

CALIFORNIA STATE UNIVERSITY, NORTHRIDGE

THE EFFECTS OF SURF THERAPY ON SELF-DETERMINATION AND QUALITY OF
LIFE IN YOUNG ADULTS WITH AUTISM SPECTRUM DISORDER

A thesis submitted in partial fulfillment of the requirements

For the degree of Master of Science in Kinesiology

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May 2018

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Acknowledgements

I would like to thank my committee members who provided support and guidance during my graduate studies and the writing of this thesis. Additionally, I would like to thank Dr. Taeyou Jung, Dr. Teri Todd, and Mai Jara for admitting me into the Kinesiology Master's Program. Each of you have been instrumental in my growth as a student and individual. Words cannot express my appreciation for everything you have done for me. You have given me an incredible opportunity to learn, contribute to literature, and be a part of the Brown Center of Achievement family, and for that I shall be forever grateful. To my parents, who raised me to value integrity, commitment, accountability, and sacrifice. Felicite and Ashraf, my achievements are only possible because of you.

To my chair, Dr. Teri Todd,

To Dr. Ashley Samson,

To Dr. Belinda Stillwell,

To Dr. Taeyou Jung,

To Mai Jara

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ABSTRACT

THE EFFECTS OF SURF THERAPY ON SELF-DETERMINATION AND QUALITY OF LIFE IN YOUNG ADULTS WITH AUTISM SPECTRUM DISORDER

by

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Master of Science in Kinesiology

Adults with Autism Spectrum Disorder (ASD) typically exhibit low levels of self-determination and quality of life (Wehmeyer & Shogren, 2017; Heijst & Geurts, 2014). Such deficits are associated with lower rates of employment and independent living as well as an increased risk for depressive and anxiety related disorders (Leyfer et al, 2006). Purpose: The purpose of this mixed methods study was to evaluate the effects of surf therapy on self-determination and quality of life and to capture the meaning and value that young adults with ASD ascribe to their experience. Methods: Fifteen participants (age 18-26) enrolled in a surf therapy program participated in this study. The Arc's Self-Determination Scale and the World Health Organization Quality of Life Field Scale were used to collect measurements before, immediately following, and six weeks following the program. Additionally, qualitative data were collected via photovoice, a participant-centered research methodology that uses picture-taking as an alternative form of communication and self-expression. Participants took part in a focus group following the program during which they discussed their photographs that most accurately reflected their experience of surf therapy and how it impacted their lives. Quantitative and qualitative data were merged during the interpretation of the results using a convergent triangulation design. Data Analysis: A paired samples t-test was conducted to compare the measurements (pre/post/retention) of self-determination and quality of life. Qualitative data were collected through artifacts (photographs) and as verbatim transcript which was analyzed

using a generic coding process. Results: Statistically significant improvements were found for both self-determination (pre-post: $p < 0.001$; pre-follow-up: $p < 0.001$) and quality of life (pre-post: $p = 0.002$; pre-follow-up: $p < 0.001$). Additionally, four shared themes emerged from the qualitative data: positive psychological impact, socialization and community, changing perspectives of physical activity, and surf therapy as an empowering and uplifting experience. Conclusion: Findings from this study support surf therapy as an effective method for improving self-determination and quality of life in young adults with ASD. Furthermore, the results support the exploration of alternative physical-activity based programs for the psychosocial benefit of young adults with ASD.

Keywords: surf therapy, Autism Spectrum Disorder, self-determination, quality of life, mixed-methods design

CHAPTER I

INTRODUCTION

Autism Spectrum Disorder (ASD) is a group of neurodevelopmental disorders characterized by persistent deficits in both verbal and nonverbal social communication, motor development, and sensory integration (American Psychiatric Association; APA, 2013). It currently affects approximately 1 in every 59 individuals in the United States (Baio et al., 2018). The core deficits tend to plateau during the years following adolescence and persist into adulthood, significantly impeding successful transition to independent adulthood (Taylor & Seltzer, 2010; Happe & Charlton., 2012). However, disability is a natural element of the human experience and does not exclude an individual from being at the forefront of their navigation through life (Americans with Disabilities Act; ADA, 2009). Although there is no cure for ASD, enhanced levels of physical activity, self-determination, and quality of life each can have positive effects on several of the associated deficits. The understanding that each of the three factors can have a significant impact on an individual with ASD has been established in literature and drove this research study.

Physical Activity & ASD

Increased participation in physical activity for individuals with ASD is associated with improvements in social skills, social motivation, and reductions in self-stimulating and repetitive sequences of behavior (Powers et al., 1992). Additionally, enhancements in balance, flexibility, cardiorespiratory endurance among other physical fitness variables and improvements in sensory seeking, distractibility and inattention have also been documented in literature (Yilmaz et al., 2004). Considering the known benefits of physical activity as well as the detriments of sedentary lifestyles, it is concerning that research consistently observes lower levels of physical activity in

members of this population when compared to their age-matched peers (Sachs, 2017; Lalonde et al., 2014). In addition to participation in physical activity, both self-determination and quality of life status can have positive effects on the deficits associated with ASD.

Self-determination and Quality of Life

Self-determination refers to autonomous behavior that leads to personal choice and control over one's life (Wehmeyer, 1999). An individual is self-determined when he/she is the primary causal agent for the decision-making processes of life, as opposed to being governed by external influences or circumstances (Wehmeyer 1999). Causal agency refers to the ability to intentionally make decisions that lead to desired outcomes. Often placed among the most important outcomes of the education system for individuals with disabilities, self-determination is associated with increased rates of employment, independent living, post-secondary academic success, and is a potent predictor of overall quality of life (Shogren et al., 2013; Wehmeyer & Shogren, 2017; Field et al., 2003; Martin et al., 2003). Quality of life is one's perception of their life position in relation to their goals, expectations, standards, and concerns (World Health Organization Quality of Life Group, 1998). It has become a goal of public policy and an emphasis of rehabilitative services for individuals with developmental disabilities (Zekovic & Renwick, 2003).

In consideration of the relevance of self-determination and quality of life to the human experience, it is concerning that individuals with ASD typically experience low levels of both variables. Furthermore, the associated social skill deficits place the individual at greater risk for developing secondary conditions including depression, anxiety, and aggression (Bellini, 2006; Laugeson, et al., 2011). The transition to adulthood is often considered a developmental turning

point, and such deficits can lead to socially isolated lifestyles and vulnerability during such a critically important stage of life.

Physical Activity

Participation in physical activity is necessary for the health and wellbeing of all people (US Department of Health and Human Services, 1996). Increased levels of physical activity in individuals with ASD are associated with enhancements in balance, flexibility, cardiorespiratory endurance among other physical fitness variables (Yilmaz et al., 2004). In addition to improvements in physical fitness, notable improvements in sensory seeking, distractibility and inattention, social skills, behavioral patterns, social motivation along with reductions in self-stimulating and repetitive behavior are documented (Elliot et al., 1994 ; Powers et al., 1992; Findlay & Coplan, 2008; Yilmaz et al., 2004). In consideration of the known benefits of physical activity, it is concerning that research consistently reports lower levels of physical activity in members of this population when compared to their peers of typical development (Pan et al., 2012; Draheim et al., 2002). These trends place a significant burden upon the individual, as several chronic health conditions are associated with the socially isolated, sedentary lifestyles led by the majority of adults with ASD (Trost et al., 2002). These include cardiovascular disease, insulin resistance syndrome, and obesity which are more prevalent among individuals with ASD when compared to those without developmental disabilities (Hildebrandt et al., 2016; World Health Organization, 2002; Draheim et al., 2002). The understanding that physical activity may improve outcomes across multiple domains for individuals with ASD is intriguing.

Surf Therapy as a Sport & Physical Activity-Based Service

The environments within sport settings provide individuals with new opportunities to experience feelings of mastery and accomplishment and competence, perhaps translating to other aspects of their lives (Harper et al., 2008; Laursen & Yazdgerdi, 2012). Surf therapy, an adapted approach to the sport of surfing, incorporates several fundamental skills of self-determination within a physically challenging and socially stimulating environment. As supported in literature, surf therapy is a cost-effective, sport-based service that may improve social skills and combat the secondary conditions related to the social and motor deficits in adults with ASD (Godfrey et al., 2015; Cavanaugh, 2010; Stuhl & Porter, 2015). Attending to these needs during adulthood is a worthwhile pursuit, as it may assist individuals navigate the challenges associated with the transition to adulthood. The sport of surfing, in particular, provides the participant with opportunities to develop effective strategies, assess previous motor outcomes, and develop new action plans accordingly. Sensory integration (visual, proprioceptive, auditory, vestibular), social interaction, the natural environment, and therapeutic properties of water all contribute to the unique experience of surf therapy.

Previous studies have shown positive outcomes in social competence, social skills, and self-concept of individuals with ASD following the participation in surfing camps (Cavanaugh et al., 2014). Surf therapy has also been documented to produce significant improvements in upper-body strength, core strength, as well as cardiorespiratory endurance (Clapham et al. 2014). Research indicates that young adults with developmental disabilities have comparatively low levels of cardiorespiratory fitness, making the documented cardiorespiratory benefits particularly noteworthy (Hayden, 1998; Fernhall & Pitetti, 2001; Pitetti & Campbell, 1991). Such benefits are especially meaningful in consideration of the cardiovascular diseases associated with the

sedentary lifestyles that prevail among individuals with ASD (Troost et al., 2002; Draheim et al., 2002).

The therapeutic effects of surfing in various populations have been explored in literature, however, few have implemented a mixed methods research design. Collecting both qualitative and quantitative data provided a more comprehensive understanding of the study's purpose. Qualitative methods can contribute to our understanding of the participants experience and the aspects of an intervention that may have the most effect upon outcome variables (Cavanaugh et al., 2014). Including such methods seemed necessary, as the strengths and perspectives of young adults with ASD are significantly understudied in literature (Teti et al., 2016). Photo voice, the qualitative data collection tool for this study, is a participatory research methodology commonly implemented in health research as a mechanism for personal and community change (Wang & Burris, 1997). Incorporating the voice of the participant as a component of data collection provided unique insight into the experience of surf therapy.

Pictures can support the expression of personal strengths among young adults with ASD by offering an alternate form of communication (Teti et al., 2016). Photovoice is particularly well-suited to help young adults with ASD express their strengths, creativity, and has been shown to enable individuals in marginalized populations overcome social barriers (Wang & Burris, 1997; Teti et al. 2016). Furthermore, it is known for facilitating participant empowerment by giving people control over their photographs and facilitates discussion of the meaning the individual ascribes to an experience (McCrimmon & Montgomery, 2014; Wang & Burris, 1994). Placing the participant in such a role generates a richness to the data of a study that is difficult to produce without participant input (Wang & Burris, 1994). This is critical for a

population like young adults with ASD, as members have limited opportunities to exercise independence and self-expression (Teti et al., 2016).

With regard to quantitative methods, the Arc's Self-Determination Scale is a standardized instrument designed to measure an individual's strengths and weaknesses regarding self-determination status (Wehmeyer & Kelchner, 1995). The tool includes four domains and can provide valuable insight into the underlying causes for low self-determination (Wehmeyer & Kelchner, 1995). Furthermore, assessing subjective quality of life using the World Health Organization Quality of Life Field Scale provided a comprehensive understanding of overall well-being than can be achieved by strictly objective measures. Merging these two methods together during interpretation yielded a rich and comprehensive understanding of the study's overall purpose.

