuse, redirect their oppositional behavior, or manage their ADD/ADHD co-diagnoses, reported outcomes that show positive, medium or large effects for the generalized population are not as well defined for the ASD individual.

Opening a discussion on how to best serve this population was the intention of this study.

## APPENDICES

# Appendix A

## Diagnostic and Statistical Manual for Mental Disorders ASD Criteria and Subsequent Changes to Diagnostic criteria

DSM Ed.	Pub. Year	Diagnostic Criteria for "Autism"	Changes from Previous DSM Edition and Size	
			(Blashfield, Keeley, Flanagan & Miles, 2014)	
I	1952	No mention of Autism. Closest diagnosis was a description of Schizophrenic Reaction – Childhood Type. There were no criteria offered to distinguish it.	N/A	This edition was 132 pages with emphasis on veterans with post-war "psychopathic" or "psychoneurotic" personalities
II	1968	No diagnosis criteria presented. Closest diagnosis was Schizophrenic Childhood Type which described "autistic, atypical and withdrawn behavior" and a general unevenness because of "failure to develop identity separate from the mother" (APA, 1968)		Presented some behaviors to distinguish the disorder.  This edition described 182 mental disorders.
III	1980	Infantile Autism was introduced as a new category of pervasive developmental disorders and included criteria of: 1) Pervasive lack of responsiveness 2) Resistance to change 3) Age of onset before 30 months  Adults who formerly manifested these behaviors, but who no longer met the criteria, were designated "Infantile Autism – Residual State"	Kanner's non-negotiable checklist of 16 symptoms was presented (need this list)	Autism was removed from the area of schizophrenia and established a new category known as "pervasive developmental disorders"  This edition described 265 mental disorders (+83 from previous issue)
III-Text Rev.	1987	Childhood Onset Pervasive Developmental Disorder (COPDD) added for onset after 30 months. Criteria: 1) Lack of social responsiveness and inappropriate clinging 2) Hyper or hypo-sensitivity to stimuli 3) Bizarre fantasizing 4) Morbid thoughts and interests	Kanner's non-negotiable checklist now required 8 of the 16 criteria and added sections from which a certain number must be met in each.  Removed COPDD completely and introduced Pervasive Developmental Disorder – Not Otherwise Specified (PDD-NOS)	"Residual state" was dropped. Infantile Autism was rechristened Autistic Disorder  This edition described 292 mental disorders (+27 from previous edition)



# Appendix A (cont.) Diagnostic and Statistical Manual for Mental Disorders ASD Criteria and Subsequent Changes to Diagnostic criteria

IV	1994	<p>Autistic Disorder – was also referred to as <b>Kanner's</b> Autism, childhood autism, or early infantile autism.</p> <p>Criteria:</p> <p>A. A total of six or more items with at least two from area 1, and one each from 2, and 3.</p> <ol style="list-style-type: none"> <li>1) qualitative impairment in social interaction in at least two of the following: impairment in the use of multiple nonverbal behaviors; failure to develop peer relationships; lack of spontaneous seeking to share enjoyment, interests, or achievements with other people; lack of social or emotional reciprocity.</li> <li>2) qualitative impairments in communication as manifested by at least one of the following: delay in or lack of the development of spoken language; marked impairment in the ability to initiate or sustain a conversation; stereotyped and repetitive use of language; lack of varied, spontaneous <del>make believe</del> play.</li> <li>3) restricted repetitive and stereotyped patterns of behavior, interests, and activities by at least one of the following: encompassing preoccupation with one or more patterns of interest that is abnormal in intensity or focus; inflexible adherence to specific, nonfunctional routines or rituals; stereotyped and repetitive motor mannerisms; persistent preoccupation with parts of objects.</li> </ol> <p>B. Delays or abnormal function in at least one of these areas, with onset prior to 3 years: social interaction, language used in social communication, or symbolic/imaginative play.</p> <p>C. Not better accounted for by <b>Rett's</b> Disorder or Childhood Disintegrative Disorder.</p>	<p>Lorna Wing proposed Asperger's Syndrome which had already been included in the Internal Classification of Diseases, published by World Health Organization. This was one of only two new diagnoses accepted out of 94 proposed. The second was type II bipolar disorder.</p> <p>This edition described 383 mental health disorders (+70 from previous edition) in 297 categories.</p>
		<p>Asperger's Disorder is introduced with the following criteria:</p>	

Appendix A (cont.)

