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EXPLORING AN OUTDOOR EXPERIENTIAL AND PYD PROGRAM'S
INFLUENCE ON YOUTH IN A RESIDENTIAL AND DAY TREATMENT
PROGRAM

A Dissertation

Presented to

the Faculty of the Graduate School of Social Work

University of Denver

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

by

Rebecca Durbahn

August 2018

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PROGRAM
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Abstract

This dissertation explores the process and examines the outcomes of youth participating in a positive youth development adventure-based intervention Challenge By Choice (CBC) with outcomes of youth receiving treatment as usual in a residential and day treatment program. This dissertation aims to build on the growing body of literature on outcomes associated with PYD theoretical models and AET approaches. Specifically, the proposed dissertation asks: Is there a difference in externalizing behavioral outcomes for youth who participate in CBC as compared to peers of similar age/behavioral baseline who receive only treatment as usual?

To answer this research question, a mixed methods sequential design was used. First a qualitative inquiry into staffs' perceptions of youth in the program, followed by a retrospective quasiexperimental quantitative study, ending with qualitative interviews to interpret and make sense of quantitative findings.

The results indicated there was not a significant difference in externalizing behavioral outcomes for youth the intervention group compared to the treatment as usual group. The qualitative strand helped to make sense of these results through highlighting that during the actual intervention, the youth in the intervention group appeared to make progress with increased skills and decreased behaviors but that any perceived positive impact was not sustained or supported by the quantitative results. The qualitative results

revealed 3 themes that helped to frame the perceived impact of the intervention and, one key theme related to barriers to sustained changes revealed possible explanations for the increase in externalizing behaviors post the intervention.

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I would like to take the time to acknowledge the support, guidance and time that my committee has devoted to helping me through this entire dissertation process. I would like to thank and acknowledge Michele Hanna, Heather Taussig, Kim Bender, and Kathy Green. Each member of my committee has been an instrumental and invaluable participant in this process. I am grateful and thank you each for your part in my journey.

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List of Abbreviations

1. Residential Treatment Program (RTC)
2. Day Treatment Program (DTX)
3. Residential and Day Treatment Programs (DTRCCF)
4. Challenge by Choice (CBC)
5. Tennyson Center for Children (TCC)
6. Positive Youth Development (PYD)
7. Adventure-based Experiential Theory (AET)
8. Adverse Childhood Experiences (ACES)

Chapter 1: Introduction

Background

Exposure to traumatic events is common for a majority of the population. Epidemiological surveys indicate that 50-90% of the population is exposed to at least one traumatic event over the course of a lifetime (Bryant & Nickerson, 2014). Traumatic events include but are not limited to a range of experiences such as natural disasters, war, genocide, mass violence, child maltreatment, accidental trauma and death of a loved one (Briere & Spinazzola, 2005). The type of traumatic event that will be highlighted in this dissertation will be child maltreatment; including abuse and neglect. Child maltreatment will be highlighted due to its ongoing adverse impact on youth, families, and society as a whole (Felitti & Anda, 2010), which will be discussed throughout the introduction and literature review chapters in greater detail.

Impact of Child Maltreatment. Effects of childhood maltreatment extend across biological, emotional, behavioral, and cognitive domains, including increased risk of for mental health and psychiatric problems (Goldman Fraser et al., 2013; van der Kolk, 2014). Children who experience childhood maltreatment are significantly more likely than other youth to develop symptoms of PTSD, depression, personality disorders, conduct problems, attentional problems, suicidality, aggressive behaviors, socio-emotional problems and substance use (Watts-English et al, 2006). There is also the

potential for development of physical illness and disease that may surface before or alongside other concerns (DeGregorio, 2013; Felitti & Anda, 2010; Kearney, Weschler, Kaur & Lemos-Miller, 2010; Skowron & Reinemann, 2005).

Some children experience more risk factors than protective factors, and are at increased risk for the development of prolonged psychological problems. These risk factors can be understood through a developmental framework that highlights factors at the individual, family, and environmental levels, and contribute to increased vulnerability to the adverse consequences of child maltreatment. Some of the interpersonal risk factors that relate to increased impact from trauma exposure include poor impulse control, attention deficits, low self-esteem, insecure attachments, and history of previous traumas, (Cook et al, 2005; Jenson, Alter, Nicotera, et al, 2013). Risk factors in the developmental context of family include family discord, parental substance abuse, intergenerational history of abuse and/or neglect, parental depression, early child rearing and negative social beliefs about child rearing (Cook et al, 2005; IOM, 2013). Some of the risk factors that have the strongest correlation at the environmental level include residing in a stressful environment, living in poverty, low social economic status, and being exposed to a high level of community violence (IOM, 2013). All of these risk factors have been found to be correlated with child maltreatment; however, no causal link has been determined between risk factors and child maltreatment (IOM, 2013). Furthermore, it has been found that for youth who are exposed to an increased number of these adverse experiences and risk factors, there is a greater likelihood of child maltreatment itself, as well as adverse life course outcomes (Briere & Spinazzola, 2005; Children's Bureau, 2015; Felitti & Anda, 2010).

The framework presented by Cook et al (2005) elaborates on the individual psychosocial domains of impairment for children who are exposed to prolonged child maltreatment and further describes the areas that influence increased risk. These domains include: attachment, biology, affect regulation, dissociation, behavioral control, cognition, and self-concept. These are the domains of functioning that are impacted by exposure to child maltreatment, but are also domains that act as risk factors for experiencing future traumatic events and developing prolonged negative impacts related to trauma exposure (Cook et al., 2005; Cohen, Mannarino, Klietheres, & Murray, 2012).

Economic Impact of Child Maltreatment. Regardless of the type of services maltreated youth have access to, child maltreatment presents with a significant economic burden to the US society (Goldman Fraser et al., 2013; Slutsky, Atkins & Chang, 2010). This economic burden factors in the various systems that are accessed to support maltreated youth. These systems can include child welfare, health care, criminal justice, and special education. It has been estimated that the total life time costs and expenditures of child maltreatment is approximately 122 billion dollars (Goldman Fraser et al., 2013). This estimate is reflective of both short term and long term health care costs across the various systems (Goldman Fraser et al., 2013; Pears & Fisher, 2005; Rubin, Allessandrini & Feudtner, 2004). This estimate does not take into account the high use of Medicaid funding for youth in the child welfare system; which is an additional financial expense of child maltreatment. Overall, the overabundance of youth who are impacted by maltreatment, and significant financial burden of maltreatment, all highlight a huge gap and area of concern when considering trauma interventions. Not enough youth have access to high quality interventions. The interventions themselves have limitations

regarding accessibility and effectiveness on outcomes (Goldman Fraser et al., 2013; Pears & Fisher, 2005; Rubin, Alessandrini & Feudtner, 2004).

Residential and Day Treatment. Residential and day treatment programs are two interventions that aim to ameliorate the impact of trauma symptoms. These intervention approaches attempt to increase functional and adaptive skills for youth for which the severity of child maltreatment and the severity of trauma related symptomology lead to the child being unsuccessful in their home and/or in a traditional educational settings. There are several levels of care for children who are struggling with social, emotional, and behavioral challenges such as foster homes, group homes, kinship homes, day treatment programs, and residential treatment programs. Day treatment and residential treatment programs are often considered to be two of the highest levels of care which both provide services to some of the most trauma impacted youth (Briggs et al., 2012; Hair, 2005; Quisenberry & Foltz, 2013; Strickler et al., 2015). In the literature and in practice, the only levels of care that are considered to be higher are psychiatric hospitals and juvenile detention facilities (McMillen, Lee & Johnson-Reid, 2008; Preyde, Frensch, Cameron, White, Penny & Lazure, 2010).

In recent years there has been an increase in mental health budget cuts, increased insurance restrictions, and an increased emphasis on minimizing the use of residential placements. Therefore, once youth reach day treatment and residential treatment programs, they have a significantly higher level of acuity with regards to their mental health needs as compared to other youth (Briggs et al, 2012).

Residential and day treatment programs (DTRCCF) aim to facilitate mental health and behavioral stabilization for youth displaying unsafe, acute symptoms that interfere

with their abilities to maintain safety. Residential treatment centers are 24 hour a day, staff secured programs that provide mental health and psychiatric care for youth. Day treatment programs provide a similar structure and focus upon safety and stabilization for youth who display high levels of social, emotional and behavioral impairments in a school environment. Often times, day treatment programs are nested within residential treatment facilities and provide daily therapeutic and educational care to both the residential youth and youth who attend the day treatment only portion of the treatment center (Briggs et al., 2012; Hair, 2005; Quisenberry & Foltz, 2013; Strickler et al., 2015).

Problem Statement

Children and youth who enter into residential and day treatment (DTRCCF) levels of care are considered to be some of the most challenging youth in terms of behavioral, emotional, and cognitive presentations (Quisenberry & Foltz, 2013). A majority of these children present with complex trauma and child maltreatment histories, significant adverse childhood experiences, and an inconsistent caregiver system (Goldman Fraser et al., 2013; van der Kolk, 2014). These youth are at increased risk for displaying high levels of aggression, impulsivity, defiance, attachment related behaviors, and a fight, flight or freeze response to perceived danger (Briggs, Greeson, Layne, Fairbank, Knoverek, & Pynoos, 2012). Criteria for qualifying for DTRCCF levels of care often require youth to have attempted but been unsuccessful at seeking services in less restrictive settings such as outpatient therapy, home based therapy, foster care, group homes, and behavioral supports within the community and/or school environments (Briggs, et al., 2012, Quisenberry & Foltz, 2013). The severity of these youths' symptoms interferes with daily functioning, necessitating placement in contained levels

of care such as day treatment and residential placements (Hair, 2005; Strickler et al., 2015).

Unfortunately, numerous youth continue to display unsafe behaviors, maladaptive patterns of coping with the stressors in their lives, and demonstrate adverse life course outcomes even after completing DTRCCF programs (Cardoos, Zakriski, Wright, & Parad, 2015; Hair, 2005). Given the number of children impacted by trauma and requiring high levels of care and high levels of therapeutic interventions, and the crucial role DTRCCF programs play in supporting safety, permanency, and well-being in the lives of these children, it is essential that we understand more about what may positively impact outcomes, improve functioning, and decrease trauma symptoms. Furthermore, these programs need to be able to provide therapeutic interventions that impact trauma symptoms and help improve life course outcomes for these youth.

The awareness of substandard intervention effectiveness and outcomes for youth in residential and day treatment programs is not new. In trying to understand, prevent, and reduce the adverse impact of trauma and to increase outcomes for youth who require DTRCCF programs; policy makers, researchers and practitioners need to be willing to explore diverse and emerging interventions built on the foundation of existing evidence based interventions for treating trauma symptoms. Complex trauma, ongoing ecological risk factors, and challenges around access to affordable services all present as barriers for effective interventions. This dissertation explored one DTRCCF program's unique intervention approach to determine if it begins to address these barriers.

Research Question

RQ1: Is there a difference in externalizing behavioral outcomes for youth who participate in the Challenge by Choice Intervention as compared to peers of similar age/behavioral baseline who receive only treatment as usual?

H: Youth who participate in the CBC program will demonstrate a greater decrease in negative externalizing behaviors after completion of the program, as compared to a matched sample of youth who attend usual day and residential treatment.

RQ2: Through the lens of staff participants, what are the perceived impacts of participation in CBC?

Dissertation Study Procedures

To answer these questions, a sequential mixed methods design was used with a qualitative inquiry into staffs' perceptions of youth in the program, followed by a retrospective quasiexperimental quantitative study, ending with qualitative interviews to interpret and make sense of quantitative findings. To determine if there was an association between participation in the Challenge by Choice intervention and a decrease in externalizing problem behaviors, a series of independent sample t-tests were used to compare behavior problems for youth in the CBC group and those in a matched comparison group. A thematic approach was employed to help frame the qualitative data from interviews with staff at the program at which the study took place. Open coding, focused coding, and thematic development were used to interpret and analyze the data and to help understand the perceived impacts of the Challenge by Choice program. Mixed method's analysis was utilized to merge and interpret the results ultimately bringing the two strands together to illuminate the richness of the results when blended.

Positionality

Knowledge of the positionality of a researcher is essential for ethical practice in interpretive research. Positionality is the relationship between the researcher as a person to their world view, position, authority, knowledge, and relation to their research (Foote & Bartell, 2011; Savin Baden & Howell Major, 2013). What a researcher chooses to research, the literature they review, the way the researcher interprets their findings and their world view are all interrelated and grounded in their positionality. Therefore, discussion of the researcher's positionality encourages a reflexive approach to research and transparency to the reader (Savin Baden & Howell Major, 2013).

I am a middle class bisexual cisgender white woman raised liberal and culturally Jewish. I am from the east coast, and have resided in Colorado for the past 13 years. I hold an undergraduate and postgraduate degree in social work. I am a doctoral candidate in a graduate social work program and have experience conducting quantitative and qualitative research independently and as part of a research team.

I have worked in the field of social work for the past 15 years. I started my career as a residential treatment counselor at a residential program located in Boston. Since graduating with my postgraduate degree, I have spent time as a therapist, supervisor, manager, and am now the clinical director at the Tennyson Center for Children (TCC). My experience as a therapist has included providing individual, family, group, and crisis oriented therapy services for youth and families impacted by trauma and mental health related concerns. My career has largely been centered within residential and day treatment programs in the metro Denver area. I have specialized training in trauma-informed care, trauma interventions, and working with trauma-impacted youth as well as

sexually reactive youth. I also have extensive training in coaching, supporting, and developing clinicians as a supervisor and manager. It is important to recognize my current position at Tennyson Center, as this is the site in which I have conducted this dissertation study. I started at Tennyson in February of 2016 as a clinical supervisor, and since then have had two promotions, first to Clinical Manager of Therapy services, and now as the Clinical Director of Therapy Services.

Both my passion for working with trauma-impacted youth and my role with Tennyson have a significant impact on my world view, my approach to this dissertation and to how I interpreted the results. I have worked to recognize my biases, to remain objective, and to approach this dissertation through the lens of a researcher. I have proactively used my dissertation chair as a sounding board at times to help with remaining objective and how to use my subject expertise as a strength not a limitation for this study.

Dissertation Organization

This dissertation starts with a review of the literature and theories related to child maltreatment and interventions targeting symptom reduction for children impacted by maltreatment. Following the literature review is the methodology chapter. This chapter describes the quantitative methodology used to explore the association between behavioral outcomes and participation in an outdoor experiential summer program for youth participating in a DTRCCF program and youth in a matched comparison group. This chapter also describes the qualitative methodology used to explore staff perceptions of the impact of this summer program on the youth participants.

The results of this study are presented in two chapters, Chapter 4 and 5. The results of the quantitative analysis are presented in chapter 4, and the results of the qualitative analysis are presented in chapter 5.

Finally, the dissertation ends with a discussion chapter addressing the significance of the results, and the mixed methods integration and interpretation of the qualitative and quantitative strands of analysis. The discussion chapter will also include sections devoted to the limitations of this study as well as implications drawn from this study.

Chapter 2: Literature review

Overview

Child maltreatment has the potential to interrupt a child's behaviors, ability to regulate emotions, affect regulation, and relationships. With increased research, there is a growing understanding about how child maltreatment impacts all aspects of a child, most notably their body and brain which then impacts a child's social, emotional and behavioral responses to their environment. When a child is exposed to prolonged and invasive maltreatment, they begin to respond to the world in an altered manner that reflects their body, mind, and brains attempt to cope with the chaos that trauma creates for a youth (Van Der Kolk, 2014). The literature presented in this chapter will help to demonstrate the neurobiological and theoretical context pertaining to the impact of child maltreatment. Literature related to the impact of child maltreatment through a neurobiological lens, adverse childhood experiences, residential and day treatment programs, and relevant theoretical perspectives will be highlighted in this chapter.

Impact of Child Maltreatment

Research suggests that child maltreatment disrupts the development and organization of the brain (DeGregorio, 2013; Perry, 2009; Watts et al., 2006). Childhood is the period of time that the brain is actively developing and growing. At age two, a healthy brain is approximately 75% of the size of an adult brain; with steady and progressive growth until it is fully developed (Watts et al., 2006). There are four distinct

regions of the brain that are interconnected, but independently regulate different functions. Each region develops and becomes fully functional at different developmental points throughout childhood (Perry, 2009). Therefore, the developmental period of time and age the child maltreatment is experienced will impact and influence the child in different ways. Furthermore, early childhood adverse experiences that are prolonged, invasive and involve attachment figures can interfere with and disrupt neurodevelopmental processes in more severe and detrimental ways (Ande, Felitti, Bremner, Walker et al, 2005; Perry, 2009). Child maltreatment disrupts the neurodevelopmental process which can impact overall biopsychosocial development, leading to socio-emotional and behavioral struggles as well as self-regulation difficulties.

Neurobiology. The human brain is a complicated organism of interrelated regions and systems that have unique and connected functions. The brain develops from the bottom to the top; beginning in-utero and continuing development through young adulthood. In fact, a fully developed brain does not reach maturation until an individual is in their mid-20's (DeGregorio, 2013; van der Kolk; 2014; Watts et al., 2006). This section will provide a brief description of some of the key regions and sections of the brain that are impacted by maltreatment.

