THE RELATIONSHIPS BETWEEN ADVERSE EVENTS, RELATIONAL HEALTH EVENTS, AND ADAPTIVE DISSOCIATION IN A CLINICAL SAMPLE OF ADOLESCENTS

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Paul Felker

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Author: Paul Felker

Approved by:

Chair

Member

Member

Doctoral Program Director

Associate Dean, Director

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Abstract

The purpose of this research was to explore what associations exist between early experiences and development along a dissociative continuum in youth. The early experiences of interest included both adverse events and relational health events. The dissociative continuum covered a range of development from both dysfunctional conditions to healthy adaptive conditions. The literature is dominated by a pathological view of dissociation and its adaptive capacities have been minimized. When dissociation is conceptualized as a continuum experience, it is evident that most people experience dissociation to some extent on a daily basis. Dissociation can yield enhanced focus, conservation of energy, analgesic effects, reflection, rumination, and compartmentalization. Empirical evidence supports that the relationship is the central vehicle through which change occurs in psychotherapy. There is also emerging research that suggests that some aspects of dissociation are employed in efforts to build relationships. This dissertation research explored how relationships impact dissociation. This study investigated potential antecedents of dissociation throughout select developmental stages. The data used was derived from a sample of 638 youth from a clinical population. This research found that adverse events and relational health factors combine to generate a developmental risk scale that had a predictive relationship to where youth settle on the dissociation continuum. In line with a more strengths based perspective, I found that favorable relational health factors were associated with a more organized, adaptive dissociation. Clinicians can use this information to aid in the focus and direction of their assessments and, subsequently, target their interventions to specific

areas of functioning that require further development. Most importantly, clinicians can use this information to understand and interpret their client's dissociative tendencies from a strengths focus that recognizes the relational and adaptive potential of dissociation. This can lead to more appropriate interventions, strengthen the therapeutic alliance, and help achieve better outcomes.

Keywords: *dissociation, strengths perspective, trauma*

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Chapter 1: Introduction

Many people have experienced trauma. Trauma, at its core, is an experience of powerlessness and terror (Perry, 2009). "It's an unbearable and intolerable feeling" in the face of threat (van der Kolk, 2014, p. 1). According to Purewal et al. (2016), up to 80% of people have experienced trauma in their lifetime. Other research reports that 3 million children experience trauma each year (Heller & LaPiere, 2012). People have various responses to trauma, including dissociation.

Dissociation is a tuning out of external stimuli and attending to internal stimuli (Schore, 2002), and is best described via a continuum as it varies greatly. On the severe end of the continuum, it could refer to a level of functioning where an individual ceases to have conscious awareness of an experience. This is diagnosed as dissociative amnesia (American Psychiatric Association [APA], 2013). It has also been referred to as a break between memory and affect. For instance, talking dispassionately about a traumatic experience is called "isolation of affect" (van der Kolk, 2014). On the mild end of the continuum it can be depicted as mind wandering or day dreaming. Dissociation is important because it is a ubiquitous response to traumatic experiences and can affect overall functioning, including contact with reality and relations with others (Gruberger, Ben-Simon, Lekovitz, Zanfer, & Hendler, 2011).

The history of dissociation is important as the context from which it came gave it a specific, one-dimensional meaning. The term dissociation was first coined in the late 1800s by a psychologist named Pierre Janet (Ringel & Brandell, 2012). The

symptomology was ascribed to women who presented as “hysterical” as a result of trauma they had endured as children. Perhaps due to its etiological association with the acute end of the continuum, dissociation has primarily been presented in the literature as a pathology. As a result, the literature presents an overly narrow view, thereby contributing to a myopic understanding of dissociation that eclipses the functional capacities that dissociation serves. These functional capacities include coping with boredom, tuning out typical stimuli to conserve energy, use as an ego defense mechanism to avoid anxiety, and self-reflective functions (Butler, 2006; Gruberger, et al., 2011).

The helping relationship is the central vehicle through which change occurs. People heal from trauma in the context of relationships (Strait, 2014). The empirical literature reports data to support the centrality of relationships in clinical outcomes (Day, 2016; Palmstierna & Werhart, 2013; Perry, 2009). Children can heal from trauma and improve functioning. One of the most important ways this is accomplished is via corrective attachments or relationships (Perry, 2009).

Heller and LaPiere (2012) developed the Neuro-Affective Relational Model (NARM), which is a relationship-based therapy designed to treat trauma. NARM is an empirically-based therapy based on attachment theory which states people are wired for relationships and innately seek proximity toward their primary caregivers (Christian, Sellbom, & Wilkenson, 2016). According to attachment theory, people develop attachment styles based upon their relational experiences with their caregivers. Whipple Bernier, and Mageau (2009) stated, “Empirical research has shown convincingly that parent–infant attachment plays a key role in subsequent psychosocial and behavioral

child outcomes" (p. 219). Essentially, these early life experiences provide a blue print for how an individual will likely relate to other people in their lives.

Prior to beginning my dissertation research, I theorized that dissociation could serve in an adaptive capacity and enhance relational functioning. The long-standing social work perspectives of person-in-environment and strengths-based functioning support the need for an expanded focus on dissociation. Understanding the relationship between dissociation and relational health is pertinent to social work for several reasons. People dissociate many times throughout the day, and therefore it is important to have a normative view (Baars, 2010; Gruberger et al., 2011). Secondly, relationships are critical in the social work profession, and people dissociate within relationships rather consistently. A one-sided view of this continuum experience may adversely affect relationship building and the development of rapport between clients and clinicians. Social workers may have trouble relating to the client because they pathologize dissociation and target it for change. Misconceptions and misunderstandings, particularly those in line with a pathological depiction, could alter the clinician's ability to empathically join with a client (Strait, 2014). According to Walker (2009), a misinterpretation of dissociation in the clinical relationship can be deleterious. For example, a mother whose children are placed in foster care may dissociate as a coping mechanism under the threat of the termination of parental rights (Walker, 2009). The caseworker might assess the mother's dissociative tendencies as a "lack of interest," "lack of bonding," "lack of attachment," and/or "lack of attunement." There is emerging research to suggest that if the caseworker in this example was informed and attuned to

dissociation, they could more fully understand and more effectively help the client (Strait, 2014).

Chapter 2: Literature Review

The literature is presented in four categories: (1) an overview of trauma, (2) a historical look at the study of trauma, (3) the effects of trauma with a focus on dissociation, and (4) how healing happens. The review concludes with a summary of the concepts and gaps in the literature.

Trauma: Overview

Trauma is an experience of powerlessness and terror (Perry, 2009). "It's an unbearable and intolerable feeling" in the face of threat (van der Kolk, 2014, p. 1). It is the experience of extreme distress in which a person has no control (Herman, 2015). It occurs when a person's coping strategies are overwhelmed. The harm, or threat of harm, is so great it ignites an extreme stress response within the individual.

Research reported by the Centers for Disease Control and Prevention (CDC) stated that one in five Americans was sexually molested as a child; one in four was beaten by a parent to the point of leaving a mark on the body; one in three couples have engaged in physical violence; 25% of people grew up with alcoholic relatives; and one out of eight witnessed their mother being beaten (Larkin, Felitti, & Anda., 2014).

First used in 1998, the Adverse Childhood Experiences (ACE) study revealed the widespread prevalence of trauma and its impact (Purewal et al., 2016). Researchers surveyed a sample of over 17,000 people about ten adverse childhood experiences (Felitti et al., 1998). These adverse experiences included alcoholism, violence, divorce, and incarceration of caregivers in the family, and the experience of abuse.

The ACE study found 80% of the adults surveyed had experienced trauma (Felitti et al., 1998). This study not only outlined the prevalence of trauma but, for the first time, assessed the effects of trauma over the course of development. As such, it provided links to developmental and lifestyle vulnerabilities, health issues, and other adverse outcomes. According to the ACE study, people who had been exposed to trauma had an increased risk for seven out of the 10 leading causes of death (Felitti et al., 1998). People with high ACE scores had triple the risk for heart disease, triple the risk for lung cancer, and a 20-year reduced life expectancy (Purewal et al., 2016).

In the last decade, research has been conducted to explain responses to trauma and traumatic stress. As noted above, but important to underscore as central to the experience of trauma, Perry (2009) reported that people respond to trauma or stress in one of two ways, (1) fight/flight, or (2) freeze. The first response is hyper-arousal with increased respiration, increased heart rate, and the release of stress hormones into the individual. These individuals either “fight or run” with increased adrenaline and increased blood flow to muscles to increase strength. Subsequent externalized behaviors, in reaction to this internal process, can include aggression, hostility, anger, belligerence, and violence. The second type of response is hypo-arousal, which is typified by lower respiration, lower heart rates, and the absorption of stress hormones from the bloodstream. The resulting externalized behaviors from this response can include numbing, avoidance, withdrawal, depersonalization, derealization, and dissociation.

The central nervous system (CNS) subdivides into the autonomic and voluntary. The fight, flight, or freeze response is under the guidance of the autonomic nervous

system. Advances in neuroscience have helped explain the neurobiology, which undergirds the stress response. The amygdala and the hippocampus are specific structures within the brain that help make up the stress response. The amygdala is the alarm center signifying danger and the hippocampus gives context to the messages of danger. The amygdala, in concert with the right prefrontal cortex, modulates dissociation (Schore, 2002). Dissociation is a hypo-arousal response to stress.

Trauma impacts the neurobiology of individuals in a variety of ways. These include brain development and the way DNA is transcribed within the body (Purewal et al., 2016). In addition, it impacts a person's ability to reason, their memory, their emotional regulation, and their relational capacity. What follows is a brief review of each these dimensions.

Reasoning. Trauma thwarts the reasoning process. When a person experiences an adverse event, the trauma activates their stress response system. Specifically, the Hypothalamic-Pituitary-Adrenal Axis (HPA Axis) releases stress hormones such as cortisol and adrenaline into the blood stream (Perry, 2009). Blood flow in the brain is targeted toward sub-cortical structures such as the limbic system, the diencephalon, and the brain stem (Perry, 2009). The result is that the cortex, the "thinking part of the brain," goes off line. This renders the person as somewhat reptilian in their repertoire or ability to respond. When the cortex is hijacked, the reasoning capacity of the individual is reduced or completely neutralized, depending on the level of threat. When the cortex is not functioning, things like cause-effect, consequences, morals, and decision- making are impaired or nonoperational as these are cortex-mediated functions (Perry, 2009). A

person must have access to their cortex to be able to utilize these capacities. The result is the person is able to fight the threat or flee from the treat, and little else.

Memory. Trauma also impacts memory. As noted above, when the HPA Axis is activated, blood flow is shunted to the sub-cortical structures such as the limbic system. The limbic system is considered the emotional brain, and it comprises the amygdala, the hippocampus, the thalamus, and hypothalamus (van der Kolk, 2014). These structures are important as they all share responsibility for and contribute to memory (Rothschild, 2000). It makes intuitive sense that memory is central to the experience of trauma. If a person could not remember the experience, then trauma would have no lasting effect. As van der Kolk (2014) argued in *The Body Keeps the Score*, trauma and its memory get locked into the body of a person. It is the memory and subsequent ongoing experience of trauma that make it an enduring and painful phenomenon.

Rothschild (2000) stated the amygdala and the hippocampus are central to memory. The amygdala records emotions and physical sensations while the hippocampus records time and context for the experience (Rothschild, 2000). This is why infants have no explicit memory. The amygdala is fully formed at birth and the hippocampus matures between the ages of 2-3. People with Posttraumatic Stress Disorder (PTSD) have smaller hippocampi, and it is theorized the stress hormone cortisol inhibits the hippocampi thus neutralizing the person's ability to give the traumatic experience both a context and a history (Rothschild, 2000). The result is people live out, in the present moment, the stress of the trauma and its accompanying painful emotions. Cozolino and Santos (2014) stated there are two different types of memory and both are

necessary and adaptive. The implicit memory is primitive, fast, and not accessible to our cortex, while the explicit memory is slower, more developed, and is accessible to our cortex. Explicit memory is central to the fight/flight/freeze response. Implicit memory is central to intentional and thoughtful responses dictated by cortex functions (Cozolino & Santos, 2014).

Emotional regulation. Sequentially, trauma impacts emotional regulation. When a person's stress response is activated, and the fight/flight response is mobilized, they are emotionally driven by the limbic system which subsequently hijacks the cortex. The stress hormones induce a state of hyperarousal in an effort to ensure survival. This is an adaptive coping mechanism designed to ensure the survival of the person; however, it is diametrically opposed to a state of calm. When a person is hyper-aroused, they are sympathetically dominant. This occurs when the HPA Axis is releasing stress hormones into the body, priming it for the fight/flight response. A state of calm occurs when a person is parasympathetically dominant. When a person is parasympathetically dominant, the body metabolizes the stress hormones resulting in lower respiration rates and a lower heart rate, thus restoring a state of equilibrium or peace. Emotional dysregulation may be the most challenging and difficult symptom of trauma (Perry, 2009).

Relational capacity. When a person cannot emotionally regulate, they have difficulty learning, sleeping, eating, and most importantly relating to other people. As noted in the literature, we are highly social beings (Perry, 2009). Our survival in the early part of life depends on our sociability. The clinical literature adds further emphasis

to this point by noting the relationship is the most important variable in determining clinical outcomes (Day, 2016; Palmsteirna & Werhart, 2013; Perry, 2009). Perry (2009) and van der Kolk (2014) argued that if a person has been traumatized and cannot emotionally regulate then this can impair their ability to relate.

At an extreme level of relational incapacity, diagnostic labels may be applied. One such label, Borderline Personality Disorder (BPD), has generated substantial controversy. According to Lacasse (2014), BPD is a misogynistic label that has been used to stigmatize women. Historically, BPD has been difficult to treat and was viewed as enduring (APA, 2013). Part of the diagnostic criteria includes chaotic relationships which can frustrate family, friends, and clinicians (APA, 2013). Females who have endured sexual abuse often struggle to regulate emotionally. This creates a state of chaos in interpersonal relationships. They need others but simultaneously feel threatened by others, and they especially fear being vulnerable to another. They are ambivalent; they want intimacy and they fear intimacy.

Study of Trauma: Historical Perspective

Historically, the study of trauma has been episodic. Trauma was the focus of the helping professions in three distinct periods: the late 1800s, after World War I, and the women's movement in the 1970s (Herman, 2015). As interest in trauma and its effects emerged during these three key time periods, so did pathologizing narratives about dissociation (Herman, 2015).

Jean-Martin Charcot, a French neurologist, undertook the study of dissociation from a scientific perspective in the late 1800s (Ringel & Brandell, 2014). This gave

trauma and the sequela of dissociation credibility as it was examined rigorously by the field of medicine. This person-centered view, with its scientific rigor and respect shown towards clients, has since been considered the "Heroic Era" of traumatology (Herman, 2015). This was a critical departure from previous work that had peripheralized women and labeled them as "hysterics" (Herman, 2015). Prior to Charcot's pioneering work with women who had trauma histories, there was very little understanding of dissociation.

Judith Herman (2015) provided a detailed argument about the historical treatment and conceptualization of trauma, stating that consideration of trauma was abandoned by the helping professions each time because it was too painful for society to face. Herman (2015) asserted that the idea that World Wars I and II and the Vietnam War could have such deleterious effects on soldiers was resisted by the helping professions as the wars ended and people yearned for peace.

Freud suggested that hysteria, which many have associated with modern-day PTSD, was the result of trauma, specifically child abuse. However, it was Pierre Janet, a French psychologist and student of Charcot, who coined the term "dissociation" (Herman, 2015). These early forerunners – Janet, Charcot, and Freud – linked the concept of dissociation with trauma. This was called the "Heroic Era" of trauma research as helping professionals listened empathically to women and their experiences of sexual abuse as children. According to Herman (2015), Freud later recanted his findings that linked dissociation to the client's reports of abuse in childhood, and this set the stage for an era where trauma was not explored in depth.

Historically, trauma has not been well understood. For example, van der Kolk (2014) in *The Body Keeps the Score*, stated that in the late 1970s Vietnam veterans who were experiencing flashbacks were diagnosed with psychosis and prescribed antipsychotic medication (van der Kolk, 2014). This is understandable as they were seeing things that were not there. Essentially, they were assessed as experiencing hallucinations (now known as flashbacks). The allied mental health professionals of that time used the best information they had at that time to diagnose and treat these individuals. Unfortunately, their armamentarium did not include the diagnosis of PTSD. PTSD, flashbacks, and dissociative experiences were not understood and not part of the nomenclature of the allied mental health community.

The trauma-informed movement has helped mental professionals reconceptualize this. Terms like "post traumatic growth" point to the adaptive components of how people respond to trauma (Calhoun & Tedeshi, 2004). Though the information is slowly being translated to lay people and society in general, most professionals within the trauma movement who treat trauma see the symptoms of trauma as a person's best attempt to cope with the adversity. The potential for growth after a traumatic event was further articulated by Gilin and Kauffman (2015) who argued that trauma content can trigger traumatic reactions within students in the classroom setting but can also lead to increased insight, more intimate relationships, and an enhanced appreciation for life, all positive byproducts of the post traumatic growth experience (Gilin & Kauffman, 2015).

As is the case with trauma, dissociation has not been well understood. According to Spiegel (2006), dissociation is the "stepchild" of psychology, as it is poorly

understood, under recognized, and under diagnosed (Spiegel, 2006). He conducted a study in which nearly 25% of clients seeking treatment at a mental health center tested positive for dissociative disorders, yet only 4% had the corresponding diagnosis from their treatment providers (Spiegel, 2006).