Diagnostic and Statistical Manual for Mental Disorders ASD Criteria and Subsequent Changes to Diagnostic criteria

- A. Qualitative impairment in social interaction manifested by at least two of the following: impairment in the use of multiple nonverbal behaviors such as eye contact; failure to develop peer relationships; a lack of spontaneous seeking to share enjoyment; lack of social or emotional reciprocity.
- B. Restricted repetitive and stereotyped patterns of behavior, interests, and activities as manifested by at least one of the following: encompassing preoccupation with one or more stereotyped and restricted patterns of interest; inflexible adherence to specific, nonfunctional routines or rituals; stereotyped and repetitive motor mannerisms; persistent preoccupation with parts of objects.
- C. Significant impairment in social, occupational, or other areas of functioning.
- D. No clinically significant general delay in language.
- E. No clinically significant delay in cognitive development or self-help skills et al.
- F. Criteria are not met for another Pervasive Developmental Disorder or Schizophrenia.
- PDD-NOS – Considered subthreshold autism but did not require rituals, intense focus, and repetitive behavior to all be present.

IV- 2000  
Text  
Rev.

Published, in part, to correct the error requiring that, in order to meet the criteria for PDD-NOS, a child must display impairments in social interaction, communication, and behavior – the typo stating OR rather than AND prompted over-diagnosis of autism and created a mysterious “autism epidemic” (Silberman, 2015, p. 401)

V	2013	<p>SCD – Newly named disorder with criteria of:</p> <p>A. Persistent difficulties in the social use of verbal and nonverbal communication as manifested by all of four criteria:</p> <ol style="list-style-type: none"> <li>1) Deficits in using communication for social purposes.</li> <li>2) Impairment in the ability to change communication to match context or the needs of the listener.</li> <li>3) Difficulties following rules for conversation and storytelling.</li> <li>4) Difficulties understanding what is not explicitly stated and ambiguous meanings of language.</li> </ol> <p>B. Deficits resulting in functional limitations in effective communication, social participation and relationships, academic achievement, or occupational performance.</p> <p>C. Onset of symptoms in the early developmental period.</p> <p>D. Symptoms that are not attributable to another condition.</p>	<p>Added social (pragmatic) communication disorder, a new condition involving persistent difficulties in the social uses of verbal and nonverbal communication. Considered the “threshold” diagnosis of ASD because it does not require the restricted and repetitive behaviors criteria.</p>
		<p>Introduced Autism Spectrum Disorder – A newly named disorder of persistent deficits in:</p> <p>A. Social communication and social interaction across multiple contexts. Patients must have deficits in all three of:</p> <ol style="list-style-type: none"> <li>1) Deficits in social-emotional reciprocity.</li> <li>2) Deficits in nonverbal communicative behaviors used for social interaction.</li> <li>3) Deficits in developing, maintaining, and understanding relationships.</li> </ol> <p>B. Restricted, repetitive patterns of behavior, interests, or activities manifested in two of the following:</p> <ol style="list-style-type: none"> <li>1) Stereotyped or repetitive motor movements, use of objects, or speech</li> </ol>	<p>ASD encompassed autism, Asperger’s disorder, childhood disintegrative disorder, <del>Rett’s</del> disorder, and pervasive development disorder not otherwise specified.</p> <p>Reduced groups of symptoms from three to two but required patients to meet the requirements for all three of the social communication and interaction criteria as well as two of the four restricted, repetitive patterns of behavior criteria.</p> <p>Described three severity levels of (1) “requiring support”, (2) “requiring substantial support”, and (3) “requiring very substantial support”.</p>

Appendix A (cont.)

Diagnostic and Statistical Manual for Mental Disorders ASD Criteria and Subsequent Changes to Diagnostic criteria

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2)	Insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior
3)	Highly restricted, fixated interests that are abnormal in intensity or focus
4)	Hyper- or hypo-reactivity to sensory input or unusual interest in sensory aspects of the environment.
C.	Symptoms present in the early developmental period.
D.	Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning.