Brain stem and hypothalamus. The brain begins development with the brain stem and the hypothalamus; which are located right above the spinal cord. These two regions are often referred to as the reptilian brain. The reptilian brain is the primitive part of the brain and is responsible for basic survival; such as the functioning of the lungs, the heart, the immune system, and the endocrine system (Lupien, McEwen, Gunnar & Heim, 2009; van der Kolk, 2014). A newborn infant is an example of the reptilian brain functioning

prior to other regions of the brain developing. An infant's world revolves around the basics of survival such as breathing, eating, sleeping, defecating, and urinating; which are all functions that are regulated by the reptilian brain (Perry, 2009; van der Kolk, 2014). When an infant is provided with an environment and attachments that allow for consistency of basic needs; the brain stem and the hypothalamus learns to function appropriately and creates a foundation of balance between the functioning of the lungs, heart, immune system, and endocrine system. This balance is known as homeostasis (van der Kolk, 2014).

However, when an infant and developing brain are not provided with a consistent, nurturing, or predictable environment, this can interrupt and disrupt the development and functionality of the reptilian brain and result in disequilibrium (Perry, 2009; van der Kolk, 2014). For infants who are exposed to maltreatment, the basic functions of survival can be interrupted. For example, some infants are left hungry and meals are not predictable or consistent; other infants are not provided with nurturance or soothing when they cry or are in need; others are hit or shaken in response to their cry, and some infants are exposed to nurturance and care one minute but are then exposed to anger or inconstancy the next. These are just a few examples of behaviors and experiences that interrupt the developing brain and associated basic human functioning. The impact of this is the possibility of life long struggles with sleep, self-regulation, medical health problems, digestion, and the ability to self-soothe (Felitti & Anda, 2010; der Kolk, 2014). This developmental time period is the foundation for the rest of the brains development. Maltreatment and disruptions of this process during this timeframe can have detrimental and adverse reactions on the development of the rest of the brain, and can result in life

long struggles with social-emotional, cognitive, and physical health functioning (Lupien et al., 2009; van der Kolk, 2014)

Limbic system. As a healthy brain grows and develops, the next region of the brain, which is located right above the reptilian brain, is the limbic system. The limbic system is also commonly referred to as the mammalian brain. The limbic system develops through an individual's interaction with their environment, experiences and individual temperament. This is the region that shapes both emotions and the ability to cope with the social world (Lupien et al., 2009; Perry, 2009; van der Kolk, 2014). Infants and toddlers learn and develop through touching, moving, crawling, watching, and listening. It is through their constant interactions with people, environments, and experiences as well as through the reactions to those interactions in which the limbic system learns how to feel and cope with those experiences (Perry, Pollard, Blakely, Baker & Vigilante, 1995; Perry, 2009; van der Kolk, 2014). For a child who experiences consistent love, nurturance, and safety the brain learns to experience positive emotions and ability to cope. This is where emotion regulation and affect regulation first begin to take shape (Perry et al., 1995; Perry, 2009). A developing infant and toddler will look to their caregiver for how to react to a situation, for comfort when they experience something new and unsettling, and for consistency in getting their needs met. When caregivers provide these opportunities for love, nurturance, and consistency the limbic system stores these emotions and memories and integrates them as part of that individual's foundation for life long relationships and interactions with others and with the world (Lupien et al., 2009; Perry et al., 1995; Perry, 2009; van der Kolk, 2014). This interactional perspective is commonly known as neuroplasticity (Perry, 2009).

Conversely, children who are not provided with positive opportunities for love and nurturance, and when caregivers react in an inconsistent or adverse way; the mammalian brain stores that information and the developing brain reacts adversely (Perry, 2009). Some youth develop and integrate maladaptive patterns of coping and relating to the world and to others. This maladaptive pattern is due to perceptions of feeling unwanted, unloved and developing the perception that the world is a scary, unpredictable and an unkind environment (van der Kolk, 2014). When the development of the limbic system is interrupted, the result can lead to struggles with distorted perceptions of the world, challenges with self-regulating and coping with adverse experiences, and behavioral challenges with impulsivity and inattention (Lupien et al., 2009).

Central nervous system. As the reptilian brain and the limbic system develop, they begin to interact and result in the functioning of the central nervous system, also known as the emotional brain. This part of the brain is responsible for deciphering danger, opportunity and pleasure. When your brain senses an experience that stimulates one of these reactions, it signals you by releasing a hormone. This hormonal release is experienced as common visceral sensations that trigger both a physical and emotional response (Perry, 2009; van der Kolk, 2006; van der Kolk, 2014). The central nervous interprets the information that a person interacts with, and labels the experience as safe or as dangerous (van der Kolk, 2014).

There are various regions within the central nervous system that aid in its deciphering and interpreting of experiences. The thalamus is where the information converges and is first processed by the brain (Goldberg, 2001). This process begins as an

individual experiences various sensory inputs such as sight, sound, smell and touch. Once the sensory aspects of the experience are processed, the amygdala then begins to decipher the emotional significance of the experience. If the amygdala senses danger, it begins to secrete stress hormones such as cortisol and adrenaline (LeDoux, 2011). When the thalamus and the amygdala have interacted and interpreted the experience as dangerous or threatening, hormonal secretion is triggered as a function of the hypothalamus. However, if danger is not detected, the thalamus bypasses the hypothalamus and sends the information and neural pathway directly to the pre-frontal cortex for the brain to interpret in a higher order and rational manner. The entire interaction and process, although lengthy to explain, takes place in less than a second (DeGregorio, 2013; Goldberg, 2001; LeDoux, 2012; Lupien, et al., 2009; Perry, 2009; van der Kolk, 2006; van der Kolk, 2014; Weniger, Lange, Sachsse, & Irle, 2008).

The brain and body often return to baseline after the danger has passed. However, for youth who experience prolonged and/or invasive maltreatment, the emotional brain begins to react to this by perceiving danger even when the individual is not in a dangerous situation (LeDoux, 2011). The brain is attempting to protect the individual by signaling danger, but the result is an overproduction of hormones and a brain and body that are constantly on guard and in a pattern of fight or flight (LeDoux, 2011; Perry, 2009; van der Kolk, 2014). Childhood maltreatment can significantly affect the structure and functionality of the brain. For some adults who were exposed to childhood maltreatment, portions of the emotional brain such as the hippocampus and the amygdala are smaller than those of adults not exposed to interpersonal trauma as children (DeGregorio, 2013; Weniger, Lange, Sachsse, & Irle, 2008). In a fully developed brain,

the interaction between the hippocampus and the amygdala is responsible for processing emotional, social, and sensory information (Belsky & de Haan, 2011; Perry, 2009; Weniger et al., 2008). Conversely, interference with the brain functionality and structure can manifest through an individual developing and displaying symptoms of PTSD and other trauma related diagnosis (van der Kolk, 2014) and gross impairments with emotional, social and sensory processing (Perry, 2009).

Prefrontal cortex. One of the last portions of the brain to develop is the prefrontal cortex, often referred to as the rational brain. Executive functioning is the technical term for the higher order functioning tasks that the rational brain controls. The rational brain is responsible for making sense of the world through such tasks as abstract thought, language, the ability to plan, to delay gratification, to think before acting, and the ability to reflect. Furthermore, the prefrontal cortex allows an individual to demonstrate an empathetic understanding for people and the world around them (Goldberg, 2001; LeDoux, 2012; Lupien, et al., 2009; Perry, 2009; van der Kolk, 2006; van der Kolk, 2014; Weniger et al., 2008). Healthy functioning of the prefrontal cortex is a function of sequential development of the other regions of that brain that have been described throughout this section (Perry, 2009).

Although the prefrontal cortex begins to develop upon birth, it does not become fully functional until an individual reaches their mid-twenties. Thus, when there have been disruptions with brain development secondary to exposure to maltreatment, the sequential development of the brain is interrupted, ultimately disrupting the functionality and development of the prefrontal cortex (LeDoux, 2012; van der Kolk, 2014). When this happens, the automatic responses that are controlled by the sensory and emotional parts

of the brain remain activated. The pathways to the prefrontal cortex are not able to develop properly and a maltreated individual's brain is not able to access the ability to think, rationalize, and remain calm when the other parts of the brain perceive a threat. This enables some individuals to remain in the state of fight or flight, to remain impulsive, and to remain in a mode of survival (Goldberg, 2001; LeDoux, 2012; Lupien, et al., 2009; Perry, 2009; van der Kolk, 2006; van der Kolk, 2014; Weniger et al., 2008).

Psychoneuroimmunology. Psychoneuroimmunology (PNI) provides a framework for understanding the interaction of trauma and the body. This framework considers both the psychosocial and ecological risk factors as well as biological risk factors for youth who are impacted by maltreatment (Pace & Heim, 2012). In particular, this model helps to understand the impact of maltreatment on the stress response system through three different pathways within the body. These pathways include nervous system, the inflammatory response system, and the pathways of homeostasis and allostatis. Ultimately, various systems of the body have been increasingly shown to be adversely impacted by maltreatment; which can result in life course health problems and a compromised immune system. Furthermore, PNI highlights how the interruption of these various systems is connected to symptoms of trauma and PTSD (Kendall-Tackett, 2009; Pace & Heim, 2012; Robles, Glaser & Kiecolt-Glaser, 2005).

Nervous system. Maltreatment impacts the stress response system and ultimately leads to a weaker immune system. The mechanisms in which the stress response system is impacted can be understood through three different pathways. First, traumatic events dysregulate the nervous system, including the hypothalamic-pituitary-adrenal (HPA) which is part of the sympathetic nervous system and the autonomic nervous system

(Kendall-Tackett, 2009; Pace & Heim, 2012; van der Kolk, 2014). The nervous system is responsible for arousal within the body, which includes the fight or flight response (Yehuda & LeDoux, 2007; van der Kolk, 2014). When an individual experiences a distressing event, the HPA axis and the sympathetic nervous system are activated in what is commonly referred to as the fight or flight response. In most circumstances, this reaction is a healthy and normal, producing necessary chemicals such as norepinephrine, dopamine, and cortisol to induce adrenaline to keep oneself safe. In most circumstances, the body is able to return to base line through activation of the autonomic nervous system which releases acetylcholine to help slow breathing, heart rate, relax muscles and to act as a break for the activation of sympathetic nervous system (Yehuda, 2009; van der Kolk, 2014).

However, for a child who is exposed to prolonged trauma that induces this reaction on an ongoing basis, the body becomes unstable due to an overload in chemicals, and the immune system is weakened. The sympathetic nervous system becomes overused and strained, which results in too much adrenaline and too much cortisol being released in the stressed body. The autonomic nervous system is not able to balance out the activated sympathetic nervous system (Kendall-Tackett, 2009; Pace & Heim, 2012; van der Kolk, 2014; Yehuda, 2009; Yehuda & LeDoux, 2007). Similarly, individuals with PTSD also have an overactive HPA axis and sympathetic nervous system due to the body perceiving a threat even when none is present (Pace & Heim, 2012; van der Kolk, 2014).

Inflammatory response system. The next pathway that leads to a weakened immune system is dysregulation of the inflammatory response system. When a child experiences trauma or a threatening situation, the body responds by releasing

proinflammatory chemicals. The body responds more rapidly and there is a significant rise in inflammation within the body that interferes with the stress response system (Pace & Heim, 2012; Robles, Glaser & Kiecolt-Glaser, 2005). These chemicals alter the body's ability to heal or fight infections. A balanced amount of proinflammatory chemicals is healthy, and acts as protective factor for the body to fight off infections. However, an overload of these chemicals, which is a common response to trauma, is maladaptive for the body. Too many proinflammatory chemicals has been linked to numerous life course health problems such as autoimmune diseases, coronary heart problems, chronic pain, and impaired wound healing. Furthermore, an abundance of inflammation within the body interrupts the functioning of the stress response system (Kendall-Tackett, 2009; Robles et al., 2005; Yehuda, 2009.).

Homeostasis and allostasis. The last pathway of the negative impact of trauma on the body is through homeostasis and allostasis. These processes are essentially the body's attempts to maintain stability through stress and change (Kendall-Tackett, 2009).

Homeostasis is the ability of the body to adapt and stabilize internal systems despite external changes. Allostasis represents the stress response system's functioning in response to stressful situation. When prolonged or overwhelming trauma is experienced, the body struggles to stabilize and the stress response system remains activated and overloaded. This is referred to as allostatic load and results in wear and tear on the brain and body (Kendall-Tackett, 2009).

Adverse Childhood Experiences

Many youth in residential and day treatment have experienced elevated rates of adverse childhood experiences (ACES). ACES can be understood and defined as physical

abuse, sexual abuse, emotional abuse, having a substance abusing adult in the home, having a primary care giver with a mental illness, domestic violence in the home, criminal behavior by a primary caregiver, death of a primary care giver, and having a primary care giver incarcerated (Felitti, Anda, Nordenberg, Williamson, Spitz, Edwards, Koss & Marks, 1998). The literature suggests that youth who enter into residential and day treatment programs often present with a multitude of ACES as well as co-occurring struggles that contribute to the social, emotional, behavioral, and developmental challenges that necessitate placement in higher levels of care (Felitte et al., 1998; Larkin & Dean, 2014; Shabat, Lyons & Martinovich, 2008).

This is concerning because ACES have been associated with a host of negative social, emotional, behavioral, and health related outcomes. The concept of ACES grew out of a retrospective study that was completed by Felitti and Anda in conjunction with Kaiser Permanente from 1995-1997, (Felitti & Anda, 2010; Felitti et al., 1998; Larkin, Shields, & Anda, 2012). This study examined the relationship between exposure to ACES and negative outcomes across emotional, physical, social, behavioral and medical domains of functioning. The knowledge that grew from the Kaiser study was that ACES were common and associated with life course mental health and physical health problems. The adverse life course outcomes included increased rates of diagnosed mental health disorders, increased rates of substance abuse, increased involvement with the criminal justice system, and increase health related problems such as heart disease, lung diseases, liver diseases, obesity and a plethora of other physical health issues (Ande et al, 2002; Felittle et al., 1998; Larkin et al., 2012; Shabat et al., 2008).

Youth who have experienced multiple/co-occurring ACEs, are at particularly increased risk for adverse outcomes. The overarching findings indicated a correlational link between exposure to ACEs and adverse outcomes. The findings also indicated that often times ACEs are co-occurring, and that there is a cumulative effect, meaning that the more ACEs a person is exposed to, the increased likelihood of developing lifelong struggles emotionally, medically, socially and/or behaviorally (Felitti & Anda, 2010; Felitti et al., 1998; Larkin et al., 2012). Children exposed to trauma are significantly more likely than other youth to develop symptoms of PTSD, depression, personality disorders, conduct problems, attentional problems, suicidality, aggressive behaviors, socio-emotional problems and substance use (Watts-English et al., 2006). There is also the potential for development of physical illness and disease that may surface before or alongside other concerns (DeGregorio, 2013; Felitti & Anda, 2010; Kearney, Weschler, Kaur & Lemos-Miller, 2010; Skowron & Reinemann, 2005).

Youth in DTRCCF programs have high rates of complex trauma (ACEs) experiences, which is indicative of their high level of need. These complex, traumatic histories and high percentage of exposure to multiple ACEs is associated with the mixed outcomes of residential and day treatment programs (Felitti & Anda, 2010). As already noted; exposure to ACEs increases the prevalence and risk for development of adverse outcomes. Youth who are exposed to numerous ACEs have disruptions in their developmental pathways, which lead to disruptions with neurobiological development, which can then lead to disruptions in cognitive, emotional, social and behavioral functioning. Youth in day treatment and residential programs have already displayed a high level of impairment across at least one domain on functioning, thus their placement

in more contained levels of care. Therefore, these youth present with some of the most acute symptoms, with a significant number of risk factors that interfere with protective mechanisms and resiliency (Felitti & Anda, 2010; Felitte et al., 1998; Larkin et al., 2012).

Certain protective factors and resiliencies can help youth mitigate the effects of ACEs. Distress and psychological dysregulation are common after experiencing a traumatic event; however, a majority of those exposed to trauma demonstrate resilience and do not develop clinically significant emotional problems (Ungar, 2013). Resilience is an ecological construct that reflects the intersection of conditions of the trauma, the environment and the individual that result in the positive integration of a traumatic event into daily functioning and the capacity to positively cope (Bryant & Nickerson, 2014; Ungar, 2013). The natural recovery process that is related to resilience has several correlated protective factors which help mitigate the long-term negative impact of experiencing a trauma. Some protective factors include positive coping strategies, social support, problem solving skills, a secure attachment style, and a supportive environment (Briere & Spinazzola, 2005; Ungar, 2013). Trauma focused interventions, including some DTRCCF programs, attempt to build and increase resilience and a child's ability to positively cope with trauma experiences.

Evidence Based Trauma Focused Interventions

Trauma focused interventions include numerous key trauma specific strategies that are aimed at reducing trauma symptomology and helping children and youth process and cope with their trauma histories. These interventions are inclusive of both parent involvement and youth focused approaches. Some of the key strategies that these different treatment interventions include are coping skills, cognitive restructuring,

gradual exposure, and the trauma narrative (Cohen et al., 2012, Deblinger, Lipman, & Steer, 1996; Goldman Fraser et al., 2013; Runyon & Dublinger, 2010).