Much like the trauma field in general, dissociation and the people who suffer from it would benefit from a reconceptualization. Social work is poised to provide this as social work operates from a strengths perspective. Rather than label, stigmatize, and pathologize individuals experiencing dissociation, viewing the adaptive strengths of this innate coping mechanism can allow both client and practitioner to embrace the beneficial elements of dissociation. This reconceptualization would allow dissociation to align with the trauma-informed care movement that espouses a shift from "what's wrong with you" to "what happened to you?"

Effects of Trauma: Dissociation

The effects of trauma are varied. The APA categorized the symptoms of trauma as intrusive thoughts, hyperarousal, avoidance, and – the focus of this section – dissociation (APA, 2013). Dissociation, and the distinguishing features between normative and pathological dissociation, will be discussed in detail later. For the moment, the focus will be on the pathological end of the spectrum.

Schore defined dissociation as a "process in which the person disengages from stimulation in the external world and attends to an internal world" (Schore, 2003, p. 126). According to Schore (2003), dissociation is similar to "playing dead" where the individual is inhibited and tries to avoid attention in an effort to become unseen (p. 126).

Dr. Alan Schore (2002) described this process as a “primitive” response, and this is commensurate with a lack of cortical or logical functioning during a traumatic response. He explained the neurobiology of dissociation as rooted in the sympathetic nervous system being pushed to its limits. In this context, the parasympathetic nervous system takes over in an effort towards equilibrium by inducing a hypo-aroused state. When this occurs, the right brain collapses figuratively and ceases to function. A dissociative state ensues. Without an operational prefrontal cortex, this state of dissociation renders a person helpless and hopeless in an extreme way, and this is the point at which the risk of suicide is at its highest (Schore, 2002). Infants, children, and, in the case of many types of trauma, even adults cannot overpower perpetrators or run, both of which are hyper-aroused responses. Thus, a hypo-aroused response is more adaptive in these instances. Hypo-arousal, specifically dissociation, mutes pain and is sometimes the only response available in an infant, child, or adult’s repertoire (Curran, 2010). Internal escape is exercised when external escape is not possible (Curran, 2010). According to Strait (2014),

> Dissociation has long been understood as an adaptation to extreme trauma, wherein the mind learns to turn off or disconnect to promote survival. This is seen in psychic phenomena such as trance, experiences of numbness or blankness, depersonalization and derealization, and at an extreme, gross disconnection from self or reality. (p. 311)

Dissociation is a complex, brain-mediated function. Several brain structures inter-relate in the execution of this function. The diencephalon, specifically the locus

ceruleus and nucleus accumbens septi, are integral (Perry, 2009). The right brain, specifically the right prefrontal cortex, and its inability to modulate amygdala functions also contribute to dissociation (Schore, 2002).

The *Diagnostic and Statistical Manual of Mental Disorders,* 5th edition (*DSM-5*) defines dissociation as a disruption in a person's ability to normally integrate consciousness, memory, or perceptions (APA, 2013). According to the APA, dissociation includes both positive dissociation (intrusions into awareness) and negative dissociations (inability to access information or mental functions) (2013). There is a chapter in the *DSM-5* dedicated solely to dissociative disorders; these include Dissociative Identity Disorder, Dissociative Amnesia Disorder, and Depersonalization/Derealization Disorder (APA, 2013). In addition to this there is a chapter called "Trauma and Stressor Related Disorders," which includes PTSD with dissociative features and Acute Stress Disorder with dissociative features (APA, 2013). The common features throughout these diagnoses are alterations in consciousness, memory, perception, and/or cognition (APA, 2013).

Dissociative disorders are highly associated with trauma. The longer the trauma lasts and the more severe the trauma, the increased likelihood the person will use dissociation as a means of coping (Schore, 2003). The symptom of dissociation is particularly associated with sexual abuse in childhood (Mollon, 2002). Dissociation is most often found when the abuser is a caregiver (Mollon, 2002). It "frequently involves a numbing of the pain and a frozen state in which the individual can talk about a traumatic experience but without any associated affect" (Walker, 2009, p. 110).

Dissociation in Social Work and Other Professional Literature

The literature is amply supplied with scholarly articles on the deleterious effects of dissociation. In a word search for dissociation, I found 146 peer-reviewed articles in the *Social Services Abstracts*. Every article I reviewed presented the concept as pathology. To name just a few examples, articles related dissociation with eating disorders, self-injury, substance abuse, neglect of children, choosing partners who abuse their children, and being abusive parents themselves (Chaney & Burns-Wortham, 2014; Klanicky, Harrington, & McChargue, 2008; Lev-Weisel & Zoha, 2014; Ross, 2007; Walker, 2009). Some of the articles referenced a "normal" component of dissociation, but only in passing; the main thesis of the articles was a pathology focus (Chaney & Burns-Wortham, 2014; Klanicky et al., 2008; Lev-Weisel & Zoha, 2014; Ross, 2007; Walker, 2009).

Despite social work being a strengths-based profession, there were no peer-reviewed articles indexed in the *Social Services Abstracts*. One exception in the social work literature was a study by Dr. Jacqueline Strait from the University of Pennsylvania, who examined the experience of the client's dissociation from the clinicians' point of view. In her qualitative study, the therapists reported that the experiences of dissociation in clients were unnerving, intimidating, scary, and difficult to handle (Strait, 2014). The results were a "collapse of relationality" and a "paralyzed retreat" in the worker-client dyad (Strait, 2014, p. 312). She recommended therapists should not avoid or truncate the clients' dissociation. Strait (2014) suggested dissociation could result in a state of resonance between the worker and the client – a way of connecting empathically and

deeply with the client and their traumatic material. The result could be an enhanced and more effective therapeutic relationship. She suggested rather than the worker truncating the client's dissociative experience in a counseling session, the worker should allow the client to continue in that experience. The workers were then able utilize their own discomfort as a way to empathically connect with the internal chaotic state of the client. The result was "resonance," and clients experienced this as supportive.

Outside of the social work literature, research by Dr. Lisa Butler, a psychologist, found that most dissociative experiences are normative and include things like daydreams, fantasies, and an absorption in mental activities (Butler, 2006). The function of normative dissociation is to assist individuals with "processing, escape, and reinforcement" (Butler, 2006, p. 45). Her research supports the idea that dissociation can be used as an adaptive mechanism, allowing an individual to withdraw within themselves to process information or experiences. Perhaps dissociation allows the individual to tune out external stimuli, reflect, contemplate, and neurobiologically realign themselves so they can reenter the experience or the relationship in a more attuned and emotionally regulated way.

This view of dissociation parallels a description of sleep by a group of circadian neuroscientists who stated sleep is for energy conservation, brain processing, and memory consolidation (Espie et al., 2016). These circadian neuroscientists argued sleep is a core need that should be placed in the foundation of Maslow's hierarchy of needs (Espie et al., 2016). Most people sleep a third of their lives. They argued that the quality of this time can significantly impact the quality of the remaining two-thirds of life (Espie

et al., 2016). Thus, the quality of the dissociation, which the literature reveals most people do most of the time to varying degrees, may be seen as impacting the quality of people's relational experiences

Butler's (2006) article provided some insight into the concept of dissociation and aligns with Schore's concept of "playing dead." Both authors suggested that dissociation is purposeful, intentional, and involves volition. This view of dissociation allows room for avoidance to be construed as an adaptive coping strategy against the threat of further danger. In this depiction of dissociation, the individual regroups so that they come out of the episode safer and better able to engage in an intentional way.

Studies of "mind wandering" may contribute to the understanding of dissociation. Gruberger et al. (2011) conducted a study that located the neural circuitry for mind wandering. Using neuroimaging techniques, they located the neurobiological basis for this process in the hippocampus, the precuneus, and the posterior cingulate cortex. Having located the neurobiological basis for this process, the authors surmised that mind wandering served two purposes. The first was for future planning and entailed integrating past and present experiences. The second was the consolidation of learning, thus enhancing the abilities of the brain (Gruberger et al., 2011).

Baars (2010) conducted research on mind wandering and concluded that it was purposeful. Research participants were asked to perform a cognitive task during which neuroimaging processes examined the circuitry in their brains. The same tests were conducted when there was no cognitive task and the brain was at rest. Neuroimaging tests revealed high activation in certain areas of the brain when there was no task assigned; the

resting state was shown to be an extremely active state. Baars (2010) concluded that mind wandering is a goal-oriented process.

Thus, while the literature indexed in *Social Services Abstracts* does not include specific studies on the functional aspects of dissociation, there are other studies that point to the adaptive nature of dissociation. Such adaptive functions include safety, planning, integrating past and present experiences, consolidation of learning, and overall enhanced brain functioning.

Healing from Trauma

The effects of trauma are varied and so are the ways in which people experience healing. Several perspectives and treatment modalities are pertinent, including trauma-informed care, attachment theory, and neurobiology. First and foremost, in the trauma-informed care movement is the concept of, and need for, safety. This principle is *sine qua non* in traumatology. Secondly, attachment theory underscores the primacy of relationships. As cited previously, the relationship is the central vehicle through which change occurs in the helping relationship. And, most recently, advances in the neurosciences have provided the understanding of the neurobiological substrates behind trauma- informed care and attachment theory.

Based on the principles of trauma-informed care and attachment theory, as well as advances in neurobiology, key interventions used to treat people who struggle with trauma include Trauma-Focused Cognitive Behavioral Therapy (TF-CBT), Eye Movement Desensitization Reprocessing (EMDR), and exposure and desensitization treatments. The premise of these interventions is the recognition that people with trauma

histories have associations stored in their bodies and their minds between stimuli and past painful experiences. There are triggers of this previously experienced stimuli, which activate these stored associations, and this ignites the stress response. These individuals go into a state of hyperarousal and/or hypoarousal, depending on their specific history. Both states of arousal are attempts to seek safety. Interestingly, a person can experience hyperarousal and dissociation simultaneously. Perry cited a case where he asked a ten-year-old boy to go to the car with him to retrieve some paper work. A later review of the boy's heart rate when he asked that question showed an elevated heart rate of 140. Perry then read the case history to find the boy was sexually abused by his stepfather in the garage of their home, therefore being asked to go to the car meant "I am going to abuse now" which triggered a stress response. However, when Perry asked the boy to go with him to the car to retrieve the paperwork, the boy dissociated, glazed over, and did not hear or respond to his question, despite Perry asking him multiple times.

The interventions for these hyperaroused and/or hypoaroused states are designed to alter the conditioned associations. The client is helped in learning new associations paired with coping skills, competence, and the experience of safety within the clinical setting. These coping skills can include massage, yoga, movement, dance, drumming, and a variety of other enrichment activities to help people emotionally regulate and experience safety and healing (Perry, 2009).

In healing from trauma, and particularly addressing the symptom of dissociation, it is important to consider how dissociation is conceptualized. If dissociation is conceptualized as a pathology, then the goal is to eradicate it. If dissociation is

considered a continuum experience and potentially adaptive, then the goal is to modify it, so it can retain its adaptive capacities. Therefore, it is important to understand the purpose of dissociation.

Van der Kolk (2014) argued that the medical model is predicated upon understanding how an organ or a system in the body is designed to function normally, identifying *dys*functions in the organ or system, and developing methods to cure or correct problems. Once dissociation was conceptualized as outside the body's normal array of function, it became categorized as a problem to be corrected or cured. Literature predicated on the medical model tends to be pathology-focused, and this may have contributed to a reactionary treatment of dissociation.

By contrast, approaching dissociation as a continuum phenomenon aligns with several other aspects from the literature. According to Schore (2002), to understand atypical development we must first understand typical development. Much of a person's identity and ability to function depends upon the how the neuronal processes come together in the developmental years. These formative years lay the blue print for the person's neurobiological architecture that they will carry with them throughout their lives (Perry, 2009; Schore, 2002; van der Kolk, 2014).

Understanding what functional capacities dissociation could serve may help in our treatment of it. Exploring the adaptive capacities can help clinicians develop treatment goals where the focus is on helping clients identify and maintain the functional aspects of the dissociative continuum.

Essentially, healing from the negative effects of dissociation centers around the idea of "integration." At its core, dissociation is a "splitting off" or a "tuning out." Therefore, healing occurs by "tuning in" and by integration. Helping clients reconstitute themselves by integrating previously fragmented experiences and effects can assist in recovery (Rothschild, 2000).

Trauma often occurs within the context of relationships. Conversely, healing from trauma also occurs within the context of relationships (Cozolino & Santos, 2014; Fosha, 2003; Herman, 2015; Perry, 2009). Perry stated that the relational environment of the child is the major mediator of the therapeutic experience (2009).

What is less known is exactly how relationships mediate trauma. Cozolino and Santos asserted that the mechanism of the relationship between the client and the worker is a principle reason why therapy works (Cozolino & Santos, 2014). When a worker empathically attunes to another, this connection allows for co-regulation to occur which helps the client neurobiologically rewire themselves in such a way as to promote healing, safety, and connection (Cozolino & Santos, 2014).

Gaps in the Literature

Following a review of existing literature on trauma and dissociation, I have identified a number of gaps. First is the connection between human relationships, which have been shown to be important both in our general, psychobiological development and in the clinical, therapeutic sense, and dissociation, a continuum experience (Butler, 2006). There is little in the literature that investigates the relationship between these two variables.

The literature is clear that relationships are central in therapeutic outcomes (Day, 2016; Palmstierna & Werhart, 2013; Perry, 2009). What are the constituent parts of a relationship that contribute to positive outcomes? What are the co-occurring resiliency factors that support relational health?

Another gap in the literature is the understanding of how the timing of adverse experiences may impact dissociation and relational health outcomes. Are there developmentally sensitive periods during which this capacity organizes within the brain? In addition to the timing, do different types of adverse experiences have a greater impact than others?

Conceptual Framework

To summarize, the theories used to undergird this research study included attachment theory, the Neurosequential Model of Therapeutics (NMT), and social constructionism.

Attachment theory. Attachment theory postulates human beings are highly social creatures. This theory emphasizes the centrality of relationships and thus provides an explanation for people's innate tendency to form strong, affectionate bonds with another person, typically their primary caregiver (Allen, 2015). Bowlby's assertion that human beings are hardwired for connection has been validated by neuroscience (Heller & LaPiere, 2012), Bowlby argued that human beings are genetically predisposed toward proximity seeking with primary caregivers as an evolutionary mechanism of survival (Allen, 2015). We are social beings made for relationships. When caregivers consistently meet the needs of a child, the child is free to explore their environment, trusting comfort

and security will be provided in moments of distress (Allen, 2015). This echoes the theme of rupture and repair. Times of distress are inevitable due to the vicissitudes of life. The question is whether mechanisms of repair are available (Allen, 2015).

The "Strange Situation" provides empirical support for attachment theory. In this scenario, a stranger enters the room with a child and their caregiver, the caregiver leaves the room, and, typically, the child will cry for their caregiver (Ainsworth, Blehar, Waters, & Wall, 1978). The caregiver re-enters the room and the repair that ensues determines the child's attachment (Ainsworth et al., 1978). Does the child seek and receive the soothing comfort from their caregiver? The crux of the experiment is the rupture and repair that occurs. Rupture and the ensuing distress are instrumental. How this is ameliorated is essential.

Attachment theory argues people have either a secure attachment or an insecure attachment. Those who were comforted in their distress developed a secure attachment. Conversely, children who did not receive consistent care developed insecure attachments. For example, orphans in Romania who were neglected suffered significant developmental problems and even death (Heller & LaPiere, 2012; van der Kolk, 2014).

Further research on attachment theory has shown "remaining emotionless and at a distance actually serves to maintain proximity to the caregiver" for some dyads (Strait, 2014). For example, a child of a caregiver who suffers from schizophrenia might employ dissociative tendencies as a coping strategy in an effort to de-stimulate the environment and de-stimulate the relationship in particular. People who suffer from schizophrenia have difficulty with processing stimulation. Children learn to de-stimulate by

withdrawing and/or dissociating from the relationship. The result is that a parent feels more calm and regulated. In this emotionally regulated state, the parent is able to engage the child. Though it is counter-intuitive, dissociative tendencies by the child can actually enhance proximity seeking (Allen, 2015).

A related concept is "isolation of affect," which is described as separating feelings from facts (or content) (Allen, 2015, p. 4). It is a splitting that occurs to tone down an emotionally charged situation or experience. It is similar to de-stimulating the relationship as noted above. It also aligns with Straits' (2016) assertion that dissociation can serve to enhance relationships. Dissociation may be congruent with relational health.

Agency and a desire to be affiliated are implicit assumptions to attachment theory; it is a two-person psychology (Allen, 2015). Agency, or self-determination, is manifested in proximity-seeking behaviors by people. It is the connecting or coalescing of two people in a relationship. Attachment theory can help free dissociation from being understood primarily as an internal, intra-psychic phenomenon. The literature has shown the etiology of dissociation, as understood as pathology, is a two-person psychology. It is trauma endured in relationships.

Based on the principles of attachment theory, the trauma movement highlighted that not only are people wired to be social beings in relationships with one another, but safety within these relationships is of paramount importance. The rapid advancements of neuroscience in the last few decades have contributed to attachment theory, as well as to the articulation of principles of trauma-informed care. Not only are people relational, social, and safety-seeking beings, but the brain itself is a highly social organ.