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## Appendix B

### Interventions for Children, Adolescents, and Young Adults of the ASD Population

Type of Intervention Studied	Established (ES) Emerging (EM) Unestablished (U)
Animal-Assisted Therapy	U
Auditory Integration Training	U
Augmentative and Alternative Communication Devices	EM
Behavioral Interventions	ES
Cognitive Behavioral Intervention Package	ES
Comprehensive Behavioral Treatment for Young Children	ES
Concept Mapping	U
Developmental Relationship-based Treatment	EM
DIR/Floor Time	U
Exercise	EM
Exposure Package	EM
Facilitated Communication	U
Functional Communications Training	EM
Gluten-free/Casein-free diet	U
Imitation-based Interventions	EM
Initiation Training	EM
Language Training (Production)	ES
Language Training (Production & Understanding)	EM
Massage Therapy	EM
Modeling	ES
Movement-based Intervention	U
Multi-component Package	EM
Music Therapy	EM
Natural Teaching Strategies	ES
Parent Training	ES
Peer Training Package	ES
Picture Exchange Communication System	EM
Pivotal Response Training	ES
Reductive Package	EM
Schedules	ES
Scripting	ES
Self-Management	ES
SENSE Theatre Intervention	U
Sensory Intervention Package	U
Shock Therapy	U
Sign Instruction	EM
Social Behavioral Learning Strategy	U

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Social Cognition Intervention	U
Social Communication Intervention	EM
Social Skills Package	ES
Social Thinking Intervention	U
Structured Teaching	EM
Technology-based Intervention	EM
Theory of Mind Training	EM

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Table B-1: Interventions for Children, Adolescents, and Young Adults of the ASD Population included in the National Standards Project review by the National Autism Center and the project's conclusions on the evidence base supporting them.

## Appendix C

### Youth Outcome Questionnaire<sup>1</sup>

**Youth Outcome Questionnaire (Y-OQ® 2.0 SR)**

Name \_\_\_\_\_ Date \_\_\_\_\_

**PURPOSE:** The Y-OQ® 2.0 SR is designed to describe a wide range of troublesome situations, behaviors, and moods that are common to adolescents. You may discover that some of the items do not apply to your current situation. If so, please do not leave these items blank but check the "Never or almost never" category. When you begin to complete the Y-OQ® 2.0 SR you will see that you can easily make yourself look as healthy or unhealthy as you wish. Please do not do that. If you are as accurate as possible it is more likely that you will be able to receive the help that you are seeking.

**DIRECTIONS:**

- Read each statement carefully
- Decide how true this statement is during the past 7 days.
- Completely fill the circle that most accurately describes the past week.
- Fill in only one answer for each statement and erase unwanted marks clearly.

Developed by  
Gawin Wells, Ph.D.,  
Gary M. Burlingame, Ph.D. and  
Michael J. Lambert, Ph.D.

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OQ Measures, LLC  
P.O. Box 521047  
Salt Lake City, UT 84152

Toll-Free USA:  
1-888-MH-SCORE  
(1-888-647-2673)  
Phone: (801) 649-4392  
Fax: (801) 747-4900

Email:  
INFO@OQMEASURES.COM

Website:  
WWW.OQMEASURES.COM

	Never or Almost Never	Rarely	Sometimes	Frequently	Almost Always or Always
1. I want to be alone more than others my same age .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I have headaches or feel dizzy.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I don't participate in activities that used to be fun.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I argue or speak rudely to others.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I have more fears than others my same age.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I cut classes or skip school altogether.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I cooperate with rules and expectations of adults.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I have a hard time finishing assignments, or I do..... them carelessly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I complain about things that are unfair .....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I have trouble with constipation or diarrhea.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. I have physical fights (hitting, kicking, biting, or scratching..... with my family or others my age.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I worry and can't get thoughts out of my mind.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I steal or lie.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I have a hard time sitting still (or I have too much energy).....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. I feel anxious or nervous.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I talk with others in a friendly way.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. I am tense and easily startled (jumpy).....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. I have trouble with wetting or messing my pants or bed.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. I physically fight with adults.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. I see, hear, or believe in things that are not real.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. I have hurt myself on purpose (for example cut, scratched..... or attempted suicide)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. I use alcohol or drugs.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. I am disorganized (or I can't seem to get organized).....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. I enjoy my relationships with family and friends.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. I am sad or unhappy.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. I have pain or weakness in muscles or joints.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. I have a hard time trusting friends..... family members, or other adults.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. I think that others are trying to hurt me even..... when they are not	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. I have threatened to, or have run away from home.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<sup>1</sup> Website:  
WWW.OQMEASURES.COM