Numerous studies, systematic reviews and meta-analysis have been conducted in relation to child maltreatment and child maltreatment interventions. However, a majority of the existing reviews target subsets within child maltreatment that are focused on a particular form of maltreatment, or a particular intervention outcome. Few have examined the effectiveness and limitations of trauma focused evidenced based interventions. This section will examine four different trauma focused treatment interventions (Goldman Fraser et al., 2013). The interventions that will be examined include combined parent-child cognitive behavioral therapy, trauma-focused cognitive behavioral therapy, eye movement desensitization reprocessing, and group treatment program for sexual abuse. This is not an exhaustive list of trauma focused interventions, but are some of the more commonly utilized interventions and ones that are at times utilized within residential and day treatment programs.

Combined parent-child cognitive behavioral therapy. Combined parent-child cognitive behavioral therapy is a treatment intervention and approach that is geared towards working with parents who have a history of being physically abusive and their children. This modality is focused on youth aged 7 to 13 who meet criteria for PTSD through use of a trauma symptom checklist or who meet criteria for externalizing disorders; and have a history of being physically abused. History of abuse is determined through either self-report by the parents, or a documented history of a founded allegation of physical abuse within a four month time frame prior to beginning the intervention (Kolko & Swenson, 2002). The overall goals of combined parent-child cognitive

behavioral therapy are to reduce trauma symptomology in youth, reduce externalizing behavioral problems, improve parent-child relationships, and improve positive parenting skills, and reduce risk of continued physically abusive behaviors by parents (Goldman Fraser et al., 2013; Kolko, 1996; Kolko & Swenson, 2002; Runyon et al., 2010).

To work towards its intended outcomes, combined parent-child cognitive behavioral therapy utilizes a phasic model. The child focused phase focuses on helping the youth develop coping strategies, developing a sense of safety, and working up to being able to work through gradual exposure and a trauma narrative. The parent phase focuses on psycho-education, enhancing parenting skills, and going through a clarification process to help parents take accountability for their behaviors and make amends with their children. The final phase is the combined parent-child phase, which focuses on going through the clarification phase, enhancing the parent-child relationship, and developing a family safety plan to increase safety, problem solving skills, and communication skills within the family system (Cohen et al, 2012, Deblinger, Lipman, & Steer, 1996; Goldman Fraser et al., 2013; Kolko, 1996; Kolko & Swenson, 2002; Runyon et al., 2010).

Methodological approaches. Combined parent-child cognitive behavioral therapy has been studied through the use of a randomized control trial (RCT). For the RCT, active experimental groups who were participants in the intervention were compared to control groups who were participating in parent-focused only treatment as usual within their communities (Goldman Fraser et al., 2013). Key outcomes that were measured included trauma symptoms, externalizing and internalizing behavior problems, and the parent-child relationship (Runyon et al., 2010). Results indicated that overall, participants

in the combined parent-child cognitive behavioral therapy had a reduction in trauma symptoms and improvements within the parent-child relationship. However there was no clinically significant improvements regarding externalizing and internalizing behavior problems indicated (Goldman Fraser et al., 2013; Runyon et al., 2010). Furthermore, there was not a noteworthy reduction in use of corporal punishment by the participants in the experimental group, compared to the control group (Runyon et al., 2010).

Although the rigorous level of support of the combined parent-child cognitive behavioral therapy yielded some positive results related to the reduction in trauma symptoms in the youth who participated, there were a number of conflictual results related to ongoing behavioral struggles and ongoing use of corporal punishment that both raise some concerns related to efficacy of this trauma focused approach (Runyon et al., 2010). Furthermore, from the literature regarding combined parent-child cognitive behavioral therapy, there seems to be limited explanation into a theoretic framework to support this approach. The theoretical framework that was mentioned is geared toward a behavioral rationale and social learning theory (Deblinger et al., 1996; Kolko, 1996; Kolko & Swenson, 2002; Runyon et al., 2010).

Trauma focused-cognitive behavioral therapy. Another example of a trauma informed EBP is Trauma-Focused- Cognitive Behavioral Therapy (TF-CBT). Numerous studies have been conducted using a TF-CBT approach, with children ranging in age from 2 through 18. TF-CBT has three phases; the coping skill phase, the trauma narrative and processing phase, and the closure phase. TF-CBT aims to enhance child safety, parenting skills, and the skills to be able to manage emotions and affect. (Cohen et al, 2012; Lawson & Quinn, 2013). The structure of this model includes: 1) psycho-education

to the caregiver; 2) opportunities for the caregiver to develop appropriate responsive strategies and techniques; 3) sessions with the child to develop coping strategies and create a trauma narrative; and, 4) sessions with both the child and the caregiver in a highly structured and feedback oriented environment (Cohen et al, 2012; Lawson & Quinn, 2013). This model is an example of an ecological and attachment theory informed approach to trauma treatment in the sense that there is significant focus on the child-caregiver relationship (Cohen et al, 2012; Lawson & Quinn, 2013).

TF-CBT focuses on improving youth's ability to positively cope with trauma histories and symptoms (Goldman Fraser et al., 2013). The intended outcomes focus on improving children's behavioral and emotional struggles related to their history of maltreatment. Youth participants all had a trauma history, met criteria for PTSD and/or met criteria for internalizing or externalizing problems (Cohen et al., 1996; Cohen et al, 2004; Cohen et al, 2012; Deblinger, 2001; Deblinger et al., 2011; Deblinger et al., 2011; Goldman Fraser et al., 2013; Lawson & Quinn, 2013). This intervention has been utilized most with youth who have sexual abuse histories, but has also been utilized with the other forms of maltreatment. The average length of treatment using this approach is 12-16 weeks, with each session lasting 60-90 minutes (Goldman Fraser et al., 2013).

Methodological approaches. Numerous iterations of this intervention have been tested using a RCT approach (Cohen et al., 1996; Cohen et al, 2004; Deblinger, 2001) There is a strong body of literature that demonstrates the effectiveness of this intervention (Deblinger, Mannarino, Cohen, & Runyon, 2011; Deblinger, Mannarino, Cohen & Steer, 2006). The various studies compared treatment groups with control groups. The outcomes measured and compared include trauma symptoms, externalizing behavioral

problems, parenting skills, and caregiver mental health (Goldman Fraser et al., 2013). Outcomes indicate that participants in TF-CBT compared to the control participants had a significant reduction in trauma symptoms; caregivers had a reduction in depressive symptoms, and increased positive parenting skills. However, there was no significant difference between the groups in terms of behavioral struggles for the youth (Cohen et al., 1996; Cohen et al, 2004; Deblinger, 2001; Deblinger et al., 2011; Deblinger et al., 2011; Goldman Fraser et al., 2013). Despite the abundance of literature and robust empirical support of TF-CBT, overall, the results of the interventions have yielded small to medium strength of evidence; indicating that there is significant room for improvements regarding the outcomes for youth and their families (Goldman Fraser et al., 2013). This small to medium strength of evidence is in part due to the small sample sizes, and ongoing behavioral struggles in the youth, and homogeneity of the sample (AHRQ, 2013; Deblinger, Mannarino, Cohen, & Runyon, 2011; Deblinger, Mannarino, Cohen & Steer, 2006; Goldman Fraser et al., 2013).

TF-CBT is a phasic model that utilizes numerous sequential steps and skills that build off each other. This intervention is grounded in attachment theory, as evidenced by the heavy emphasis on developing a secure bond, and the recognition that behavior and symptomology in children will not improve until the caregiver's capacity to provide consistency and nurturing improves (Lawson & Quinn, 2013; Querido, Warner, & Eyberg, 2002). Each phase of this model seems to align with what is known about the body and the brain. For example, the first phase focuses on safety, coping skills, and affect regulation. By focusing on safety and coping skills, this model appears to be targeting the brain stem in this early phase. Helping a child learn how to cope, to feel

safe, and to develop the ability to regulate emotions, while also helping parents learn how support, respond, and parent in a more effective manner are examples of how to retrain the reptilian brain to return to homeostasis (Perry, 2009; van der Kolk 2014). A traumatized brain will struggle to move onto the processing phase, which requires use of higher levels of brain functioning, if the lower portions of the brain have not had the chance to heal, reorganize, and re-learn basic functioning (Perry, 2009). Overall, this model, even though not explicitly linked to neurobiology, does appear to be aligned with what is known about how the brain is impacted by trauma.

Eye movement desensitization reprocessing (EMDR). EMDR is a phasic model that focuses on information processing by addressing past traumatic experiences and integrating it into a larger context of their lives. Treatment component include 8 phases, and the total length of treatment ranges from 12-15 sessions. This intervention approach uses techniques such as bilateral eye movements, tapping, and using various tones. As these techniques are being used, the individual is simultaneously focusing on past memories, present triggers, or potential future trauma triggers (Ahmad, Larsson, & Sundelin-Wahlsten, 2007; Gelinas, 2003; Goldman Fraser et al., 2013; van der Kolk, 2014). Essentially, EMDR, attempts to help traumatized individuals process their trauma and integrate it into the daily functioning, while also helping to create a new positive schema related to the experience of the trauma (Gelinas, 2003; Shapiro, 2001).

Methodological approaches. Numerous studies have been conducted regarding the efficacy of EMDR, which has included pilot studies and RCT studies (Chemtob et al., 2000; Feske, 1998; Jaberghaderi, Greenwald, & Rubin, 2004; Lohr, Tolin, & Lilienfeld, 1998; Shapiro, 2001; Spector & Read, 1999). The overarching outcomes from the

numerous studies that have been conducted indicate that EMDR has a positive impact on reducing trauma symptomology, and that there is a statistically significant reduction on symptoms of PTSD as compared to the control groups (Chemtob et al., 2000; Feske, 1998; Jaberghaderi, Greenwald, & Rubin, 2004; Gelinas, 2003; Lohr, Tolin, & Lilienfeld, 1998; Shapiro, 2001; Spector & Read, 1999).

EMDR grew out of neurobiology and information about how the various regions of the brain can become disorganized and disrupted when exposed to child maltreatment. A maltreated brain does not always have the capacity to process information about trauma and subsequently develops maladaptive patterns of coping as a way to deal with the adverse experiences (Perry, 2009; Shapiro, 2001; van der Kolk, 2014). When a child or youth experiences a trauma, an imbalance occurs in the nervous system and

“the information-processing system is unable to function optimally and information acquired at the time of the event, including images, sounds, affect, and physical sensations, is maintained neurologically in its . . . [original] distressing, excitatory state-specific form” (Shapiro, 2001, p. 31).

This can lead to a child or youth experiencing trauma symptoms such as nightmares, flashbacks, intrusive thoughts, physical sensations, affect, or behaviors (Gelinas, 2003; Shapiro, 2001; van der Kolk, 2014). EMDR uses a mind-body approach to help counteract these impacts of trauma by using rapid eye movements and tapping to help the brain process the trauma, and to make new positive associations in place of the triggers (Gelinas, 2003; Shapiro, 2001).

Group treatment program for sexual abuse. The group treatment program for sexual abuse is a group approach for victims of sexual abuse. The group targets females aged 9 to 12, with length of stay in the program 6 months to one year. The group is a

once weekly intervention that aims to provide a supportive and safe environment for youth that provides psycho-education, reduce risk for future victimization, and aims to increase youth's ability to positively cope. Some components of this model include focus on relaxation technique such as muscle relaxation, guided imagery, and positive coping skills. Outcomes that this intervention target were emotional and behavioral problems for the youth who participate (McGain & McKinzey, 1995; Trowell, Kolvin & Weermanthri, 2002).

Methodological approaches. This intervention has not been tested using a randomized approach, but has been tested with a non-randomized controlled trial. The treatment group was compared to a waitlist control group. The treatment group was comprised of females who were referred to the intervention by child protective services or self-referrals. Outcomes indicate that participants in this study had improved behaviors, including conduct problems, aggression and attention problems. Despite positive outcomes, these findings have limitations due to the non-randomized control design, small sample size, and no replication studies (AHRQ, 2013; McGain & McKinzey, 1995; Trowell, Kolvin & Weermanthri, 2002).

The group treatment program for sexual abuse is a group process that, from an assessment of the literature, does not seem to be phasic, sequential, or grounded in neurobiology. The literature supports a social learning theoretical approach that aims to use a positive peer culture, psycho-education and the use of relaxation techniques to reduce anxiety, trauma symptoms, and improve behaviors in females with sexual abuse histories (McGain & McKinzey, 1995; Trowell, Kolvin & Weermanthri, 2002). Although not developed with a neurobiology lens, the use of relaxation techniques have been

shown to reduce inflammation in the body and calm an overproducing and overworking brain that gets caught in fight, flight or freeze patterns (Pace & Heim, 2012; Perry, 2009, Robles et al., 2005; van der Kolk, 2014).

Residential Treatment Programs

The overall goal of residential treatment programs is to provide a stable, consistent, and structured environment in which youth can develop and implement skills to improve behavioral and emotional regulation while also reducing trauma symptoms (Hair, 2005). These programs often focus on skill development in the areas of impulsivity, attachment, attunement, regulation, communication, behavioral aggression and antisocial behaviors (lying, stealing). Although each program varies, some universal components include behavior modification, academic achievement, social skills building, psychiatric/medication management services, and individualized therapeutic treatment goals (Quisenberry & Foltz, 2013; Strickler et al., 2015). Ultimately, the aim is to provide an environment for youth to process the underlying contributing factors that have led to maladaptive behaviors and for youth to acquire and integrate the needed skills to demonstrate safety and stability necessary to integrate back into less restrictive settings. The more skills youth have for managing stress and emotions, the less externalizing behavioral struggles will be present, and an overall increase in functioning will be achieved (Briggs et al., 2012; Hair, 2005; Quisenberry & Foltz, 2013; Strickler et al., 2015).

Residential treatment for children and youth is expensive, and despite efforts to minimize utilization of residential care as an intervention when possible, it continues to be a part of the child welfare continuum of care (James et al., 2012; McMillen et al.,

2008; Preyde et al., 2011). For each child who accesses residential treatment, the average yearly cost is estimated to be over \$75,000 (McMillen et al., 2008; Shirley, 2002). The high level of cost, the focus on lower level interventions, a shifting insurance and Medicaid landscape, and philosophies related to preserving family systems and providing therapeutic interventions within the home environment have contributed to a decrease in the number of youth accessing residential treatment (Goldman Fraser et al., 2013; James et al., 2012; Pears & Fisher, 2005; Rubin et al., 2004). The consequence of this has been that of the youth accessing residential treatment, they are often some of the more clinically acute children who have often not been successful in less restrictive settings (Briggs et al., 2012).

Aside from the economic burden of residential treatment, there is also mixed results for the effectiveness of these programs in terms of outcomes (Goldman Fraser et al., 2013; James et al., 2012; McMillen et al., 2008; Pears & Fisher, 2005; Preyde et al., 2011; Rubin et al., 2004). There are a limited number of studies about residential treatment and outcomes but from the studies that do exist, the results are not consistent. Some studies indicate that there is some effectiveness for behavior and symptom reduction (Preyde et al, 2011; Wilmhurst, 2002) and some indicate either no progress or a regression in terms of behaviors and symptoms (Asarnow, Aoiki, Elson, 1996; Barth, Greeson, Green, Hurley, & Sisson, 2007). Furthermore, most of the literature and research indicated that even if an immediate improvement was observed, that long term outcomes indicated that youth did not demonstrate long term benefits or sustained positive improvements after completion of residential treatment (Nofel, Cook, Leschild, St. Pierre, Steward, & Johnson, 2011). Some of the trends in the literature indicate that

for youth with more acute symptoms and more complex trauma histories progress and symptom reduction is often slower and not sustained. Whereas for youth with less severe behaviors and symptoms, positive outcomes are noted more often (Asarnow et al., 1996; Barth et al., 2007, James et al., 2012; McMillen et al., 2008; Pears & Fisher, 2005; Preyde et al., 2011; Rubin et al., 2004)

Regardless of the outcome, there are some common challenges and themes discussed in the research that pertains to residential treatment. From the literature that was reviewed, a common theme and limitation pertaining to methodology was observed. All of the articles reviewed cited the limitation about not being able to employ the use of a well-designed and well executed randomized control trial. This led to the sentiment that it was challenging to fully understand or investigate the effectiveness of residential treatment. Ethical considerations, practicality, and feasibility of using a random assignment for an intervention and control group were all discussed as the main barriers for not being able to use a randomized control trial. Furthermore, without a randomized control trial and without random assignment, regardless of statistical manipulation through propensity score matching to help create a statistically matched sample for control groups; there were inherent discrepancies such as family functioning, family involvement and level of acuity between intervention and control groups (Goldman Fraser et al., 2013; James et al., 2012; McMillen et al., 2008; Nofle et al., 2011 Pears & Fisher, 2005; Preyde et al., 2011; Rubin et al., 2004)

Day Treatment Programs

Day treatment programs are educational programs that aim to enhance academic, social, emotional and behavioral skills for youth who have not been successful in a

traditional or less restrictive school environment (Crofford, Rittner, & Nochajaski 2013). Day treatment programs traditionally attempt to provide a safe, secure and structured environment in which youth can gain access to smaller class sizes, less staff to student ratios, and increased support in academics, behavioral interventions, and therapeutic interventions (Crofford et al., 2013; Gagnon & Leone, 2005; Gagnon & McLaughlin, 2004). A majority of youth placed in day treatment programs qualify for an Individual Education Plan (IEP) that outlines learning and/or emotional disabilities that qualify the student for specialized services to increase academic success (Crofford et al, 2013; Gagnon & Leone, 2005). Due to the scope of this dissertation, the focus of the literature that was reviewed was on day treatment programs that provide services to youth with social, emotional, and behavioral challenges. There are also day treatment programs that specialize in working with youth who have eating disorders, autism, significant cognitive and developmental delays, and/or youth with significant learning differences. Although there is some overlap, articles and literature that solely focused on one or more aforementioned areas were excluded.