Purpose

The purpose of this convergent mixed methods study was to evaluate the effects of a six-week surf therapy program on self-determination and quality of life in young adults with Autism Spectrum Disorder and explore the meaning and value the participants ascribed to their experience. A convergent triangulation design was used, involving the collection of both quantitative and qualitative data concurrently. Quantitative data were collected via the Arc Self-Determination Scale (Wehmeyer & Kelchner, 1995) and the World Health Organization Quality of Life Field Scale (WHOQOL, 1998) with the purpose of evaluating the effects of surf therapy on the two variables. Qualitative data were collected via Photovoice (Wang & Burris, 1997) to provide insight into the participants' experiences as well as the aspects of the surf therapy program that were most impactful upon their self-determination and quality of life. The datasets were given equal weight and merged during the discussion to yield a comprehensive

interpretation of the study's purpose. This study used the Functional Model of Self-Determination (Wehmeyer, 1999) and the Self-Determination Theory (1991) as a mechanism to define, understand, and interpret changes in the multidimensional behavioral construct. In consideration of the complexity of the variables being measured and gaps in literature, employing such methods seemed warranted. Integrating the voices and perspectives of the participants provided a deeper understanding of the aspects of their experience that were most impactful.

Hypothesis

There will be a change in self-determination and quality of life measurements following participation in a structured 6-week surf therapy program.

Integrating the voices and perspectives of the participants into the research design will provide insight into the participants' experience of surf therapy.

The quantitative and qualitative results will be complementary and provide a deeper understanding of the aspects of the surf therapy that are most impactful upon their self-determination and quality of life.

Null Hypothesis

There will be no change in self-determination and quality of life measurements following participation in a structured 6-week surf therapy program.

Integrating the voices and perspectives of the participants into the research design will not provide insight into the participants' experience of surf therapy.

The quantitative and qualitative results will not be complementary and will not provide a deeper understanding of the aspects of the surf therapy that are most impactful upon their self-determination and quality of life.

Research Questions

Will there be a change in self-determination and quality of life measurements following the surf therapy program?

Will there be insight into the experience of surf therapy and the aspects of the experience that were most impactful?

How do the qualitative results expand upon our interpretation of the changes in self-determination and quality of life?

Assumptions

- Participants will be truthful during data collection
- Participants will understand how to use cameras and take meaningful pictures
- Participants will understand the instructions given during data collection

Limitations

- Sample size
- Short intervention
- Participant sample may not accurately represent the population adults with ASD
- The use of questionnaires

Delimitations

- The study evaluated only one surf therapy program.

Operational Definitions

- Self-determination: acting as the primary causal agent in one's life and making choices and decisions regarding one's quality of life free from undue external influence or interference (Wehmeyer, 1999).

- Quality of Life: One's perception of their position in life in relation to their goals, expectations, standards and concerns (World Health Organization, 1998).
- Autism Spectrum Disorder (ASD): group of developmental disorders characterized by social, motor, and sensory deficits (APA, 2013).
- Surf Therapy: An adapted approach to the sport of surfing incorporating group physical activity, goal-setting and attainment, social integration, and executive and gross motor skill development.
- Photovoice: a participatory research method in that incorporates the participant into the data collection process by taking photographs and using meaningful discussion as a platform to express personal strengths and perspectives (Wang & Burris, 1997).

Significance of the Study

The purpose of this mixed methods study was to evaluate the effects of surf therapy on self-determination and quality of life in young adults with ASD and to explore the meaning and value the participant ascribed to their experience. Often placed among the most important outcomes of the education system, self-determination is associated with increased rates of employment, independent living, post-secondary academic success, and is a potent predictor of overall quality of life (Shogren et al., 2013; Wehmeyer & Shogren, 2017; Field et al., 2003; Martin et al., 2003; Lachapelle et al., 2005; McDougall et al., 2010). Individuals with ASD, however, typically experience low levels of both self-determination and quality of life, placing them at risk for developing depressive and anxiety related disorders (Leyfer et al, 2006) as well as heart disease, diabetes, and obesity due to sedentary lifestyles (Hildebrandt et al., 2016; World Health Organization, 2002; Draheim et al., 2002). The well-documented benefit of physical activity on several mental health variables (Sowa & Meulenbroek, 2012; Findlay & Coplan,

2008; Yilmaz et al., 2004) along with the detriments of sedentary lifestyle warrant the investigation of physical activity-based services. However, research of such services for transition-aged adults with ASD is minimal (Kunzi, 2014). Combatting the effects associated with ASD may be achieved by placing the individual in a position to develop the fundamental skills of self-determination within physically challenging and socially stimulating environments. Evaluating services such as these is a worthwhile endeavor, as they may contribute to the development the individual and promote the betterment of society.

CHAPTER II
REVIEW OF LITERATURE

Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) is defined as a group of neurodevelopmental conditions presenting deficits in both verbal and nonverbal communication, social interaction, sensory processing and atypical motor development (APA, 2013). ASD can have a significant impact on social and emotional reciprocity, both of which are necessary components of effective communication, social competence, and emotional well-being. Furthermore, members of this population tend to experience difficulties in developing and maintaining relationships and tend to display restricted and repetitive sequences of behavior (APA, 2013). Acting out such atypical, ritualistic sequences of behavior is often excessive in nature and accompanied by considerable resistance to change (APA, 2013).

In addition to social deficits, individuals with ASD display varying degrees of atypical motor development and sensory integration (APA, 2013). Difficulties with balance, maintaining posture, walking, and coordinating movement (Jansiewics et al., 2006; Minshew et al., 2004) as well as atypical sensory seeking and avoidance may be observed. Exaggerated responses to tactile, gustatory, vestibular, and proprioceptive stimulation are among the core sensory impairments (APA, 2013). The severity of the motor, sensory, and social symptoms experienced by the individual with ASD are wide ranging and fall on a spectrum. For example, deficits in social communication and interaction can range from slightly unusual social initiations and atypical responsiveness to the body language of others to severe social impairments marked by little to no receptivity. Similarly, restricted and repetitive behavior can range from minimally

affecting self-management and the execution of tasks to severely limiting autonomous functioning in all aspects of daily living (APA, 2013).

Incidence of ASD

Approximately 1 in 59 individuals in the United States are diagnosed with ASD (Baio et al., 2018). Prevalence is higher among males (1 in 42) than in females (1 in 189) and it is displayed in all racial, ethnic and socioeconomic groups (Baio et al., 2013). Additionally, nearly half (44%) of children with ASD have average to above average intellectual ability (APA, 2013). While the precise cause of ASD is unknown, most experts consider it a complex condition that may be the result of several environmental and genetic factors (APA, 2013).

Diagnosing ASD

Developmental screening followed by a comprehensive diagnostic evaluation is currently the standard for establishing a diagnosis (Lord et al., 2006). This typically includes the Autism Diagnostic Interview-Revised (ADIR) and Autism Diagnostic Observation Schedule/Autism Diagnostic Observation Schedule (ADOS-2). The ADIR is a standardized exam composed of ninety-three items divided into three functional domains: language and communication, reciprocal interaction, and restricted and repetitive behaviors and interests. The ADI-R is a comprehensive interview that provides a thorough assessment and evaluation of an individual's status with regard to the core components of ASD (Bildt et al., 2013). The ADOS-2 is a semi-structured observation, includes several modules, and is typically implemented by developmental pediatricians, child neurologists, and child psychologists (Fusar-Poli et al., 2017). Examiners are able to reliably diagnose ASD by observing a child's behavior, verbal communication, movement, and development by the age of two (Fusar-Poli et al., 2017). Diagnosing older children, adolescents, and adults can be difficult, as some behavioral symptoms may overlap

with other disorders (APA, 2013). Nevertheless, obtaining a correct diagnosis during later stages of development or even adulthood can perhaps help the individual understand prior difficulties and obtain appropriate assistance and services. Such services can potentially help improve upon some of the more substantial impairments.

Social, Motor, and Sensory Deficits

Social Deficits

Among the most frequently experienced challenges for those with ASD are in social communication and interaction (Johnson, 2004; Chamberlain et al., 2006). Therefore, services typically place attention on the development of social skills in an effort to equip such individuals with the necessary skills for long-term success. Strategies target the improvement of verbal and nonverbal communication skills, development of problem-solving strategies and awareness of the emotional reactions of others. The lack of social competence can lead to a life of social isolation and withdrawal from society, therefore methods such as these are worthwhile and necessary (Bellini, 2006).

Social competence requires a combination of skills, including the incorporation of appropriate conversational skills, successful interaction, and the maintenance of social relationships (Elliot et al., 2016). It can be thought of as an overarching construct that enables an individual to successfully adapt and exercise several social skills (Elliot et al., 2016). In order to achieve success, individuals are required to understand how and when to use these skills. Additionally, an integral component of social competence is the ability to adapt such learned skills across diverse settings and situations (Elliot et al., 2016). Furthermore, social competence can be brought about by regularly interacting with others, within small groups, and by

comfortably meeting social challenges (Morrison & Blackburn, 2008). Of course, as many of us have experienced, such skills are developed and strengthened over time and with much practice and participation in activities set in socially stimulating environments. Many individuals with disabilities experience a negative self-concept due to a lack of participation in socially and physically stimulating activities and experience social anxiety (Shattuck et al., 2011; Maddox & White, 2015). Much of their participation is facilitated for them by service providers and restricted to therapeutic settings. With this understanding, services are often structured in ways that aim to replicate natural environments and improve the social skill deficits associated with ASD (Kunzi, 2014).

Motor & Sensory Deficits

In addition to social skill deficits, individuals with ASD typically display atypical motor coordination and sensory integration. While symptoms do fall on a spectrum, the prevalence of motor deficits is widely documented (Travers et al., 2013). Previous research indicates the presence of varying gross and fine motor impairments such as poor motor planning, postural stability, and dyspraxia (Travers et al., 2012) along with an adherence to repetitive non-purposeful movement (Pan et al., 2009; Johnson, 2004; Emck et al., 2011; Barber et al., 2012). Additional difficulties with maintaining balance and action planning are also seen (Travers et al., 2012). Individuals with ASD struggle with complex motor actions that require more complex planning and sequencing, defined specifically as developmental dyspraxia, as well as visual and temporal feedback (Dewey, 1995; Ray et al. 2007; Minshew et al. 2004; Mostofsky et al. 2006; Ament et al., 2014). Such deficits have been noted to occur in persons with average and above-average IQ (Howard et al., 2014; Eikeseth, 2009), suggesting that these motor deficits may not be determined by intellectual functioning.

Transition to Adulthood

The primary social and communication deficits experienced by individuals with ASD plateau during the years following adolescence and persist into adulthood, likely impeding successful transition to independent adulthood (Russell-Smith et al., 2012; Taylor & Seltzer, 2010; Happe & Charlton., 2012). As documented in literature, the number of individuals with ASD in this critically important stage of life is increasing at a substantial rate. In 1998, 15,480 students ages twelve to seventeen with a diagnosis of ASD were receiving special education services in the United States (Shattuck et al., 2011). In 2007, the population increased to 99,803 and continues to rise and the majority are not receiving adequate services (Shattuck et al., 2011; Taylor & Seltzer, 2010).

During this period, one faces many new challenges. Establishing and navigating social and professional relationships, developing intimacy, independent living, obtaining and maintaining employment, and developing skills to manage unstructured time are among such challenges. Successful occupation of these adult roles and responsibilities can be especially challenging for an individual with ASD (Billstedt et al., 2005; Orsmond et al., 2013; Sperry & Mesibov, 2005). Members of this population characteristically struggle with this transition, therefore, focus ought to be directed toward the development of programs and services that promote higher quality of life following high-school graduation (Carter et al., 2013; Foley et al., 2012; Test et al., 2017).

Transition to Adulthood and ASD

A mixed methods research study conducted by White and colleagues in 2015 investigated the needs and challenges faced by college-aged students with ASD. The purpose of the study was to explore of the most significant challenges faced by members of this population. This task

was undertaken with the knowledge that the years following high-school represent a period of heightened risk for symptom exacerbation for such individuals (White et al., 2015).

Three groups of participants were recruited for this study; parents, students with ASD, and school personnel. Subjects with ASD were required to be full or part-time students at a postsecondary institution. School personnel were required to be employed at the institution and have experience working with students with ASD. Five full-time students with ASD, thirty full-time faculty, and thirty-two parents of students with ASD were included in the study. The study included focus groups that were held at the academic institution with the intention of providing a platform for participants to discuss their beliefs, attitudes, and perspectives with regard to the challenges of postsecondary education. Additionally, surveys were administered to each participant and the content included information pertaining to deficits, strengths, and areas of challenge observed most frequently among students with ASD. Interview questions were derived from experts in the field of qualitative research methodology. Survey questions included questions pertaining to past or current challenges, utilization of resources to overcome challenges, and the usefulness of transition services. Focus group discussions and interviews were audio-recorded, transcribed and analyzed for prevalent themes.