<sup>1</sup> Used with permission obtained from OQ® Measures, LLC

## Appendix D

### Outcome Questionnaire OQ-45.2<sup>2</sup>

Outcome Questionnaire (OQ-45.2) Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_  
Never Rarely Sometimes Frequently Always

#### Instructions:

Looking back over the last week, including today, help us understand how you have been feeling. Read each item carefully and fill the circle completely under the category which best describes your current situation. For this questionnaire, work is defined as employment, school, housework, volunteer work, and so forth.

Developed by  
Michael J. Lambert, Ph.D.  
and  
Gary M. Burlingame, Ph.D.

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Uses

For More Information  
Contact:

OQ Measures, LLC  
P.O. Box 521047  
Salt Lake City, UT 84152

Toll-Free USA:  
1-888-MH-SCORE  
(1-888-647-2673)

Phone: (801) 649-4392  
Fax: (801) 747-6900

Email:  
INFO@OQMEASURES.COM

Website:  
WWW.OQMEASURES.COM

- |   |                       |                       |                       |                       |                       |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1. I get along well with others.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 2. I tire quickly.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 3. I feel no interest in things.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 4. I feel stressed at work/school.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 5. I blame myself for things.....   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 6. I feel irritated.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 7. I feel unhappy in my marriage/significant relationship.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 8. I have thoughts of ending my life.....   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 9. I feel weak.....   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 10. I feel fearful.....   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 11. After heavy drinking, I need a drink the next morning to get going. (If you do not drink, mark "never").....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 12. I find my work/school satisfying.....   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 13. I am a happy person.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 14. I work/study too much.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 15. I feel worthless.....   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 16. I am concerned about family troubles.....   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 17. I have an unfulfilling sex life.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 18. I feel lonely.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 19. I have frequent arguments.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 20. I feel loved and wanted.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 21. I enjoy my spare time.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 22. I have difficulty concentrating.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 23. I feel hopeless about the future.....   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 24. I like myself.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 25. Disturbing thoughts come into my mind that I cannot get rid of.....   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 26. I feel annoyed by people criticizing my drinking (or drug use).....<br>(If not applicable, mark "never")..... | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 27. I have an automatic.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 28. I am not working/studying as well as I used to.....   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 29. My heart pounds too much.....   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 30. I have trouble getting along with friends and close acquaintances.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 31. I am satisfied with my life.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 32. I have trouble at work/school because of drinking or drug use.....<br>(If not applicable, mark "never").....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 33. I feel that something bad is going to happen.....   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 34. I have sore muscles.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 35. I feel afraid of open spaces, of driving, or being on buses, subways, and so forth.....                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 36. I feel nervous.....   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 37. I feel my love relationships are full and complete.....   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 38. I feel that I am not doing well at work/school.....   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 39. I have too many disagreements at work/school.....   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 40. I feel something is wrong with my mind.....   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 41. I have trouble falling asleep or staying asleep.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 42. I feel blue.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 43. I am satisfied with my relationships with others.....   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 44. I feel angry enough at work/school to do something I might regret.....  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| 45. I have headaches.....   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