The demographic profile of students within day treatment programs is not fully understood, however, from what is described in the literature, there are numerous similarities to youth within residential programs (Crofford, et al, 2013; Furtado et al., 2016). Overall, more males enter into day treatment and there is a disproportionate representation of marginalized identities and youth who live in poverty (Crofford, et al., 2013). In addition to an educational diagnosis, most youth within day treatment programs also have a psychiatric diagnosis. Furthermore, a significant number of youth who are enrolled in day treatment programs, especially programs nested within residential

programs also have a high number of adverse childhood experiences and histories of child maltreatment (Crofford et al., 2013; Furtado et al., 2016).

The structure and approach of day treatment programs vary widely and there does not seem to be model that is consistent across day treatment programs. The core components that seem to be similar across the spectrum of programs include the focus on not only academics, but also on safety, stabilization of behaviors, skill building related to increasing prosocial behaviors, emotion regulation skill development, and therapeutic support to address the underlying and driving psychiatric or clinical function related to the externalizing behaviors (Crofford et al., 2013; Furtado, et al., 2016; Gagnon & Leone, 2005; Gagnon & McLaughlin, 2004). The overarching goal of day treatment is to stabilize the youth enough to be able to step down to less restrictive educational settings. Youth who reside in residential treatment programs often attend day treatment programs that are nested within residential programs (Furtado et al., 2016).

The research associated with day treatment programs is scant and inconsistent. The limitations of both the research designs and the outcomes can be associated with numerous factors such as inconsistencies in day treatment models, inconsistencies in referral and admission processes, varying lengths of time spent in day treatment programs, and challenges with implementing rigorous research designs (Furtado et al., 2016; Gagnon & Leone, 2005). These challenges present as barriers to fully understanding the impact or outcomes associated with day treatment programs.

Some of the positive outcomes associated with day treatment levels of care include the cost effectiveness and some indications of decreasing problem behaviors. The literature highlights the cost effectiveness of the day treatment intervention as compared

to residential levels of care (Crofford, et al., 2013). However, the length of time that youth remain enrolled in day treatment appears to be much longer on average than how long youth are residing in residential. In some instances, youth remain in day treatment for several years prior to transitioning to less restrictive levels of care (Crofford et al., 2013; Furtado, et al., 2016; Gagnon & Leone, 2005; Gagnon & McLaughlin, 2004). Despite long lengths of time spent in day treatment programs, the research indicates that youth who receive support and interventions at day treatment, demonstrate more progress with symptom reduction and a decrease in externalizing behavior problems as compared to youth who receive residential treatment only (Crofford, et al., 2013; Furtado, et al., 2016).

Interventions through a Theoretical Lens

With mixed evidence regarding the effectiveness of traditional approaches to residential and day treatment programs, the field is progressing towards new frames of thinking about work with this population. Two theoretical frameworks are particularly relevant to approaching the needs of youth in residential and day treatment levels of care. The two theoretical frameworks that will be highlighted include Positive Youth Development (PYD) and Adventure-based experiential therapy (AET).

Positive Youth Development Theoretical Framework. Positive Youth Development (PYD) can be used as a guiding theoretical approach to understanding and reframing the issue of adverse childhood experiences among youth in DTRCCF levels of care. As previously highlighted, the impact of adverse childhood experiences are problematic because of the many ripple effects of negative outcomes that can occur as a result. However, approaching these youth and programs through a problem-centered lens,

fails to adequately address the many factors that work interdependently to yield such outcomes. Problem-focused approaches often attempt to address one issue, while insufficiently attending to related ones (Eccles & Appleton, 2002). For example, many DTRCCF programs have solely focused on reducing unwanted behaviors, while failing to adequately address skill development, healthy relationships, and other related components that are integral to improving overall functioning for these youth (Eccles & Appleton, 2002). In contrast to this, PYD emphasizes strategies through a strength based lens, reframing with a view of people as opportunities for growth, rather than as problems in need of fixing (Eccles & Appleton, 2002).

Positive Youth Development (PYD) is a strengths-based theoretical framework and developmental framework focused cultivating the strengths of each individual youth, engaging youth in their own development, and helping youth develop skills to access resources from their environments and utilize skills to increase health and wellbeing (Jenson et al., 2013). Key PYD practice strategies include creating safe spaces to build meaningful relationships, offering opportunities for identity development, maintaining high expectations and rewards for positive behavior, supporting youth involvement and autonomy, providing structured opportunities to learn and apply useful skills, and integrating family, school and community efforts when appropriate (Jenson & Anyon, 2014). PYD encourages youth to engage their own strengths to navigate toward increased application of life long skills, supportive relationships, positive social norms, and self-determination (Eccles & Appleton, 2002). PYD highlights 5 key characteristic which include —Caring, Character, Competence, Confidence, and Connection (Lerner,

Almerigi, Theokas, & Lerner, 2005). PYD programming focuses on cultivating these 5 key characteristics as central for development and growth for youth.

PYD theory grew out of a social ecological model of development (McDonough, Ullrich-French, & McDavid, 2018). PYD examines and attempts to understand the interactional process of youth as they interact with each eco-system of their life. This includes understanding the interaction between youth and their family, school, spiritual community, neighborhood, the larger community, and at an interpersonal/individual level. Social ecological perspectives help to frame how individual and interpersonal factors, social relationships, cultural contexts, and larger societal contexts interact in reciprocal manner to influence development (Eccles & Appleton, 2002; Lerner et al., 2005; McDonough, et al., 2018). When these interactions are positive and have elements that are outlined by PYD literature, such as safe adults, opportunities to connect, and engaging in activities that facilitate the engagement of youth in their own strengths, then development has been linked to more positive outcomes. However, when these opportunities do not exist or when there are significant risk factors such as child maltreatment and adverse childhood experiences that overshadow the presence of protective factors, there has been a link to negative outcomes (Eccles & Appleton, 2002; Jensen et al., 2013; Lerner et al., 2005; McDonough, et al., 2018). It is through interacting with each ecological system in a youth's world in which youth can develop and integrate the 5 key characteristics. PYD theory recognizes and takes into account the lack of resources that exist in many impoverished, marginalized communities and attempts to provide intentional opportunities for youth have access to safe adults, and

experiences that help to shape positive development (McDonough, et al.,2018; s Jensen et al., 2013).

A growing body of evidence supports the efficacy of this approach in promoting positive outcomes and reducing problem behaviors among adolescents (Eccles & Appleton, 2002; R. Lerner, J. Lerner, & Benson, 2011). A majority of the literature focuses on PYD being applied to afterschool programs, largely centered in neighborhoods and communities that are considered impoverished, under-resourced, high rates of community violence, and higher proportions of youth from marginalized identities (Durlak et al., 2007; Eccles & Appleton, 2002; Ginwright & James, 2002; McDonough et al., 2018; Jensen et al., 2013).

Programs that have been influenced by PYD theory have been linked to numerous outcomes through the literature and research. The cultivation of youth and adult relationships has been one of the key outcomes associated with participation in PYD programs and associated with other positive outcomes for youth (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004; Durlak et al., 2007; McDonough, et al., 2018). Other factors that have been associated with positive outcomes include quality of social relationships, a nurturing environment, and supporting autonomy development. However, these factors when unpacked seem to be related to and present when the youth and adult relationships have been cultivated (Catalano, et al., 2004, Durlak, et al., 2007, McDonough et al., 2018). It is through strong relationships between youth and adults that create an environment in which a youth feels safe, and therefore can experience the cultivation of social relationships and development of autonomy; all of which are protective factors and contribute to positive development. Furthermore, the literature

suggests that peer relationships and feelings of acceptance are associated with positive youth development and are cultivated through PYD programs (McDonough, et al., 2018). All of these factors of peer acceptance, positive youth-staff relationships, a nurturing environment, sense of autonomy, as well as a structured environment, have all been associated with development of self-esteem, self-worth, motivation, hopefulness, and wellbeing (Catalano et al., 2004; Durlak et al., 2007; Eccles & Appleton, 2002; Ginwright & James, 2002; McDonough et al., 2018; Jensen et al., 2013)

In the literature and in practice, PYD has been most often associated with community based afterschool programming. However, recently, there has been more of an emphasis on the key tenants of PYD to be implemented within residential, day treatment settings, as well as within juvenile justice. This theoretical orientation is aligned with the philosophy and goals that many DTRCCF programs are shifting toward. One of the key components for healing after trauma is safety. Being exposed to a safe environment, safe adults, and an opportunity to develop a sense of safety within oneself is imperative for youth to heal and to work through the adverse impact of trauma. In addition to a sense of safety, some of the key features that can contribute to improved life course outcomes for youth exposed to ACES include providing them with opportunities to feel a sense of belonging, to connect with caring adults, and opportunities to develop and implement adaptive skills (Durlak et al., 2007; Ginwright & James, 2002; Lerner et al., 2005).

Adventure-based experiential therapy. Adventure-based experiential therapy (AET) is an adjunctive form of therapy that utilizes a hands-on, small group, outdoor and interactive approach to achieve a therapeutic outcome (Eckstein & Ruth, 2015; Gass,

1993; Priest, Gass, & Gillis, 2000; Wilson & Lipsey, 2000). AET can include a range of activities such as rock climbing, ropes courses, kayaking, hiking, and team building. The intended therapeutic outcome can vary depending on the program, and on the population. However, there is an overall emphasis on cultivating motivation for change on an individual basis with an overarching focus on mental health, behaviors, and emotional growth (Bowen & Neill, 2016). The therapeutic focus includes recreation, education, and development (Crisp & O'Donnell, 1998; Eckstein & Ruth, 2015). These approaches also include a behavioral focus which is inclusive of skill development, emotion regulation skills, problem solving skills, and decreasing maladaptive behaviors (Eckstein & Ruth, 2015; Priest et al., 2000). Through engagement in new and challenging outdoor adventure activities, interactions with positive adults, and collaborations with peers, youth are exposed to interactive experiences that facilitate the growth and development of adaptive skills and behaviors (Eckstein & Ruth, 2015).

Adventured-based experiential therapy grew out of experiential learning theory. Experiential theory is a theory of learning that posits that learning and knowledge are best developed through hands on and real life experiences (Kolb, 1984; Kolb, Boyatzis & Mainemelis, 1999). It is through the process of interacting with the environment, experiences, challenges, content, skills and knowledge based material in an interactive and engaging manner in which learning and knowledge are achieved. There are four main components for effective experiential learning with the first two devoted to understanding knowledge, and the last two devoted to transforming that knowledge. The four components include a concrete experience, reflective observation, abstract conceptualization, and active experimentation. A concrete experience is encountering a

new experience or situation. Reflective observation includes reviewing and discussing the concrete experience. Abstract conceptualization is the process of making meaning of what has been learned and experienced. Active experimentation is integrating the skills and trying what has been learned in related environments/situations (Kolb, 1984; Kolb, Boyatzis & Mainemelis, 1999). These four components, when integrated and executed in full, theoretically lead to effective learning and increased knowledge (Kolb, 1984).

The research indicates that adventured-based experiential therapy has been associated with numerous social-emotional and behavioral outcomes. Several studies highlighted that use of AET was associated with an increase in social skills and pro-social behaviors for adolescents (Glass & Benschhoff, 2002; Moote & Wodarski, 1997; Tucker 2009; Tucker & Norton, 2013). AET influenced programs for youth have also been linked to a reduction in recidivism for youth have sexually offended (Gass & Gillis, 2010), a decrease in depression symptoms (Norton, 2010), an increase in healthy attachment (Bettman & Tucker, 2011), and overall improvements with regards to psychosocial functioning (Russell, 2003; Tucker et al., 2011). In addition to the individual gains linked to AET, some of the research also indicates improvements with regards to family functioning (Harper & Russell, 2011; Tucker & Norton, 2013).

Despite several studies that outline positive impacts of AET, the research is limited to a small array of settings and has very little takes place in residential or day treatment levels of care. The settings most often studied include wilderness therapy programs, summer camps, mental health clinics, and outdoor education programs such as Outward Bound (Tucker & Norton, 2013). In addition to the limitations of settings that have been examined in the literature, there are also limitations related to research design.

A critique of a majority of the literature reviewed was regarding the research not being rigorous and limitations with not being able to implore the use of randomized designs (Bettman & Tucker, 2011; Gass & Gillis, 2010; Harper & Russell, 2011; Norton, 2010; Russell 2003; Tucker & Norton, 2013).

Some of the treatment and therapeutic AET programs have similar components as day treatment and residential programs. The similarities include a structured, phasic and therapeutic approach to programming. Both focus on the development of skills, decreasing unwanted external behaviors, and the integration of adaptive knowledge and skills for increased individual functioning. Given the overall aim of DTRCCF programs encompassing skill development to improve functioning across all domains and a similar emphasis within AET, it seems that this approach could be beneficial and possibly be one pathway for improving outcomes.

Challenge by Choice

The Challenge by Choice (CBC) program is an existing program nested within the Tennyson Center for Children (TCC) which is the day treatment and residential program where this study took place. CBC is an example of a program that is influenced by both PYD and AET philosophies and also has some neurobiological aspects integrated into its foundational elements. The CBC program is an 8 week summer program focused on providing youth experiential, hands-on learning opportunities while interacting with outdoor adventure based activities. The program aims to provide a safe, structured, and nurturing environment with supportive staff relationships to help promote skill building, social skills, and opportunities to gain a sense of belonging; all of which are essential components and features of PYD programs (Catalano et al., 2004; Durlak et al., 2007;

Eccles & Appleton, 2002; Ginwright & James, 2002; McDonough et al., 2018; Jensen et al., 2013). Furthermore, the CBC program uses concrete experiences through outdoor, experiential activities as the mechanisms to facilitate PYD features and therapeutic growth with regards to affect regulation and skill development (Bettman & Tucker, 2011; Gass & Gillis, 2010; Harper & Russell, 2011; Norton, 2010; Russell 2003; Tucker & Norton, 2013). The CBC program is unique to Tennyson Center, and has no prior research or literature related to the program itself. This program will be expanded upon in the next chapter, and will be examined further through a neurobiological lens in the discussion chapter of this dissertation.

The next chapter will include a discussion of the methodology used for this dissertation. This will include a discussion of Tennyson Center for Children, a more in-depth discussion of the CBC program, and a discussion of the overall research design for this dissertation.

Chapter 3: Methodology

Purpose and Design

The overall aim of this dissertation was to examine behavioral outcomes associated with youths' (aged 9-15) participation in a summer program influenced by positive youth development and adventure-based experiential theories, known as Challenge by Choice (CBC). The study examined change on key behavioral outcomes for the Challenge by Choice participants compared to change on behavioral outcomes for youth receiving treatment as usual in a residential and day treatment program. The study took place in a Denver-based non-profit agency, the Tennyson Center for Children, which is a residential and day treatment provider for youth in the Denver area. This pilot study used a mixed methods sequential design in which both the qualitative and quantitative strands were developed and executed independently (Cresewell & Clark, 2011). First, qualitative inquiry aimed to understand staff perceptions of CBC participants' behavior post CBC participation. Then, quantitative analyses were conducted, using administrative data, to examine change in behaviors pre-post intervention period. Finally, qualitative inquiry asked staff for their interpretation of the quantitative findings in addition to their perceptions of CBC participant's behavior post CBC participation (Teddlie & Tashakkori, 2009).

The aim of the quantitative strand was to gain a greater understanding of the outcomes associated with participation in the program. To reach this aim, the quantitative

strand encompassed a quasi-experimental design with a small convenience sample (Fraser, Richman, Galinsky, & Day, 2009) and quantitative measurement of outcomes at baseline and posttest. Although this type of design has limitations, namely potential for selection bias and inability to claim causality for certain; it can contribute to understanding potential outcomes associated with the CBC intervention in a residential and day treatment setting.

The qualitative focused on the adults working with both the CBC and non-CBC youth. The purpose of the qualitative strand was twofold. First, the qualitative strand aimed to understand staff's impressions of the outcomes, behaviors and participation in the CBC program. Secondly, the qualitative strand sought to help explain the quantitative results/trends. Therefore, there were two waves of qualitative interviews. The first wave was conducted within one month of the end of the 2016 summer CBC program. These interviews were conducted with the staff who worked with both CBC and non-CBC youth at the same time. The aim of these interviews was to have the interviewees explain their perceptions and observations of the CBC kids compared to non-CBC kids. The second wave of interviews was conducted 3-4 months post the end of the intervention with the 2016 CBC staff only, and was informed by the quantitative data trends and analysis. These interviews aimed to have the CBC staff reflect and interpret trends and observations revealed in the quantitative data. Each participant was shown initial excel graphs of overall behaviors of CBC and non CBC youth as tracked in the internal data base that Tennyson Center used to track behavioral data. This qualitative strand attempted to enhance understanding of the quantitative strand, while also adding another

layer of understanding of the perceived association of the CBC program on externalizing behavior of the intervention group (Teddlie & Tashakkori, 2009).