The findings of this study revealed that the most significant challenges faced by college-aged students with ASD were in the areas of social, self-determination, and self-regulation needs. Socialization, the transition to independence and adulthood, intimacy, academic demands, and participating in social interactions without the aid of parents or faculty were also found to be of great challenge. Challenges in the domain of self-determination, the ability to be the primary agent in decision-making processes, were a central finding of the study. Among such challenges identified was maintaining goal-directed behavior, developing independent living skills, gaining

employment, motivation, self-regulation, advocating for accommodations, and identifying personal strengths. The results of this study highlight the importance of socialization, self-determination, and self-regulation skills for young adults with ASD.

Another study, conducted by Taylor and Seltzer in 2010, involved following youths with ASD for ten years beginning at approximately sixteen years of age. Researchers monitored the severity of social impairments in individuals with ASD, with particular attention to changes in maladaptive behavior during the transition from high school to adulthood. Measurements of problematic behavioral patterns and ASD symptoms were taken during the high school years. The rate of improvement was subsequently observed during the years following graduation. The intent of this study was to observe the behavioral patterns associated with ASD during the transition to adulthood.

The sample used in this longitudinal study was 242 mothers of transition-aged sons and daughters with ASD averaging 16.3 years. The Autism Diagnostic Interview-Revised (ADI-R), a structured interview, was used to evaluate ASD symptoms and behavioral outcomes. Sub-domains of the ADI-R include questions pertaining to social behavior, interests, reciprocity, and communication. Furthermore, maladaptive behavior was measured using the Behavior Problems sub-scale of the Scales of Independent Behaviors—Revised (Bruininks et al., 1996). Maladaptive behaviors are considered to be injurious to self, atypical, and repetitive (Bruininks et al., 1996). Externalized maladaptive behaviors are considered to be injurious to others, associated with negative outcomes, disruptive, uncooperative, and socially inappropriate (Bruininks et al., 1996).

It is encouraging that the rate at which symptom severity decreased was continuous and steady during the high school years (Taylor & Seltzer, 2010). It is equally disconcerting,

however, that in the years following high school the rate of improvement slowed significantly. Behavioral outcome improvements slowed significantly during the years immediately following high school. An average improvement of 0.82 points per year during high school was reduced by over one-half, to 0.31 points per year following high school (Taylor & Seltzer, 2010). High school exit was more detrimental to individuals with high functioning ASD (IQ>70; DSM V); their symptom improvement slowed more so than that of lower functioning individuals during this critical time. In consideration of these trends, it is not surprising that adults with ASD experience poor adult outcomes when compared to the general population, experiencing poor educational outcomes, lower rates of employment and financial independence, and further impairment in social skills development. (Billstedt et al., 2005; Henniger & Lounds-Taylor, 2012).

In consideration of the unique social, motor, and sensory deficits experienced by this rapidly growing population, it would be reasonable to investigate ways to promote participation in activities designed to enhance these skills. Such services may assist adults with ASD to navigate this critically important transition process. However, the adoption of and adherence to such programs cannot occur without opportunity. Services during this developmental turning point encourage participation in desired activities conducive to both social skill improvement as well as the adoption of and adherence to physically active, healthy lifestyles (Eaves & Ho, 2008; Shattuck et al. 2011). Individuals with ASD tend to lead sedentary and socially isolated lifestyles when compared to the general population (Draheim et al., 2002), with the primary barrier to participation often identified as a lack of opportunity (Pan et al., 2010; McCollum, 2015; Hilton et al. 2008; Simeonsson et al. 2001).

Participation

Participation is “what the person can do, wants to do, has the opportunity to do and is not prevented from doing” (Mallinson & Hammel, 2010). Essentially, the act of participating in an activity is goal-oriented, meaningful, and rewarding (Coster & Khetani, 2008) and is associated with enhanced life-satisfaction and overall well-being (Law et al., 2004). Interactive settings can provide opportunities for participation that challenge an individual’s ability to adapt behavior appropriately and effectively to environmental feedback (Mallinson & Hammel, 2010). Young adults with disabilities often participate in social activities in a more restricted manner within therapeutic and unnatural settings (Hilton et al., 2008; Liptak et al., 2011; Shattuck et al., 2011; Shields et al., 2013). Furthermore, the opportunities to participate in naturally occurring social activities tend to become less frequent in the years following secondary school (Shattuck et al., 2011). Such trends likely contribute to the decreased rates participation, well-being, life satisfaction, and prevalence of social isolation (Shattuck et al., 2011).

Lack of Opportunity

The primary barrier to participation often identified by individuals with ASD is the lack of opportunity. Therefore, additional services that promote enjoyable and socially engaging activities deserve attention. A recent study examined participation patterns of young adults with high functioning ASD (McCollum et al., 2015). Young adults between the ages of eighteen and twenty-five diagnosed with ASD were recruited across twenty-eight community centers. Twenty-four participants met the criteria, having an IQ score of at least seventy on the Wechsler Abbreviated Scale of Intelligence, Second Edition (WASI-II, $M = 100$ $SD = +16.12$) were included in the study. The AYA-ACS, an assessment of participation in everyday activities developed for individuals between the ages of eighteen and twenty-five, was administered. The

seventy items of the AYA-ACS span seven domains: chores (eleven items), leisure (thirteen), social (ten), education (eight), work (ten), health and wellness (nine), and parenting. Decreased social skills were a central component of the findings. The results revealed patterns of high frequency in the leisure domain of the AYA-ACS and significantly less participation was shown across the social and educational domains. With regards to social activities, the participants most frequently reported, “not participating in, but having an interest in.” Lacking the opportunity, fear, anxiety about the attitudes of others, and lacking transportation collectively directed participation patterns, with the lack of opportunity being the most potent predictor. Therefore, it is necessary to recognize that young adults with ASD would benefit from assistance with building social networks and being integrated into programs that promote social acuity, as demands for social competence significantly increase during the transition to adulthood.

Three Influencing Factors

Three influencing factors on the core deficits associated with ASD will be examined. Increased levels of physical activity, self-determination, and quality of life each associated with positive effects on social, behavioral, and physical health related outcomes in individuals with ASD.

Physical Activity

Participation in physical activity is necessary for the health and well-being of all people (US Department of Health and Human Services, 2008). Increased levels of physical activity in individuals with ASD are associated with enhancements in balance, flexibility, cardiorespiratory endurance among other physical fitness variables (Yilmaz et al., 2004). In addition to improvements in physical fitness, notable improvements in sensory seeking, distractibility and inattention, social skills, behavioral patterns, social motivation along with reductions in self-

stimulating and repetitive behavior are documented (Elliot et al., 1994; Powers et al., 1992; Kunzi, 2014; Yilmaz et al., 2004). In consideration of the known benefits of physical activity, it is concerning that research consistently reports lower levels of physical activity in members of this population when compared to their peers of typical development (Drahelm et al., 2002). These trends place a significant burden upon the individual, as several chronic health conditions are associated with the socially isolated, sedentary lifestyles led by the majority of adults with ASD (Troost et al., 2002). Cardiovascular disease, insulin resistance syndrome, and obesity are more prevalent among individuals with ASD when compared to those without developmental disabilities (Troost et al., 2002).

In addition to the typical treatment models for individuals with ASD, researchers have investigated the effects of physical activity programs on several outcomes for members of this population. One study, conducted by Zachor and colleagues in 2016, examined the effects of an outdoor adventure program on autism symptom severity levels and adaptive behavior patterns in children with ASD. The study included fifty-one participants, forty males and eleven females, within the age-range of three to seven years. An intervention group of thirty participants took part in the outdoor program, while a control group of twenty-one participants did not. Members of the control group were not significantly different in age, sex, cognitive, nor adaptive behavior measurements. The outdoor program was designed with the purpose of enabling the participants to enhance their self-image, social and communication skills, and physical abilities by means of outdoor exercise and adventure-based activities.

The program included thirteen weekly sessions of challenging outdoor activities and social collaboration. Each session was approximately thirty minutes, conducted in local parks, and was led by a senior guide and two field instructors. Each session began with an opening

group song and included a two-way climbing rope ladder, a rope elevator group activity, a rope bridge, and hammock rope swing. The rope elevator required one child to be connected with a harness to the rope tied to the top of a tree, while the rest of the children were responsible for pulling him/her upward to a platform at the top of the tree. This group activity incorporated trust, teamwork, social coordination, and responsibility. Each activity required motor skill development as well as communication and social collaboration. Sessions concluded with a group song and a brief group activity during which children were asked to share their experience and speak about the activities they enjoyed most.

The outdoor activity program required children to navigate social, physical, and executive function challenges. Children were also challenged to be aware of the requests and emotions of fellow participants in an effort to promote social coordination in a group setting. By providing opportunities to participate in group problem-solving tasks, the researchers hypothesized that autism symptom-severity and adaptive skills would show improvement.

The Social Responsiveness Scale (SRS), a sixty-five-item questionnaire that evaluates autism symptom severity, was used. Subdomains of the questionnaire include social awareness, social cognition, social communication, social motivation, and autistic mannerism, and the total score serves as an index of severity of social deficits as related to ASD. The Vineland Adaptive Behavior Scales (VABS), a standardized interview designed to assess adaptive behavior in children was also used. Subdomains include communication, daily living skills, socialization, and motor skills.

The results of the study revealed that the outdoor program had a significant effect on ASD symptom severity, with the intervention group showing a reduction while the control group showed the opposite trend. The improvements in participants in the intervention group reflected

enhancements in verbal and non-verbal communication, imitation, and social reciprocal behavior. Such development of social and communication skills may have been facilitated by increased opportunities to cooperate and communicate with peers in a group setting with the purpose of achieving goals. Furthermore, the severity of restricted and repetitive behaviors did not worsen in the intervention group, perhaps due to the participation in active, reasonably challenging, socially stimulating tasks. In contrast, restricted and repetitive behavior became more prominent in the control group. The findings of this study suggest potential of outdoor activity-based services and programs for the improvement of social skills and behavioral patterns in individuals with ASD (Zachor et al., 2016).

Another study, conducted by Pan in 2010, investigated the effects of a ten-week water exercise program on the aquatic and social skills of sixteen participants with high-functioning ASD between the ages of six and nine years. Prior to the start of the study, an informative workshop was held to introduce the water exercise program to the participants and their parents. The ten-week program included two ninety-minute sessions each week for a total of twenty sessions. The study consisted of two ten-week phases. During the first, eight children participated in the water exercise program while eight children formed a control group and did not. During the second ten-week phase, immediately following the first, the groups were reversed. Social competence, antisocial behavior, and aquatic skills were each measured in both groups before and after each ten-week phase.

The water exercise program used the Humphries Assessment of Aquatic Readiness (HAAR: Humphries, 2008) and the Halliwick Method (Martin, 1981). These commonly used methods utilize a biomechanics approach to aquatic readiness and swimming competence in a progressive manner. Components included social and floor warm-up activities, small group

instruction, whole group games and activities, and a one-to-one instructor-student ratio. This enabled the student to benefit from constant supervision and individually-based instruction as well as from social interactions with peers. Water orientation skills included breathing exercises, floating activities, swimming stroke development, and limb and trunk exercises. Group activities included cooperative games involving hula-hoop swimming, noodle passing and team oriented kicking drills.

The School Social Behavior Scale (SSBS-2) was used to assess social competence and antisocial behavior. Social competence included peer relations, self-management and compliance, and academic behavior, while antisocial behavior included hostile, irritable, aggressive, defiant, and disruptive patterns or expressions. The scale is a norm-referenced, standardized instrument designed to be used for children. The HAAR checklist was used to assess aquatic skills. The instrument was designed according to the Halliwick method, which includes mental adjustment, introduction to water environments, balance and control, and independent movement in water. During the administration of the HAAR checklist, the child and instructor were in the water together. The child was verbally instructed to perform each skill and the child was subsequently assessed based on performance of the skill.