<sup>2</sup> Used with permission obtained from OQ® Measures, LLC



## Appendix E

### NATSAP Staff Questionnaire - Initial<sup>3</sup>

NATSAP Research and Evaluation Network



#### NATSAP SQ-I (Staff Questionnaire – Initial)

Client ID : \_\_\_\_\_ Admission Date \_\_\_\_\_ Date of Survey \_\_\_\_\_

1. If available, please provide the DSM diagnostic code for the primary diagnosis being used for initial treatment planning: \_\_\_\_\_
2. If available, please provide the DSM diagnostic code for the secondary diagnosis being used for initial treatment planning: \_\_\_\_\_
3. Please provide the Axis V: GAF Global Assessment of Functioning or Children's Global Assessment Scale if the client is under the age of 18: \_\_\_\_\_
4. What is the client's primary reason for referral?
  - a. Alcohol/Substance abuse
  - b. Anxiety issue
  - c. Attention Issue (ADD/ADHD etc)
  - d. Autism/Asperger's
  - e. Depression
  - f. Mood Disorder
  - g. Learning Disability
  - h. Oppositional Defiance/conduct issues
  - i. Trauma related issues
  - j. Eating Disorder
  - k. Self-Injury
  - l. Obsessive-Compulsive Disorder
  - m. Other (please specify – leave text field)
5. What, if any, is the client's secondary reason for referral?
  - a. Alcohol/Substance abuse
  - b. Anxiety issue
  - c. Attention Issue (ADD/ADHD etc)
  - d. Autism/Asperger's
  - e. Depression
  - f. Mood Disorder
  - g. Learning Disability
  - h. Oppositional Defiance/conduct issues
  - i. Trauma related issues
  - j. Eating Disorder
  - k. Self-Injury
  - l. Obsessive-Compulsive Disorder
  - m. Other (please specify– leave text field)
6. What, if any, is the client's tertiary reason for referral?
  - a. Alcohol/Substance abuse
  - b. Anxiety issue
  - c. Attention Issue (ADD/ADHD etc)
  - d. Autism/Asperger's
  - e. Depression
  - f. Mood Disorder
  - g. Learning Disability
  - h. Oppositional Defiance/conduct issues
  - i. Trauma related issues

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<sup>3</sup> Appendices E-J used with permission obtained from the National Association of Therapeutic Schools and Programs

## Appendix F

### NATSAP Research and Evaluation Network



### NATSAP SQ-I (Staff Questionnaire – Discharge)

Client ID : \_\_\_\_\_ Discharge Date \_\_\_\_\_ Date of Survey \_\_\_\_\_

1. Client's condition at discharge:
  - a. Maximum benefit/graduation
  - b. Premature, against program advice
  - c. Premature, but with program approval
  - d. Transferred to another program
  - e. Other (please specify)
2. Client's length of stay in days: \_\_\_\_\_
3. Estimated percentage of program completed:
  - a. Less than 25%
  - b. 25%
  - c. 50%
  - d. 75%
  - e. 100%
4. If client is headed to another program, please name the program: \_\_\_\_\_
5. Did the client's parents come to visit during the course of treatment?
  - a. \_\_\_\_\_ Yes
  - b. \_\_\_\_\_ No

*If yes, please answer the questions below:*
6. How many times did the client's parents come to visit during treatment? \_\_\_\_\_
7. On average, how long did the parents stay during each visit (hours)? \_\_\_\_\_
8. While visiting, did parents participate in therapy with their child?
  - a. \_\_\_\_\_ Yes
  - b. \_\_\_\_\_ No
9. While visiting, did the parents participate in therapy without their child?
  - a. \_\_\_\_\_ Yes
  - b. \_\_\_\_\_ No

## Appendix G

NATSAP Research and Evaluation Network



### NATSAP AQ-I (Adolescent Questionnaire – Initial)

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**Please answer these questions based on when you were admitted to the program**

1. During the last 6 months, has a doctor prescribed you medication(s) for psychological or emotional problems (e.g. for depression, anxiety, ADHD, etc?)
  - a. ☐ Yes
  - b. ☐ No

If Yes, please indicate how good you were at taking the medications provided  
☐ Very Poor      ☐ Poor      ☐ Adequate      ☐ Good      ☐ Excellent

*For questions 2-6, if you transferred from another facility, please refer to the three months prior to that placement.*

2. On average, over the last three months, how many days a week have you used: (Note: if you transferred from another facility, please refer to the three months prior to that placement.)
  - a. Alcohol \_\_\_\_\_
  - b. Marijuana \_\_\_\_\_
  - c. Other Drugs (including inhalants, or abuse of prescription drugs) \_\_\_\_\_
3. Over the past 3 months, when you have used substances, what is the average
  - a. Number of alcoholic beverages you consume per drinking experience \_\_\_\_\_
  - b. Amount of marijuana (in grams) you consume per experience \_\_\_\_\_
  - c. Dose of other drugs you consumed per experience \_\_\_\_\_
4. Over the past 3 months, when you have used substances, what is the maximum
  - a. Number of alcoholic beverages you have consumed in 24 hours \_\_\_\_\_
  - b. Amount of marijuana (in grams) you have consumed in 24 hours \_\_\_\_\_
  - c. Dose of other drugs you have consumed in 24 hours \_\_\_\_\_
5. On average, over the past 3 months, how many times per week have you had more than 5 drinks in a day?  
\_\_\_\_\_
6. On average, over the past 3 months, how many times per week have you consumed alcohol to the point of intoxication?  
\_\_\_\_\_
7. How would you best describe yourself:
  - a. ☐ Bi-sexual
  - b. ☐ Heterosexual “straight”
  - c. ☐ Homosexual (Gay or Lesbian)
  - d. ☐ Not sure
  - e. ☐ Other
8. During the last 2 months, how often have you exercised or been physically active for 30 minutes or more?
  - a. ☐ Never
  - b. ☐ Once a week or less
  - c. ☐ A couple of times a week
  - d. ☐ Most days of a week
  - e. ☐ Every day