Setting

Tennyson Center. Tennyson Center for Children (TCC) is a non-profit treatment center for youth aged 5-18. TCC is located in Denver, Colorado and was established in 1904 as a Christian orphanage. Since that time, TCC has grown and evolved to become a treatment center for children, youth and families impacted by crisis, trauma, abuse and neglect. TCC works with youth and families who have been exposed to a high number of ecological and systemic risk factors, and who present with numerous adverse childhood experiences. TCC seeks to cultivate resiliency with the goal of improving outcomes for social, emotional, behavioral, and academic skills and functioning. The philosophy of TCC is to “provide comprehensive, unbiased, strength based services for those in need. This includes a child-centered, family-focused and community-based approach” (www.tennysoncenter.org).

TCC has the capacity to provide home-based therapeutic services, day treatment educational services, and residential treatment services. Due to the scope of this dissertation, the focus was on youth in the day treatment and residential treatment programs. There are numerous ways to be referred into TCC’s day treatment and residential programs. Youth are often referred to these levels of care after being unsuccessful at lower levels of care, (e.g. public school, foster homes, group homes, kinship care) a history of unresolved trauma and neglect symptoms, and continuing to display a pattern of maladaptive behaviors (www.tennysoncenter.org). Residential clients reside at Tennyson, and attend the day treatment program. Day treatment clients attend

the program for school, but reside outside of TCC (foster home, group home, kinship placement, or with parents). Although day treatment and residential treatment are different levels of care, there are numerous similarities between the youth in each level of care at TCC. The youth in both programs have a history of trauma, abuse, neglect and symptoms that interfere with their ability to function at lower levels of care. These youth often present with significant behavioral challenges such as struggling to manage emotions, aggressive behaviors, interpersonal and social skill deficits, and mood instability. Day treatment and residential programs aim to provide a structured, consistent, and predictable environment that is safe and allows for the youth develop, practice and implement skills to increase functioning and decrease trauma symptoms (Cardoos et al., 2015; Hair, 2005; Quisenberry & Foltz, 2013; Strickler et al., 2015). Tennyson center's treatment approach and the modality that all clinicians are trained in is trauma-focused cognitive behavioral therapy (TF-CBT). Although other modalities of treatment are integrated into treatment and there is an individualized approach for each child based on presenting symptoms and challenges, TF-CBT is the core EBP that is utilized agency wide.

Challenge by Choice Intervention. Challenge by Choice (CBC) is an established program nested within Tennyson Center, offered to only a subgroup of youth. CBC focuses on creating an experiential environment outside the classroom. CBC is an 8 week program that takes place during the extended school year summer program for Tennyson. Academics consisted of work similar or congruent to the activity planned that week. For example, if rock climbing was the activity of the week, Tuesday the staff implemented instruction of rock formations and types. Wednesdays and Thursdays were spent off

campus, usually hiking various trails or other related activities that allowed youth to learn, practice and try new skills in preparation for the Friday's activities. Fridays consisted of a "high intensity" activity (e.g. rock climbing, kayaking, white water rafting, overnight camp trips) related to the adventure theme of the week. The program has been in existence for 19 years. However, due to changes in CBC programming and limitations regarding access to data, this study focused on youth who attended CBC during the summers of 2013-2016; with the qualitative strand focusing on the summer of 2016 only.

Three Tennyson staff were assigned to work in the CBC program for the duration of each summer. The staff were TCC employees who expressed interest in facilitating the CBC program, applied for the position and were selected by the CBC classroom supervisor. The CBC staff worked closely with the CBC classroom supervisor, who had been supervising and implementing CBC for the past 8 years. However, the CBC staff were not formally trained or certified in the implementation of experiential activities. Therefore, the CBC program also partners with an external program, the National Sports Center for the Disabled (NSCD). NSCD is an outdoor therapeutic recreation program, and provides professional support for the CBC program in terms of facilitating and implementing the technical components of the program (such as rock climbing, rafting, and ropes courses) (ncds.org).

CBC is an adventure based program that provides new and different experiences while incorporating traditional adventure-based experiential and positive youth development philosophies and skills. Each week the youth were introduced to a new outdoor activity which required its own unique skills. Youth participated in kayaking, equine therapy, rock climbing, high ropes course, fishing, river boarding, and hiking at

high altitudes. The aim of the program is to provide unique learning experiences outside of the classroom that can foster adaptive life skills.

Helping traumatized children overcome poor self-esteem, low self-confidence, the inability to build appropriate social relationships, and poor sportsmanship is paramount to the healing process (Bowen & Niell, 2016). Therefore, in addition to learning and applying practical skills to help navigate each activity; the youth in CBC are also exposed to hands-on skill building for emotion and behavioral regulation. To successfully complete each activity, the youth need skills such interpersonal skills, social skills, team-working skills, the ability to problem solve, and skills to manage their behaviors. The hands on nature of the program allows for youth to be exposed to and to practice adaptive skills that are associated with healing, thriving, and resiliency after trauma (Itin, 1997; Lissen, 2000; Neill, 2008).

Quantitative Sample

Participants in the quantitative strand of the study were youth who attended either the day treatment or the residential program at the Tennyson Center for Children (TCC). The intervention group was youth who participated in the CBC program. The comparison group consisted of youth who were matched on select key variables of number of pre-intervention problem behaviors, ACE scores, age, gender, race, and program type (residential or day treatment). Data was included from 2013-2016.

Intervention group. The intervention group included 4 cohorts from 4 different summers spanning 2013-2016 (N=32; n1=8, n2=6, n3=8, n4=10) and included youth aged 9-15 who participated in the 8 week adventure therapy program, Challenge by Choice, as well as treatment as usual at the host agency. Due to the nature of the program,

selection into the intervention group was not random and instead was a sample of convenience (Fraser, Ricman, Galinsky, & Day, 2009). Selection was based, among youth in this age range, on youth interest in CBC program participation and youths' ability to stay safe during, and successfully complete, a pre-intervention group hike. Staff defined safe behaviors as: following staff directions after the first prompt, not engaging in significant bullying behaviors towards peers during the hike, and not displaying aggressive or assaultive behaviors towards staff or peers during the hike. The opportunity to participate in the CBC program was announced to all youth in the 9-15 year old age bracket who attend the TCC summer program. The announcements were made in the spring prior to each summer programming beginning. Youth interested were asked to complete a brief one page application answering questions about their interest in the program. For youth who completed the application, their families and/or guardians were then contacted to complete the necessary releases and paperwork that would allow the youth to attend a trial hike. All youth who completed the application and had completed paperwork went on a trial hike in the spring prior to CBC. After the pre-intervention trial hikes were completed, the staff met and narrowed the lists of potential participants to the youth who became the intervention group for each cohort.

Comparison group. Comparison group members (N=32) were also between the ages of 9-15 were divided into four different cohorts, with each cohort representing youth who attended summer programming of corresponding year. Comparison group youth were participants of programming at the day treatment and residential program but were not involved in CBC. They continued to receive treatment as usual through the duration of time that the intervention group was participating in CBC. These youth were

selected based on the degree to which they matched characteristics of the intervention group members using pre intervention data from the agency's internal electronic health records system and database. Matching was completed through utilization of key characteristics as a way to help mitigate the inherent selection bias of this type of research design and to help reduce alternative explanations related to outcomes (Fraser et al., 2009; Locke, et al., 2010). For each CBC participant, the electronic health records system and the internal School Wide Information System (SWIS) database was utilized to identify 3-5 youth with similar numbers of total behaviors, and similar key characteristics (age, race, gender and if in the day treatment or residential program). From the 3-5 youth identified for each CBC youth, the list was narrowed down to identify one matched participant with the most similar key characteristics. Due to the overall focus of the study being on behaviors, the pre-intervention problem behaviors were used as the most important key matching characteristic. After youth were identified based on behaviors, the matching process focused on the other key characteristics starting with age, then gender, program (day treatment or residential), and race.

To assess whether matching was successful in creating 2 comparable groups, logistic regression was used to determine the probability of being assigned to the treatment group based on baseline key covariates (age, race, gender, and if in the day treatment or residential program). Logistic regression estimates probability of group membership fairly well, while also having few assumptions and being an overall flexible model (Austin, 2011; Hellevick, 2009). Therefore the logistic regression model was used to help determine that the comparison group was not significantly different than the CBC

group. Key characteristics included: age, gender, race, number of problem behaviors, and setting (RTC or DTX) (Hellevick, 2009).

One of the limitations of the logistic regression models was that in examining the key characteristics all in one model; the variance for each individual covariate was not examined independently. To determine if each covariate was associated with group membership, each individual covariate was examined through the use of bivariate analysis (independent t-tests and chi square tests) to test its relationship with group membership (intervention/comparison).

Sample Characteristics.

A total of 64 youth participants were included in the sample across 4 different years of programming (2013-2016). There were 32 youth participants in the intervention group (cohorts: n1=8, n2= 6, n3= 8, n4= 10) and 32 in the comparison group (cohorts n1=8, n2= 6, n3= 8, n4= 10). Table 2 describes characteristics of the total sample and characteristics of the two groups. Of the 64 youth in the total sample, more than half identified as male (73.4%). In regards to race/ethnicity, a large percentage (64%) of the sample identified as white. The participants ranged in age from 9 to 15, with a mean of 11.66 years of age. Fifty nine percent of the participants were in the day treatment and 34.3% were in the residential program. The number of adverse childhood experiences for the sample ranged from 0 to 9, with a mean of 3.59 (SD=2.39) adverse childhood experiences for the entire sample. Due to attrition, 17 youth participants (intervention=10, comparison=7) were no longer enrolled in agency services during the posttest timeframe. One youth participant from the intervention group was later dropped

from the sample due to it being determined that he was an outlier and had an adverse impact on the results.

The 46 youth participants retained in the analysis were also majority male (80.4%) and white (69.6%). These youth ranged in age from 9 to 15, with a mean age of 11.57. Seventy-four percent of the participants were enrolled in day treatment, with 26% enrolled in the RTC program. The number of adverse childhood experiences ranged from 0 to 9, with a mean of 3.43 (SD=2.39). In terms of behaviors, the pre-summer intervention period total number of problem behaviors ranged from 0 to 81, with a mean of 19.28 (SD=20.67). Overall, the entire sample, as well as the sample enrolled both pre and post interventions, were fairly consistent, with no notable differences. Table 1 further describes the sample characteristics.

Table 1: *Quantitative Sample Characteristics*

	Original Sample				Final Sample				Matching Statistic
	Full Sample (N = 64)		Final Sample (n = 46)		CBC (n = 21)		Comparison (n = 25)		
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
Gender									$\chi^2=.684, p>0.05$
Male	47	73	37	80.43	18	85.7	19	76	
Female	17	27	9	19.56	3	14.28	6	24	
Race/ Ethnicity									$\chi^2=.153, p>0.05$
White	41	64	32	69.6	14	66.7	18	72	
Black	9	14	5	10.8	3	14.28	2	8	
Latino	7	11	5	10.8	1	4.7	4	16	
Multiracial	7	11	4	8.7	3	14.28	1	4	
Program									$\chi^2= .123, p>0.05$
Residential	22	35	12	26.1	6	28.6	6	28.6	
Day Treatment	42	65	34	73.9	15	71.4	19	76	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Age	11.66	1.56	11.57	1.54	11.36	1.92	11.65	2.2	$t(44)=-.796, p>0.05$
ACE Scores	3.59	2.39	3.43	2.39	3.68	2.56	3.16	2.25	$t(44)= .848, p>0.05$
Pre Total Behaviors	30.06	47.91	19.28	20.67	16.9	21	21.28	20.5	$t(44)= -.711, p>0.05$

Evaluation of matching success

The first model was with the entire sample of 64 youth (Intervention =32, Comparison =32). The outcome for the logistic regression model determined that the

independent variables (group membership) and covariates (total problem behaviors, age, gender, race, ACE scores, and program type) were not significant predictors of group membership; therefore the samples were not significantly different at baseline.

However, due to attrition, the post intervention samples for both groups lost youth participants. Following the completion of the summer program, 17 of youth participants (intervention=10, comparison=7) were no longer enrolled in either program. Therefore, a second logistic regression was run utilizing participants from both intervention and comparison groups who had both pre and post data (N=47, intervention=22, comparison=25), and excluding participants who did not have post data. The second logistic regression analysis demonstrated that the covariates (total problem behaviors, age, gender, race, ACE scores, and program type) were not significant predictors of group membership, and the groups were not significantly different at baseline.

Through the process of examining the data further, one intervention participant appeared to be an outlier. The number of his pre-intervention behavioral referrals was 290, whereas the next closest youth participant (this participant's comparison group match) had only 175 referral behaviors. The other participants were all below 169, with most participants having less than 100 referrals behaviors at baseline. Because this participant was such an extreme outlier, a comparable match could not be found, and because the comparison match that was identified was dropped from analyses due to having no post test data, the outlier was dropped from analysis.

A third logistic regression model was run to confirm group equivalency after dropping the outlier from the analysis. The third logistic regression model examined the relationship between key characteristics (gender, grade, race, ace score, pre intervention

problem behaviors and which program each youth was enrolled) and group membership to determine if the covariates were significant predictors of group membership in either the intervention or comparison group without the inclusion of the outlier participant. None of the independent variables, individually or as a group, were significantly associated with group membership. Therefore, the two groups were not significantly different at baseline indicating that the intervention and comparison group were matched appropriately.

After the logistic regression was run, bivariate assessment of matching was the next step. Independent sample t-tests were utilized to examine if the means of the continuous variables differed for the intervention sample when compared to the comparison sample. The three continuous variables that were analyzed were the ACE scores ($t(44) = .848, p > 0.05$), pre-intervention total number of problem behaviors ($t(44) = .711, p > 0.05$), and age ($t(44) = -.796, p > 0.05$). None of the means differed significantly indicating that each of the continuous variables was matched for group equivalency when isolating each of the individual covariates.

To test the association between two categorical variables, chi square analysis was utilized. Each dichotomous variable (race, program, and gender) was analyzed to see if there was an association with group membership. Program and group membership were not significantly related, and were independent of one another ($\chi^2(1) = .123, p > 0.05$). Gender and group membership were not significantly related, and were also independent of one another ($\chi^2(1) = .684, p > 0.05$). Race and group membership were also not significantly related ($\chi^2(1) = .153, p > 0.05$).

Based on the results of the logistic regression models, the independent sample t-tests, and the chi square analysis there was not significant difference between the intervention and the comparison groups. This indicates that there was group equivalency and that the two samples were matched appropriately. The final sample that was used for further analysis was the sample that included pre/post data, and excluding the outlier (N=46).

Procedures and Data Collection

Quantitative measures. To accurately track behaviors, TCC uses the School Wide Information System (SWIS) database. The SWIS database is an online and confidential information system to collect and summarize youth behaviors. As staff at TCC track students' behaviors on a daily basis, this information is then entered into the SWIS database. Tracking the daily behavior includes identifying the type of unwanted behaviors being displayed. (www.pbisapps.org). Each incident of unwanted behavior is called a "Referral" at TCC and within the SWIS database. The overarching purpose of the SWIS database is to track unwanted behaviors to help identify patterns. The patterns are associated with how often referrals are occurring, which types of unwanted behaviors (see table 1) are happening the most, where and when these behaviors happen the most, and which youth are involved. Understanding these patterns can help inform how staff intervene to increase positive behaviors, identify the skills that the staff need to focus on within their groups to help the youth acquire the skills to reduce unwanted behaviors, and to track progress for youth over time. The system can track behaviors at the individual level as well as a group level. The SWIS database was an integral part of this dissertation

as it was a primary data source for tracking behaviors for both the intervention and the comparison group (www.pbisapps.org).

Dependent variable: Behavior Problems. The overall purpose of this study was to examine the association between the CBC program participation and behavioral outcomes for youth who participate in the CBC program as compared to the comparison group. Therefore, the dependent variable was the behaviors that were tracked on the SWIS database. There are 15 different unwanted and problem behaviors that are tracked on the database. For the purpose of this dissertation, the different problem behaviors used by TCC were categorized into 4 different sub-categories by this researcher. The sub-categories included Physical Aggression, Relational Aggression, Avoidant Behavior, and Property Aggression. Physical aggression referred to any behavior in which a youth becomes physically unsafe towards others (fighting, aggressive bullying behavior, aggressive violations of boundaries). Relational aggression was operationalized as interpersonal conflict that is more covert and focused on the emotional aspect of a relationship (bullying, harassment, threats). Avoidant behaviors were negative behaviors that youth employ to leave, avoid, and refuse certain situations. This can include behaviors such as being on the run, being out of bounds (not being where youth is expected to be), and refusal behaviors (Ignoring prompts, refusing to complete school work). Property aggression was aggression that was not directed at others, but instead was directed at physical property (property destruction and stealing). See Table 2.

All of the behaviors, for both the intervention and the comparison group, were tracked using the SWIS database. The staff that work with the youth were responsible for observing, tracking, and entering the problem behaviors into the database. Staff track

behaviors on 15 minute intervals and are responsible for tracking each incident of unwanted externalizing behaviors then entering that data into the SWIS database. The database has pre-set list of problem behaviors that staff can enter using a dropdown menu option. SWIS is a national database, and there are several problem behaviors that are not utilized by TCC. Therefore, in the development of the subcategories, only the problem behaviors used by TCC were included.