Participation in the water exercise program led to decreases in antisocial behavior, increases in social competence, as well as enhancements of aquatic skills (Pan, 2010). Furthermore, the results indicated sustainability of impact for at least ten weeks, as the group participating in the program during the first ten-week phase retained the outcomes upon measurement following the second ten-week phase. Though not part of the study's results, parents of several children reported significant improvements in self-confidence, social skills, and athletic performances. Furthermore, some parents reported that their children expressed

desire to pursue inclusive activities they typically avoided in the past, to be included in social circles, and to continue improving their swimming skills by participating in swimming programs.

Sport, Physical Activity and Social Skills Improvement

The understanding that physical activity enhances skills across multiple domains of human experience for individuals with ASD is intriguing. Services frequently incorporate physical activity as a means of enhancing several characteristics of socially appropriate behavior and social competence (Kunzi, 2014). Engaging in physical activity in group settings is particularly intriguing. Group physical activity and sport-based services have been found to be cost-effective methods to promote the enhancement of physical fitness variables as well as socialization skills and social well-being in individuals with ASD (Findlay & Coplan, 2008). Sport participation is associated with improvements in assertiveness and self-control, as well as self-esteem related to physical ability and physical appearance in persons with ASD (Findlay & Coplan, 2008).

Participation in sport based services offer opportunities for increased social interaction, social collaboration, and relationship-building through group physical activity (Harper et al., 2008; Laursen & Yazdgerdi, 2012). The integrative environment in which these activities occur presents an organized structure and framework, yet allows for self-expression and creativity within naturally occurring situations. Such environments can facilitate further development of social skills by providing the participant with opportunities to navigate rules, regulations, and structure yet allow room for self-expression and choice making (Findlay & Coplan, 2008). The naturalistic, interactive experience for participants allows for opportunities to exercise social and emotional reciprocity that may subsequently enhance social skills and the ability to form relationships (Findlay & Coplan, 2008). Such critically important skills are promoted when the

fundamental needs of social belonging, relatedness, and competency are satisfied, and can only be achieved through experience (Laursen & Yazdgerdi, 2012).

Self-Determination

The civil and disability rights movements of the 1960s and the prohibition of discrimination profoundly influenced the advocacy of self-determination for all people. The Rehabilitation Act of 1973 and Americans with Disabilities Act (ADA) in 1990 called for the weaving of individuals with disabilities into the fabric of society (Carney, 1990). The themes of such movements established that making choices and taking control of the choices and decisions that affect one's life is a fundamental human right and ought to be a part of the human experience for all people. The Normalization Principle with emphasizes the necessity for individuals with disabilities to have the same treatment and life experiences as those without disabilities. This principle as well as the ADA emphasizes that people with disabilities should enjoy equality and have access to the same life experiences as those in the general population (Nirje, 1972). Self-advocacy and independent living movements subsequently emphasized the protection of fundamental civil rights in such a way that facilitates their meaningful integration into society (Ward, 1999). The inclusion of self-determination into the policy of the ADA and Rehabilitation Act further supported the construct as a fundamental human right.

The theoretical foundation self-determination is built upon the philosophical doctrine of determinism and that all human behavior is determined by prior events and experience. Self-determination is a rich and multidimensional construct that emerged from the field of philosophy. The personal governing and control over one's decisions is a behavioral outcome that researchers have come to understand through the lens of personality and motivational psychology. Personality psychology, in particular, endeavors to describe and explain individual

differences in behavior. The early debate within this discipline of psychological science was whether a person's behavior was caused by internal or external factors as well as the degree to which such factors influence behavior. The study of motivation, for example, has produced focused investigations into the variables that ultimately determine the ways in which an individual behaves and interacts with the environment. The existence of several theories among varying disciplines of study to explain human behavior and decision-making supports the notion that it is a truly complex and multidimensional subject.

Wehmeyer's Model of Self-Determination

Theories of self-determination are essentially concerned with the processes by which individuals become autonomous and exert control over their lives (Wehmeyer, 1999). In Wehmeyer's functional model (1999), self-determination is defined as "acting as the primary causal agent in one's life and making choices and decisions regarding one's quality of life free from undue external influence or interference; a causal agent being someone who makes or causes things to happen" (Wehmeyer, 1999). Furthermore, individuals who are self-determined display autonomous, self-regulating, psychologically empowered, and self-realizing behavior. According to the model, psychological empowerment is achieved when an individual exercises autonomous actions in a way that shapes their future. The development of self-determination emerges as individuals learn skills and develop perspectives that facilitate autonomous choice and decision-making (Shogren et al., 2015).

Self-Determination and Adult Outcomes

One's self-determination status has been associated with academic and transition outcomes, employment, recreational activity, and independent living (Konrad et al., 2007; Carter et al., 2006; Field et al., 2003; Wehmeyer et al., 2013). Efforts to promote self-determination in

individuals with disabilities generally document significant and positive results (Wehmeyer et al., 2013) as well as improvements in self-determination status, college academic goal attainment, and access to general education curriculum (Wehmeyer et al., 2013; Shogren et al., 2013). The promotion of self-determination is an emphasis of federal policy, as it is often referred to as the most important outcomes of the educational system for individuals with disabilities, a potent predictor of overall quality of life, and associated with increased rates of employment, independent living, post-secondary academic success (Konrad et al., 2007; Carter et al., 2006; Field et al., 2003; Martin et al., 2003; Wehmeyer & Schwartz, 1997). In 2008, the United States Administration on Developmental Disabilities initiated the National Training Initiative on Self-Determination (SD-NTI) in recognition of the importance of self-determination to the human experience. Therefore, efforts to enhance self-determination status are an integral component of special education services in secondary education and transition services (Shogren et al., 2015; Wehmeyer et al., 2017).

Promoting Self-Determination for Individuals with ASD

Research indicates that students with ASD are less self-determined when compared to members of the general population (Wehmeyer et al., 2017; Chou & Yu-Chi, 2013). Such indications among individuals with disabilities pursuing postsecondary education is especially concerning, as critical thinking, autonomy, and higher levels of independent living are expected and absolutely necessary for success (Taylor & Seltzer, 2010). The development of self-determination can be facilitated in adults with ASD through participation in activities that include choice and decision-making, problem-solving, goal-setting and attainment, and self-management skills (Wehmeyer, 1999). Having the opportunity to make choices, solve problems, set goals, and develop self-management skills is associated with decreases in maladaptive

behavior as well as increases in socially appropriate and adaptive behaviors (Shogren et al., 2008). Therefore, appropriately designed services can enable individuals to become more self-determined and, consequently, experience a higher quality of life (Wehmeyer & Schwartz, 1997). Deficits in self-determination and the lack of opportunity for developing related skills in the years following high school makes college students with disabilities vulnerable to lower rates of academic success, independent living, and employment rates (Wehmeyer et al., 2013). Because one's transition to adulthood is saturated with new challenges and expectations, researchers have investigated the role that self-determination status plays in the successful navigation of this developmental turning-point.

One study, conducted by Palmer and Wehmeyer in 2003, investigated the relationship between enhanced self-determination status and positive adult outcomes. Ninety-four participants, averaging 19.25 years of age, with learning disabilities were recruited across seven states (Alabama, California, Connecticut, Kansas, North Carolina, Texas, and Virginia). Self-determination status was measured upon high-school graduation, one year following graduation, and three years post-graduation. Average IQ for participants was 82.91. The adult version of The Arc's Self-Determination Scale (Wehmeyer & Kelchner, 1995), a seventy-two-item questionnaire, was used to assess self-determination. The instrument has been validated for use with transition-aged individuals with ASD and learning disabilities (Chou & Yu-Chi, 2013). The instrument provides data on overall status by assessing the degree to which an individual is autonomous, self-regulating, psychological empowered, and self-realizing (Wehmeyer, 1999).

As mentioned, an individual is said to be self-determined when he/she displays the four essential characteristics of self-determination (Wehmeyer, 1999). Autonomy relates to an individual's independence and action based on personal values, interests, beliefs and desires.

Self-regulation is composed of problem-solving, goal-setting, and task performance.

Psychological empowerment relates to an individual's perceived control over choices and decisions. Lastly, self-realization pertains to an individual's knowledge of their strengths and limitations and their actions based on this knowledge to promote personal growth and development. The Arc's Self-Determination Scale measures the degree to which an individual possesses these four essential characteristics. The instrument has been field-tested and used in many research studies involving participants with cognitive and developmental disabilities (Wehmeyer et al., 2000; Wehmeyer & Schwartz, 1997, 1998).

Results from this study aligned with previous associations between enhanced self-determination status and positive adult outcomes (Wehmeyer & Schwartz, 1997). Participants with high self-determination status, when compared to those with lower scores, were significantly more likely to live independently, have either full-time or part-time employment, maintain a bank account, and achieve financial independence (Palmer & Wehmeyer, 2003). Furthermore, there were no areas in which participants with low self-determination displayed more positive outcomes than those with high self-determination status and no significant differences in IQ were found between those with low and high self-determination (Palmer & Wehmeyer, 2003). Therefore, intelligence in and of itself does not appear to cause differences in levels of self-determination (Palmer & Wehmeyer, 2003). The results of this study align with the notion that promoting self-determination in adults with disabilities is an important endeavor. Skills that contribute to self-determination status include goal-setting, decision-making, problem-solving and environmental interaction (Agran et al., 2002). Services that provide the instruction of such skills can enhance self-determination for individuals with disabilities placing them in positions to experience positive adult outcomes (Palmer & Wehmeyer, 2003).

Quality of Life

Quality of life is “one’s perception of their position in life with regard to expectations, standards, and goals” (World Health Organization, 1998). It is subjective in nature, has become a goal of public policy, and an emphasis of rehabilitative services for individuals with developmental disabilities (McDougall et al., 2010). Composed of several core principles, one’s quality of life is entirely independent of disability status (Verdugo et al., 2012). These core dimensions include emotional and material well-being, interpersonal relations, personal development, physical health, self-determination, social inclusion, and the exercising of one’s rights.

Quality of Life & ASD

The maladaptive behavior patterns and social deficits experienced by individuals with ASD can have a deleterious effect on their quality of life (Heijst & Geurts, 2014). Furthermore, the sensory processing, motor coordination, and executive functioning deficits place members of this population at increased risk for diminished quality of life (Heijst & Geurts, 2014). Therefore, it is not surprising that adolescents and young adults with ASD experience lower quality of life ratings when compared to those without ASD (Burgess & Gutstein, 2007; Heijst & Geurts, 2015). In consideration of such trends in literature, improving this variable for individuals with disabilities has become a focus of transition services (McDougall et al., 2010). Although it is understood that the facilitation of enhanced quality of life for members of this population is a worthwhile and necessary endeavor, relatively little is documented regarding the subjective aspects of such measurements (Burgess & Gutstein, 2007). Assessing subjective quality of life among individuals with ASD is advantageous, as it provides a more comprehensive understanding of overall well-being than can be produced by strictly objective

measures (Heijst & Geurts, 2015). Investigating the factors that contribute toward the quality of life of individuals with ASD in transition to adulthood will contribute to the improvement of transition services. Renty and Roeyers (2006), for example, found that social support and social skill development were related to quality of life for individuals with high-functioning autism spectrum disorder.

One study, conducted by Garcia-Villamizar and colleagues in 2010, investigated the effects of a recreation and leisure program on the quality of life in adults with ASD. In the study, thirty-seven adults with ASD from seventeen to thirty-nine years of age represented the intervention group and thirty-four adults with ASD from twenty-four to thirty-eight years of age formed the control group. All participants presented a clinical diagnosis of ASD and were screened to exclude psychiatric and neurological disorders.