## Appendix H

NATSAP Research and Evaluation Network



### NATSAP AQ-D (Adolescent Questionnaire – Discharge)

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. Following discharge, who do you intend to live with?
  - a. ☐ Mother
  - b. ☐ Father
  - c. ☐ Both parents
  - d. ☐ Other legal guardian
  - e. ☐ Other family member
  - f. ☐ With room mate
  - g. ☐ By myself
  - h. ☐ A residential treatment facility
  - i. ☐ A therapeutic boarding school
  - j. ☐ Other (please specify)
2. Since admission to the program, has a doctor prescribed you medication(s) for psychological or emotional problems (e.g. for depression, anxiety, ADHD, etc?)
  - a. ☐ Yes
  - b. ☐ NoIf yes, please indicate how good you were at taking the medication as prescribed.
  - a. ☐ Very poor
  - b. ☐ Poor
  - c. ☐ Adequate
  - d. ☐ Good
  - e. ☐ Excellent
3. How would you describe yourself?
  - a. ☐ Heterosexual "straight"
  - b. ☐ Homosexual (gay or lesbian)
  - c. ☐ Bi-sexual
  - d. ☐ Not Sure
  - e. ☐ Other
4. While at the program, how often have you exercised or been physically active for 30 minutes or more?
  - a. ☐ Never
  - b. ☐ Once a week or less
  - c. ☐ A couple of times a week
  - d. ☐ Most days of the week
  - e. ☐ Every day
5. Currently, how satisfied are you with the quality of treatment you received at the program?
  - a. ☐ Very dissatisfied
  - b. ☐ Somewhat dissatisfied
  - c. ☐ Neutral
  - d. ☐ Somewhat satisfied
  - e. ☐ Very satisfied
6. How much effort did you put into your treatment at the program?
  - a. ☐ No effort
  - b. ☐ Little effort
  - c. ☐ Average effort
  - d. ☐ Above average effort
  - e. ☐ Maximum effort
7. Compared to when you began the program, how would you describe your problems?
  - a. ☐ Much worse
  - b. ☐ Somewhat worse
  - c. ☐ The same
  - d. ☐ Somewhat better
  - e. ☐ Much better
8. Were you brought to the program by a transport service?
  - a) yes
  - b) no

*If you answered "yes," please complete the following questions. If you answered "no," please stop.*

## Appendix I

### NATSAP Research and Evaluation Network



### NATSAP Adult-I (Initial)

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**Please answer these questions based on when you were admitted to the program**

1. During the last 6 months, has a doctor prescribed you medication(s) for psychological or emotional problems (e.g. for depression, anxiety, ADHD, etc?)
  - a. ☐ Yes
  - b. ☐ No

If Yes, please indicate how good you were at taking the medications provided

☐ Very Poor ☐ Poor ☐ Adequate ☐ Good ☐ Excellent

*For questions 2-6, if you transferred from another facility, please refer to the three months prior to that placement.*