Neurosequential Model of Therapeutics (NMT). The Neurosequential Model of Therapeutics (NMT) is foundational to this dissertation. Dr. Bruce Perry allowed me to have access to the dataset from the Child Trauma Academy (CTA) to conduct a secondary analysis. The NMT is a "developmentally sensitive, neurobiologically informed approach to clinical work" with children who have experienced trauma (Barfield, Dobson, Gaskill, & Perry, 2012, p. 31). The NMT is not a therapy, but rather a group of assertions about how neurobiological processes undergird people's response to trauma. It sequences existing therapies in such a way as to help these therapies be most effective (Perry, 2009). As part of NMT, Bruce Perry has conducted extensive research and collected data from clinicians trained in NMT about the children they work with. It is this data that was used for my research.

The research of Dr. Neal Miller (1969) provided an empirical basis from which NMT grew. Miller's research revealed (1) the autonomic nervous system can learn, and (2) the autonomic nervous system can be very specific in its activation (1969). He demonstrated the "automatic" system was susceptible to interventions. For example, he demonstrated blood flow to the stomach wall, an autonomic response, could be altered by shock and/or reward. This showed that viscerally-mediated responses could be conditioned.

The brain has four distinct regions and develops in an observable and predictable pattern, from the bottom up: (1) brain stem, (2) diencephalon, (3) limbic system, and lastly (4) the cortical regions (Perry, 2009). A key assumption of the NMT is that the timing of the traumatic experience is important. The NMT asserts the part of the brain

that was developing most at the time the trauma occurred is where the intervention must be targeted. If the child is disorganized in this part of the brain, this disorganization will negatively impact future development of the brain. Therefore, interventions must be directed at the part of the brain that was developing most when the trauma occurred.

The NMT conceptualizes a parallel process between the order of the brain's development and treatment. Perry (2009) postulated that too often interventions are targeted at the symptoms and not the root. If there was a disruption in the early development of a child, such as prenatally, the impairment would be located within the brainstem or diencephalon. Therefore, interventions targeted at the cortex, which develops later, would be less effective because the child did not have a fully developed cortex during the time the trauma occurred. The intervention must be synchronous with the genesis of the problem.

Interventions directed at the lower parts of the brain (such as the brain stem and diencephalon, which are the first to form) can change. This is critical to the NMT. Historically these areas had been untreated or unaddressed in therapy with children who had suffered trauma. They were considered autonomic and not amenable to treatment (Gaskill, 2010). Therefore, even if the NMT was correct in its primary assumption, which is early trauma impairs future brain development, if these lower regions were not amenable to change, treatment would be moot.

The NMT quantifies dissociation. The NMT creates a "brain map" of individuals (Barfield et al., 2012). This map quantifies 32 brain-mediated functions. This allows the clinician to determine the vulnerabilities and strengths of an individual in areas such as

sensory regulation, self-regulation, cognition, and relational domains. The map is a visual representation of the status of brain-mediated functions. "This information helps direct the selection and timing of developmentally appropriate enrichment, educational, and therapeutic activities" (Barfield et al., 2012, p. 31). These quantified brain-mediated functions are scaled in numbers from 1-12, essentially denoting severe, moderate, mild, normal levels of functioning. The "dissociation continuum" is one of these quantified brain-mediated functions.

Social constructionism. Because attachment and dissociation are social phenomena, social constructionism is applicable to the conceptual framework for this study. An organizing principle of the conceptual model for this study is the socially constructed treatment of dissociation.

A one-sided view of the problem tends to add the power of stigma to the process. Not only have the adaptive components of dissociation been neglected in the helping literature, but labeling theory suggests a sole focus on the negatives leads to stigma.

Link and Phelan (2001) write:

> In our conceptualization, stigma exists when the following interrelated components converge. In the first component, people distinguish and label human differences. In the second, dominant cultural beliefs link labeled persons to undesirable characteristics— to negative stereotypes. In the third, labeled persons are placed in distinct categories so as to accomplish some degree of separation of "us" from "them." The fourth, labeled persons experience status loss and discrimination that lead to unequal outcomes. Stigmatization is entirely contingent

> on access to social, economic and political power that allows the identification of differentness, the construction of stereotypes, the separation of labeled persons into distinct categories and the full execution of disapproval, rejection, exclusion and discrimination. Thus, we apply the term stigma when elements of labeling, stereotyping, separation, status loss and discrimination co-occur in a power situation that allows them to unfold. (p. 367)

People who have been diagnosed with dissociative disorders have been stereotyped and marginalized. Strait (2013) noted from her research that people who actively dissociated in session were feared by the clinicians caring for them. A more nuanced examination of the literature along with advances in neuroscience reveals dissociation as an innate, natural, goal-oriented process. Baars states (2010), “Something that takes up that much mental energy must serve a purpose” (p. 208).

In conclusion, the theories of attachment, neurobiology, and social constructionism provided the conceptual framework for this study. The conceptual framework can be summed up as a neurobiologically-informed, developmentally sensitive, and process-oriented framework.

Chapter 3: Methodology

This study examined case-level data from youth presenting for clinical care, in order to ascertain whether certain historic antecedents may predict the level of function on a dissociation continuum. The historic antecedents included adverse events and relational health events at specified developmental stages; viz., intrauterine, perinatal, infancy, early childhood, and childhood. The investigation followed a progression of inquiries where findings at each step informed the next step, with the ultimate aim of developing a best model of prediction from the available data. The inquiries employed descriptive analyses (frequency histograms) of sample characteristics, bivariate correlations of all predictor variables and the dissociation continuum, Cronbach's Alpha for scale construction, exploratory factor analyses (principal component approach) of scale dimensions, partial correlations of a two-factor prediction model, and comparison of effect sizes (correlation coefficients) for a composite-factor model *vis-à-vis* all other associations identified in the study.

The line of questioning that directed the investigation followed as shown below:

- Which, if any, predictor variables show significant association with dissociation continuum outcomes? (bivariate correlations)
- Are predictor variables distinctly related directly, or inversely, to dissociation continuum outcomes? (bivariate correlations)
- Are there patterns, or clusters, of predictor variables related to each other and similarly to the dissociation continuum outcome? (correlation matrices)

- Which is the most viable approach to predictor model building? Multiple regression techniques or aggregate scale(s) construction? (correlation matrix for multicollinearity)
- Do clusters of predictor variables, if aggregated, present viable scales that predict as well, or better, than separate variables? (Cronbach's Alpha)
- Do the scaled clusters present unidimensional scales, or multiple dimensions? (factor analysis / principal components)
- If there are at least two aggregated predictor scales, what is the relation between them? And, is the correlation to the dissociation continuum outcome independent of the other prediction scale? (partial correlation)
- If there are at least two aggregated predictor scales (e.g., one derived from adverse events and another derived from relational health events) and they are not independent of each other, can they combine into a new, composite prediction variable that predicts as well, or better, than either scale separately?
- What is the relative importance of current relational health conditions versus past developmental risk conditions for predicting dissociative continuum scores?

Data Source and Collection

This research examined data collected by the Child Trauma Academy (CTA). The CTA is a non-profit organization working to improve the lives of high-risk children through direct service, research, and education (Child Trauma Academy, 2016). "A

major activity of the CTA is to translate emerging findings about the human brain and child development into practical implications for the ways we nurture, protect, enrich, educate, and heal children" (Child Trauma Academy, 2016, para. 2). "The translational neuroscience work of the CTA has resulted in a range of innovative programs in therapeutic, child protection, and educational systems" (Child Trauma Academy, 2016, para. 2). The data included scaled measures on 32 brain-mediated functions, scaled measures for various types of adverse events, timing of the adverse events, and scaled measures of relational health factors, past and present (Please see Appendices A and B for the operationalization of these variables).

This dataset was made available to me by Dr. Bruce Perry. After consulting with him about my interests, he permitted me to conduct a secondary analysis utilizing the data collected by the CTA. In addition to providing access to the data, he enrolled me into the CTA's training program where clinicians from around the world receive training in understanding and using the principles that guide the Neurosequential Model of the Therapeutics (NMT). The basic premise of the model is that the timing of adversity is critical in treating trauma. The part of the brain that was developing most at the time of the trauma is important, as it points the clinician to the specific structure of the brain that needs to be the target of the interventions. Perry's work, the NMT, the dataset, and my research are anchored in this conceptual model.

CTA-trained clinicians recorded data on clients using an on-line, interactive, questionnaire instrument supplied by the CTA. The instrument was anchored on a 12-point scale for all variables. For brain functions, including the dissociation continuum,

low numerical ratings (1-3) indicated dysfunction, and high numerical ratings (10-12) indicated high functioning or healthy development. For historic antecedents of adverse events and relational health events, the scale represented the degree or severity of events. So, a high number for adverse events indicated very bad circumstances, whereas a low number indicated minimal adversity. For relational health events, a high number indicated very good circumstances for relational health, whereas a low number indicated minimal circumstances for supporting relational health. The reader should note that the scales operated in opposite directions; i.e., a high rating was good for one (relational health) but bad for the other (adverse events).

The ratings were based upon the clinicians' work with the client. The clinicians were advised to gather as much information from family members and various records that may have been available to them. The instrument, in turn, generated a report, including a brain map, to assist the clinician in problem solving and treatment planning. The CTA encouraged that the more input into the rating process, the more accurate the ratings. The clinicians were also given an opportunity to rate their level of confidence (high, moderate, or low) for the assessment ratings they recorded.

The instrument assessed several domains. First, were measures of adverse childhood experiences for each developmental stage; viz., intrauterine, perinatal, infancy, early childhood, childhood, youth, early adulthood, and adult. Second, were measures of relational health events or circumstances for each developmental stage. Third, were measures of 32 central nervous system functions representing a neurodevelopment sequence corresponding to the developmental stages; viz., brain stem, diencephalon,

limbic system, and cortical telencephalon. Lastly, a current relational health assessment was completed. The clinicians were instructed to assess the brain functions and relational health factors within the most recent three months. The CTA training emphasized fidelity of assessment across all domains. The clinicians were only allowed to submit client information into the database after they had demonstrated proficiency and fidelity in using these instruments. Fidelity was assessed by giving clinicians case study scenarios to assess. These assessments were then compared to standardized scores by the staff at the CTA.

The central brain function of interest for this study was the dissociation continuum. It was anchored on a 12-point scale, with 1-3 indicating less organized dissociative functioning, and 10-12 indicating more highly organized dissociative functioning. The key question in my research process was whether there is a qualitative difference between scores. For instance, are scores between 10-12 just the absence of dysfunctional dissociative aspects, thus rendering dissociation more of a categorical variable? Or are there qualitative differences between the scores on this continuum? The CTA hosts monthly "Metric Scoring" calls where clinicians in the program call in and talk with Dr. Perry and his staff and consult with them about scoring these brain-mediated functions. This is where case specificity is addressed. Clinicians present their cases to Dr. Perry with the specific clinical details and Dr. Perry helps guide the clinicians in how to score the brain mediated functions, including dissociation. It is during these "Metric Scoring" calls where dissociation is identified as a continuum experience. People with more highly organized dissociation have capacities that are

qualitatively different. For example, actors need to possess the ability to dissociate in order to enter their role and perform. Other people need to tune out external stimuli and attend to their internal thought processes in order to be highly productive in their career pursuits. Therefore, highly organized dissociative scores are not just the absence of pathology, but the presence of adaptive capacities.

The data were transmitted to the researcher via an Excel spreadsheet. The dataset included cases with age groups including children, youth, and young adults. A filter was applied to the spreadsheet to extract only cases designated as "youth" (age 11 years to 18). The "youth" stage of development was selected so I would have access to full data from each stage of childhood. The extracted data for the "youth" cases was then imported into IBM-SPSS version 20 for graphical and statistical analyses.

The Sample

The subjects became known to the CTA by professionals seeking help in their treatment of these persons. The CTA-trained professionals operate from their home agencies distributed across the United States and abroad. After filtering for age, there were 4,325 youth in the dataset. Age categories were 11 to 13 years 47.5%, 14 to 16 years 42.3%, and 17 to 18 years 10.2%. Gender categories were male, 59.4%, and female, 40.6%. Race categories were Caucasian 60.3%, African American 13.8%, Hispanic 11.3%, Native American 1.8%, Asian 1.7%, and the rest Other or unknown. The CTA is unable to identify any demographics beyond these designations that were listed by the clinician when they entered the data into the dataset. The data were collected between the years 1995-2016.

In preliminary analyses, correlations between predictor variables (see Tables 1 & 2) and the dissociation continuum scores were statistically significant, but showed very small effect sizes (.30 and below). Fortunately, the data gathering instrument included a variable for the clinicians' confidence level in scoring the client's history of adverse events (as high, moderate, or low). Similarly, the instrument included a variable for the clinician to rate their own confidence level in scoring the history of relational health events (again as high, moderate, or low). Filtering the data set by selecting only "high" confidence for both histories (adverse events and relational health events) yielded n = 638 cases. Correlations for this filtered sample showed moderate effect sizes. In as much as moderate effect sizes (at least) are warranted to lend any meaningful findings for clinical purposes, all the reported analyses herein pertain to the filtered sample. Frequency histograms of dissociative continuum scores were examined for comparison between the full sample (n = 4,325) and the filtered sample (n = 638) to demonstrate congruency and minimal biasing of the outcome variable by the filtering procedure. It is notable, however, that applicability of the findings herein rests upon having "high" confidence in the clients' history of adversity and relational health.

Human Subject Protection

This is a secondary analysis of an existing dataset. The researcher, therefore, had no control or involvement in the process of data collection. The dataset received from the CTA contained no information that could possibly identify an individual, or group of individuals. Furthermore, all analyses and reporting of findings were conducted in aggregate numbers, further obviating the possibility of identifying information about

individuals. The study proposal was submitted for expedited review and approval by the Widener University Institutional Review Board (IRB). The IRB granted approval for the study in June of 2017.

Type and Purpose of Data

The purpose of the CTA in gathering these data was to support clinical problem solving and treatment planning, rather than research. Mental health professionals completed structured questionnaires on the children. These data were placed into the dataset by the clinicians. Reports and brain maps were generated by the online apparatus to assist the clinician with case problem solving and treatment planning. The online software application continued to support the clinician by recording clinical interventions and follow-up outcomes. The data available for this research effort, however, included only the assessment data, not the clinical interventions.

The systematic regimen of data collection, the scope of information included, and the volume of cases accrued lend merit to exploring this dataset to pursue certain research questions. I have not located anything in the literature pertaining to dissociation to match this scope of data collection and level of rigor.

Table 1: Adverse Event Predictor Variables

Intrauterine Infancy Early Childhood	Maternal Factors	Drug & Alcohol	Depression Neglect	Domestic Violence	Transitions Chaos Stress	Other Trauma

Preliminary Analysis: Scan for Predictor Associations

This study is a secondary analysis of an existing dataset to explore factors

contributing to the development of dissociative functions. Dissociative functions were measured as a dissociative continuum on a scale 1-12, with the low score indicating a dysfunctional state and the high end indicating a healthy, adaptive state. The predictor variables included the level of past adverse events (six event-types in total) at each of five developmental stages (Table 1), and the level of six conditions of relational health, also at each of five developmental stages (Table 2). Dimensions of adverse event predictor variables included the type and severity of adversity, and the timing of adversity according to developmental stages, as depicted in Table 1. Dimensions of relational health predictor variables included the type and strength of relational health, and the timing of relational health factors according to developmental stages, depicted in Table 2. Appendices A and B provide the codebooks clinicians used for scoring all variables.

Table 2: Relational Health Predictor Variables

Intrauterine	Wanted Pregnancy	Mother Safe	Mother Supported	Mother Caregiving	Father Present Supportive	Kinship Support
Perinatal Infancy Early Childhood	Mother Safe	Mother Attuned Responsive	Primary Caregiving	Father Present Supportive	Kinship Sibling Supports	Community Support
Childhood	Mother Attuned Responsive	Primary Caregiving	Father Present Supportive	Kinship Sibling Supports	Peer-School Supports	Community Support

The principle approach of this study employed bi-variate correlations to identify associations between predictor variables and the current measure at the time of assessment on the dissociation continuum. The Pearson correlation was applied to all the predictor variables: viz., measures of six distinct adverse events in each stage of development (each on a scale 1-12), and measures of six distinct conditions of relational

health in each stage of development (each on a scale 1-12). In this analysis, the Spearman Rank Order correlation was also applied for comparison to the Pearson. The rationale was that the Pearson correlation assumes a "straight-line" linear relationship, whereas the Spearman operates solely on rank order correspondence. If the Spearman correlation was stronger than the Pearson, it would suggest a nonlinear, or a curvilinear, relationship was operating. The Spearman did not yield a stronger correlation for the present data set, so the Pearson correlation was used throughout this analysis and provided for consistent comparisons of effect sizes among predictor correlations.

Using IBM-SPSS version 20, the correlation coefficients were compiled into correlation matrices to identify variables having strong versus weak correlations among the predictor variables as well as with the outcome variable; i.e., dissociation continuum scores. For example, suppose two or more predictor variables show a similar correlation with the dissociation continuum. This could be a matter of collinearity where several predictors are operating through a common latent variable, or dimension, like "stress." Or, some predictors could be related to the dissociation continuum in unique ways. This can be ascertained by comparing the correlations that predictor variables have with the dissociation continuum to the correlation they have with each other. If these correlations do not correspond with each other, it suggests that uncommon mechanisms are operating. If the associations are similar among the predictor variables, it suggests that there may be a common, underlying mechanism operating.

Predictor Variable Clusters and Compilation of Predictor Scales

Upon being informed by the exploratory phase of this study, this investigation

found a very similar negative association among all adverse event variables and the dissociation continuum. It also found a very similar positive association among all relational health variables and dissociation continuum. And, the exploratory phase found strong correlations among the predictor variables of each kind; i.e., adverse events with other adverse events and relational health events with other relational health events. The multicollinearity was so strong as to preclude proceeding with multiple regression approaches to model building.