Subjects in the intervention group participated in a twelve-month recreation and leisure program. Before the program, each participant in this group completed a Leisure Lifestyle Profile. Researchers used this profile to incorporate individualized and appropriate activities. The group recreational activities involved swimming, playing catch, Frisbee games, hiking, and bowling. Other components of the program included group social events, attending events such as fairs, movies, concerts, museums and participating in crafts such as puzzles, printing activities, and darts. Activities were selected by the researchers based on several criteria. Activities were designed to be structured, well-defined, visually represented, reactive, comfortable, and active. Once each participant was acquainted with each activity, he/she had the freedom to participate in preferred activities. Participants were not forced to take part in activities they did not particularly enjoy, therefore their participation patterns were determined by their interests and desires.

The Quality of Life Questionnaire, a forty-item scale, was used to measure quality of life. It is designed to be used for individuals with intellectual disabilities (Keith & Schalock, 1994). Subdomains of the instrument include questions pertaining to satisfaction with life, perceived competence/productivity, empowerment/independence, and social belonging/community integration. All participants completed the questionnaire prior to and following the twelve-month recreation and leisure program. Those in the intervention group participated in the twelve-month program, while control group did not.

The results of this study indicate that participation in recreational activities has a positive effect on quality of life in adults with ASD, while those in the control group showed no significant changes. These results align with the understanding that adults with ASD can experience the benefits associated with enhanced recreational activity when given appropriate opportunities (Fullerton & Coyne, 1999). Furthermore, the recreational activities included in this study provided participants with the opportunity to socially interact in dynamic settings (Garcia-Villamizar & Dattillo, 2010).

Quality of Life & Self-Determination

There is growing interest in the relationship between self-determination and quality of life for individuals with disabilities (McDougall et al., 2010). A study conducted by Wehmeyer and Schwartz in 1998 investigated the relationship between self-determination status and quality of life in fifty adults with disabilities.

Subjects in this study had an average age of 36.22 years, ranging from twenty to sixty-nine years of age, were recruited from group homes in the Texas area, and forty-nine percent were employed. The subjects all had similar living arrangements, with four to six fellow residents in each group home. Level of intelligence and environmental factors were both

controlled during the study. Researchers hypothesized that those with higher levels of self-determination status would subsequently have higher quality of life measurements. The Quality of Life Questionnaire (QOL.Q; Keith & Schalock, 1994), a forty-item rating scale designed for individuals with disabilities, was used to measure quality of life. This instrument is administered in an interview format and consists of four subdomains: life-satisfaction, perceived competence/productivity, empowerment/independence, and social belonging/community integration. The adult version of The Arc's Self-Determination Scale, a seventy-two item scale, was used to measure self-determination. The four subdomains of this instrument include questions pertaining to autonomy, self-regulation, psychological empowerment, and self-realization.

Self-determination status was found to be significantly correlated with quality of life measurements (Wehmeyer & Schwartz, 1998). Participants with higher measurements of self-determination status had higher measurements in quality of life, and those with lower self-determination measurements had lower quality of life measurements (Wehmeyer & Schwartz, 1998). Such results align with other research findings that self-determination is a potent predictor of overall quality of life and suggest that promoting self-determination in individuals with disabilities is a worthwhile pursuit (Palmer & Wehmeyer, 2003).

Surf Therapy

In an effort to address the clinical implications of past research, surf therapy is proposed as a service that implements the use of group physical activity, social collaboration, goal setting and attainment, choice and decision making, and gross motor skill development (Cavanaugh, 2014; Rogers et al., 2014). As supported in literature and to be discussed, it is a complementary service that may improve socialization skills and combat secondary conditions related to the

social and motor deficits in adults with ASD (Godfrey et al., 2015; Cavanaugh, 2010).

Attending to these needs during adulthood is a worthwhile pursuit, as it may assist individuals in this population learn to navigate the challenges associated with the transition process. This model involves the integration of psychomotor, affective, and cognitive skill within a physically challenging and socially stimulating environment.

Surf Therapy in Literature

Studies have found surf therapy to have positive effects on an individual's motivation, participation in other sport programs, self-confidence, social skills, and physical fitness variables including cardiorespiratory endurance, flexibility, core strength, and upper body strength (Clapham et al. 2014.) A study conducted by Cavanaugh and colleagues in 2014 investigated the benefits and outcomes of a two-day surf camp curriculum on social competence, social skills, and self-concept of students with ASD. Researchers measured the effects of participating in a surf camp on social skills for eleven campers with ASD between ten and sixteen years of age using the Social Skills Improvement System (SSIS, Gresham et al., 2010). The social skills curriculum of the program was designed to address three areas: social competence, social skills, and self-concept. Curriculum included yoga stretching, preliminary paddling lessons, cooperative group social interaction activities. The acronym S.U.R.F was used in order to help campers actively engage in helpful tasks. The S.U.R.F skills were as follows: Stay in the group, Use my SEE steps (sound, expression, and eye contact), Remember to ask questions, and Form a friendship. This provided structure for the campers and a clear understanding of what was expected. Campers also participated in group activities such as arts and crafts, paddle relay races, and sandcastle building. Each camper was required to use the SURF skills and complete a skills checklist following each activity to ensure that the skills were being practiced.

The SSIS is an instrument used to assess the social skills and problem behaviors of individuals aged three to 18 years. Communication skills, cooperation, assertion, responsibility, empathy, engagement, and self-control were each measured. Data were collected one week prior to camp, at the completion of camp, and once again two weeks following camp.

The results revealed positive effects on social competence, social skills, and self-concept changes of campers with ASD following the participation in the two-day Learning Through Sun, Sand, and SURF camp curriculum. Data analysis indicated significant improvements in assertion, responsibility, and engagement in the social skills domain. The researchers of this study suggest further investigation of the effects of surf therapy on outcomes for individuals with ASD. Furthermore, qualitative methods should be explored to investigate the aspects of surf therapy that may have the most effect upon outcome variables (Cavanaugh et al., 2014).

Another study examined the effects of surf therapy on components of physical fitness in children with disabilities. The study investigated the effects of a surf program on several physiological measurements including; balance, strength, endurance, flexibility, and cardiorespiratory endurance (Clapham et al. 2014). Results indicated that this surf program improved numerous areas of physical fitness and can be an effective complementary adapted physical activity service. There were significant improvements in the participants' upper-body strength, core strength, as well as cardiorespiratory endurance. In the upper extremities, there were increases in grip strength and in the participants' range of motion. Furthermore, a substantial increase in core body muscle strength was found. Most research indicates that children with disabilities have low levels of cardiorespiratory endurance when compared with their abled bodied peers (Murphy, 2008; Draheim et al., 2002). Therefore, one of the more

intriguing finding of this study was the increase in cardiorespiratory endurance (Clapham et al. 2015)

Structured surf therapy interventions have also shown to have positive effects on perceived well-being, depression, positive attitude, self-management, empathy, behavior, and lifestyle adjustments (Godfrey et al., 2015). Research endeavors have found surf therapy to be a feasible and effective intervention for improving the physical fitness of children with disabilities (Clapham et al. 2014).

One particular study, termed “The Wave Project”, conducted by Godfrey and colleagues in 2015, found intriguing qualitative data supporting a robust positive impact of surfing on “vulnerable young people”. A total of 121 individuals, aged eight to eighteen years, facing mental health issues or social exclusion were referred by health, education, and social services. Data were collected using validated questionnaires on subjective outcomes, impact (parent and referrer perspective), and sustainability of impact. Well-being measurements were taken prior to and following the six-week trial.

Wellbeing was operationally defined and measured in accordance with the New Economic Foundation (NEF), suggesting that overall wellbeing includes life satisfaction as well as social and emotional functioning (NEF, 2012). The study found that “clients felt better (96%), happier (98%), had fun (99%), made friends (89%), and felt fitter (87%)” after participating in a surf therapy intervention. Seventy-nine percent of parents reported a more positive attitude and 62% reported improved communication skills. All well-being measures showed statistically significant changes. Location, gender, and attendance were unrelated to any variable. Data collected from 39 parents and 13 referees showed the Wave Project was extremely positive for family life, behavior, and achievement at school. In addition to the significant improvements

after the course, over 70% of clients continued to surf and consistently attended a surf club up to a year later (Godfrey et al., 2015).

Surf Therapy and PTSD

Surfing as a therapeutic endeavor has also been investigated in veterans suffering from post-traumatic stress disorder (PTSD). A small research study was conducted by Rogers and company in 2014 examining surf therapy as a potentially therapeutic intervention for veterans with a clinical diagnosis of PTSD. Of the 14 veterans initially recruited to participate in the study, 10 completed the program. Participants completed the PTSD Symptom Severity Checklist (military version) and Major Depression Inventory before and after the 5-week program. Findings reported significant improvements in PTSD (symptom severity checklist- military version, Wilcoxon; signed rank $Z = 2.5$, $p = 0.01$) and in depressive symptoms (major depression inventory, Wilcoxon signed rank $Z = 2.05$, $p = 0.04$). Results suggest surf therapy to be a potentially effective and feasible intervention for mental health disorder PTSD. Based on findings in literature, it is worthwhile to investigate the efficacy of surf therapy as a vehicle for improving self-determination and quality of life measures in young adults with ASD.

Gap in Literature

Research investigating physical activity-based services has been primarily limited to children and adolescents (Kunzi, 2014). The strengths, perspectives, and abilities of young adults with ASD are significantly understudied (McCrimmon & Montgomery, 2014), therefore research that facilitates the empowerment of such individuals may be a fruitful pursuit (Wang & Burris, 1994). Employing a mixed-methods approach may also be advantageous, as it may provide a rich understanding of the influential aspects of a particular intervention (Creswell, 2003). These endeavors can subsequently contribute to the development and refinement of

service programs to appropriately complement the service recipient (McCrimmon & Montgomery, 2014). “Photovoice” (Wang & Burris, 1997) is a participatory research method often used in areas of health research to promote both individual and community growth and development. This participant-centered research method provides an alternative form of communication and self-expression and can subsequently empower individuals among marginalized populations overcome social barriers (McCrimmon & Montgomery, 2014; Wang & Burris, 1997).

The considerable lack of research investigating and utilizing the voice and perspectives of young adults with ASD establishes the importance of methods like photovoice. As a research method, it is based around the provision of cameras with the understanding that pictures can potentially support the expression of personal strengths, creativity, and the overcoming of social barriers (Teti et al. 2016). Via picture-taking, the participant is placed in a position to capture and discuss the things that affect their health and experience of life (Teti et al., 2016).

Findings in literature suggest that Photovoice is particularly advantageous as a method of assisting young adults with ASD to express their needs, desires, and perspectives (Teti et al., 2016). Placing the participant in such a role generates a richness to the data of a study that is otherwise difficult to achieve (Wang & Burris, 1994). This can be particularly advantageous for young adults with ASD, who typically have limited opportunities to exercise independence and creative expression (Teti et al., 2016).

Research methods that identify the strengths, interests, and perspectives of young adults with ASD could improve these individuals’ interactions in social, vocational, and educational settings (McCrimmon & Montgomery, 2014). Insightful discussion can facilitate the enhancement and depth of data while providing empowering opportunities for both the

participants and communities (Catalani & Minkler, 2010). The inclusion of photovoice in studies with pre-trial and post-trial measurements of quality of life enhances its potential as an instrument to facilitate self-expression in individuals with ASD (Teti et al., 2016).

A study conducted by Teti and company in 2016 used Photovoice as a method to explore the strengths and perspectives of young adults with ASD in an effort to better understand their experience of growing up with ASD. Eleven subjects with an average age of 20 years participated in this study. Participants captured via picture-taking what they identified as illustrations of their experience of growing up with ASD. Researchers led four discussions (3 group and 1 individual discussion) during which the participants shared their photographs and the ascribed personal meaning of each. During the first meeting, researchers explained the purpose of the study and the ethics of picture-taking along with appropriate methods for obtaining consent to take another individual's picture. The participants were taught the basic functions of the camera and were encouraged to take pictures throughout the week which would be presented during the following meetings. During the second and third discussions, participants shared and discussed how each photograph illustrated their experience as an individual with ASD. Probing questions, such as "what does this photo capture about your life story with ASD?" and "what does this picture mean to you?", were used to promote insightful discussions. Lastly, the fourth discussion was held on an individual basis and purposed to give the participant an opportunity to reflect on their photographs individually. Probing questions, such as "how did you decide what to photograph?", and "what did you learn about yourself in the process?" were provided to promote meaningful discussion.