2. On average, over the last three months, how many days a week have you used:
  - a. Alcohol \_\_\_\_\_
  - b. Marijuana \_\_\_\_\_
  - c. Other Drugs (including inhalants, or abuse of prescription drugs) \_\_\_\_\_
3. Over the past 3 months, when you have used substances, what is the average
  - a. Number of alcoholic beverages you consumed per drinking experience \_\_\_\_\_
  - b. Amount of marijuana (in grams) you consumed per experience \_\_\_\_\_
  - c. Dose of other drugs you consumed per experience \_\_\_\_\_
4. Over the past 3 months, when you have used substances, what is the maximum
  - a. Number of alcoholic beverages you have consumed in 24 hours \_\_\_\_\_
  - b. Amount of marijuana (in grams) you have consumed in 24 hours \_\_\_\_\_
  - c. Dose of other drugs you have consumed in 24 hours \_\_\_\_\_
5. On average, over the past 3 months, how many times per week have you had more than 5 drinks in a day?  
\_\_\_\_\_
6. On average, over the past 3 months, how many times per week have you consumed alcohol to the point of intoxication?  
\_\_\_\_\_
7. How would you best describe yourself:
  - a. ☐ Bi-sexual
  - b. ☐ Heterosexual "straight"
  - c. ☐ Homosexual (Gay or Lesbian)
  - d. ☐ Not sure
  - e. ☐ Other
8. During the last 2 months, how often have you exercised or been physically active for 30 minutes or more?
  - a. ☐ Never
  - b. ☐ Once a week or less
  - c. ☐ A couple of times a week
  - d. ☐ Most days of a week
  - e. ☐ Every day

## Appendix J

### NATSAP Research and Evaluation Network



### NATSAP Adult-D (Discharge)

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. Following discharge, who do you intend to live with?
  - a. ☐ Mother
  - b. ☐ Father
  - c. ☐ Both parents
  - d. ☐ Other legal guardian
  - e. ☐ Other family member
  - f. ☐ With room mate
  - g. ☐ By myself
  - h. ☐ A residential treatment facility
  - i. ☐ A therapeutic boarding school
  - j. ☐ Other (please specify)
2. Since admission to the program, has a doctor prescribed you medication(s) for psychological or emotional problems (e.g. for depression, anxiety, ADHD, etc?)
  - a. ☐ Yes
  - b. ☐ NoIf yes, please indicate how good you were at taking the medication as prescribed.
  - a. ☐ Very poor
  - b. ☐ Poor
  - c. ☐ Adequate
  - d. ☐ Good
  - e. ☐ Excellent
3. How would you describe yourself?
  - a. ☐ Heterosexual "straight"
  - b. ☐ Homosexual (gay or lesbian)
  - c. ☐ Bi-sexual
  - d. ☐ Not Sure
  - e. ☐ Other
4. While at the program, how often have you exercised or been physically active for 30 minutes or more?
  - a. ☐ Never
  - b. ☐ Once a week or less
  - c. ☐ A couple of times a week
  - d. ☐ Most days of the week
  - e. ☐ Every day
5. Currently, how satisfied are you with the quality of treatment you received at the program?
  - a. ☐ Very dissatisfied
  - b. ☐ Somewhat dissatisfied
  - c. ☐ Neutral
  - d. ☐ Somewhat satisfied
  - e. ☐ Very satisfied
6. How much effort did you put into your treatment at the program?
  - a. ☐ No effort
  - b. ☐ Little effort
  - c. ☐ Average effort
  - d. ☐ Above average effort
  - e. ☐ Maximum effort
7. Compared to when you began the program, how would you describe your problems?
  - a. ☐ Much worse
  - b. ☐ Somewhat worse
  - c. ☐ The same
  - d. ☐ Somewhat better
  - e. ☐ Much better
8. Are you currently prescribed psychiatric medications (e.g. for anxiety, ADHD, etc?)
  - a. ☐ Yes
  - b. ☐ NoIf yes, please indicate how compliant you been with taking the medication(s) while in treatment:
  1. ☐ Very poor
  2. ☐ Poor
  3. ☐ Adequate
  4. ☐ Good
  5. ☐ Excellent
9. Were you brought to the program by a transport service?
  - a. ☐ Yes
  - b. ☐ No