In pursuit of building a prediction model, the investigation explored the possibility that all adverse event variables contribute to a common scale (the aggregate sum of adverse event scores in a given developmental stage). To test this possibility, Cronbach's Alpha was conducted for each group of adverse event variables within each developmental stage. Similarly, Cronbach's Alpha was conducted for each group of relational health events within each developmental stage to determine if a relational health scale (aggregate sum of relational health event scores) was warranted. Cronbach's Alpha provides a measure of internal consistency for variables intended to contribute to a common scale.

Although Cronbach's Alpha gave a measure of internal consistency for variables in a scale, it could not provide evidence that the scale is unidimensional. For that, exploratory factor analysis using the principal component approach was applied to determine if the adverse event scale had a unidimensional character, or multiple dimensions. Similarly, the relational health event scale was subjected to an exploratory factor analysis using the principal component approach to determine if it had a unidimensional character, or multiple dimensions. This was repeated for each developmental stage with generated scree plots and eigenvalue tables. Principal

Component Analysis (PCA) was selected specifically because it uses a linear combination of variables to create index variables called components, and yields an optimal number of components. The PCA was compatible with the study's objective of building a scale from linear contributions of adverse event variables. The optimal number of components derived from PCA answered the question, "were aggregated scales unidimensional or multidimensional?" (Institute of Digital Research and Education, UCLA, n.d.; Leech, Barrett, & Morgan, 2008; The Analysis Factor, 2017).

A Two-Factor Prediction Model

The foregoing analyses led to consideration of a two-factor model for predicting dissociation. Total adverse events associated with development of the dissociative continuum inversely. That is, the more adversity the lower the development of healthy dissociation. Similarly, total relational health events associated with development of the dissociation continuum positively. The greater the relational health the more highly developed was healthy dissociation. Given that there was a strong inverse relationship between total adverse events and total relational health events, it was pertinent to ask if these two factors really operate independently. A partial correlation was conducted for the three variables; i.e., dissociation continuum, and the two predictor variables as Total Adverse Events, and Total Relational Health Events.

The partial correlation looked at the correlation to dissociation continuum with one predictor while controlling the other predictor. The analysis was repeated to look at the predictors the other way around. The results of the partial correlations suggested that the two- factor model was incomplete, as the two factors (adverse events and relational health events) seemingly do not, or cannot, operate independently of each other.

A Composite Factor Prediction Model

A final model was developed by combining the two factors into a single composite variable designated as Developmental Risk. It was calculated as Total Adverse Events minus Total Relational Health Events and yielded a score that depicts the summative balance between adversity and relational health. If adversity scores exceeded relational health scores, then the Developmental Risk scores indicated higher risk. If, on the other hand, relational health scores exceeded adversity scores, then the Developmental Risk scores showed a low developmental risk for a given developmental stage. A Developmental Risk score was compiled for each developmental stage; i.e., intrauterine, perinatal, infancy, early childhood, and childhood. Frequency histograms were generated to examine the distributions of Developmental Risk scores. Pearson correlations were computed between Developmental Risk scores and dissociative continuum scores for each developmental stage. Gains in effect size were examined by comparing the magnitude of correlation coefficients of the Developmental Risk composite model with the Two-Factor model and the separate individual predictor variables.

Concurrent Variables as Predictors

The CTA data gathering instrument also included a number of relational health variables that measure current conditions at the time of assessing brain functions. A list of the relational health variables is presented in Table 3. Notice that the first variable asked the clinicians to rate the overall history of relational health for the client, not the clients' current relational health. All the other variables did pertain to current relational

health conditions.

Table 3: Current Relational Health Variables

History of Relational Health
Current Relational Health – Mother
Current Relational Health – Primary Caregivers
Current Relational Health – Father/Male
Current Relational Health – Siblings
Current Relational Health – Extended Family
Current Relational Health – School /Peers
Current Relational Health – Therapy/Tutor
Current Relational Health – Sports/Clubs
Current Relational Health – Community/Cultural

Bivariate correlations were conducted for each of these current relational health variables and dissociative continuum scores using the Pearson correlation. The correlation coefficients were compared between the historic antecedent predictor variables and current relational health conditions.

Interpretation of Relationships

This study placed emphasis on "effect sizes" rather than conventional statistical significance. The large sample size made it likely that statistical significance would obtain even in circumstances of very slight relationship or differences. Table 4 presents an interpretation of effect size used in this study.

Table 4: Interpretation of the Strength of a Relationship (Effect Sizes)

General Interpretation of the Strength of a Relationship	The *d* Family D	The *r* Family R
Much larger than typical	|1.00|	|.70|
Large or larger than typical	|.80|	|.50|
Medium or typical	|.50|	|.30|
Small or smaller than typical	|.20|	|.10|

Note. Adapted from Leech et al. (2008, p. 81)

Chapter 4: Findings

The original sample of youth consisted of 4,325 cases selected by age 11-18 from a larger clinical population. Females were 40.6 % and males 59.4%. After filtering the sample for only those cases where clinicians had "high" confidence in rating historic antecedents of adverse events and relational health events (n = 638), females were 43.3%, and males were 56.7%; i.e., a slight increase in female representation.

Table 5: Comparison of Effect Sizes between full sample and "high confidence" filtered sample

Relation to Dissociative Continuum	Pearson *r*	Pearson *r*
Adverse Events Early Childhood	Full Sample n=4,325	High Confidence Sample n=638
Primary Caregiving	-0.201	-0.32
Drug/EtOH	-0.109	-0.236
Depression/Neglect	-0.206	-0.323
Domestic Violence	-0.152	-0.278
Transitions Chaos Distress	-0.192	-0.325
Other Trauma	-0.194	-0.289

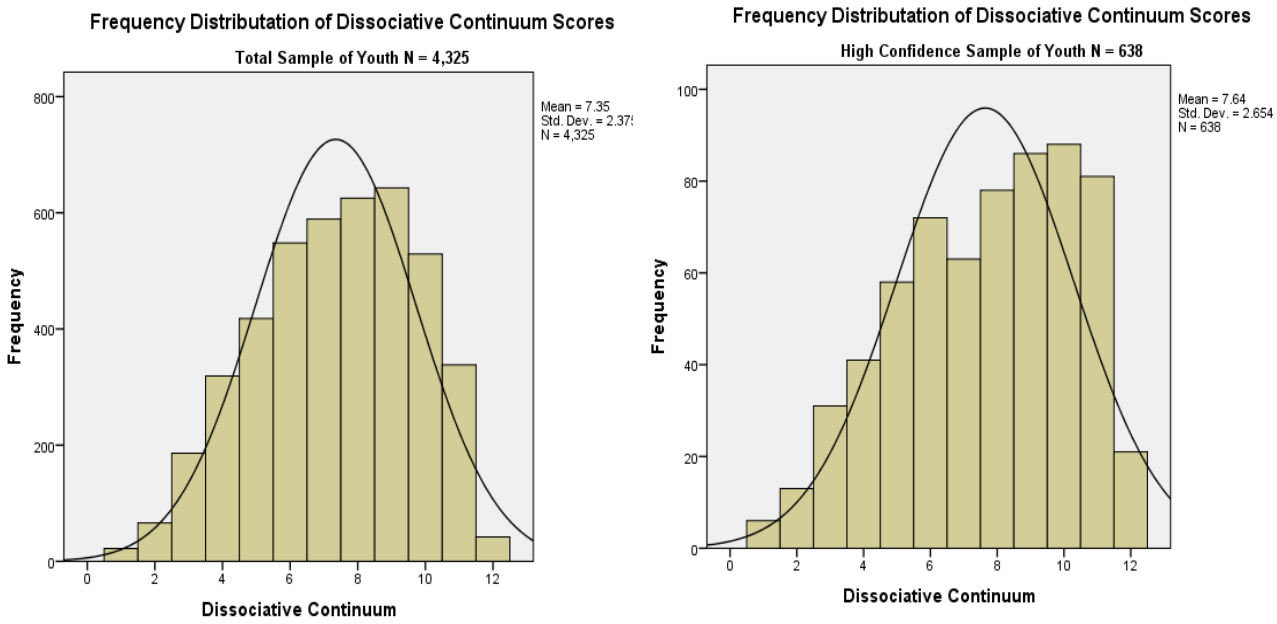
Note. All coefficients are significant at $p < .01$or better.

The decision to use such filtering derived from findings like those presented in Table 5. Using the full sample, correlations between adverse events in early childhood and scores on the dissociative continuum showed small effect sizes, even though they were statistically significant. By selecting only those cases where the clinicians indicated a "high" level of confidence in rating adverse events and relational health events, a substantial gain in strength of relationship was availed. Table 5 presents a portion of the data examined, drawing from events during the early childhood stage of development. Similar findings were obtained from all developmental stages and with relational health

variables as well as adverse events. The findings presented in this study, therefore, reflect only cases where clinicians indicated high confidence in rating historic antecedents (n = 638).

Changing the sample, even if only to reduce "noise" from low confidence assessments, altered the composition of some variables, like gender proportions. It was deemed prudent to look at potential effects on the key dependent variable; i.e., dissociation continuum. Frequency histograms were generated and are presented here in Figure 1.

Figure 1: Frequency Distribution of Dissociative Continuum in Full Sample and Filtered Sample.



The dissociative continuum was a 1 -12-point scale, with 1-3 being the lowest indicating less organized dissociative capacity and 11-12 being the highest indicating the most organized. The original sample, n=4325, presented a mean of 7.35. The filtered sample, n=638, presented a slightly higher mean of 7.64. Given that the standard

deviations were 2.3 and 2.6, the difference of 0.29 between means yielded a very small effect size; i.e., Cohen's *d* = .126, which is smaller than small. While acknowledging that filtering the sample did introduce some slight bias from the full sample toward higher ratings on the dissociative continuum, and a slightly increased female representation, the gain in analytic power was deemed warranted.

The histograms in Figure 1 highlight the fact that the literature is focused on the pathology end of the dissociation continuum. Individuals with scores in the 1-3 range are people who would typically be diagnosed with some dissociative disorder according to the *DSM*-5, including Dissociative Identity Disorder, Dissociative Amnesia Disorder, Depersonalization Disorder, and Derealization Disorder. However, those with scores in the 1-3 range comprise only 7.3% of the population, which means that 92.7% are left out of the literature. Thus, the majority of the clinical population is not depicted in the literature, nor are the adaptive capacities of dissociation

Table 6: Descriptive Statistics on Adverse Event Variables

		N	Mean	Median	Mode	Std. Deviation
Intrauterine	Maternal Factors	638	5.88	6	2	3.291
	Drug/EtOH	638	5.11	4	1	3.771
	Depression/Neglect	638	5.47	5	1	3.348
	Domestic Violence	638	4.98	5	1	3.483
	Transitions/Chaos/Distress	638	6.35	7	10	3.414
	Other Trauma	638	4.48	3	1	3.142

(continued)

		N	Mean	Median	Mode	Std. Deviation
Perinatal	Maternal Hx	638	5.35	5	1	3.366
	Drug/EtOH	638	4.78	4	1	3.651
	Depression/Neglect	638	5.49	5	1	3.285
	Domestic Violence	638	4.51	3	1	3.491
	Transitions/Chaos/Distress	638	5.87	6	1	3.559
	Other Trauma	638	4.94	4	1	3.499
Infancy	Primary Caregiving	638	5.62	6	1	3.406
	Drug/EtOH	638	4.83	4	1	3.697
	Depression/Neglect	638	5.54	5	1	3.348
	Domestic Violence	638	4.76	4	1	3.548
	Transitions/Chaos/Distress	638	6.21	6	10	3.454
	Other Trauma	638	5.07	4.5	1	3.464
Early Childhood	Primary Caregiving	638	5.68	5	1	3.479
	Drug/EtOH	638	4.78	4	1	3.714
	Depression/Neglect	638	5.56	5	1	3.312
	Domestic Violence	638	4.84	4	1	3.652
	Transitions/Chaos/Distress	638	6.79	7	10	3.233
	Other Trauma	638	5.55	5	1	3.533
Childhood	Primary Caregiving	130	5.15	4.5	3	3.121
	Drug/EtOH	638	4.09	3	1	3.378
	Depression/Neglect	638	5.55	5	1	3.136
	Domestic Violence	638	4.43	3	1	3.538
	Transitions/Chaos/Distress	638	7.03	7	10	3.171
	Other Trauma	638	6.04	6.5	1	3.587

Table 7: Descriptive Statistics of Relational Health Conditions

		N	Mean	Median	Mode	Std. Deviation
Intrauterine	Wanted pregnancy	638	6.81	7	12	3.651
	Mother Safe	638	6.86	6	12	3.751
	Mother Supported	638	6.37	6	4	3.324
	Mother Caregiving Hx	638	6.48	6	6	3.079
	Father Present/Supportive	638	5.35	4	1	3.562
	Kinship Support	638	6.3	6	3	3.383

(continued)

		N	Mean	Median	Mode	Std. Deviation
Perinatal	Mother Safe	638	7.34	7	12	3.693
	Mother Attuned/Responsive	638	7.13	7	12	3.549
	Primary Caregiving	638	7.7	8	12	3.486
	Father Present/Supportive	638	5.72	5	1	3.794
	Kinship/Sibling Supports	638	6.66	6	4	3.46
	Community Support	638	6.19	6	4	3.342
Infancy	Mother Safe	638	7.12	7	12	3.638
	Mother Attuned/Responsive	638	7.06	7	12	3.36
	Primary Caregiving	638	7.48	8	12	3.276
	Father Present/Supportive	638	5.48	5	1	3.66
	Kinship/Sibling Supports	638	6.81	6	4	3.248
	Community Support	638	6.14	6	4	3.274
Early Childhood	Mother Safe	638	7.08	7	12	3.664
	Mother Attuned/Responsive	638	6.86	7	10	3.292
	Primary Caregiving	638	7.22	7	7	3.087
	Father Present/Supportive	638	5.36	4	1	3.647
	Kinship/Sibling Supports	638	6.91	7	10	3.07
	Community Support	638	6.46	6	3	3.165
Childhood	Mother Attuned/Responsive	638	7.06	7	10	3.168
	Primary Caregiving	638	7.43	8	6	2.909
	Father Present/Supportive	638	6.37	6	10	3.443
	Kinship/Sibling Supports	638	7.08	7	10	2.841
	Peer-School Supports	638	5.83	5	3	2.665
	Community Support	638	7.08	7	7	2.64

Scan for Predictor Correlations

Bivariate correlations of every adverse event variable and the dissociative continuum showed a pervasive inverse relationship. The more severe the adverse event (high rating) the lower was the assessed dissociative continuum score. The pattern was persistent for all stages of development. Effect sizes for the relationships were near, or above, medium. The strongest relationship seemed to be between dissociative continuum score and each of the six types of historic antecedents experienced during early childhood, compared to relationships observed at other developmental stages. The results of scanned adverse events are presented in Table 8.

Table 8: Correlations Between Adverse Events and Dissociative Continuum

	Maternal Factors	Drug/ EtOH	Depression /Neglect	Domestic Violence	Transitions/ Chaos Distress	Other Trauma
Intrauterine	-0.241	-0.212	-0.28	-0.251	-0.271	-0.22
Perinatal	-0.295	-0.223	-0.314	-0.253	-0.28	-0.224
Infancy	-0.331	-0.251	-0.324	-0.274	-0.319	-0.274
Early Childhood	-0.32	-0.236	-0.323	-0.278	-0.325	-0.289
Childhood	-0.33	-0.212	-0.281	-0.19	-0.231	-0.241

Note. All Pearson Coefficients are statistically significant beyond $p < .01$

A similar scan of all relational health variables, across all developmental periods, showed a pervasive positive relationship with dissociative continuum (see Table 9). The array of variables was a little more complicated in that relational health variables change somewhat from some developmental stages to other developmental stages. For example, “Peer-School Supports” didn’t appear until the childhood stage of development. “Wanted Pregnancy” only appeared during intrauterine stage of development.

"Community Support" didn't appear during intrauterine stage, but continued as a factor for all subsequent stages (see Table 9).

A general examination of the coefficients showed that there was some variation among the variables regarding strength of relationship (effect size) from one variable to another and from one developmental stage to another. The more striking finding, however, was that all the relational health variables showed a similarly positive correlation with dissociative continuum. For most variables, the strength of relationship was larger than "small" and many showed an effect size of "medium." Further analysis was warranted to draw conclusions beyond these generalities. In sum, adverse events inversely related to dissociative continuum development and relational health events positively related to dissociative continuum development.

Table 9: Correlations Between Relational Health Variables and Dissociative Continuum

	Wanted pregnancy	Mother Safe	Mother Supported	Mother Caregiving Hx	Father Present Supportive	Kinship Support
Intrauterine	0.222	0.245	0.246	0.275	0.249	0.215
	Mother Safe	Mother Attuned Responsive	Primary Caregiving	Father Present Supportive	Kinship Sibling Supports	Community Support
Perinatal	0.264	0.285	0.25	0.228	0.214	0.184
Infancy	0.272	0.307	0.278	0.278	0.25	0.197
Early Childhood	0.292	0.31	0.336	0.269	0.289	0.254
	Mother Attuned Responsive	Primary Caregiving	Father Present Supportive	Kinship Sibling Supports	Peer-School Supports	Community Support
Childhood	0.281	0.277	0.212	0.303	0.224	0.211

Note. All Pearson coefficients were statistically significant beyond $p < .01$

Model Building Choices

In addition to scanning historic antecedent variables for relationships to the dissociative continuum, correlation matrices revealed even stronger relationships among the presumed predictor variables. In one such matrix that revealed relationships among adverse events during early childhood stage of development, the Pearson correlation coefficient between "Primary Caregiving" and "Depression/Neglect" was $r = .84$

Most relationships between one predictor variable and another were not as high as .842, but nearly all were in the larger-than-typical (> .50) effect size category. Similar results were found in correlation matrices of the relational health variables, and within every developmental stage.