The researchers transcribed each discussion verbatim, coded the transcripts, and performed thematic analysis to identify emerging themes shared within the group. Transcripts

were entered into “Atlas.ti (Scientific Software Development, 2011) to perform thematic analysis. The themes that emerged were relationships, challenges to independence, work experiences, negotiating school and learning, and stress.

Findings from this study support Photovoice as a well suited and appropriate mechanism to assist the expression of personal strengths in young adults with ASD (Teti et al. 2016). Many forms of therapy are “problem-oriented” in their approach. Gaining an understanding of the strengths, perspectives, and thought processes of young adults with ASD can perhaps improve therapeutic interventions by structuring such services from an “abilities” perspective (McCrimmon & Montgomery, 2014). Services that aim to promote independent living and employment could allow the identity, special interests, and strengths of the participant to fuel the program’s methodology. Similar methods could potentially improve the quality of life for members of this population during the critically important transition to adulthood (Teti et al., 2016).

The therapeutic effects of surfing in various populations have been explored in literature, but few have implemented a mixed methods research design and, to our knowledge, none report curriculum. Incorporating the voice of the participant as a component of data collection will provide a unique insight to and understanding of the value ascribed to the experience of surf therapy.

Summary of Literature

Considering the relevance of self-determination, quality of life, and physical activity in the discussion of ASD, it is concerning that individuals with ASD consistently document low measures in each of the three (Wehmeyer et al., 2013; Kunzi, 2014, Heijst & Geurts, 2014). Furthermore, there is minimal research investigating physical-activity based services for young

adults with ASD (Kunzi, 2014) and their effects on self-determination (Chou et al., 2017) and quality of life (Heijst & Geurts, 2014). Findings from previous research into surf therapy for individuals with ASD and other disabilities are intriguing. However, there is a lack of research empirically investigating the effects of surf therapy on mental and physical health among young adults with ASD. Numerous day programs for children do exist, however, none report structured curriculum nor do any seek to quantify the effects of their services. Nevertheless, literature does indicate that participation in structured surf programs can have a positive impact on individuals with ASD.

Significance of the Study

This concurrent mixed-methods research study evaluated a program that can potentially improve critically important variables of the human experience for all people: self-determination and quality of life. Individuals with ASD experience lower measurements in both variables when compared to their peers of typical development. Such deficits are associated with lower rates of employment, independent living, and academic success following high school which subsequently impede their transition to independent adulthood and successful integration into society. Additionally, lower rates of physical activity place members of this population at increased risk for obesity, depression, heart disease, and insulin resistance syndrome. Such trends place economic burden both on the individual and the public health system. Combatting these effects may be achieved by placing young adults in a position to develop the fundamental skills of self-determination within physically challenging and socially stimulating environments. Evaluating services such as these is a worthwhile endeavor as they may be a benefit to the individual and promote the betterment of society.

CHAPTER III

METHODOLOGY

This concurrent mixed-methods study evaluated the effects of surf therapy on self-determination and quality of life in young adults with Autism Spectrum Disorder (ASD) and explored the meaning and value the participants ascribed to their experience. A convergent, triangulation design was used, collecting both quantitative and qualitative data concurrently. Each data set was given equal weight and were merged during interpretation. In consideration of the complexity of the variables being measured and gaps in literature, employing such methods seemed warranted.

Participants

The participants in this study were enrolled in a surf therapy program designed for young adults with ASD. The program is one of many surf therapy services offered by NSSIA accredited surf therapy companies. The IQ requirement to participate in the surf therapy program, per the company's guidelines, is 70 and above, placing these individuals with ASD in the high-functioning category as stated in the Diagnostic and Statistical Manual of Mental Disorders 5th edition (DSM5). Each participant's IQ was verified through Individualized Education Plans (IEP) by the surf therapy company. Participants were required to sign release of liability forms provided by the surf therapy company. Participants did not receive any school or community credit for participation/completion and had the choice to participate in the program without being included in the research study. To be included in the study, the participants were required to be at least eighteen years of age, have a minimum IQ of 70, and provide informed consent. Participants filled out consent and liability forms provided by the company as well as those provided by the

researcher. Permission to carry out the study was granted by the Institutional Review Board of California State University Northridge.

Materials

The researcher provided water-proof disposable cameras and the assessment scales for each participant in the program. The scales provided were the adult version of “The Arc’s Self-Determination Scale” and the “World Health Organization Quality of Life-BREF (WHOQOL-BREF)”.

The Arc’s Self-Determination Scale is a standardized instrument designed to measure an individual’s self-determination status and can provide valuable insight into the contributing factors of an overall score (Wehmeyer, 1996). With appropriate support and accommodation from the evaluator, the participant evaluates various aspects of their belief system regarding their own autonomy, self-regulation, self-realization, and psychological empowerment (Wehmeyer, 1996). The scale is standardized, contains 72 items, and is divided into four sections. Each section examines an essential characteristic of self-determined behavior: autonomy, self-regulation, psychological empowerment and self-realization.

The WHOQOL-BREF was used to measure the perceived quality of life of the participants. The scale is standardized, contains 26 items, and is a valid method for evaluating subjective quality of life of individuals with disabilities. Both scales have been designed, field-tested and validated for the purpose and population of this study. The use of the Arc’s Self-Determination Scale does not require permission. The researcher was granted permission to use the WHOQOL-Bref (appendices). Training in the use and/or administration of scales was not required.

Data Collection

Measurements of self-determination and quality of life were taken before, immediately following, and six weeks following the surf therapy program. This study employed a concurrent mixed-methods design. Qualitative data was gathered during the six-week surf therapy program via picture-taking. Following the program, participants took part in a focus group which was voice-recorded and transcribed verbatim.

Pre-Intervention

Prior to the start of the six-week program, the researcher gave each participant one copy of each scale: the adult version of “The Arc’s Self-Determination Scale” and the “WHOQOL-BREF”. The researcher followed questionnaire protocols, and details are as follows. Each participant completed these two questionnaires at the office suites of the company. The participant was informed of why they were completing the questionnaires. Furthermore, the researcher communicated the importance of answering each question honestly and in a way that did not make the participant anxious (“There is no correct answer for any of these questions”). The researcher did not overstate the scale’s importance. Each participant was given one hour to complete “The Arc’s Self Determination Scale”, and thirty minutes to complete the “WHOQOL-BREF”, as suggested by questionnaire protocols. Both scales were completed in one sitting. The researcher verbalized each question, therefore, each participant was provided with both written and oral presentation of every question. Answer choices were also read aloud by the researcher. The student was seated for the entirety of the testing process and bathroom breaks were permitted. The researcher defined any words and clarified any questions the participant had during the testing process. Definitions of words were provided upon request but not presented in a way that influenced the participant’s answer. The researcher communicated the

importance of participants avoiding to answer in a way that is “socially appropriate” (“Please choose the answer that best describes you”). The researcher communicated to the participant that his/her test is strictly confidential material and would not be shared.

On the first day of the program, the researcher outlined and discussed the purpose of photovoice and the ethics of picture-taking (i.e., inappropriate pictures; how to obtain consent to take a person's picture). The researcher supplied each participant with one Kodak “Water & Sports Single Use Camera” and instructed the participants regarding camera function. Each camera allowed up to 27 photographs. This meeting took place at the start of the first session of the six-week program. Upon verbal acknowledgment of understanding from each participant regarding ethical picture taking and appropriate and safe usage, the participants were encouraged to take pictures during the six-week program that communicated their experience and perspective of participation in the program. Each participant had the freedom to participate in the surf therapy program without taking part in picture-taking. The participants were not told when nor of what to take pictures. The researcher communicated to the participants to take at least five pictures over the duration of the six-week program, but were permitted to take as many as the camera allowed (27 photographs). The cameras were distributed and collected each session and kept in a sealed container in the possession of the researcher.

Post-Intervention

One week following the six-week surf therapy program, each participant completed each questionnaire once again under the same conditions as described for the first measurement: the adult version of “The Arc’s Self-Determination Scale” and the “WHOQOL-BREF”. Testing procedure for this test was identical to the first test administration. The researcher outlined the components of each instrument and answered any questions.

Six weeks following the completion of the six-week program, each participant completed both questionnaires under the same conditions as the first two measurements. The specific day and time of this test was one that was most convenient for each participant, but was required to be during the sixth week following the program.

On the day following the completion of the program, the researcher developed the pictures and uploaded them onto a password-protected laptop. Pictures were also given to each participant. Additionally, all pictures were loaded onto a cd, uploaded onto a password protected laptop, and projected during the second photovoice meeting. This enabled the group to see and comment on the picture being discussed during the focus group.

On the following weekend, the group met at the office suites of the surf therapy company to have a group discussion of their photographs. Each participant chose up to three photographs to discuss with the group (“Choose up to three photographs that you would like to share with the rest of the group. Choose photographs that you like and that have meaning to you.”). Each participant was given up to ten minutes to address the following questions:

1. What are 3 words that come to mind when seeing this photograph? Follow-up question: Does this photograph have any influence on you as you move into adulthood?
2. How does this picture make you feel? Follow-up question: How does it influence you?
3. How does this picture reflect your experience of participating in Positive Horizons?
4. How does this picture reflect who you are as an individual?
5. How is this picture important to you?

Prior to the discussion, the following information was communicated to the group:
Researcher: “I would like you to keep in mind that we would like this to be a relaxing and enjoyable experience during which you can speak freely about your pictures. There are no

correct responses to any of these questions. These are your pictures and are unique to your experience of the program. Take your time addressing the questions that I ask, and there is no time limit. For those of you in the audience, if you would like to comment on your peer's photograph, we will have time to do so following his/her discussion". Each participant was given the same amount of time to discuss their photographs. All photographs were digitally uploaded onto a password-protected laptop and were projected as to allow the rest of the group to see the photograph being discussed. The other participants in the group were encouraged to provide feedback and discuss how the presenter's photographs impacted them, following the participant's discussion of their photographs.

Data Analysis

For both scales, raw scores were obtained from each domain and summed to determine a total raw score. This score was subsequently converted into percentile scores for comparison with sample norms to determine the percentage of positive scores. This was achieved using the scale's procedural guide conversion tables. The total self-determination and quality of life positive scores were used for statistical analysis and interpretation. Quantitative data was reported as a mean \pm standard deviation. A paired sample T-test was conducted to examine the effect of participation in 6-week surf therapy program with the effect of time (pretest vs. posttest vs. retention) on self-determination and quality of life in adults with ASD. SPSS version 23.0 for Windows (IBM, Armonk, New York) was used to record and analyze the data. The level of significance was set at .05.

Qualitative data in the form of transcripts was coded using a generic coding process. Interview recordings were thematically analyzed using a six-step approach, as outlined by Creswell (2007): The researcher read over the transcripts several times to gain a general a sense

of the tone and nature of each interview. Memo's were written to capture the researcher's initial thoughts and reactions to particular segments of the transcripts. Once each interview recording was transcribed, read, and memo'd, the researcher employed a generic qualitative (Creswell, 2007) analysis sequencing process. A generic coding process was used to identify codes and aggregate the text into smaller categories of information. This process was a mechanism to capture meaning of particular segments of transcript. Labels and definitions were assigned to each code. Through a generic coding process, codes were grouped into categories and then into subcategories for grouping purposes. Lastly, the researcher identified themes that emerged from the generic data analysis process. The themes represented broad units of information consisting of several codes that converged to form a common idea or philosophy. Member checking was performed to validate the researchers' interpretation of data. This procedure involved speaking with each participant about their transcripts to confirm that the researcher correctly interpreted what the participant voiced. The investigator read the transcripts, codes, and identified patterns with the subject with the intent of evaluating credibility and validity of the research. The researcher encouraged the participant to reflect upon the accuracy of the researcher's coding and identification of shared themes as well as what may have been potentially missing.