Table 2: *Problem Behaviors*

Sub-Categories	Problem Behaviors
Physical Aggression	fighting, aggressive bullying behavior, aggressive violations of boundaries, self-harm
Relational Aggression	bullying, harassment, threats, verbal aggression, inappropriate affection
Avoidant Behavior	Ignoring prompts, going on run, being out of bounds
Property Aggression	Property destruction, stealing, vandalism

Baseline behaviors were established by extracting data related to behaviors during the timeframe prior to the summer CBC intervention for both groups. To assess change, data was collected at the completion of the summer programming for both the intervention and comparison groups. This included pulling the number of referrals for every youth in the intervention and comparison groups for the 2 months prior to the summer intervention period and the 2 months following the summer intervention period. The referrals were then categorized into the four sub-categories at baseline and posttest.

The data was transferred to Excel, de-identified, and uploaded to SPSS for statistical analysis.

Independent variable: Group membership. Youths' participation (or lack of participation) in the CBC program was used as the independent variable. It was predicted that participation in the CBC program would be associated with a greater reduction in total problem behaviors and the four categories of problem behaviors over the comparison group. Youth were coded as participants if they attended during the CBC program (0= never attended program, 1= attended).

Covariates. Upon admission to any of the TCC programs, each youth goes through a thorough intake process. The intake process is meant as a way to gather historical and relevant biopsychosocial information to help with the initial assessment of each client to determine the initial goals and direction of treatment. All of the information is entered into the TCC internal electronic health record system. The covariates, race, gender, age, program type (RTC or DTX) and ACE score, were all gathered from TCC internal electronic health records system. Racial groups included Black, Latino, White, and Multiracial. Due to the small sample size, race was recoded to White and Others. Gender was a binary measure of male or female; boys served as the reference group. Participation in the different programs was coded as Day Treatment or Residential. ACE scores were coded as the number of adverse experiences each child had experienced as indicated in the ACE questionnaire.

Adverse Childhood Experiences Questionnaire. Part of the intake process includes having the youth and their caregiver/parent/guardian complete the Adverse Childhood Experiences Questionnaire. This questionnaire is a 10 question assessment tool that helps

identify if a youth has experienced any ACES. There are 10 categories on the ACE assessment, and for each category that a child has experienced there is a score of 1. The scores therefore can range from 0 to 10, with 0 indicating that a youth has not experienced any adverse childhood experiences, and a 10 indicating that a child has experienced all 10 categories of ACEs (Felitti & Anda, 2010; Felitti et al., 1998). The categories in the TCC internal electronic health record system for ACES include: recurrent physical abuse, emotional abuse, sexual abuse, emotional or physical abuse, household with a drug/alcohol abusing adult, household with someone incarcerated, household with someone who is chronically depressed/suicidal/mentally ill/institutionalized, one or no parents, and exposure to domestic violence.

Quantitative Data Analysis

To determine if there was an association between participation in the intervention and a decrease in externalizing problem behaviors as compared to the comparison group, a series of independent sample t-tests were used. An independent sample t-test compares 2 means of continuous variables that are divided into independent and dependent variables. This type of t-test compares the mean scores of the same variable, with two samples taken from independent populations (Howell, 2011). This statistical test helped determine if the changes in problem behaviors between pre to post was significantly different between the intervention and control group. To complete the t-tests, change scores were created by subtracting the number of behavioral referrals at post from the number of referrals at pre for each category of behavior problem and for total number of behavioral referrals. Based on this calculation, larger numbers indicate a greater reduction in problem behaviors. This process was repeated for each of the subcategories

of problem behavior to determine if there was a significant difference between intervention and comparison groups in change pre to post for each of the four subcategories.

Qualitative Data Collection and Analysis

Purpose and Design. The qualitative strand focused on the adults working with both the CBC and non-CBC youth. Two waves of interviews were conducted. The first wave was conducted within one month of the end of the 2016 summer CBC program. These interviews were conducted with the staff who worked with both CBC and non-CBC youth at the same time. The aim of these interviews was to have the interviewees explain their perceptions and observations of the CBC kids compared to non-CBC kids. The second wave of interviews was conducted 3-4 months post the end of the intervention with the 2016 CBC staff only, and was intended to be informed by the quantitative data trends and analysis. Both waves of interviews had the same base interview questions and aimed to have the CBC staff reflect on their perceptions and observations; however, the second wave of interviews also aimed to have staff interpret trends and observations revealed in the quantitative data. Each participant was shown initial graphs from excel of overall behaviors as tracked in the internal data base that Tennyson Center utilizes to track behavioral data. The data was reflective of pre and post the CBC program for the CBC participants as well as the matched comparison group of youth who received treatment as usual during the same timeframe. All of the data was de-identified and was only in the form of excel bar graphs for accessibility and ease of interpretation for the interviewees. This qualitative strand attempted to enhance understanding of the quantitative strand, while also adding another layer of understanding

of the perceived association of the CBC program on externalizing behavior of the intervention group (Teddle & Tashakkori, 2009).

The perception, observations, and experiences captured in all of the interviews provided a unique and meaningful context used to enhance and build upon the quantitative strand. The two waves had the same base interview guide. However, the second wave of interviews had 2 additional questions related to viewing and interpreting initial graphs about change in behaviors for CBC and non CBC youth. Unfortunately, through the interview process it became apparent that the second wave of interviews that had staff review and reflect on the excel graphs was not successful due to confusion by the adult participants related to the graphs. This confusion and lack of useful or meaningful data for the 2 questions focused on interpreting the excel graphs and quantitative data was confirmed through the first coding cycle. This will be expanded upon in the results section.

Qualitative Sample Characteristics. In total, 6 adult staff members participated in the qualitative interview process. The adult staff members included 5 females, and one male who all identified as white. Three female participants were in the first wave of interviews, and 2 females and one male were in the second wave. All participants had a Bachelor's Degree level of education, with two staff members self-identifying as currently being enrolled in graduate programs for counseling related degrees. The length of employment for the 6 adults ranged from 6 months to 10 years, with a mean of just under 2 years of employment at Tennyson Center. For both waves, each participant was contacted individually via an in-person conversation explaining the purpose and goal of the study, the purpose of the interviews, and their individual role. For each interviewee,

informed consent was obtained, and it was explained that participation was completely voluntary.

Qualitative data collection. The interviews followed a semi-structured interview guide with several probing follow-up questions [see appendix A]. The interviews were all audio recorded, transcribed verbatim and analyzed. The interviews ranged from 30 minutes in length to 60 minutes in length, with most lasting close to 45 minutes.

The aim of the qualitative interview guide was to highlight and to understand the observations and perceptions of the CBC and comparison group. The interview guide therefore highlighted process and experience with questions aimed at understanding the behaviors and skills of both CBC and non CBC youth both during and after summer programming.

Qualitative data analysis. Data analysis included open coding, followed by focused coding, which lead to the process of theme development (Saldana, 2013). Coding and theme development were conducted using Microsoft Word software and the track changes feature of Word. Open coding was used as the first cycle coding method. This approach was selected as the method to interpret the data in an open, holistic and exploratory manner (Saldana, 2013). This allowed for the researcher to be flexible with coding, and to get a sense of the stories and themes that emerged from the data. The first cycle of coding included coding each interview one at a time, going in order in which the interviews took place. This researcher coded each interview by going through the transcriptions line by line, and developing the code book through an iterative process of coding one transcript, moving onto the next and applying codes as appropriate or

holistically identifying new codes when appropriate for the data. The initial code process yielded 45 codes.

After the initial coding phase, a second cycle of coding was used to reorganize and categorize the initial codes (Saldana, 2013). Focused coding was selected as a way to help synthesize, interpret and make meaning of the data from the interviews in a systematic and organized manner (Saldana, 2013). The goal of focused coding was to take the initial codes, and code them into categories that emerged from the data. This process included examining the initial 45 codes to loosely develop categories based on similarities and overlapping or interconnected concepts (Rubin & Rubin, 2012; Saldana, 2013). Through the focused coding process, the code book was synthesized down to 10 codes.

Once a code book was developed from the two coding cycles, the process transitioned to developing themes. The researcher took the 10 categorical codes developed in the focused coding cycle, and utilized code mapping as a mechanism to further categorize and synthesize the data into themes (Saldana, 2013). The codes were separated into smaller categories, reorganized based on the story that the data was telling, and ultimately merged into themes. The final analysis resulted in the emergence of 4 key themes. The key themes included *relationships*, *out of comfort zone*, *skill building*, and, *barriers and lack of sustained change*. The resulting themes will be discussed in the qualitative results chapter.

Mixed Methods Data Analysis

This pilot study utilized a mixed methods sequential design in which both the qualitative and quantitative strands were developed and executed independently frame

(Cresewell & Clark, 2011). The first wave of qualitative data was gathered initially, followed by the quantitative data, and the second wave of qualitative data was then gathered and utilized to enhance and increase understanding of the CBC program (Padgett, 2012). Initially, the qualitative and quantitative strands were analyzed independently. The quantitative strand focused upon outcome evaluation, whereas the qualitative strand focused on process evaluation. Upon completion of the initial analysis, the results of the two strands were merged in a convergent analysis. The overall goal of the convergence was to compare and contrast the themes from each strand to triangulate the data as well as highlight discrepancies between the two strands (Teddlie & Tashakkori, 2009). It was important to explore from both a qualitative and a quantitative perspective to develop a comprehensive understanding of the process of the program itself, as well as possible association between the CBC program and externalizing behaviors. The results of the mixed methods analysis will be presented in in the discussion chapter.

Chapter 4: Quantitative Results

Changes in Problem Behavior

Total problem behaviors. Changes in total problem behaviors and the 4 subtypes were compared between groups. See table 3 for a summary of the results.

Table 3
Independent Sample t-test: Changes in externalizing behaviors pre to post
(N=46, CBC=21, Comparison=25)

Characteristic	CBC		Comparison		T	P value
	M	SD	M	SD		
Total Problem BX	-13.10	28.1	.84	20.97	-1.92	.061
Avoidant Behaviors	-6.48	12.02	-2.16	11.32	-1.25	.217
Aggressive Behaviors	-1.76	8.77	1.16	6.58	-1.29	.204
Relational Aggression	-4.95	15.23	.88	9.07	-1.61	.116
Property Destruction	.24	2.61	.60	4.29	-.337	.737

An independent sample t-test was run to determine if there was a significant difference, between the intervention and comparison group, in change from pre to post for total number of problem behaviors. The mean change in total problem behaviors for youth in the CBC sample was -13.10 (SD=28.10) while the mean change in problem behaviors for the comparison sample was .84 (SD=20.97). The Levene's Test for Equality of Variances indicated that the two sub-samples did not have significantly different variances ($F=.630$, $P=.432$), therefore the independent samples t-test with equal variances assumed was used. The t-test indicated that there was not a statistically

significant difference, between the intervention and comparison group in change in behaviors from pre to post ($t(44)=-1.92, p>0.05$). However, it should be noted, given the small sample size, that this model came close to approaching significance with a significance value of $p=.061$. The intervention group, on average, displayed an increase in problem behaviors following the CBC intervention program that approached significance. Whereas, the comparison group displayed an overall decrease in problem behaviors from pre to post.

Avoidant style of problem behaviors. The mean change in avoidant style of problem behaviors for youth in the CBC sample was $-6.48(SD=12.03)$ while the mean change in avoidant style of problem behaviors for the comparison sample was $-2.16(SD=11.31)$. The Levene's Test for Equality of Variances indicated that the two subsamples did not have significantly different variances ($F=.008, P=.927$), therefore the independent samples t-test with equal variances assumed was used. The t-test indicated that there is not a statistically significant difference between the mean change in the subcategory of avoidant problem behaviors from pre to post intervention when comparing the CBC intervention group to the comparison group ($t(44)=-1.252, p>0.05$). There was not a significant difference in how the intervention group and comparison group changed. Both the intervention and comparison group demonstrated an increase in avoidant style of problem behaviors with a similar mean change for both groups.

Relational style of problem behaviors. The mean change in relational style of problem behaviors for youth in the CBC sample was $-4.95(SD=15.25)$ while the mean change in relational style of problem behaviors for the comparison sample was $.88(SD=9.08)$. The Levene's Test for Equality of Variances indicates that the two sub-

samples did not have significantly different variances ($F=1.437$, $P=.237$), therefore the independent samples t-test with equal variances assumed was used. The t-test indicated that there was not a statistically significant difference between the mean change in the subcategory of relational style of problem behaviors from pre to post intervention when comparing the CBC intervention group to the comparison group ($t(44)=-1.61$, $p>0.05$). The pattern of change scores for relational style of problem behaviors indicate that the comparison group had an increase in relational problem behaviors following the CBC intervention and the comparison group demonstrated a small decrease in relational problem behaviors following the TCC summer program.

Physically aggressive style of problem behaviors. The mean change in physical aggression style of problem behaviors for youth in the CBC sample was -1.76 ($SD=8.77$) while the mean change in physical aggression style of problem behaviors for the comparison sample was 1.16 ($SD=6.58$). The Levene's Test for Equality of Variances indicated that the two sub-samples did not have significantly different variances ($F=.232$, $P=.632$), therefore the independent samples t-test with equal variances assumed was used. The t-test indicated that there was not a statistically significant difference between the mean change in the subcategory of physical aggression style of problem behaviors from pre to post intervention when comparing the CBC group to the Comparison group ($t(44)=-1.290$, $p>0.05$). The intervention group demonstrated a slight increase in physical aggression whereas the comparison group demonstrated a slight decrease in problem behaviors in this subcategory of problem behaviors.

Property destruction style of problem behaviors. The mean change in property destruction style of problem behaviors for youth in the CBC sample was $.24$ ($SD=2.61$)

while the mean change in property destruction style of problem behaviors for the comparison sample was .60(SD=4.29). The Levene's Test for Equality of Variances indicated that the two sub-samples did not have significantly different variances ($F=2.622$, $P=.113$), therefore the independent samples t-test with equal variances assumed was used. The t-test indicated that there was not a statistically significant difference between the mean change in the subcategory of property destruction style of problem behaviors from pre to post intervention when comparing the CBC group to the Comparison group ($t(44)=-0.337$, $p>0.05$). Change scores indicated that in the subcategory of property destruction both the intervention and the comparison group had a slight decrease in problem behaviors in this area.

Chapter 5: Qualitative Results

Qualitative Themes

The qualitative strand attempted to enhance understanding of the quantitative strand, while also adding another layer of understanding of the perceived association of the CBC program on externalizing behavior of the intervention group. Although there were two waves of interviews, the second wave of interviews in which the excel graphs were shown to the participants, did not yield unique results. The participants struggled to understand the graphs and became confused by the graphs presented to them. Therefore, the themes and story that unfolded from analyzing the data will be presented together and will reflect the part of the interview guide that was the same for all adult participants. Four main themes emerged through the analysis process which included *relationships*, *out of comfort zone*, *skill building through real life experiences*, and *barriers and lack of sustained behavioral change*.

Relationships. There was an overarching sense that the relationships that were fostered during and through CBC had a positive impact for the youth participants. This included both the relationships that the youth formed with each other, as well as the relationships that were formed with staff. There seemed to be a unique bond that was cultivated that included trust, attachment, and a sense of security that staff perceived was

not formed with the youth who did not participate in CBC. As one staff participant articulated,

I think that they have a higher tolerance for the staff. I think that they trust the staff more and listen to them. Like really feel that these staff are here for me, or like, I can talk to them. I don't think that dynamic is always present like during the summer school months with the other children.

This pattern of trust and bonding seemed to emerge out of the unique experiences and opportunities that the staff and the youth participants shared. The shared experiences seemed to cultivate a stronger relationship than the traditional summer programming, and seemed to function as a protective factor for the youth. Another staff participant described this development of these unique relationships,

I think the comradery between my team and the kids is 100 times better than the comradery of any of the classrooms that run during the summer. The fact that they have to rely on each other for things so much. The fact that we do team building and activities all of the time, every single day, is a huge thing for them.

This shared experience between staff and youth participants was further highlighted by another staff participant,

It's more of that the job assignments that they each have are dependent on them like eating, for each other, or having materials to do something. And so they know that if they let each other down, they are going to suffer in some capacity. And so I just feel that partnership, that community, with CBC is a million times stronger in that community.

The CBC program seemed to really foster closeness and trust that was compared to a family like closeness. The dynamics provided the youth with a secure and safe environment. A staff participant articulates this relationship dynamic,

CBC to me, well from at least just looking from a far, seems to be, well the culture was almost like this tight knit family type, they were comfortable with all the staff they were comfortable with each other. I mean you didn't have, you maybe had some bullying or some fighting, not physically. But it was a whole different dynamic.

The secure base that was provided by the CBC staff was perceived to allow the youth to experience these new environments and activities, while also going through challenges. The unique support that was provided through the relationships seemed to allow the youth to respond to stressful situations in a different and more adaptive manner. This is exemplified by a staff participant,

I think he trusted in them a lot more and he is definitely a relationship kid because you could see that with his teacher and his homeroom. But then, once he bonded with the CBC staff, even when, I think he got like a hook from a fishing pole in his eye or something, and he was like, I don't know, just to watch him with the staff, he completely trusted in whatever they needed him to do to keep him safe. That was like a whole change from what I've seen. Like if any other staff had walked in, I don't think it would have been the same.

Overall, staff participants described the role that CBC played in the development and fostering of a strong relationship between staff and youth participants. Furthermore, there

was a sense that these relationships formed through shared experiences and opportunities that were unique to the CBC program.