<b>RUBRIC QUALITY</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>
<b>Evidenced-based research evaluation</b>	Would exceed SAMHSA or USDOE rating for model program	Would receive SAMHSA or USDOE rating for model program	Would receive SAMHSA or USDOE rating for effective program	Would receive SAMHSA or USDOE rating for promising program	Would not receive any SAMHSA or USDOE rating
<b>Case studies or clinical samples included</b>	Two or more case studies/clinical samples included in research	One case study/clinical samples included in research	Hypothetical case study/clinical samples included in research	Direct reference to treatment population is clearly made in an appropriate manner	No connection of findings to treatment population
<b>Experimental Design</b>	Random (true) experimental design	Quasi-experimental design with appropriate comparison group(s) and equal n's	Quasi-experimental design with comparison group(s) but statistical limitations (e.g., ANOVA test violations).	Single group, pre-post test design	Single data collection (e.g., post test only), no comparison group
<b>Benefit-Cost Analysis</b>	Financial benefits of treatment combined with program costs are compared against other programs offered to clients. Comparisons are calculated in a benefit cost ratio for clients to understand	Financial benefits of treatment combined with program costs are compared against other programs offered to clients.	Financial benefits of treatment combined with program costs are presented.	Program costs are presented.	None completed
<b>Results reporting</b>	Complete and accurate reporting on significance testing, effect size, and cost benefit figures compared to other research studies	Complete and accurate reporting on significance testing, effect size, and cost benefit figures	Complete and accurate reporting on significance testing and effect size	Complete and accurate reporting on significance testing	No significance testing completed
<b>Training models</b>	Clear uniform & tested professional training model presented with methods of validating/ certifying adherence to model	Clear uniform and tested professional training model presented	Clear uniform professional training model presented	Reference to guidelines on how to implement intervention program is made	No reference on how to implement intervention program
<b>Power of research design (NAROPA or power calculation)</b>	Research design has enough power to significantly reduce Type II errors	Research design has enough power to reduce most problems with Type II errors	Research design has enough power to reduce some problems with Type II errors	Research design has enough power to reduce minor problems with Type II errors	Research design is destined to fail from the beginning of the analysis due to multiple sources of Type II

<sup>4</sup> Used with permission M. Gass.

Rubric of Thirteen (13) elements of Evidenced-based practices of effective adventure programming research in education, mental health, social service, and youth development. Mike Gass [mgass@unh.edu](mailto:mgass@unh.edu). University of New Hampshire. Comments are welcome. Special thanks to Project Adventure, Inc. for their support of this project.



## Appendix K

<b>Instrumentation</b>	Instrument measures variables of the "highest value" in the population being analyzed, possesses well established & high levels of validity and reliability (e.g., higher than .90), is appropriate for client group, possesses strong levels of objectivity	Instrument measures variables of the "high value" in the population being analyzed, possesses established levels of validity and reliability (e.g., higher than .80), is appropriate for client group, possesses adequate levels of objectivity	Instrument has been used with population with relative success, established yet somewhat lower levels of validity and reliability scores (e.g., .70)	Instrument has been used with population with mixed success, established yet somewhat lower levels of validity and reliability scores (e.g., .60)	errors Value of measured variables is limited or unknown, instrument possesses no established validity or reliability measures. Limited previous use with client group, subjective analysis in reporting scores
<b>Cultural variability</b>	Treatment accounts for differences in SES, gender, language, intellectual abilities, cultural characteristics.	Treatment accounts for four of these characteristics	Treatment accounts for three of these characteristics	Treatment accounts for two of these characteristics	Treatment generalization is limited to specific research population
<b>Treatment/Intervention fidelity</b>	Clear treatment manual available documenting well-defined and previously tested treatment/ intervention practices, testing procedures in place to verify maintenance of intervention procedures	Treatment manual available but not previously tested	Treatment procedures available for replication but not manualized, no testing to verify maintenance of intervention procedures	Information on treatment limited and not replicable unless further information is acquired	No information on treatment available
<b>Background literature support</b>	Building off of at least two highly similar control group studies or a large series of single-case study designs (e.g., more than 30).	Building off of at least one highly similar control group studies or several single-case study designs	Sound, accurate, and complete review of the literature in this particular area of adventure research that is also integrated with study's findings	Several key pieces of related research presented as a background and integrated with findings	None or inaccurate review of the literature in this area of adventure research
<b>Replication</b>	Treatment Program has been replicated in more than two sites with different populations	Treatment Program has been replicated in more than one site with different populations	Treatment Program has been replicated in more than one site with same population	Treatment Program has been replicated in one site with different populations	Treatment program has not been replicated
<b>Length of treatment effectiveness assessed</b>	Effects of treatment analyzed for three years or more	Effects of treatment analyzed for more than one year	Effects of treatment analyzed for more than six months	Effects of treatment analyzed for more than one month	Treatment effects only analyzed immediately after treatment



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