CHAPTER IV

RESULTS

Paired Sample T-Test

Data analyses were conducted to evaluate the effects of a six-week surf therapy program on self-determination and quality of life fifteen young adults (age 18-26) with ASD. Participants completed two questionnaires to evaluate change in self-determination and quality of life following participation in the surf therapy program. Statistically significant improvements were found for both variables following the program (Self-determination pre/post, $t(14) = -6.60$, $p < 0.001$; pre/follow-up, $t(14) = -6.28$, $p < 0.001$. Quality of life, $t(14) = -3.92$, $p = 0.002$; pre/follow-up, $t(14) = -6.86$, $p < 0.001$).

Photovoice

Photovoice, a qualitative research method, was used to capture the meaning and value the participants ascribed to their experience. Upon generic qualitative analysis of transcript, four higher order themes emerged upon analyses: Psychological impact, socialization & community, changing perspectives of physical activity, and surf therapy as an empowering and uplifting experience (See Appendix C). A generic coding process was used to identify codes and aggregate the text into smaller categories of information. This process was a mechanism to capture meaning of particular segments of transcript. Through this generic coding process, codes were grouped into categories and then into themes. The themes represented broad units of information consisting of several codes that converged to form a common idea or philosophy, and below is a table depicting the categories that ultimately formed each theme. Furthermore, the number of participants that expressed the idea pertaining to each category is listed.

Table 1. Themes & Categories

| Theme | Categories (# of participants) |
|--|---|
| Positive Psychological Impact | <p><u>Emotion & mood</u> -Accomplishment (13) -Perseverance (13) -Resilience (3) -Overcoming fear (4) -Changing perspectives (5) -Proud (4) -Happy (15) -Improved concentration (2) -Increased arousal (6) -Satisfaction (4) -Positive impact on mood (4)</p> <p><u>Pertaining to Self</u> -Ability (14) -Positive impact on self-concept (12) -Positive impact on self-confidence (5) -Improved self-confidence following surf therapy (11) -Improved self-worth following surf therapy (15)</p> |
| Socialization & Community | <p>-Social & relatedness (12) -Environmental (3) -Camaraderie (6)</p> |
| Physical Activity | <p>-Changing perspectives of physical activity (5) -Positive perspective of PA component of S.T (5) -Physically demanding (2) -Positive impact on lifestyle (1)</p> |
| Surf Therapy as an Empowering Experience | <p>- Surfing as a coping skill (3) -Desire to continue (12) -Enjoyment (15) -Positive experience (13) -Empowering (11) -Challenging (9) -Motivational (3) -Uplifting (3) -Educational (11)</p> |

CHAPTER V

DISCUSSION

The purpose of this mixed methods study was to evaluate the effects of surf therapy on self-determination and subjective quality of life in young adults with ASD and to capture the meaning and value participants ascribe to their experience. The Arc's Self-Determination Scale and World Health Organization Quality of Life-Field Scale were used to collect quantitative data before, after, and six weeks following the surf therapy program. Photovoice was used to collect qualitative data because it is particularly well-suited to help young adults with ASD express their strengths as individuals (Teti et al., 2016). Using photovoice in concert with quality of life measurements amplifies its potential as a mechanism for self-expression and empowerment (Teti et al., 2016).

Research methods that contribute to the empowerment of the participants can subsequently provide a deeper understanding of their experiences and perspectives (Wang & Burris, 1997). A major focus of this study was to capture the meaning and value the participants ascribed to their experience of surf therapy. Integrating the participant's voices, creativity, and self-expression into the research design yielded a greater depth of interpretation of the study's purpose. A convergent, mixed methods triangulation design was used, collecting both quantitative and qualitative data concurrently. Each data set was given equal weight and were merged to facilitate this interpretation. In consideration of the complexity of the variables being measured and gaps in literature, employing such methods seemed warranted.

Self-Determination & Quality of Life

The participant's initial measurements of both self-determination and quality of life prior to the six-week surf therapy program were characteristically low. This finding is in agreement with previous research indicating that young adults with ASD experience lower levels of both variables when compared to their age-matched peers (Wehmeyer & Shogren, 2017; Heijst & Geurts, 2015). Following the program, self-determination and quality of life measurements were significantly higher. Statements from the participants such as "Before doing this I used to tell myself that I'm worthless, but now I feel like I can accomplish anything" and "I had my doubts I could do it, but in the end I proved myself wrong" give voice to the improvements.

Although individuals with ASD may experience significant delays in the development of the core skills necessary for self-determined behavior, such impairments do not necessarily exclude the individual from displaying self-determined behavior (Wehmeyer, 1999). In fact, previous research indicates that interventions promoting the core elements of self-determined behavior (specifically self-awareness, problem-solving, decision-making, and goal-setting) can be effective (Wehmeyer, 1999) and that studies seeking to enhance self-determination generally document promising results (Wehmeyer et al., 2013). The enhancement seen in both variables following the six-week surf therapy program aligns well with the prevailing experiential themes: socialization and community, changing perspectives of physical activity, surf therapy as an empowering and uplifting experience, and positive psychological impact.

Socialization & Community

Self-determination Theory has been used as a model for studying motivation within the context of physical activity (Biddle & Nigg, 2000; Ryan & Deci, 2000) and behavior (Shen et al., 2007). As outlined, all individuals have three major psychological needs that ultimately

determine the motivation to participate in an activity: relatedness (socially attached), competence (feelings of ability), and autonomy (exerting control over choices). The majority of the participants referenced a sense of belonging and relatedness, as well as experiencing feelings of empowerment and independence following the program. During the focus group, participants referenced their enthusiasm with the social component of the program: “it made me feel like I was with friends and we all did it together” and “I feel like I was a part of something, working together we’re all a team”.

Opportunities to socially interact and relate with one another created a unique sense of belonging and camaraderie for the majority of the participants: “having fun and socializing, I feel more comfortable that I can talk to new people”, and “I feel very good because I’m hanging out and making new friends” provide valuable insight into the improvements seen in the social relationships domain of the quality of life scale and align well with the relatedness component of the Self-Determination Theory (1991). The naturally occurring social interactions may have contributed to the significant improvements seen in overall self-determination as well as the social relationships domain of the quality of life scale. Statements such as “This experience made me feel more relaxed and comfortable talking to new people”, “we came together like a team, it makes me happy”, and “it influences me because we were all together, enjoying each other’s company” highlight the rich social component of the program and reflect experiences of relatedness. The majority of participants in this study expressed a sense of belonging and community: “it made me feel like I was a part of something, like a community, I was home with surfing”. The experience of surf therapy was a socially rewarding one. Observing the strong emerging theme of socialization and community within the context of the relatedness component

of the self-determination theory suggests that it may have been a key driver of the significant improvements seen in both self-determination and quality of life.

Changing Perspectives of Physical Activity

Seventy-two percent of the surf therapy curriculum entailed physical activity. The majority of participants reported positive feelings toward the physical demands of the sport. Interestingly, many noted that their participation in surf therapy changed their perspectives on physical activity and spurred interest in active lifestyles. Statements such as “I liked how we are like hey, this exercise is not punishment, this is us preparing to have a good time and preparing us to enjoy ourselves” and “I didn’t think I would like the exercises but they were practice and I did them and they helped me get better and better each week it was one of my favorite parts” reflect a positive perspective toward the exercise component of the program. “The exercises made me feel good, like I’m practicing, seeing this makes me feel happy because oh look, he’s doing something other than electronics”. Expressions such as these support the improvements measured in both the physical and psychological health domains of the quality of life scale.

The shift in perspectives toward engaging in physical activity is intriguing, as exercise levels for individuals with ASD are substantially lower than for individuals without ASD (Draheim et al., 2002). Consequently, young adults with ASD are at increased risk for anxiety, depression, and decreased quality of life (Heijst & Geurts, 2015; Burgess & Gutstein, 2007). Motivation certainly contributes toward one’s engagement in physical activity, and previous findings report adolescents with ASD to be less self-motivated to participate in physical activity than those without disabilities (Pan et al., 2010). Motivation to continue with surf therapy was prominent among the group. Many participants expressed feelings of success with

an activity from which they previously thought their disability excluded them. The competence and success that each participant achieved during the program (all 15 participants learned to paddle, maneuver, and surf independently) contributed toward the motivation to continue: “Day 1, I was like, this isn’t going to work, but it’s a good thing I stayed because I wouldn’t have been able to achieve all of that. I caught a lot of waves, I hope I can keep doing this”, and “Me, I was not confident, I’m not going to learn to surf I’m not going to be able to stand up, and then I did it, I did stand up, I’m so happy I was able to, I want to keep doing it”.

Research in the field physical education supports an association between enhanced perceptions of competence and self-determined motivation (Standage et al., 2003, 2006). Increased levels of self-determined motivation tend to correlate with enhanced effort and enjoyment within physical activity settings (Ryan & Deci, 2000). The desire expressed by numerous participants to continue with surf therapy support the association between self-determined motivation and an inclination to participate in physical activity (Shen et al., 2007; Standage et al., 2003; Ryan & Deci, 2000).

Surf Therapy as an Empowering/Uplifting Experience

The majority of participants of this study reflected on their experience and identified surf therapy as an empowering, uplifting, and positive experience: “This program made me feel like I accomplished something in life, it allows me to think differently”. The program offered many opportunities for social interaction, relationship development, physical challenge, and a “break from routine and structure”. The majority reported feelings of self-doubt and low self-confidence before starting the program, however, all fifteen reported that they felt confident in their ability as a young adult to try and accomplish new things in life following the program: “I feel like a man now” and “I feel confident and like I can accomplish anything.” Such

expressions from the participants go hand in hand with the improvements seen in the autonomy, self-regulation, and psychological empowerment domains of the self-determination scale as well as the psychological health domain of the quality of life scale.

Improvements in the autonomy and psychological empowerment domains of the self-determination scale were supported: “I can try anything I choose now” and “I can now ride multiple waves by myself”. Expressions such as “it was difficult but I managed to master it and can do it on my own now” and “I felt nervous, I was totally unsure if I’d be able to surf, but now that I did it I feel like I could perfect anything” provide rich insight into the experience and align well with autonomy component of the Self-Determination Theory (1991). Given the complexity of human behavior and emotion, it is inherently difficult to identify precise mechanisms for such significant changes. Similar improvements have been found following other surf therapy interventions. Previous studies that examined the efficacy of surfing as a therapeutic intervention for veterans with PTSD (Rogers et al., 2014) report significant improvements in symptom severity, depressive symptom severity, and psychological well-being.

Although well-being was not measured in the current study, participants reported happiness, improved concentration, and a positive impact on self-image and mood. Improvements in the psychological empowerment domain of the self-determination scale and psychological health domain of the quality of life scale also align with previous research indicating surf therapy to be uplifting and supportive of psychological well-being. “The Wave Project”, a qualitative study conducted by Godfrey and colleagues in 2015 found surf therapy to have a positive impact on the well-being of adolescents and young adults with mental health disorders (an unspecified number of participants had a diagnosis of ASD). Seventy percent of the 121 participants continued surfing up to a year following the intervention. Perhaps this

continued participation in surfing was similar to the motivation expressed by the participants of this study.

Positive Psychological Impact

The majority of participants reported that their experience of surf therapy produced feelings of happiness, a stronger belief in their ability, accomplishment, and satisfaction with self. While it may be difficult to identify the precise cause for these perspectives, they likely contributed to the significant improvement seen in the psychological empowerment domain of the self-determination scale. Statements such as “doing this made me feel happy” and “surfing on a wave standing all the way up makes me feel like I can do anything I put my mind to, confident” reflect positive psychological impact. Previous research cites enhancements in psychological health and decreases in maladaptive behavioral patterns in individuals with ASD as a result of increased opportunities to exercise autonomy and independent choice-making (Powers et al., 1992; Wehmeyer et al., 2017). The nature with which the participants made decisions (i.e., formulating strategy for exiting and entering the water, navigating the field independently, successfully timing their popping up on the surf board) during surf program may have contributed to such improvements.