Out of comfort zone. Many of the youth participants in CBC encountered new and unique experiences through their participation in CBC. This included numerous experiences that were perceived to provoke fear and anxiety due to the experiences being vastly different than their previous life experiences. Through these unique experiences, the theme of these experiences being out of the comfort zone emerged. Staff described new experiences in which youth overcame fear, came out of their shell and were pushed to their limits in a positive way. One staff participant describes this being pushed out the comfort zone and the role of relationships in helping push the youth out of their comfort zone,

I don't know if it is because they are put outside of their comfort zones and that naturally that would draw you together. Because they are doing a lot of things that I know that a lot of the kids were scared to do but then turned out to love at the end. I don't know, like they did rock climbing, and that was very fearful. I am mean it would be fearful for me. So, and just using, and knowing that staff are supporting you in those things that you are most scared of. Where you may not find that in the regular experiences that you are going to find on campus.

In many of the interviews there was a sense that through the youth facing challenging experiences and opportunities, the youth were able to grow. This is captured by another staff participant,

Pushing them out of their comfort zone. I think people in general, I think having that healthy sense of anxiety that helps you to overcome it and then realize you

can. And overcoming hiking up a hill can be transferred to overcoming intense emotions. So I think in the summer when we try to build some of those things into our programming, we see positive results with our kids.

Youth encountered obstacles on a daily basis through CBC. And it was perceived that through these unique obstacles that youth faced their fears, developed more confidence, and grew in their capacity to face situations that would previously been triggering. One staff participant discussed how the various experiences impacted the youth,

It's going down the zip line and maybe you're afraid of heights and you still have to get up and go. It's doing the obstacle course that they set-up . Rafting and you have this fear of water. It's still getting in and making those accomplishments. It's very individual. It's very much like go at your own pace, but kind of keeping up, but being able to go at your own pace as well. Pushing your own level. Kind of pushing your limit. You know, we have had kids who couldn't even walk around the block and they get in CBC and it's like a whole different world, but we're going to let them be at their level in order to still accomplish what we are asking of them

There was an overarching sense that through facing fears, being pushed out of their comfort zone and experiencing new environments that the youth participants grew in ways that the youth in the traditional summer program did not grow. The experiential and hands-on aspect of CBC seemed to facilitate this growth element. This is articulated by one of the staff participants,

I think it gives them an environment to kind of test their own boundaries and their own limits. And it kind of, it gives them a way to push themselves while also

having fun. So it is not like they are just pushing themselves into doing like their math work sheet that's a little bit harder. It's such a bigger stretch so it's obtainable and it's right there in front of them and that's like what we are doing today. They just do it and then they don't even realize it till the end of it that they had done so much more than they ever thought they could do. So it is a really huge growth experience.

Skill building through real world experiences. Throughout the summer, staff observed an increase in skills for the youth participants in CBC, as well as the non-participants. There was a sense that the less structured approach to summer and the increase in field trips, led to an increase in skills for all youth. For the CBC youth, the skill development seemed to be related to the real world experiences of practicing, implementing and having success with various skills. Staff perceived that youth were more likely to access and utilize skills outside of a classroom in real world environments. They noticed that youth were better able to regulate their emotions, they had to rely on teamwork and communication to be successful with various CBC activities, and that these experiences and skills led to an increase in autonomy, decision making, problem solving and confidence; which is articulated by one of the staff participants,

That goes with a lot of teamwork and a lot of trust activities and things like that because when you are out doing those sort of things, not just rock climbing but hiking, white water rafting, kayaking; all of that kind of stuff is really partner based and so they trust, like I said, activities, and learning how to work with each other. Knowing their individual skills and learning it's ok that you're really vocal, you're really quiet but those can be really good things when we pair them

together, and these are the reasons why. So that's kind of the basis I guess. The ground work is to build that autonomy within the children and their individual self-esteem but also to allow them to grow in the skillset of teambuilding, and partnership, and community with a group of kids and that is really a hard thing to do in regular settings.

The concept of teamwork as a mechanism for developing and implementing skills was brought up by several staff participants. Staff discussed their perspective that through the hands-on, experiential nature of the program that focused on the youth working collaboratively, that other skills naturally emerged in the process. Through teamwork, the clients developed skills related to problem solving and making autonomous decisions without relying on the adults. This point is articulated by one of the staff participants,

A lot of it was teamwork. That was a huge part of it cause they had to learn to work together and to figure out problem solving without us intervening. So it was a lot more freedom they had too. We weren't, it's a lot different being outside hiking or whatever and kind of having staff set those limits. The limits look much different outside of campus. So yeah, it was really interesting to see how they would work together and have to problem solve on their own.

In addition to developing problem solving skills, there was a sense that the clients were better able to regulate their emotions, manage their impulses and to manage triggers that might have led to externalizing behaviors in other environments. The experiential classroom environment and unique experiences contributed to the development and ability to access new skills while participating in CBC. One of the staff participants vocalized this development and implementation of skills,

I think impulse control is a huge one. Because they knew they needed to regulate themselves in order to move on and they really want to move on at this point because the next thing we going to do is going to be pretty awesome. So they learn that skill to regulate probably without even realizing it. And in a really hands on, practical way. It is such an engaging environment that they are constantly pulled into it and they are like ‘alright, alright I’ll calm down, I’ll figure this out. I will go on a walk and do what I need to do and then come back’.

In addition to interpersonal skills, CBC also fostered real life life-skills such as cooking, building fires, putting up tents, and having accountability and responsibility for oneself and one’s belongings. This practical and life skill development in addition to the interpersonal growth is highlighted by one of the staff participants,

So I think it teaches it them a lot of responsibility. I think it teaches them a healthy amount of autonomy even when it comes to like they have to pack their own stuff for CBC. Like we are not always behind them making sure they have everything they need. They have to be responsible for that. They have to be responsible for their behaviors. So that they can learn to manage their emotions so they can go on these CBC outings. I think they learn a lot of life skills when it comes to cooking, and cleaning up their tent space, and how to interact in the wilderness setting, but in a different sort of setting than they are used to. So lots of different skills and a lot of stuff.

Overall, staff described that participating in CBC facilitated the development and the ability to implement skills in a more practical and accessible way that led to an increased perception of youth’s ability to regulate their emotions, to utilize problem solving skills,

to work collaboratively and as part of a team, and to access real life life-skills. Despite all staff describing that CBC youth participants developed and implemented numerous skills through exposure to real life situations; there was also a sense that these skills were not sustained after the completion of the CBC program.

Barriers and lack of sustained behavioral change. Staff, both who facilitated and those who did not facilitate CBC, reported that they observed change during CBC. However, there was a sense that most youth were not able to sustain the change once back in the traditional programming. It was perceived that the youth seemed to struggle with the transition back into the structure and routine of the traditional programming, the lack experiential activities, and the lack of focus on relationships. Staff reported that the expectations and structure of traditional programming was stricter, more focused on compliance, and less focused on relationships and autonomy. It was staff's perception that this drastic difference after CBC was a barrier for youth sustaining the skills and improved behavior management that was developed during CBC. Staff reported that many youth demonstrated an increase in behaviors post CBC, and the ones that didn't were often the ones who discharged at the end of the summer. This lack of transferability of skills was highlighted by one of the staff participants, "skills were not able to be transferred into the traditional classroom setting or into the cottage". Another staff participant also expressed similar observations related to the CBC youth struggling to transition back into traditional programming, "the structure and routine of classroom and cottage was challenging and youth were not able to transfer skills". This same staff member went on to describe and support the lack of transferability of skills, "but I do know those behaviors have not sustained. We have seen, not worse behaviors than before,

but definitely similar and the same behaviors as before CBC”. The perception that skills were not transferable and that sustained change was not observed was fairly consistent among all staff participants.

Staff also reported that some of the lack of sustained change was also due to external factors related to each client. Life barriers seemed to be a common theme that emerged from the interviews. There was the perception that despite the youth’s relationships with staff and development of skills during the CBC program, that there were several external factors that interfered with the transferability and sustainability of the skills and change. Some of the external and life barriers that were described included family dynamics, complex trauma histories, and ongoing life events that triggered an increase in adverse behaviors and responses by the youth. This is highlighted by one staff participants,

And he really did well in the program. I don’t know that we got to see him transfer those skills as much cause he left. Well no, he was here for about 6 months after cbc. Hm, no, weren’t really able to see him transfer those skills but I also think he had a really horrific case. So there was a lot of messy stuff with his case. Life family stuff and trauma. So I don’t think we saw it.

External life circumstances and factors was highlighted as a barrier for sustained change by another staff member,

And some kids have so much going on in their lives that is a barrier. I think with our kids, and especially the really difficult cases we have there is always going to be some of those barriers. It’s hard to identify what’s helping and what’s not helping. It like, I think this helped, but then we are seeing all these behaviors.

Staff seemed attuned and aware of the life circumstances for each of the kids, and how that impacted their behaviors and ability to implement skills or to display sustained ability to manage their behaviors. Most of the staff participants talked about how complex case dynamics and the impact the complexities had on each youth.

Then you know, we have had [client name] for instance who has kind of just gone down hill. She was just managed for the first time since before summer. You know, so there is something there. I don't know if it's that it didn't stick or she just has lot going on. But it is definitely one of those things, you see that down fall a little bit. So some of the kids keep going and doing awesome, but some of the kids aren't able to sustain and maybe have like other things going on.

Chapter 6: Discussion

Overview

The current study investigated the association between participation in an adventure-based experiential program and changes in behaviors pre to post intervention. The aim was to understand changes in behavioral outcomes highlighted by the quantitative strand as well as to understand staff perceptions and observations which were highlighted by the qualitative strand. Finally, this study examined the results of both strands together to see how they were similar and how they were different. Understanding how youth in residential and day treatment programs successfully or unsuccessfully develop and implement strategies to help improve external behaviors can inform services aimed at helping these youth successfully navigate treatment and demonstrate more sustained and integrated changes for managing behaviors and trauma symptoms.

Explanation of Results Through Mixed Methods Integration

The working hypothesis was that CBC participants would demonstrate a decrease in problem behaviors after the completion of the CBC intervention. The fact that there was no association between participation in CBC and a change in externalizing behaviors, and that the CBC participants actually demonstrated a slight increase in problem was initially surprising. However, when looking at the increase in problem behaviors through the lens of the qualitative results the lack of sustained change and increase in problem behaviors has more context and ultimately makes more sense.

Integrating qualitative data as context suggests, the CBC intervention participants appeared to make progress during the program but, upon returning to traditional programming after the summer, the CBC intervention participants regressed behaviorally and displayed an increase in problem behaviors. Qualitative findings suggest strong relationships developed in CBC and being in situations that appeared to push youth out of their comfort zone, there was the development and emergence of skills to manage emotions and behaviors. However, despite these positive perceptions, the final theme emerged as barriers and lack of sustained behavioral change. Ultimately, the barriers and lack of sustained behavioral change was consistent through both the quantitative results and qualitative results. The adult participants all talked positively about the CBC intervention, and the immediate positive impact of the program. However, the end result was that despite this perceived positive and immediate impact, there was no associated change regarding externalizing behaviors. In fact, youth who participated in the CBC intervention, demonstrated an increase in total problem behaviors post the CBC intervention. This was supported by both the qualitative and quantitative data.

Through the interviews with adult participants it became clear that one of the key factors related to the CBC program was that it fostered healthy relationships that allowed the youth to feel safe, secure and connected, which are key tenants of positive youth development theory (Eccles & Appleton, 2002; Durlak et al., 2007; Ginwright & James, 2002; Lerner et al., 2005). The development of relationships and the role of positive relationships with healthy and secure adults is a key factor in both positive youth development programs as well as in the literature related to effective interventions for youth in residential and day treatment programs (Eckstein & Ruth, 2015; R. Lerner, J.

Lerner, & Benson, 2011). Relationships provide youth with a corrective experience to help mitigate the impact of trauma and to help a youth to feel supported and cared about (Durlak et al., 2007). Therefore, the notion that CBC participants appeared to respond well during the summer to the adult relationships developed through participation in CBC is consistent with existing literature. Youth spent more concentrated time with the adults in a context outside of the traditional structure of the general programming. This also helped to explain the quantitative results that illuminate that the CBC participants in general, demonstrated more problematic behaviors after the completion of the intervention. Although the youth still had interactions with the CBC staff upon transition to a regular day treatment classroom, for most youth, their primary staff was no longer the CBC staff and they had to re-adjust to their classroom staff and teachers. Transitioning back into a regular day treatment classroom, the loss of the close-knit support offered by the CBC staff, and adjusting to the rules and structure of general programming was most likely a challenge for the CBC participants which contributed to an increase in problem behaviors.

In addition to healthy relationships, the adult respondents expressed how being in situations that were new, unique and challenging allowed youth to experience circumstances out of their comfort zone. Skill building through real world experiences emerged as youth formed positive relationships and were pushed out of their comfort zone. Through being pushed out of their comfort zones the youth participants were able to face their own fears, rely on the relationships that were being formed with the adult participants, and ultimately it led to the development of life skills to help manage each unique experience and situation. This skill development through real life situations and

hands on learning is aligned with adventure based experiential theory (Glass & Benshoff, 2002; Tucker & Norton, 2013). The staff participants discussed how youth developed and were able to implement skills to regulate their emotions, communicate more effectively, and to cope with triggers during the CBC intervention. Despite this perception, these skills were not sustained and ultimately, the CBC youth participants displayed an increase in problem behaviors pre to post. Once CBC participants transitioned back into general programming, they appeared to struggle with accessing their skills, transferring the knowledge from CBC into other settings; they seemed to struggle to effectively manage their behaviors. This could in part be due to transition back into the structure, consistency, and predictability of general programming. The transition back into the monotony and highly structured programming was most likely a challenging adjustment after spending the summer interacting with nature, encountering adventure opportunities, and being exposed to new and unique situations.

Many of the adult participants spoke about the barriers to sustained change, which support and highlight the lack of sustained change that was captured by the quantitative results. Not only were the changes not sustained, the CBC participants demonstrated an increase in problem behaviors overall, and when parceling out each of the sub-categories of problem behaviors. Staff helped to make sense of this trend through their description of barriers to sustained change. Staff talked about the challenge of transitioning back into traditional programming, the complex dynamics of trauma and life circumstances that interfered with accessing skills and the loss of the CBC routine and relationships as possible reasons for the regression. Furthermore, the youth who were in the comparison group overall did not demonstrate a regression in behaviors and overall demonstrated

consistency and/or some improvements. These youth did not have opportunities to interact with nature or experiencing new experiential activities, and they did not have opportunities to develop unique relationships with staff. Therefore, the comparison youth had no context of loss of relationships, change in routine, or transition between summer and fall programming. This further helps to offer one possible explanation for why intervention youth overall demonstrated an increase in problem behaviors but the comparison group did not.

Connection to prior research

Staff participants articulated the numerous barriers to sustained changes, and the analysis of the pre to post behavior problems supported this lack of sustained change for the CBC youth participants. The results of this study support the idea that changes in behaviors for youth impacted by trauma and who are in either a residential or day treatment program are complicated. These youth are faced with complex trauma histories, face significant mental health and behavioral challenges, and their ability to access and utilize strategies and skills in the moment to manage behaviors are often stunted (Briggs et al., 2012; Hair, 2005; Strickler et al., 2015). Staff participants articulated the numerous barriers to sustained changes, and the analysis of the pre to post behavior problems supported this lack of sustained change for the CBC youth participants.

As the literature suggests, youth who have a higher number of ACE scores are more at risk for developing problem behaviors, poor impulse control, regressed decision making ability and a disorganized neurodevelopment (Felitti & Anda, 2010; Felitti et al., 1998; Larkin, Shields, & Anda, 2012). The lack of change and regression in problem behaviors can, in part, be related to the high number of ACE scores for the entire sample,

and in particular the CBC intervention group. The high number of ACE scores helps to explain why sustained change in number of problem behaviors may be so challenging to achieve. An 8 week intervention is a starting point for helping youth with complex trauma histories develop and access new skills, but true trauma integration and the ability to manage trauma triggers, emotions and behaviors must be a more integrated and long term approach (Briggs et al., 2012; Felitti & Anda, 2010; Hair, 2005; Strickler et al., 2015).

Both theoretical frameworks, positive youth development (PYD) and adventure based experiential theory, help to make sense of these results. PYD illuminates the importance of adult relationships, safety, consistency, and opportunities for autonomy, engagement and youth voice (Catalano et al., 2004; Durlak et al., 2007; Eccles & Appleton, 2002). The CBC program appeared to create a safe environment that allowed for the development of meaningful relationships, self-determination and engagement by the youth in the program itself. The qualitative strand highlighted these components as integral in the perceived success of youth during the actual intervention. However, upon transition back into traditional programming many of the PYD components were no longer present and youth appeared to deteriorate as highlighted by the quantitative strand.

An important factor emphasized as a barrier to sustained change was the transition back into traditional programming for the CBC youth participants. This transition was marked by the loss of the strong relationships, loss of the consistency of the CBC intervention, and loss of the safety that was developed during the CBC intervention. Upon completion of the CBC intervention, the youth participants returned to their traditional day treatment classroom. This included re-integrating into environments with

non-CBC staff and non-CBC youth. Not only were there changes in who the youth were interacting with, but there was notable differences in programming and structure. The traditional day treatment classrooms do not include experiential learning and utilize traditional learning methods in which youth sit at their desk with minimal interactions throughout the day. Furthermore, the CBC intervention seemed to foster a sense of community, belonging and emotional safety which is not how the traditional day treatment classroom presents.