These findings changed the course of this investigation. The original study proposal intended to explore prediction models using multiple regression techniques. The high correlations among predictor variables and a preponderance of such relationships created insurmountable collinearity difficulties for that approach. Indeed, the relationships among the predictor variables far exceeded the strength of relationships that each had with the outcome variable.

An alternative modeling approach was pursued that contemplated collinearity might be an indication of common latent variables in operation – one for adverse events, and another for relational health events. It supposed that all adverse events contributed to a common scale, call it Total Adverse Events. And, it supposed that all relational health events contributed to a common scale, call it Total Relational Health. These scales were constructed as the sum of the six predictor scores from each stage of development.

Cronbach's Alpha was computed to test the viability that the six adverse events in each stage of development might aggregate to a common scale. Similarly, Cronbach's Alpha was also computed on the six relational health variables in each stage of development (see Table 10). All the scores were high for Cronbach's Alpha, all over .900 except one grouping, Total Relational Health for the Childhood Stage of development, where the Alpha was .859. These findings suggested that the predictor variables present a very strong internal consistency for the makeup of a scale. With such internal consistency, all six variables in each stage of development were retained in the scale for further analysis.

Table 10: Reliability of Aggregated Scales for Total Adverse Events and Total Relational Health

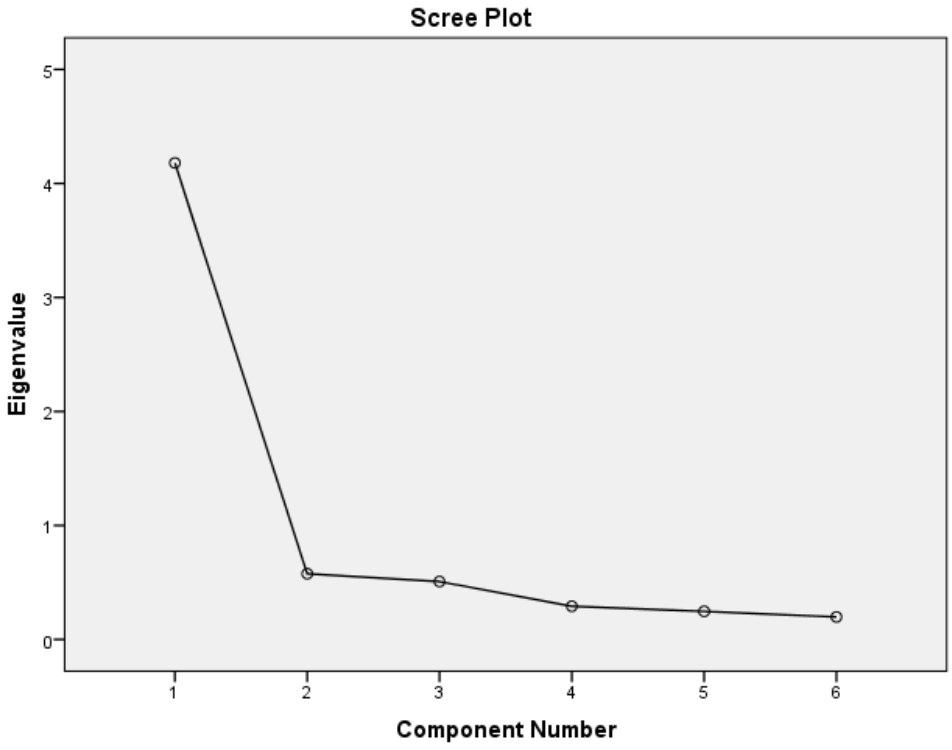
Internal Consistency for Establishing Two Scales: Total Adverse Events and Total Relational Health		
Developmental Stages	Total Adverse Events Cronbach's Alpha	Total Relational Health Cronbach's Alpha
Intrauterine	0.911	0.909
Perinatal	0.910	0.922
Infancy	0.922	0.924
Early Childhood	0.915	0.913
Childhood	0.903	0.859

The Cronbach's Alpha affirmed that the variables were reliable contributors to their respective scales (Total Adverse Events and Total Relational Health), but it couldn't determine if the scales were unidimensional or multidimensional. That is, did the scale

measure one thing, or several things? Exploratory factor analysis, using the principal component approach, was conducted to examine this question.

Exploratory factor analysis, using the principal component extraction approach, was conducted on the aggregated scales for Total Adverse Events and Total Relational Health in each developmental stage. The computations were carried out using IBM-SPSS ver. 20 statistical package. Scree plots and eigenvalue tables for each principle component analysis strongly indicated that the scales are unidimensional. In each instance, the first component captured about seventy percent of the variance with an eigenvalue over four, and then for subsequent components eigenvalues dropped well below one. Conventionally, an eigenvalue should exceed "one" in order for a component to be considered a viable factor (Leech et al., 2008, p. 66).

Figure 2: Principal Component for Intrauterine Adverse Event



Taken altogether, the Cronbach's Alpha analyses and the exploratory factor analyses supported the approach to model building which compiles variables into aggregated scales; viz., Total Adverse Events and Total Relational Health.

Table 11: Eigenvalues for Principal Component Analysis of Adverse Events during Intrauterine Stage

Component	Total Variance Explained					
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.18	69.669	69.669	4.18	69.669	69.669
2	0.576	9.608	79.278			
3	0.508	8.465	87.743			
4	0.291	4.856	92.599			
5	0.246	4.107	96.706			
6	0.198	3.294	100			

Note. Extraction Method: Principal Component Analysis.

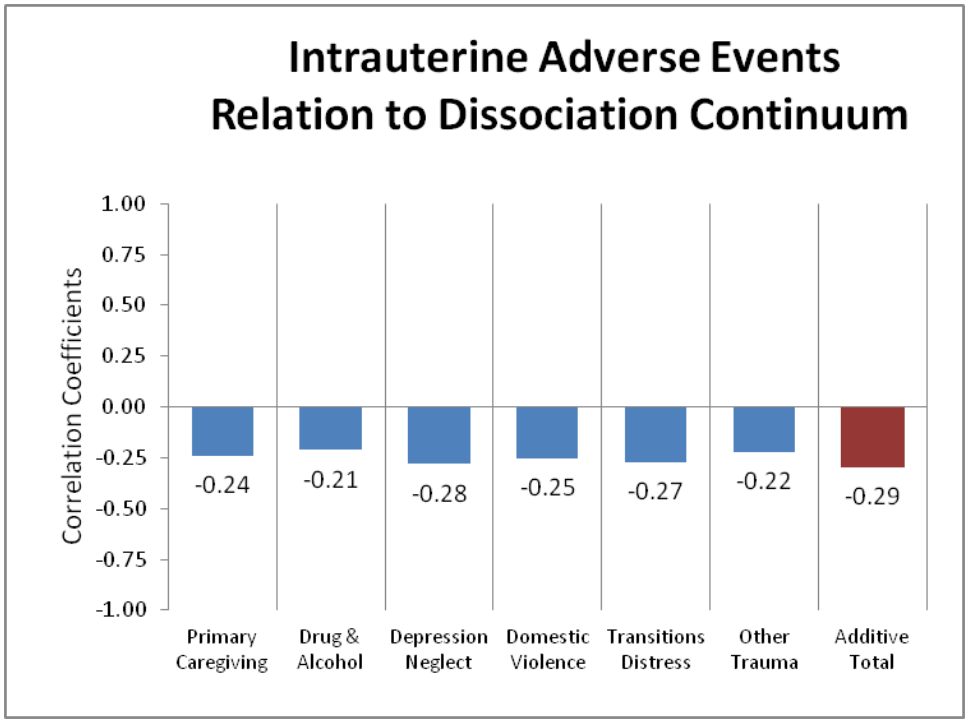
Figure 2 and Table 11 show the results of the principal component analysis for adverse events during the intrauterine stage of development. The first component has an eigenvalue of 4.180 and explains 69.669% of the variance. Subsequent components have eigenvalues below 1.0 and explain less than 10% of variance in each case. Repeated analyses for each stage of development and for relational health variables as well, revealed similar findings.

The Two-Factor Prediction Model

The two factors, Total Adverse Events and Total Relational Health, showed merit as predictors of dissociative continuum score when their correlation coefficients were compared with those of the individual variables comprising each scale. In most instances, Total Adverse Events showed a slightly stronger relationship to dissociative

continuum score compared to individual adverse event variables. One exception was a single adverse event variable from childhood stage of development; i.e., troubles with "primary caregiving" showed a stronger relationship to score on the dissociative continuum scale than the Total Adverse Events. Figures 4a through Figure 4e illustrate the comparisons. The Total Adverse Events coefficient is presented in red. Notice all coefficients are in the negative range, indicating inverse relationships between adverse events and dissociation scale score.

Figure 3a: Correlation of Adverse Events during Intrauterine Stage



It is worth reiterating here that the Total Adverse Events scale is a quantification of adversity factors. That is, the higher the number on this scale, the more adversity the person has experienced. The Total Relational Health is a quantification of resiliency

factors. That is, the higher the number, the stronger the relational health factors the person has experienced. The Dissociation Continuum is a quantification of dissociation. That is, the higher the score the more organized and adaptive the capacity to dissociate. There is a positive relationship between Relation Health Events and dissociation and a negative relationship between Adverse Events and dissociation.

Figure 3b: Correlation of Adverse Events during Perinatal Stage

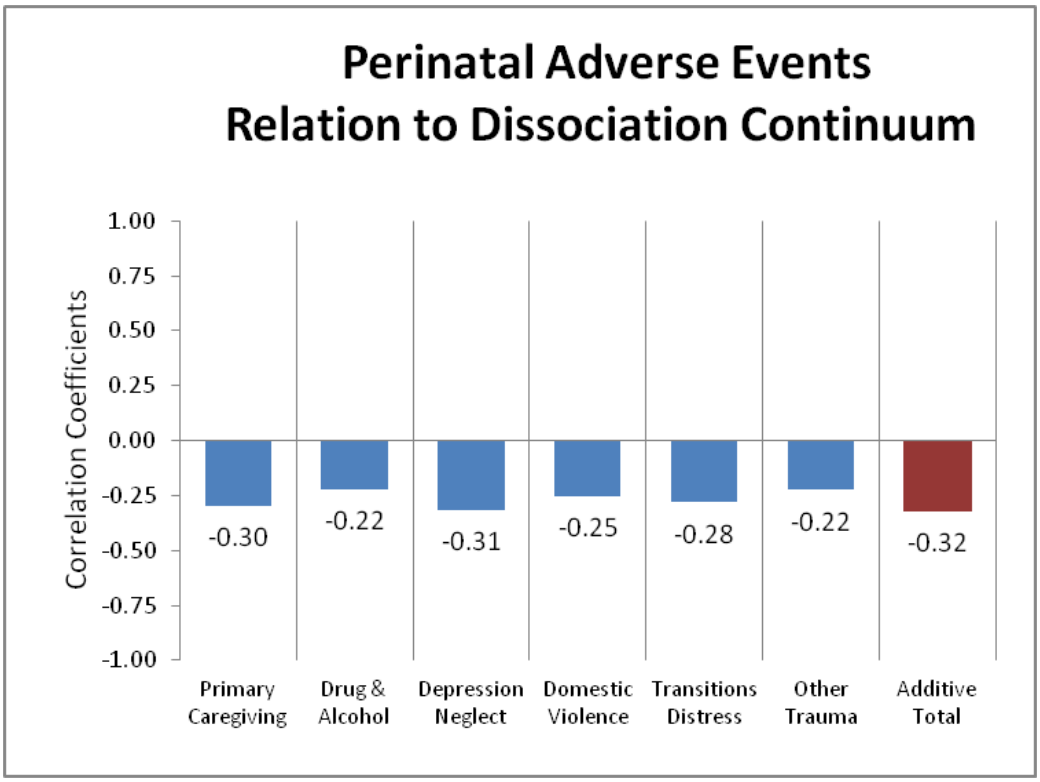


Figure 3c: Correlations of Adverse Events during Infancy Stage

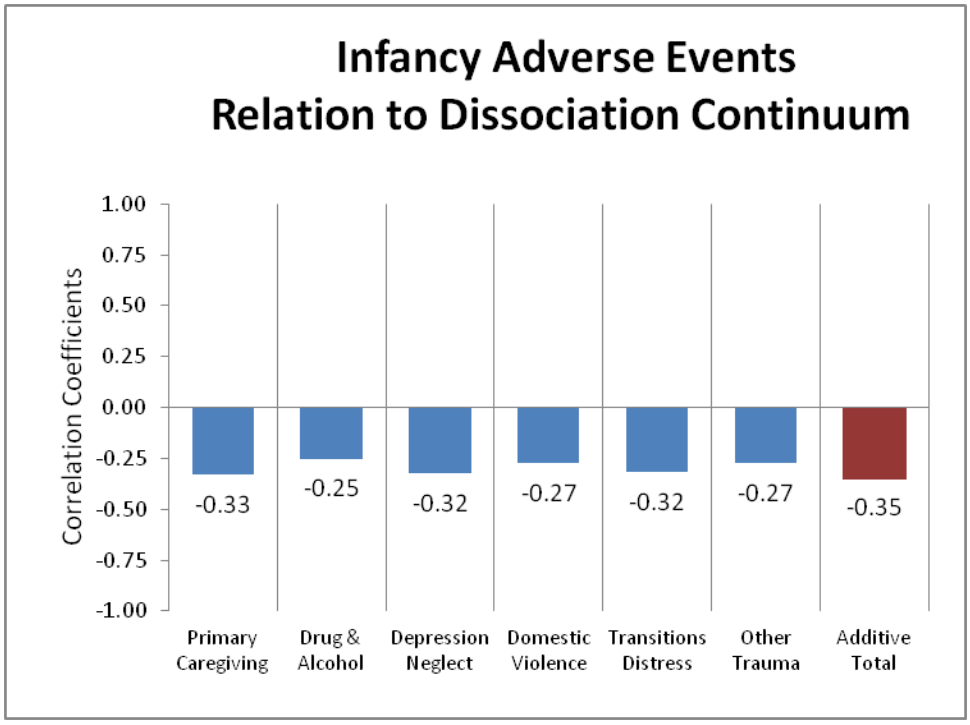


Figure 3d: Correlations of Adverse Events during Early Childhood

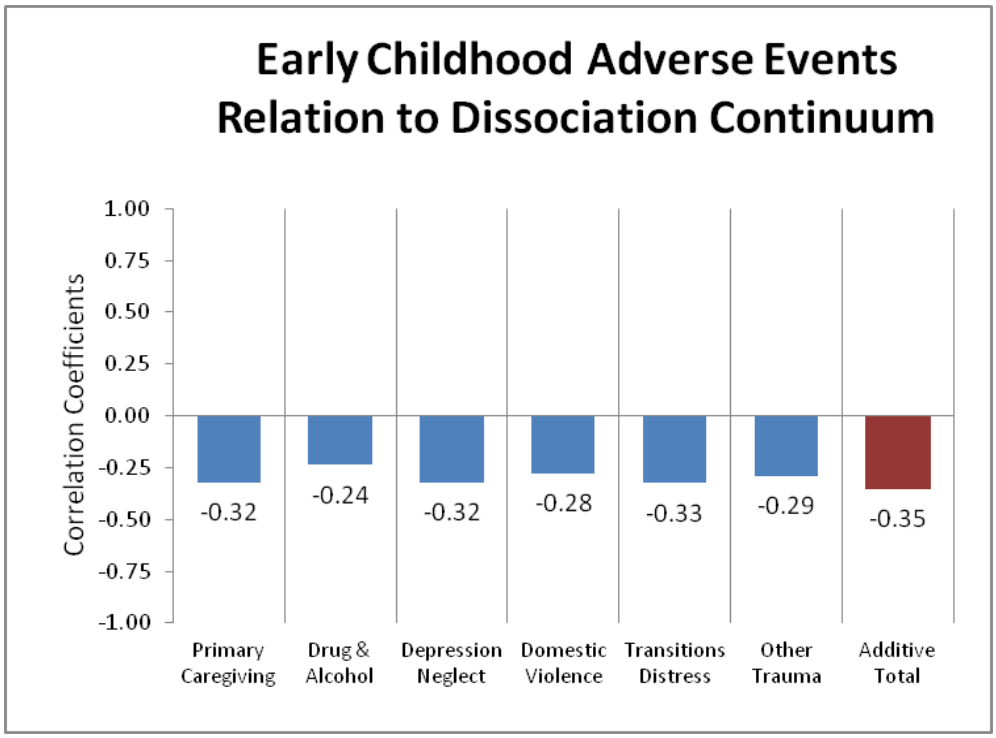
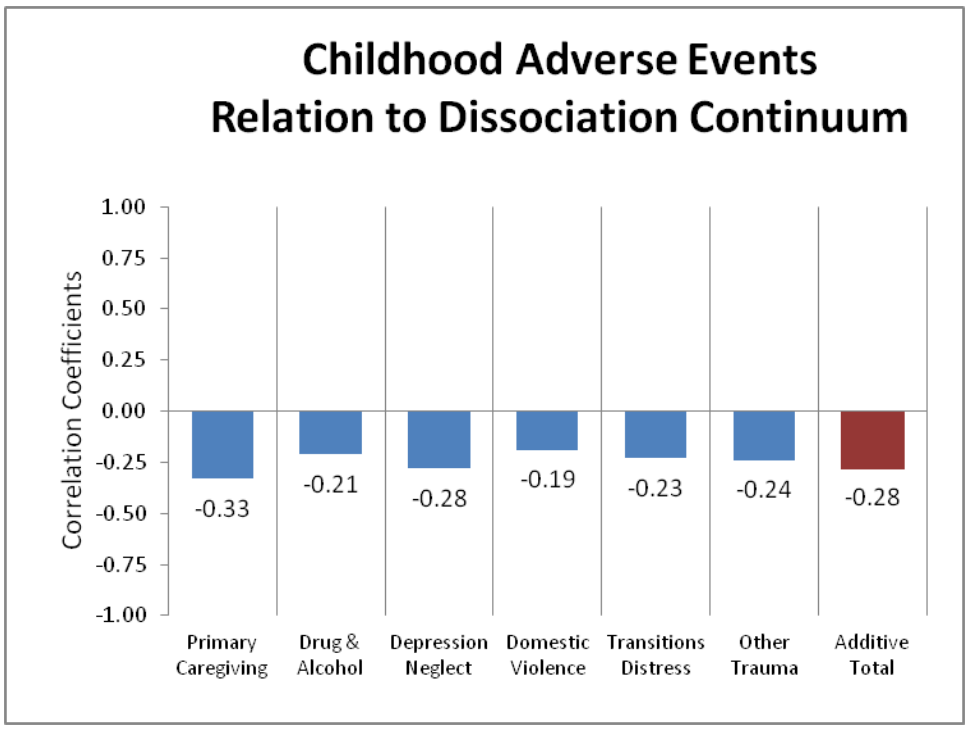


Figure 3e: Correlations of Adverse Events during Childhood Stage



In most instances, Total Relational Health showed an equal or stronger relationship to dissociative continuum scale score than individual relational health variables. The one exception occurred with a single relational health variable during perinatal stage of development. The variable "mother attuned / responsive" showed a slightly stronger relationship to score on the dissociative continuum scale than Total Relational Health. During the infancy stage of development, the same variable showed an equally strong relationship to dissociative continuum score as Total Relational Health. Figures 4a through Figure 4e illustrate the comparisons. Total Relational Health coefficients are presented in green. Notice that all coefficients are in the positive range, indicating a positive, or direct, relationship between relational health scores and levels on the dissociative continuum scale.