Of course, it is possible that such opportunity can take many forms, however it is worth considering the autonomous and decision-making role the participants filled during the six-week program as a potential mechanism for such improvement: “I believe I can do anything now that I’ve accomplished this”. Wehmeyer and colleagues (2013) established the role that positive self-image and self-awareness play in the development of autonomy and subsequently self-determined behavior. Perhaps the improved sense of self contributed to the enhancements seen in multiple domains of the self-determination scale (autonomy, self-regulation, and

psychological empowerment). Statements such as “it helped me get out of bed, instead of being in bed all day I wanted to go out, it makes me happy” and “I feel confident in myself now that I’ve learned to surf” reflect strongly upon the capacity of surf therapy to cause change in both thought and behavior.

Curriculum: Goal-Setting & Social Interaction

Interpreting the effects of the surf therapy program on self-determination and quality of life may also require attention to the program’s curriculum. Participants were provided with unique opportunities to socially interact with one another, set and evaluate goals, develop strategy (i.e., assess conditions, plan entry/exit, execute effective timing), execute tasks autonomously, express preference, and exercise decision-making ability. Each of the six sessions opened and closed with group discussion. At the start of each session, participants reported their feelings, emotions, the highlight of their week, progress in relation to the goals set the previous week, and expectations for the day. Participants were encouraged to identify problem-solving strategies they could use to achieve their expectations and goals. Goal cards were used for the purpose of giving participants an opportunity to evaluate their own progress toward each goal. Once a goal was met (ex: stand up independently on a surf board), another goal (determined by the participant) would be set.

The group discussions were led in a socially collaborative way in that each participant was encouraged to offer advice to their peers and acknowledge the achievement of goals. At the close of each session, participants gathered once again to identify their highlight of the session, their achievement, goal accomplishment, observations, emotions, and their goal for the following week. During the closing group, participants had the opportunity to evaluate and communicate their progress in relation to their set goals. Oftentimes, participants would achieve their goals

during a session and make new ones during the closing group discussion. Participants were also encouraged to identify goals away from the beach (ex: look for volunteer or employment opportunities, make their own meals, etc.) Whether a surf goal or a life goal, it was written on a goal card and used as a visual reference for evaluating progress. These tasks may have supported autonomous and self-regulating modes of behavior, as participants navigated this process independently and according to their beliefs. These practical opportunities to build component skills of self-determination may have contributed to the enhancements seen in self-determination.

The Functional Model of Self-Determination Theory (Wehmeyer, 1999) operates under the premise that learning the component skills of self-determination (i.e., choice- and decision-making, problem-solving, goal-setting, self-monitoring, perceptions of self-efficacy, outcome expectancy, self-awareness, internal locus of control, and self-knowledge) may promote causal agency and, ultimately, self-determined behavior. Such skills are essential to several fundamental activities of daily living and are critical to the successful occupation of adult roles. Previous research has found these skills to be prerequisite to the development of the four components of self-determination (i.e., autonomy, self-realization, psychological empowerment, and self-regulation) and that personal autonomy tends to be the most potent predictor (Wehmeyer, 1999; Wehmeyer et al., 2013).

Findings from previous studies also indicate that incorporating goal-setting, choice-making and problem solving into the curriculum of interventions effectively contributes to greater autonomy and enhanced self-determination among individuals with ASD (Wehmeyer et al., 2013). That is, the individuals truly acquired such skills as opposed to simply reproducing them in rote fashion. Each participant was encouraged to make choices and identify preferences

with minimal guidance from instructors. The group discussions, therefore, gave participants a platform for goal-oriented discussion and self-expression in an autonomous and collaborative manner.

Following each opening discussion, participants took part in challenging surf-related skill activities on the sand. Each of the five stations included exercises that challenged the participants' balance, agility, core strength, motor coordination, hand-eye coordination, and flexibility among other components of physical fitness (see APPENDIX A). Participants navigated the skill stations in small groups and, in doing so, enjoyed opportunities for more intimate social interaction and conversation.

Physical Activity within a Social Context

Recent research has investigated the role social interaction plays in the development of self-determination (Walker et al., 2011). It is widely viewed that self-determination as a behavioral construct is developed within social context (Walker et al., 2011). Participants would often interact and help one another to achieve the skills necessary for the progression associated with learning to surf (i.e., giving pointers, offering observations, giving encouragement, and providing feedback). A step-like progression of skill acquisition can be seen in many sports; gymnastics, swimming, and surfing are some examples. The participant may achieve a level of proficiency in a prerequisite skill with a sense of accomplishment. As the participant navigates the process of prerequisite skill acquisition, their overall ability in the execution of the desired motor pattern may improve along with their experience and self-concept.

Each of the surf skill stations challenged the participant to improve balance, gross motor coordination, and surf-related motor skills which may have subsequently contributed to their overall surfing proficiency. Paddling, standing up on a moving surf board, maintaining position

in moving water, and straddling the board all require degrees of balance, motor coordination, and postural stability. Furthermore, navigating the field in an effective manner (i.e., recognizing current conditions, anticipating and reacting to changes, and formulating strategies to achieve desired outcomes) required the participants to exercise goal-oriented choice and decision making. Experiencing this unique service led participants to reveal that they “feel more confident now”, “believe they can accomplish anything”, and identify “surfing to be a coping skill”.

Limitations

No research study is without limitations. As such, using a small sample size (n=15) and evaluating only one surf therapy program prevents the generalization of results. However, it is believed that the collection of both quantitative and qualitative data provided an accurate assessment of the effects of surf therapy on self-determination and quality of life in young adults with high-functioning ASD.

Conclusion

While the findings of the current study and past studies are intriguing, research investigations into the efficacy of surf therapy programs as an intervention method are limited. More studies like these, however, may add to the credibility of this service as a method for improving physical fitness and mental health variables among diverse populations. Particularly, there is a lack of research empirically investigating surf therapy programs for the promotion of mental and physical health among young adults with ASD. There are numerous single-day surf programs for both children and adults with ASD, however, none report structured curriculum nor do any seek to quantify the effects of their services. Results of this study do indicate that participation in a structured surf program can have a positive impact on the lives of

young adults with ASD. It is recommended that future research explore the effects of surf therapy of physical fitness variables as the majority of the participants expressed feeling stronger and more confident in their physical capacity.

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APPENDIX A: Curriculum

Surf Therapy Session Structure

15 minutes: opening discussion (goal evaluation, highlight of the week, goal-setting), social interaction, acclimation

15 minutes: group warm-up, group dynamic stretch exercise, change into wetsuits

30 minutes: surf-skills on sand in small groups: pop-ups drills, paddling technique drills with physio ball, wave-recognition techniques/strategy collaboration, balance training (bosu balls with ball toss, indo boards with ball toss, balance discs), agility drills (agility ladder)

75 minutes: in water; surfing with instructor, interacting with peers/instructors/public, practicing isolated surf skills with instructor

10 minutes: exit water with small-group; exit-strategy determined by small-group

10 minutes: change out of wetsuits

25 minutes: closing discussion (introspective, goal-setting, highlight of the day, goal-evaluation)

Surf Therapy Session Component Totals

- 6-week program, 18 total hours of surf therapy; 6 three-hour sessions; 1 session/week

8.0 hours in water (paddling, surfing, interacting with peers/instructors, maneuver practice; 44.5%)

5.0 hours motor tasks on land (warm-up group obstacle course, group jog, stretching, balance training, surf-skill training; 27.5%)

3 hours social-cognitive tasks (group activities, introspective activities, snack breaks with peers; 17%)

2 hours off-task (changing, applying sunscreen, clean-up, etc; 11%)

APPENDIX B: Quantitative Results

Table 1. Descriptive Statistics

| Measure | Pre (M) | Post (M) | Follow-up (M) |
|--------------------|---------|----------|---------------|
| Self-Determination | 62.75 | 81.35 | 78.81 |
| Quality of Life | 76.31 | 82.87 | 84.15 |

Table 2. Paired Sample T-Tests

| Paired Samples Test | Mean Δ | Std. Deviation | T | df | p |
|---------------------------|---------------|----------------|-------|----|-------|
| SD_pretest/SD_posttest | +18.61 | 10.92 | -6.60 | 14 | 0.000 |
| QOL_pretest/QOL_posttest | +6.56 | 6.49 | -3.92 | 14 | 0.002 |
| SD_pretest/SD_follow up | +16.06 | 9.91 | -6.28 | 14 | 0.000 |
| QOL_pretest/QOL_follow up | +7.85 | 4.43 | -6.86 | 14 | 0.000 |

APPENDIX C: Qualitative Results

Table 3.

| Theme | Categories |
|--|--|
| Socialization & Community | <ul style="list-style-type: none"> -Social -Environmental -Camaraderie -Sense of belonging |
| Psychological Impact | <ul style="list-style-type: none"> -Accomplishment -Perseverance -Resilience -Overcoming fear -Changing perspectives -Proud -Ability -Positive impact on self-concept -Positive impact on self-confidence -Low self-confidence before surf therapy -Lack of self-confidence/self-worth in other aspects of life -Happy -Improved concentration -Increased arousal -Satisfaction -Positive impact on mood |
| Surf Therapy as an Empowering/Uplifting Experience | <ul style="list-style-type: none"> - Surfing as a coping skill -Enjoyment -Empowering -Challenging -Motivational -Uplifting -Educational -Surfing as an enjoyable activity -Desire to continue/Lasting Impressions -Positive experience -A break from daily routine/structure |

APPENDIX D: Converged Datasets

Table 4.

| Measure | Scale Domain | Theme |
|--------------------|---------------------------|--|
| Self-Determination | Autonomy | Positive Psychological Impact |
| | Self-Regulation | Positive Psychological Impact |
| | Self-Realization | Surf Therapy: an Empowering/Uplifting experience |
| | Psychological Empowerment | Positive Psychological Impact & Surf Therapy: an Empowering/Uplifting experience |
| Quality of Life | Physical Health | Physical Activity & Changing Perspectives |
| | Psychological Health | Positive Psychological Impact |
| | Social Relationships | Socialization & Community |

Table 5.

| Measure | Scale Domain | Focus Group Transcript |
|--------------------|---------------------------|---|
| Self-Determination | Autonomy | <p>“I feel like I can do anything now”</p> <p>“I feel I can do anything I put my mind to now”</p> <p>“I think I can try anything I choose now”</p> |
| | Self-Regulation | <p>“I liked how I could keep my footing, standing and not falling off and riding it all the way to the shore, it shows I’m determined”</p> <p>“I accomplished surfing, keeping my balance and working hard”</p> |
| | Self-Realization | <p>“I used to tell myself I’m worthless, but now I think I can do anything”</p> <p>“I’m proud of myself, I feel like a man”</p> |
| | Psychological Empowerment | <p>“Even though I’m shy, it’s something I can overcome now”</p> <p>“I feel confident in myself because I learned to surf”</p> <p>“Really good, really proud, that’s exactly how I felt when I caught waves and stood all the way up”</p> |
| Quality of Life | Physical Health | <p>“It made me feel strong, athletic, I feel very good about myself”</p> <p>“It made me feel energetic, made me want to work harder”</p> <p>“It’s important to me that I had fun doing something other than electronics”</p> |
| | Psychological Health | <p>“I feel like I accomplished something, it allows me to think differently about myself”</p> <p>“When I was surfing it made me happier, kept my spirits up”</p> <p>“It helped me get out of bed, I actually wanted to go out, it made me more happy, I consider this a coping skill”</p> |
| | Social Relationships | <p>“I feel comfortable that I can talk to new people now”</p> <p>“I feel like I was a part of something, making new friends”</p> <p>“We were all at team, coming together, that makes me happy, like I was home with surfing”</p> |