The safety, relationships, sense of belonging, and structure of the CBC intervention is supported in the literature in that youth who feel safe, secure and have trusting adults are better able to access skills, to accept adult help, and have less external behavioral struggles (Durlak et al., 2007; Eccles & Appleton, 2002; Jensen et al., 2013; Ginwright & James, 2002; Lerner et al., 2005). The positive youth development influence that was present during the summer intervention seemed to have a positive impact during the intervention. However, as youth transitioned back into day treatment classrooms, there was a loss of PYD principles and there was less emphasis on relationships, cultivating a sense of belonging, and creating a consistent and emotionally safe environment. Tennyson day treatment classrooms typically focus on compliance, physical safety, rule following, and completion of academics. The stark contrast between the CBC intervention and traditional day treatment classrooms would be challenging to navigate between for most youth, and even more so for trauma-impacted youth who have less frustration tolerance, less ability to cope with change, and who struggle to navigate different relationships and environments.

In terms of adventure based experiential theory, to refresh, there are four integrated components of experiential learning that contribute to acquisition and transferability of skills, knowledge and learning. The four components include a concrete experience, reflective observation, abstract conceptualization, and active experimentation. A concrete experience is encountering a new experience or situation. Reflective observation includes reviewing and discussing the concrete experience. Abstract conceptualization is the process of making meaning of what has been learned and experienced. Active experimentation is integrating the skills and trying what has been learned in related environments/situations (Kolb, 1984; Kolb, Boyatzis & Mainemelis, 1999). These four components, when integrated and executed in full, theoretically lead to effective learning and increased knowledge (Kolb, 1984). The CBC intervention itself provided numerous concrete experiences which contributed to the youth being pushed out of their comfort zones and some of the initial skill development. However, the CBC intervention did not appear to emphasize opportunities for reflective observation, abstract conceptualization or active experimentation which support the lack of youth's ability to transfer the knowledge outside of the actual CBC intervention. As the literature related to AET suggests, for real learning and integration to take place, all four of the experiential learning components must be experienced (Kolb, 1984).

During the CBC intervention, when youth were faced with daily experiential activities and new concrete experiences, the youth seemed to demonstrate some increase in skills and the ability to access skills to manage behaviors and emotions. The staff participants all echoed the sentiment that the real world experiences cultivated increased self-confidence, increased skills, and increased ability to manage emotions. However, as

the quantitative strand highlighted and was supported through the voices of the staff participants, there was a regression post the intervention. The lack of full integration of the AET theoretical framework could have been one driving factor that contributed to a lack of integration and lack of sustained behavioral improvements. Youth needed time to reflect on the concrete experiences, and they needed opportunities to experiment with their skills and new experiences outside of the intervention. When youth had to transition back into traditional programming, there were no new experiences, less emphasis on experiential learning, and this all contributed to the regression in behaviors.

In addition to being aligned with both PYD and AET theoretical frameworks, the CBC program also aligns well with neurobiology and helping to facilitate opportunities to help create new neural pathways for the brain and to help youth develop sequential skills aligned with improving functioning of each domain of the brain. Through repetitive, rhythmic and patterned movement such as rock climbing, kayaking, and hiking the youth encounter experiences that promote sequential skills and allow youth to practice functioning in relation to each domain of the brain. The structure and consistency of the program in a safe environment aligns well with providing essential needs for the youth and replicating functioning of the reptilian brain (Perry, 2009; van der Kolk, 2006; van der Kolk, 2014). As staff attune with the youth over the course of the summer, provide empathetic and effective responses to their needs and shifting emotion states, the youth's brain are provided with key elements that nurture development of the limbic system and nervous system. The youth are challenged to manage their emotions in the face of new outdoor experiential experiences, and begin to develop more capacity to be able to label, identify and express emotions which help promote healing and development of the

emotional brain (Perry, 2009; van der Kolk, 2006; van der Kolk, 2014).. Finally, through being challenged to problem solve, work collaboratively as a team, overcome numerous concrete obstacles in a hands-on capacity, the rational brain and the pre-frontal cortex are being accessed and promoting brain development in this region (Perry, 2009; van der Kolk, 2006; van der Kolk, 2014). For a child to rock climb safely, they must be able to communicate their needs to their partner belaying them to maintain safety, they need to be able to manage their emotions that are being triggered while on the wall, and they need to be able to plan and execute their pathway up the wall which requires some problem solving skills. This example of rock climbing illustrates how each domain of the brain is needed during CBC and how this program begins to replicate real world experiences that align with the sequential needs of the brain to heal and improve overall functioning.

Despite the alignment with CBC and neurobiology, as well as with PYD and AET; this program ultimately did not yield significant results and the results indicate that there was not an association between participation in CBC and a decrease in externalizing behaviors. This makes sense when considering neurobiology. To heal the brain and develop new neural pathways in an effective and long term capacity takes significant time, repetition and practicing desired behaviors and skills in numerous environments (Perry, 2009; van der Kolk, 2006; van der Kolk, 2014). 8 weeks is not a long period of time to cultivate real change at the behavioral, emotional, social, or neurobiological level. The qualitative results provide a context that support that CBC has some perceived benefits during the actual intervention and when examining the components of CBC, they align well with PYD, AET and neurobiology. Therefore, the idea of extending the CBC

program or being more intentional with developing interventions that are influenced by PYD, AET and neurobiology ongoing would be area to explore within a residential and day treatment program. Future research should exam whether a residential and day treatment program that has programming and interventions that provide essential elements of all three of these frameworks in a sequential, structured and integrated manner yield more of an association with decreasing externalizing behaviors.

Limitations

The findings from this study should be considered within the context of certain limitations. First of all, the sample for the quantitative strand was small and a sample of convenience. The sample was not randomly selected and assignment into the CBC intervention group was not randomized due to the program pre-existing and being nested within another program. Furthermore, the selection process on the surface appeared to have some inherent biases based on staff making selections based on arbitrary and subjective factors related to safety. This limitation could have impacted the profile of the intervention group participants as selection of the intervention sample reflected the safest youth within the day treatment and residential programs. This could have impacted the results in that the intervention group was not randomized and could potentially have had some inherent differences based on self-selection and staff selection that could not be fully accounted for in the matching processes. The limitations of the small sample size were further highlighted through the attrition that impacted both the intervention and the comparison group. The initial sample size included 64 youth. However, after attrition and removing the outlier, the final sample included only 46 youth. All of these factors contribute to the lack of generalizability of this study.

Another limitation was the small number of staff respondents. Several other staff members were asked to participate who either declined, or left the agency before the interviews took place. Therefore, the voices represented through the themes in the qualitative strand were only a small group of adults working with the youth, and might not be representative of the overarching perspective of the entire staff who works with the youth at Tennyson Center. Despite the limitations and the lack of generalizability, the results are still important and can inform future programming and implications for effective interventions for youth in the day treatment and residential programs at Tennyson and, perhaps, other similar programs that serve similar young people.

An additional limitation was not having youth voices captured as part of the qualitative strand. While staff impressions yielded important and interesting themes and results; having youth feedback, perspectives and observations would have strengthened the overall quality of the results and discussion. Their perspective of the CBC program could have provided unique insights from their first-hand experience of the CBC program that was not fully captured by staff impressions and observations.

Since the inception of the CBC program, there was changes, improvements, and shifts in how the program was implemented. Although the program coordinator expressed that during the four years that this dissertation focused on, there was no concrete or observable changes in the CBC program, there could have been some discrepancies from year to year. The different staff year to year could have influenced the process of selecting youth into the program and implementing the actual program which could have influenced the CBC program from year to year. This potential shift in programming could have been a limitation that was not accounted for in the analysis.

Another possible limitation is the role that this researcher holds within Tennyson. At the time of the intervention, this researcher held the position of a clinical supervisor within the agency. Although this role was not a direct supervisor to any of the adult participants, the role of clinical supervisor is a role of leadership within the agency. This role could have been viewed as one with more authority and power than the adult participants, which could have impacted the answers given by the adult participants. Although this researcher held more power within the hierarchical structure of the agency, this researcher had been at the agency less time than any of those interviewed which hopefully ameliorated any of the negative impacts of the discrepancies in roles.

Due to limited data available, using retrospective data, and working with a pre-existing intervention there was some limitations with only being able to measure externalizing behaviors and not being able to use a randomized control design. Externalizing behaviors, although important in telling the story for trauma-impacted youth, it does not capture the full spectrum of trauma- symptoms. It would have been interesting to have been able to better understand if there was an association between participation in the CBC intervention and other trauma symptoms and internalizing symptoms in addition to externalizing behaviors. Furthermore, the process in which the externalizing behaviors were observed and recorded was a limitation in and of itself. The staff, although all trained in how to track and interpret behaviors through the SWIS system, rely heavily on their own perception of behaviors to track unwanted externalizing behaviors. This therefore could have potentially led to discrepancies in how behaviors are interpreted and tracked. Additionally, in some cases there was less than one behavior referral per day for youth, suggesting variation in how behaviors were recorded could

have great influence. Without validity and reliability assessments of this observational measure, some measurement error may have occurred.

Lastly, there were limitations with regards to the matching process and being able to observe behaviors during the actual intervention. This researcher was able to create a matched sample that was statistically equivalent to the intervention group. However, due to having a small sample to work with for the creation of the comparison group, it was at times challenging to find a match with the same number of problem behaviors and the same type of problem behaviors. Furthermore, this researcher was not able to track the behaviors during the actual intervention, which would have revealed interesting information and insights about if the CBC intervention participants did display a decrease in negative behaviors during the intervention like the adult participants described.

Implications

Despite the recognized limitations, the results have several implications for both research and practice implications. Some of these implications include integration of PYD and AET theoretical components in a more intentional and ongoing basis within residential and day treatment programs; a focus on understanding the challenges of transitions for trauma impacted youth and intentional skill development for increased tolerance for transitions, and how to transfer and sustain skills acquired through a program such as CBC to other settings.

Integration of PYD and AET. The results of this study indicate no association between participating in CBC and a positive impact on externalizing behaviors. This could lead some to the belief that it was not an effective intervention. However, due to the small sample size, limitations with research design, and in light of the promising

qualitative results, an alternative explanation of interpretation could be that the CBC program lacked full integration of PYD and AET elements, and that the intervention was not robust enough. There was the overarching belief in the qualitative results that the youth participants did benefit from CBC during the actual intervention. The staff perceptions aligned with many core components of the PYD framework.

The practice implications of this study indicate that perhaps instead of providing adventure based, PYD and experiential programming in a time-limited manner, that residential and day treatment programs would benefit from shifting to a more PYD, adventure and experiential model on an ongoing basis (integrated into traditional services in a year-round basis). The lack of changes do not speak to CBC being a standalone ineffective intervention, but highlight that instead of the intervention being nested within the pre-existing programming, that it might be more effective if it were an integrated part of the programming on a daily basis for all youth. The qualitative results overwhelmingly highlighted the perception that during the CBC intervention the CBC participants displayed positive behaviors, growth and progress. The qualitative themes highlighted that components of both a PYD and AET theoretical framework were observed and appeared to contribute to the perceived positive impact of the CBC intervention during the actual intervention. It was not until the youth transitioned back into traditional programming that did not highlight PYD or AET into its model, that the regression in behaviors was observed. This supports the notion, that if youth had more exposure to adventure-based experiential opportunities through a PYD framework and on a consistent and ongoing basis, that there might be a more sustained and observable change in external behaviors. Youth need safe adults to build meaningful relationships with, they

need engaging experiences to cultivate their voice, identity and autonomy, and they need opportunities to learn and apply useful skills (Eccles & Appleton, 2002; Jensen et al., 2013; Lerner et al., 2005). Research implications are closely related to the practice implications suggested here. Additional research is needed to understand the impact of an adventure-based experiential intervention that is ongoing and integrated into residential or day treatment programs. The qualitative results suggest that the CBC intervention had many benefits during the intervention but the quantitative results indicated no associated behavioral improvements. If a program similar to CBC could be integrated into Tennyson in a more sustained and longer term manner, not just during the 8 week summer program, the original hypothesis could be tested to see whether participation in the integrated CBC intervention would be associated with a reduction in problem behaviors.

Transitions and transferring skills. Transitions are challenging for most youth, but they can be especially challenging for trauma impacted youth. Transitions are a big concept, but to operationalize it for this dissertation, it includes transitioning from one concrete activity to the next, transitioning from one mood state to the next, transitioning from one adult to another, or transitioning from one part of a program to another. Overall, this study seemed to highlight how youth struggle with transitions. Throughout the qualitative strand the concept that youth struggled with the transition back into traditional program was discussed, which was then supported by the quantitative strand highlighting no associated changes in problem behaviors. This is also supported in the literature that highlights the mixed effectiveness of day treatment and residential programs for decreasing symptoms and problem behaviors (Briggs et al., 2012; Hair, 2005; Quisenberry & Foltz, 2013; Strickler et al., 2015). Therefore, for a residential or day

treatment program to be effective there needs to be work done on how to effectively help trauma impacted youth access and utilize skills to manage their emotions, behaviors, and symptoms not just in one setting, but through transitions in settings, moods, and adults.

This could be done through focusing on integrating all of the AET components into CBC. To increase integration of AET and to focus on how to help with transitions, the CBC program would benefit from being more intentional about creating opportunities for reflecting on the concrete experiences of the program (Kolb, 1984; Kolb, Boyatzis & Mainemelis, 1999). Discussing what was being learned during the CBC activities may be essential in bolstering the effects of the AET intervention (Eckstein & Ruth, 2015; Gass, 1993; Priest, Gass, & Gillis, 2000; Wilson & Lipsey, 2000). Youth need to reflect and discuss what is being experienced and learned in concrete and transparent ways to help with learning from and internalizing the experiences (Eckstein & Ruth, 2015; Kolb, 1984; Kolb, Boyatzis & Mainemelis, 1999; Wilson & Lipsey, 2000). This could include daily check-outs that integrate questions to provoke thought and reflection as well as creating more of a transition process at the end of the summer before transitioning back into treatment as usual.

Intentional transitions may help to acknowledge the significant transition from CBC back into the milieu. This focus on the transition could include discussing the loss and shift of the relationships between CBC youth and the staff facilitating the intervention, as well as discussions about the differences between CBC and treatment as usual. Creating a termination, reflection, celebration of the summer and opportunities for discussing potential challenges of returning to traditional programming might help to better prepare the youth for ending the CBC program and returning to treatment as usual.

Dissertation Study Final Conclusion

As this dissertation highlighted, maltreated youth are at increased risk for the development of behavioral challenges that can be difficult to ameliorate. The literature, theories and mixed methods study presented helped to illuminate the challenges that these youth experience, and the challenges of reducing symptoms and minimizing the impact of maltreatment. Neurobiology helps highlight how impactful child maltreatment is on brain development, the body and subsequently how child maltreatment impacts a child at all levels of functioning. Understanding how child maltreatment impacts development and functioning is one of the key factors in understanding the true challenges of developing and implementing interventions that will actually interrupt the adverse impacts of maltreatment. For sustained positive changes, healing, and increased functioning interventions need to be more intentional about integration of knowledge about the brain, learning theories, and positive youth development.

Integration of PYD concepts, AET learning principles, and understanding how trauma impacts the brain and body can all contribute to effective approaches to residential and day treatment programs as interventions for youth who have experienced child maltreatment. The CBC intervention that was the focal point of this study is one small scale example of a PYD and AET influenced approach aimed at reducing symptoms and increasing positive behaviors for trauma impacted youth. However, as this study demonstrated, the CBC program was not associated with long term positive results. Despite the increase in negative behaviors that were associated with participation in the CBC intervention, this study also highlighted that some of the components of the intervention if applied on a long term, ongoing basis could be associated with increased

functioning. This study positions well for future research and interventions that build on existing knowledge of the brain, body, positive youth development and adventure based experiential theories. Residential and day treatment programs continue to be intervention approaches for some of the most acute maltreated youth. Therefore, this is an important area of research to focus on as there are dire consequences for these individual youth, the community, the economy and society at large.

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Appendix

Interview Guide:

Questions given to all Adult Participants:

1. How long have you been at TCC?
2. What is your role at TCC?
3. Tell me about your understanding of the CBC program
 - a. What do you think the purpose of CBC is?
 - b. From your understanding, how is that purpose achieved?
4. What are factors that contribute to a youth participating in CBC
5. What areas of functioning do you think CBC is designed to improve?
6. Tell me about the changes you notice (both positive and negative) in kids who participated in CBC
7. Tell me about the changes you noticed in the kids who did not participate in CBC
8. Tell me about behaviors displayed by some of the youth who participated in CBC

9. Tell me about behaviors by some of the youth who did not participate
 - a. Please give examples

10. Tell me about some of the different skills displayed by CBC.
 - a. Tell me about some of the different skills displayed by non-CBC kids
(Prompt for different skills)

11. Given what you know about CBC and TCC, what do you think has led to skills and behaviors of CBC youth compared to other youth? Probe for specific techniques, activities etc.

Questions given to the 2nd Wave only:

1. After looking at these bar graphs of SWISS data prior to CBC and after CBC for referrals for the kids in CBC and a group of kids who were not in CBC, what are your impressions?
2. What do you notice? What stands out? How do you make sense of the changes?