Figure 4a: Correlations of Relational Health during Intrauterine Stage

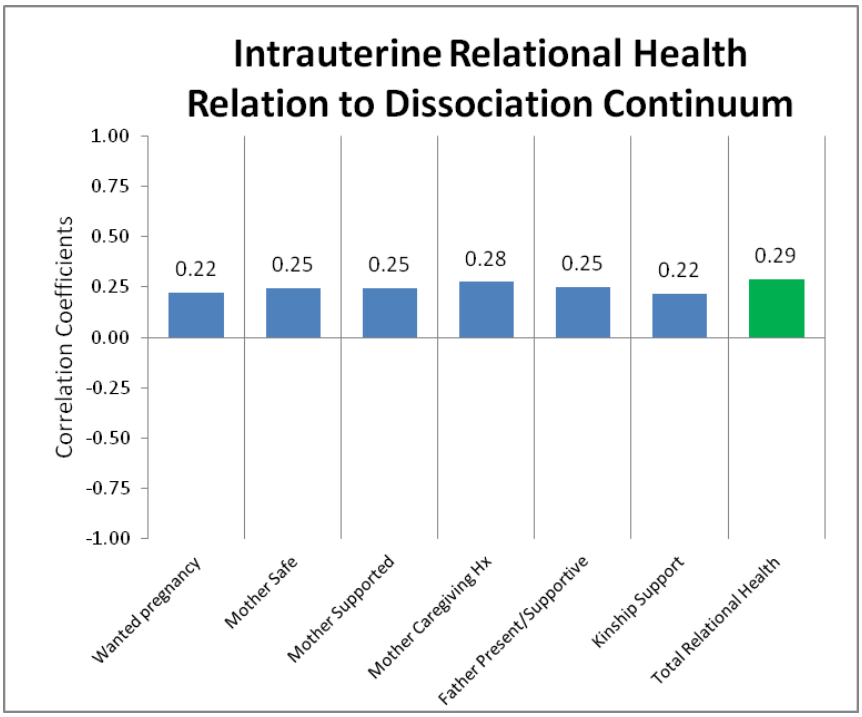


Figure 4b: Correlations of Relational Health during Perinatal Stage

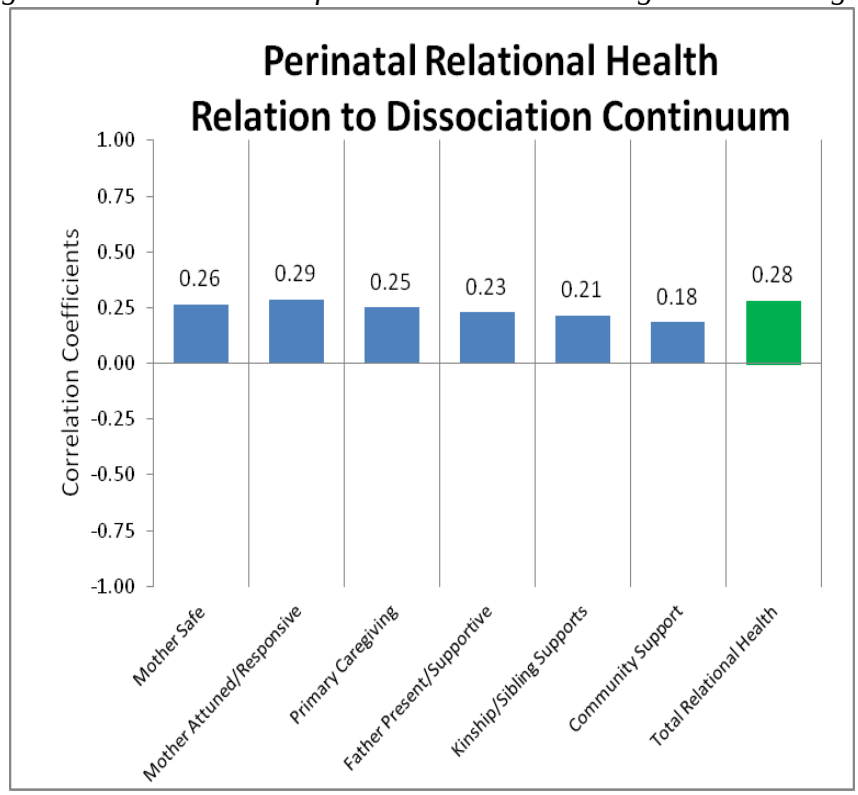


Figure 4c: Correlations of Relational Health during Infancy Stage

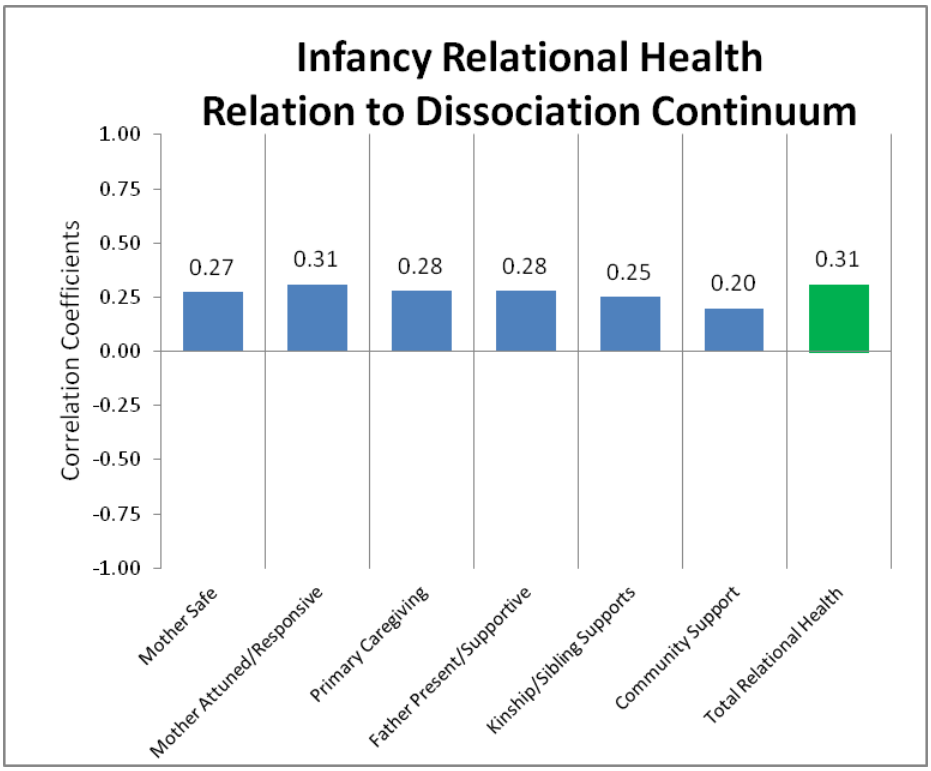


Figure 4d: Correlations of Relational Health during Early Childhood

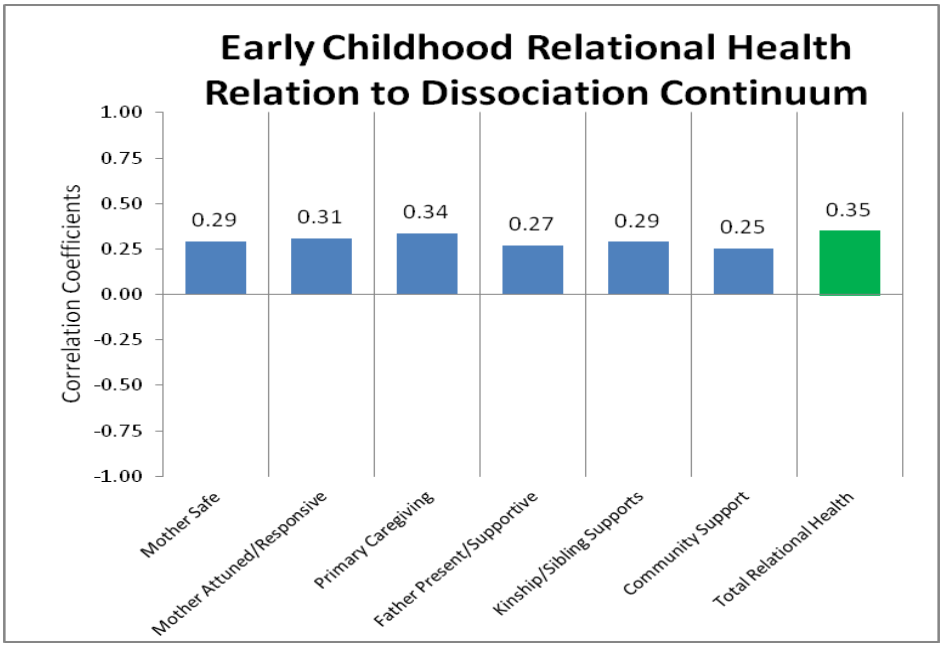
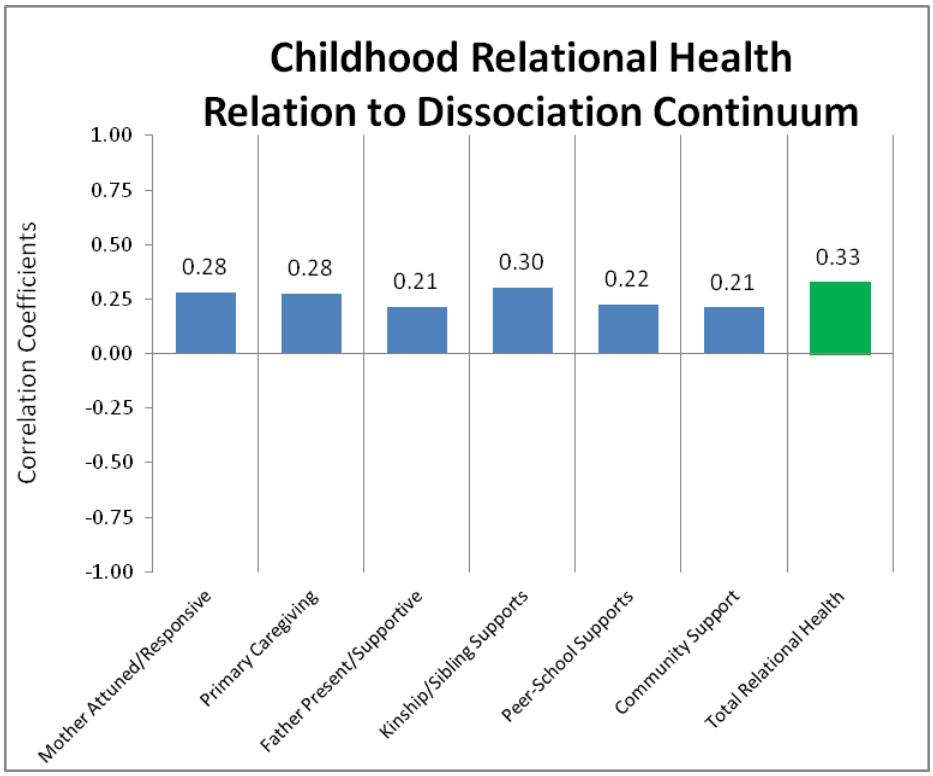
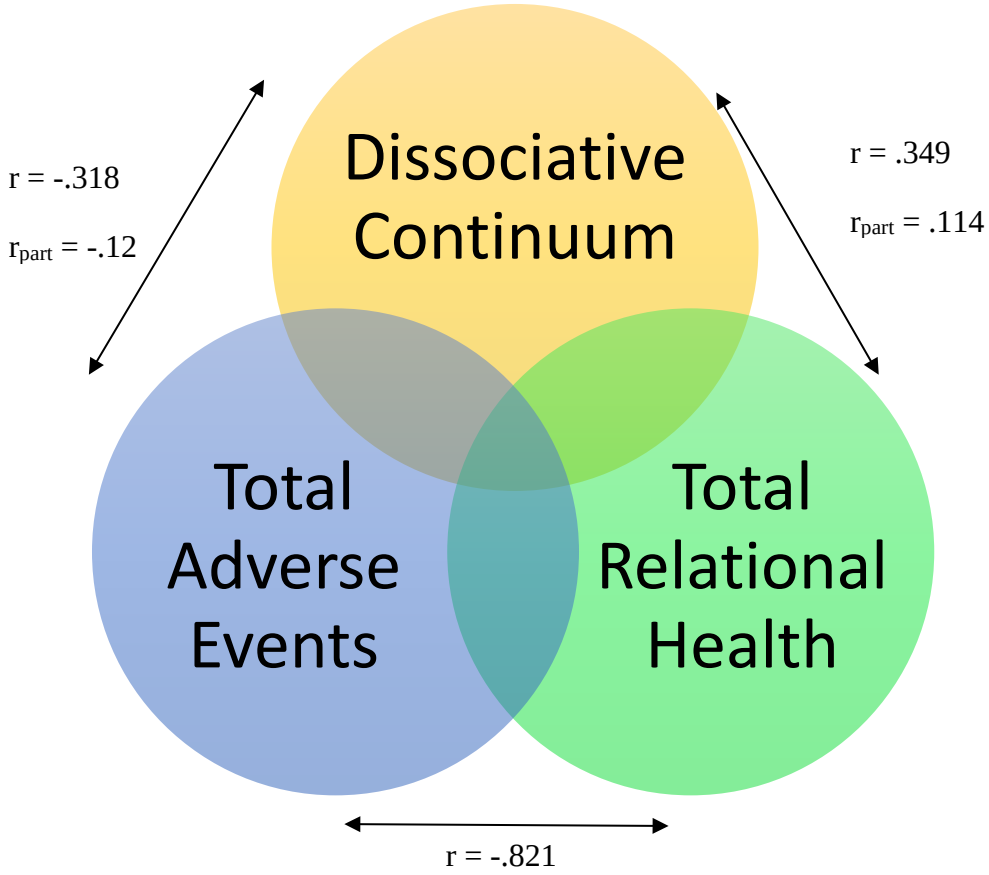


Figure 4e: Correlations of Relational Health during Childhood



The two factors, Total Adverse Events and Total Relational Health, offered a slight, but consistent, improvement over individual variables alone as predictors of dissociative continuum. Their relationships operated in opposite directions, however, where Total Adverse Events was inversely correlated with dissociative continuum, and Total Relational Health was positively, or directly, associated with dissociative continuum. The two factors, themselves, showed a very strong inverse relationship. It was pertinent to ask, “do these factors relate to dissociative continuum independent of each other, or is there some mutual dependency?” This was explored using partial correlation.

Figure 5: Correlations and Partial Correlations among Dissociative Continuum and Total Adverse Events and Total Relational Health Events.



The partial correlations (see Figure 6) demonstrated that controlling for one of the two factors greatly attenuated the relationship effect size of the other factor. From the illustrated example in Figure 6, Total Adverse Events was correlated with dissociative continuum with a coefficient of *r* = -.318. This relationship was attenuated to a coefficient of *r* = -.12 when Total Relational Health was controlled in a partial correlation. Similarly, Total Relational Health was correlated with dissociative continuum with a coefficient of *r* = .349. This relationship was attenuated to a coefficient of *r* = .114 when Total Adverse Events was controlled in a partial correlation. In all cases across every developmental stage, controlling one of the factors attenuated the

effect size of the other factor from “medium” effect size to “small” effect size.

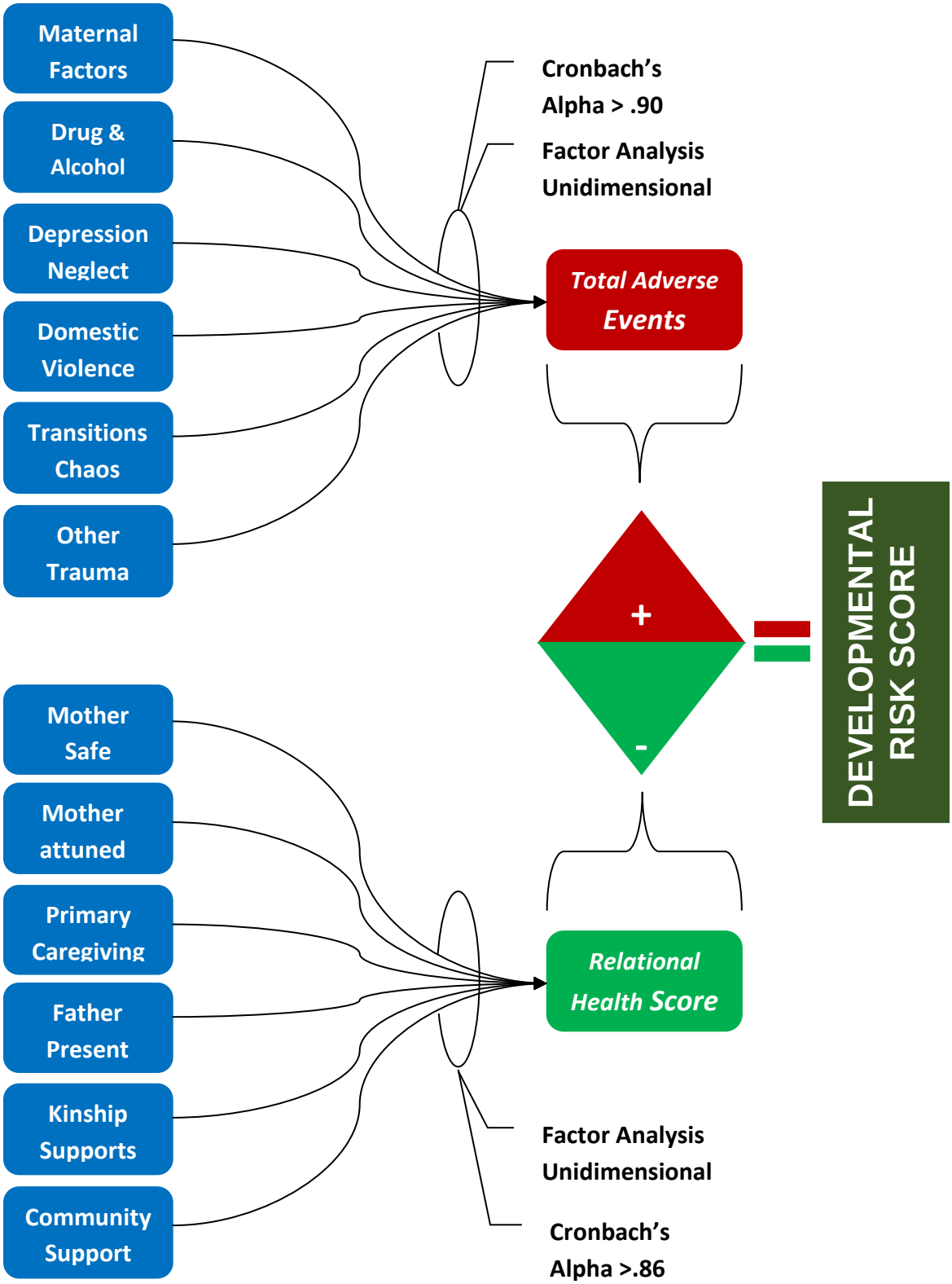
The Composite Model of Prediction

The interdependence of the two factors suggested they might combine to make an improved prediction model. A composite variable was constructed from the combination of Total Adverse Events and Total Relational Health. Given the two variables had opposite valence in their relationship to dissociative continuum, they were combined as a difference score, rather than an additive score. The new variable was designated as Developmental Risk and computed as:

(Total Adverse Events *minus* Total Relational Health)

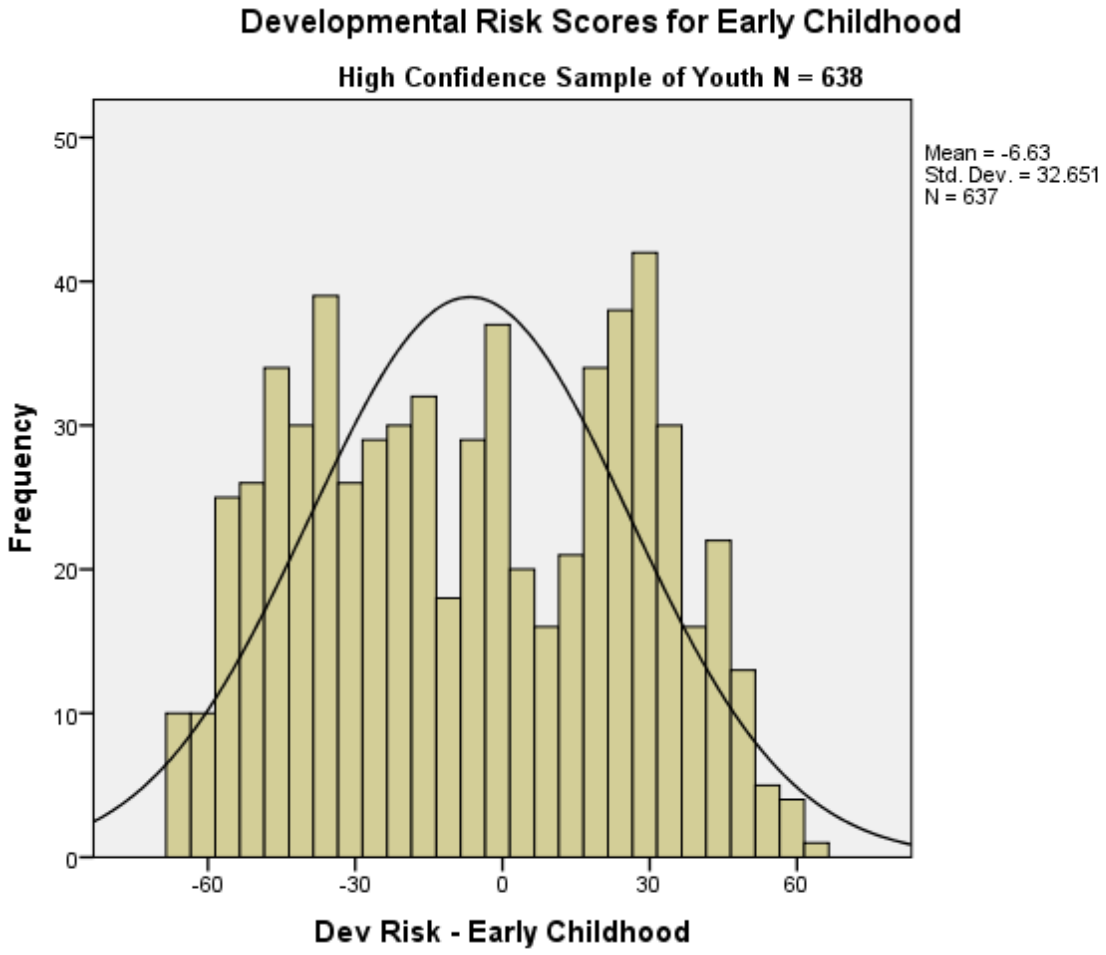
Developmental Risk was higher when Total Adverse Events exceeded Total Relational Health. Contrariwise, Developmental Risk was lower when Total Relational Health exceeded Total Adverse Events. The composite model is illustrated in Figure 7. A sample distribution of Developmental Risk scores from the Early Childhood developmental stage was generated and is presented in Figure 6. The full range of the scale was populated.

Figure 6: Structure of Composite Model of Prediction



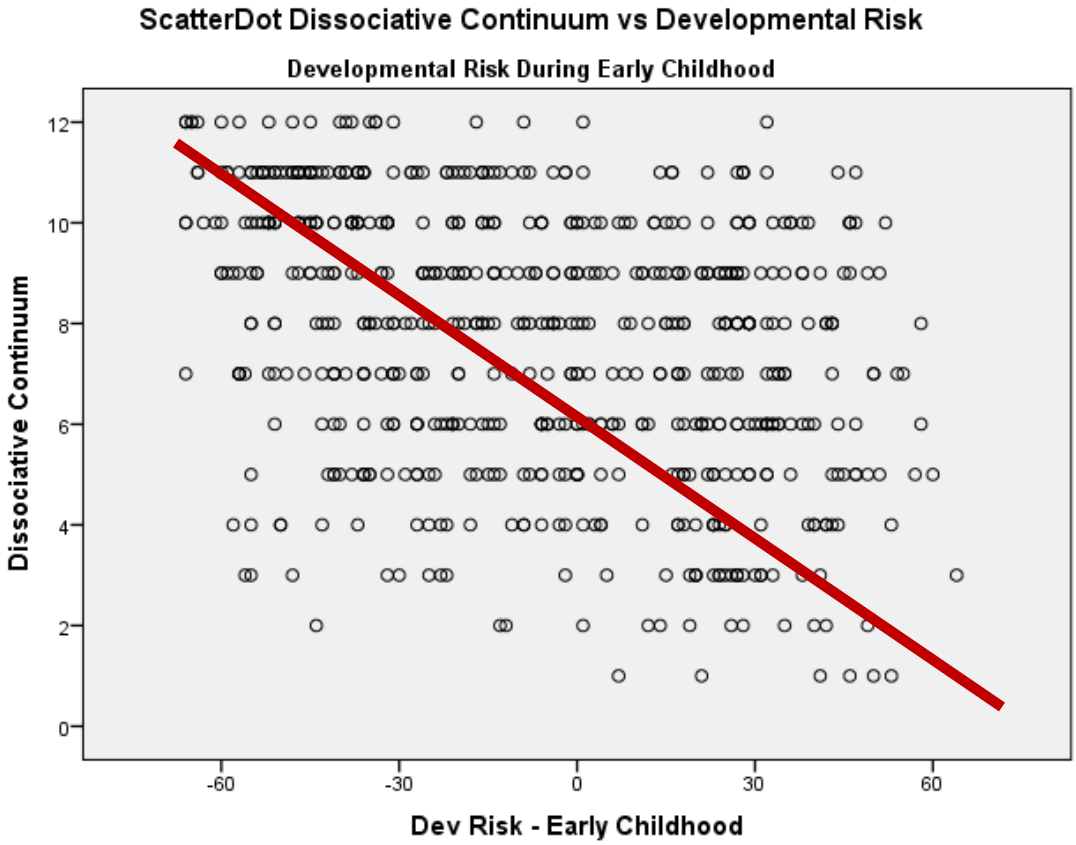
The scale for Developmental Risk was twice the range of the two factor variables. Total Adverse Events, for example, was the additive sum of the six adverse event variables, each scored from 1-12. So, Total Adverse Events ranged 6-72. Similarly, Total Relational Health was the additive sum of relational health variables, each scored from 1-12. So, Total Relational Health ranged 6-12. Total Developmental Risk combined these as a difference sum, so the range was -66 to +66, with a midpoint of zero.

Figure 7: Frequency Distribution of Developmental Risk Scores



A scatter plot was generated with SPSS graphic tools to visualize the relationship between Developmental Risk and dissociative continuum score. The resolution was limited because the dissociative continuum scale is only 12 points. Nevertheless, a linear relationship with a negative slope can be surmised on visual examination.

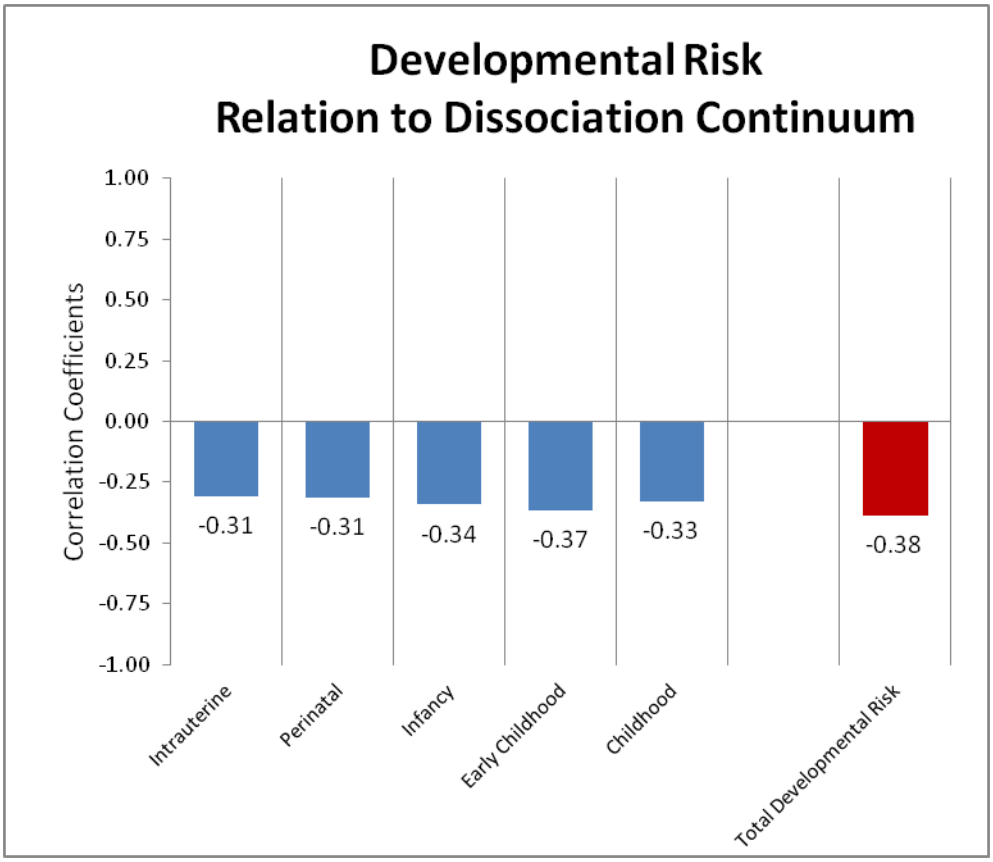
Figure 8: Scatter Plot of Dissociative Continuum vs. Developmental Risk



Pearson correlations were computed for dissociative continuum and Developmental Risk scores for each developmental stage, and for a Total Developmental

Risk score that combined Developmental Risk scores from all developmental stages (see Figure 10).

Figure 9: Correlations of Developmental Risk from All Stages of Development



Developmental Risk scores provided a slight gain in effect size for predicting dissociative continuum scale score, especially in the latter stages of development; i.e., Early Childhood and Childhood. The most substantial gain in effect size was realized by combining Developmental Risk scores across all developmental stages, with a coefficient of r = -.38.

Concurrent Relational Health Variables as Predictors

An examination of current relational health factors revealed associations with dissociative continuum (see Table 12). Correlations of "medium" effect size ($r > .30$) were found with current relational health pertaining to: Mother, Extended Family, School/Peers, and Sports/Clubs. Effect sizes between "small" and "medium" were found for the relationship between score on the dissociation continuum scale and current relational health pertaining to: Primary Caregivers, Father/Male, Siblings, and Community/Culture. The weakest relationship was found with current relational health pertaining to Therapy/Tutor.

Table 12: Correlations of Current Relational Health Variables with Dissociative Continuum

	Coefficients
History of Relational Health	0.44
Current Relational Health – Mother	0.321
Current Relational Health – Primary Caregivers	0.267
Current Relational Health – Father/Male	0.23
Current Relational Health – Siblings	0.284
Current Relational Health – Extended Family	0.321
Current Relational Health – School /Peers	0.367
Current Relational Health – Therapy/Tutor	0.182
Current Relational Health – Sports/Clubs	0.338
Current Relational Health – Community/Cultural	0.271

Note. All Pearson correlation coefficients statistically significant beyond $p<.01$

One of the factors recorded in the current relational health assessments was the clinicians' summary assessment of the client's history of relational health. This factor showed the strongest relationship ($r = .440$) of all associations to dissociative continuum examined in this study.

The “history of relational health” is derived by clinicians globally assessing the client’s relational health history inclusive of all ages and stages. The clinician assigns a number from 1-12 estimating their overall impression of the client’s relational history. The previous measures of historical relational health measures were numbers assigned to the specific developmental stages of the client. However, the current relational health history measures an overall impression by the clinician.

In conclusion, there are several noteworthy results. All adverse event variables were inversely related to dissociative continuum scores. Higher adversity was associated with lower (unhealthy) dissociative continuum scores. All relational health variables were directly related to dissociative continuum scores. Higher relational health was associated with higher (healthier) dissociative continuum scores.

Adverse event variables combine to generate a scale of total adversity and do so with very high internal consistency (Cronbach’s Alpha) and show a unidimensional scale (Principal Component Analysis). Relational health variables combine to generate a scale of total relational health and do so with a very high internal consistency (Cronbach’s Alpha) and show a unidimensional scale (Principal Component Analysis).

The two “total” scales (total adversity and total relational health) showed stronger relationships to dissociative continuum scores than individual adverse event variables or individual relational health variables. The two “total” scales (total adversity and total relational health) showed a very strong inverse relationship (r=.821) to each other. The two “total” scales (total adversity and total relational health) were mutually dependent for their strength of prediction of dissociation continuum scores.

Partial correlations found that controlling either for one variable attenuated the predictive strength of the other. Combining the two "total" scales as Total Adverse Experiences minus Total Relational Health yielded a single scale of Developmental Risk. Developmental Risk showed an inverse relationship to dissociative continuum scores. The higher the Developmental Risk score the lower (unhealthy) the Dissociative Continuum score. The sum of the Developmental Risk scores across all developmental stages yielded the largest effect size for correlations with dissociative continuum scores (r=-.38). Associations of varying effect sizes were also found between current relational health variables and dissociative continuum scores. The clinicians' rating of overall impression about the clients' relational health history showed a very strong direct relationship to dissociative continuum scores (r=.44).

CHAPTER 5: DISCUSSION

Trauma is a pervasive issue in our society and impacts 80% of the population (van der Kolk, 2014). Trauma is the number one cause of death for people ages 1-46 and the annual cost of trauma is 671 billion per year (CDC, 2015). When it comes to children, there are more than 3 million reported cases of abuse or neglect in the US and about 1 million of those cases are substantiated (Perry, 2009). Van der Kolk reports that we can help to resolve these traumas through appropriate prevention and intervention (van der Kolk, 2014). This study is designed to help realize this potential.

Summary of Findings

My study involved adolescents (11-18) and explored antecedents that help predict where the adolescents fell on a dissociation continuum scale. Dissociation is a continuum experience. It is an innate response hardwired within individuals. Further, what happens in one stage of development potentially influences future functioning throughout the lifespan. The findings from my research show that we can partially predict where an adolescent will fall on the dissociation continuum, ranging from more functional types of dissociation to maladaptive patterns, if we have detailed information about their childhood experiences.

Dissociation can serve adaptive purposes for people. Dissociation can function as a proximity seeking measure in the enhancement of relationships (Allen, 2015). The statistical analyses in this research demonstrated that adolescents with highly organized dissociative functioning also had high scores on relational health outcome measures. Though I cannot infer a causal relationship, I can conclude there is a high correlation

between the two variables. This highlights the adaptive capacity of dissociation as applied to relational functioning and subsequently reinforces the need to assess and treat dissociation from a strengths perspective.

Dissociation is a continuum experience, meaning people experience dissociation in varying degrees. Some people have highly organized dissociative tendencies that are adaptive and other people have poorly organized dissociative tendencies that are maladaptive. This study quantified dissociation on a continuum scale from 1-12 for individuals. Scores from 1-3 indicated poorly organized dissociative functioning. This type of dissociation is maladaptive and pathological in that it can influence cognitive functioning, emotional regulation, memory, and even self-awareness. This would be applicable to people diagnosed with various dissociative disorders such as Dissociative Identity Disorder (DID), Dissociative Amnesia Disorder, and Depersonalization/Derealization Disorder. Scores from 10-12 indicated highly organized dissociation functioning. These types of dissociative tendencies are referred to in the literature as normative mind wandering and day dreaming. The scale used in this study provided quantification of the range of dissociative tendencies people experience and can help further the assessment of dissociation as it relates to adaptive functioning. Because dissociation is an innate capacity within people, it is universal and ubiquitous. Gruberger et al. (2011) state that neuroscience has discovered the physical structures within the brain that mediate dissociative function. This is relevant because clinicians can target interventions to specific areas of brain functioning in treating trauma (Perry, 2009). For example, if the trauma occurred prior to the person learning language, traditional talk

therapies are less effective; the clinician should use somatic therapies to help organize the subcortical regions of the brain (Perry, 2009). Since clinicians often miss and/or misinterpret dissociative tendencies, this incomplete or inaccurate diagnosis has implications for treatment as will be discussed in a subsequent section (Spiegel, 2006).

The findings of this study revealed that there are antecedents, or historical events in the life of the adolescents, that can partially predict where an adolescent falls on the dissociation continuum. Higher levels of adversity in a child's experiences are correlated more disorganized and less functional types of dissociation. The more relational health the child experiences, the more organized and adaptive is their dissociation during the adolescent years. This has implications for assessing dissociation and addressing risk and protective factors related to its development, including how corrective relationships may serve as a protective factor in remediating pathological dissociation.

Neurobiological research has found that "states make traits" (Perry, 2006), meaning that states experienced in earlier stages of development influence capabilities, or traits, in subsequent stages. The findings of this study provide empirical support for this. There was consistency of effect size scores throughout the developmental stages. If there were adverse events in the intrauterine stage of development, it carried through subsequent stages of development. Conversely, if there was strong relational health in the intrauterine stage of development, then this carried through into adolescence. Therefore, we see from this research that in fact "states" in a previous stage of development do carry through into future stages of development. The states of either stress or relational health become codified in the developing child. This will be discussed

further in the “Implications for Treatment” section.

The strongest correlations and the highest effect sizes were when these variables were aggregated together. It is not possible to separate out the adverse variables and the relational health variables without affecting the predictive power. There is a strong collinearity that exists among the predictor variables. When something “bad” happens at home, such as domestic violence, other adverse events typically occur. Conversely, when “good” things happen in the home, such as attuned caregiving, other relational health events typically follow. Thus, when we aggregate these variables, we can partially predict where the adolescent will fall on the dissociation continuum. This is helpful to clinicians as it can serve as a guide in the assessment and intervention phases of treatment. This will be discussed more in the section for “Implications for Treatment.”

This study addresses important practice issues as prioritized in the social work profession. In January 2016, the American Academy of Social Work and Social Welfare identified 12 grand challenges for the social work profession (Bent-Goodley, 2016). The intent was to facilitate focus in the profession in a collective fashion so more can be accomplished in the field. “It is important that social workers become familiar with the grand challenges and understand that each practitioner has a role to play in advancing solutions and creating lasting change, particularly in the areas in which they practice or have influence” (Bent-Goodley, 2016, p. 197).

The first of the 12 Grand Challenges of Social Work is to ensure healthy development for all youth. (Bent-Goodley, 2016). The focus in clinical work with children is to help them get back on their developmental trajectory in an adaptive way.

While this study has applicability to several of the grand challenges, it addresses this first challenge most clearly since one of the biggest risks to healthy development is trauma. Since dissociation is one of the common reactions to trauma, this study's focus on assessing and treating it, may inform efforts to facilitate healthy development.

Implications for Treatment

The aggregated information from this study is helpful to clinicians in both assessment and treatment. As noted, single variables (adversity or relational health) had very small effect sizes in their ability to predict where an adolescent will fall on the dissociative continuum. The aggregate of the variables had a stronger predictive power of where an adolescent client will fall on the dissociation continuum.

As such, the results of this study provide a structure for the assessment process. The findings indicate several factors that clinicians should focus on with clients in order to fully assess the functional capacity of their dissociation. Clinicians should specifically assess the adversity clients have experienced related to substance abuse, domestic violence, depression/neglect, transitions, and other traumas. They should also assess how clients have experienced the attunement of caregivers. More specifically, the presence of fathers, supportive extended family relationships, supportive school relationships, and supportive community relationships are measures identified for relational health. These two areas of assessment can steer the clinician to where an adolescent client may fall on the dissociation continuum and therefore, indicate to what extent the client's dissociation may be function and adaptive. These two areas of assessment are only part of the assessment process and can assist the clinician in the assessment process.

This specificity can help mitigate ambiguity in the assessment process and more efficiently identify areas of vulnerability. With the identification of explicit experiences to consider, clinicians can more directly identify targets for intervention, factors that facilitate healing, and protective factors that may prevent further trauma.

For treatment, explicit assessment of scores on the dissociation continuum can focus clinicians in their interpretation of such dissociation. For instance, rather than interpreting dissociation as "disinterest," "resistance," or "lack of readiness for change," a low score on the continuum can alert the clinician that this dissociation is actually adaptive. By targeting the level of dissociation on a continuum, clinicians can better assess and mediate client capacities with appropriate interventions. Lower dissociative continuum scores for instance, are indicative of a sensitized stress response, and therefore more amenable to somatic therapies versus logic-based interventions (Perry, 2009). In addition, by assessing dissociation as a continuum experience, clinicians can assess how it is learned, potentially adaptive or maladaptive, especially as a behavior of proximity seeking.

Bromberg (2017), for instance, asserted that dissociation may actually be necessary to enhance the therapeutic connection in that it allows the client's typical defenses to be averted for more meaningful connection with the therapist. He further asserted that in dissociative states, the client experiences and communicates "affectively organized truths" rather than logically formulated responses (Bromberg, 2017, p.25). These emotionally charged realities are experiences that may precede and/or preclude language. They may be subcortical in their origin and therefore not necessarily

conceptually certain, yet important nonetheless as they carry significant emotional valence. This has direct implications for clinicians' countertransference reactions, especially when clients need corrective relating from the clinician. If the clinician is able to view the dissociation as an attempt to relate, they are less likely to rebuff those attempts by categorizing the client as "resistant." This in turn has direct implications for enhancing the therapeutic relationship.

In relation to this, should the client display maladaptive dissociation with the worker, the clinician can use this to further strengthen the therapeutic rapport. As noted by Strait (2016), clinicians often experience dissociative tendencies as fractures in the engagement process. It was called a "paralyzed retreat" by one clinician (Strait, 2016). Bromberg (2017) echoed this sentiment when he wrote that the dissociative state allows the worker to access information that was previously inaccessible. This information includes experiences that have been unbearable and unshareable for the client; this is referred to as "right-brain to right-brain sharing" – where the communication process is intuited and affectively informed, thus resulting in a deeper resonance (Bromberg, 2017, p. 25). The results of this study indicated that by identifying where on the continuum the dissociation falls, clinicians can use the dissociative field as a place to meet the client where they are with appropriately targeted interventions.

Because dissociation is universal and innate, the implications for treatment include alterations of the goals in therapy. Specifically, the goal of treatment may need to be to enhance the functional capacity to dissociate, rather than to neutralize it. The results of this study and the literature of Schore (2003) and Bromberg (2017), provide

support for this shift in clinical focus, from elimination to enhancement. Similarly, the conceptual framework provided by attachment theory supports this shift, in that it can facilitate corrective relating in the therapeutic dyad and help remediate the effects of trauma.

The assessment of traits in specific developmental phases has implications for clinicians in targeting interventions to disrupt these traits from becoming solidified in dynamic functioning throughout the life cycle. Since a common symptom of trauma is a disruption in emotional regulation, clinicians need to employ interventions in their work that help the client develop these skills. Rothschild (2000) and van der Kolk (2014) have been proponents of somatic therapies in addressing problems with dysregulation. Each has emphasized the importance of yoga, breathing, and progressive muscle relaxation strategies as critical to the treatment of trauma. Perry (2006), for instance, reported on his treatment with a traumatized child and how massage therapy was central to the healing process of the trauma. He underscored what Rothschild and van der Kolk had advocated in highlighting somatic therapies that incorporate body work and help regulate functioning at the limbic level of brain functioning (Perry, 2006).

By definition, trauma is an event perpetrated upon a person resulting in a highly sensitized stress response. This leads to hyperarousal within the individual. Therefore, relaxing the stress response and inducing a state of calm is required in treatment (Perry, 2009). These somatic therapy techniques, including breathing, meditation, and yoga, are particularly important and effective (van der Kolk, 2014), if used within a corrective therapeutic relationship, that both imparts psychoeducation about regulation skills, and

serves as a grounding resource. This ties into the capacity for relational health, which when increased, can potentially influence functioning on the dissociation continuum. Similarly, family work can include coaching caregivers to provide this corrective, grounding relationship.

Professional relationships, specifically the "therapy/tutor" relationship had the least impact on where an adolescent ended up on the dissociative continuum according to my statistical analyses. This has potential implications for treatment in identifying the limitations of the therapeutic relationship. Analogous to the reconnection phase that Herman (2015) prescribed in her stage model for trauma treatment, clients need to experience relatedness in their functioning world. According to these results, it is important to involve a caregiver when working with a child to further the protective capability of relational health. Interventions that are attachment or relational based may be necessary to enhance connection between the parent and child. This coincides with lessons learned from attachment theory as well as more relationally focused dynamic therapies.

Reassessment of the Literature

As stated above, this study provided specific implications for assessment and treatment. These include assisting in a more accurate diagnosis, enhanced treatment, increased understanding of the interpersonal nature of dissociation, how dissociation impacts the clinical relationship, and the importance of relational health factors. The micro considerations will be followed by a discussion of mezzo and macro considerations

First, this data can assist with assessment. It can be used to help orient clinicians

to inquire more specifically about certain aspects in the client's history. The ACE study from Felitti et al. (1998) demonstrated that the more trauma a person had experienced the poorer their health outcomes were. The ACE study asked clients about 10 items, that required a "yes" or "no" answer. The data from my study included 38 variables, each scored on a scale of severity from 1-12. The dataset provided a richer compilation of historical factors and greater specificity about what areas of support to assess. Therefore, this study can expand upon our assessment of clients with trauma.

Dissociative disorders are often under-diagnosed (Spiegel, 2006). Many clinicians miss the signs and symptoms. This leads to an inaccurate diagnosis and subsequently prevents the clients from receiving the necessary treatment to treat their past trauma. The results of my research provide the clinician with specific questions that have predictive power in determining the adolescent client's needs. This data can be used to correctly and accurately diagnosis people.

Second, this data can assist in ensuring clients receive the proper treatment interventions. Once a client is correctly diagnosed, then a therapeutic approach that properly addresses their needs can be instituted. In reference to dissociation, this involves integration. If clients present with pathological forms of dissociative tendencies, then interventions that assist them with integrating these fragmented states can be selected. Also, it is important the clinician communicate to the client that their response is an innate and natural coping skill.

Third, my research suggests that dissociation is an interpersonal phenomenon. It has historically been considered an intrapsychic phenomenon. It has largely been

considered something that happens within an individual. What is emerging in the research from Allen (2015) is that people withdraw and tune out external stimuli that is painful, that is harm happening to them from another person. People do not dissociate *sui generis*. There is a clear cause, a clear etiology. The problem lies within the external stimuli. The external stimuli are the toxic agents threatening harm causing the person to withdraw. Thus, we can conceptualize dissociation as a two-person psychology, meaning one based on interrelatedness between client and helper. This in turn, has treatment implications.

Fourth, if dissociation is reflective of a two-person psychology, the clinician would be served well to examine its impact on the clinical relationship. As noted, most clinicians find dissociation intimidating. In the literature it is described as "unnerving" and "disturbing" (Strait, 2014, p. 312). Clinicians can feel awkward when engaging clients who are displaying dissociative symptoms. Because the relationship is primary in treatment, when a clinician feels a disconnect, or feels the client is "tuning them out," then the clinician can react to that by withdrawing and failing to connect with the client. My research normalizes dissociation and not only equips clinicians to expect some dissociative tendencies but encourages them to use these as invitations to enter into a resonance with the client. This resonance with the client's inner world may allow the worker to access fragmented aspects that the client finds difficult to put into language in talk therapy. Perhaps this client's inner world lacks a sense of safety, and dissociation is the only portal in. To learn to be comfortable in that sacred inner space upon which the client is allowing us to tread can be significant in developing a therapeutic alliance and

improving clinician outcomes.

If the client scores high in adverse events and has what has been traditionally considered as a disorganized dissociation, the clinician can interpret the client's dissociation from a strengths perspective. Even if a client scores high in adverse events and even though historically this has been viewed as pathological, clinicians can view it as adaptive proximity seeking. This allows us to be more client- centered in our treatment.

A fifth and final micro consideration is the importance of relational health factors. The relational health factors in my data set included the presence of safe, attuned, and supportive caregivers. If a clinician gathers data on these areas, they can then predict, to some degree, where an adolescent client will fall on the dissociation continuum. Unlike the ACE study from Felitti et al. (1998), my data includes resiliency factors. My research results have revealed that combining adverse events with relational health factors had more power to predict dissociation than any adverse event or relational health variable alone. The more relational health factors that were present, the more organized and adaptive a person's dissociation was. Traumatology is grateful to the ACE study. Its authors gave us helpful information and an excellent starting point. Future research should include strengths such as relational health factors. Thus, my research complements and further develops their work.

To summarize the micro considerations, the findings of my research suggest that no one single factor of risk carries significantly more weight than others. What does seem to matter is that the more risk factors you have and the longer period of time these

were experienced, the higher their impact. Therefore, clinicians should endeavor to ensure their assessments are as detailed and thorough as possible. The more information, the better.

Dissociation has hitherto been considered from a micro perspective, but there are mezzo and macro implications as well. On a mezzo level, advocacy efforts are represented by the popularity of a Trauma Informed Care (TIC) approach. TIC is a service provision model used in a variety of practice settings with the aim to enhance practice with people who have suffered trauma (Bowen & Murshid, 2016). TIC is undergirded by six core principles; these include (1) safety, (2) trust, (3) collaboration, (4) empowerment, (5) choice, and (6) intersectionality (Bowen & Murshid, 2016). TIC attempts to guide helping professionals to assess clients for their trauma and screen dysfunctional behaviors via a trauma-informed lens that include viewing these behaviors as attempts to adapt. TIC also sensitizes agencies to the fact they can inadvertently re-traumatize the people they set out to serve. By disempowering clients and lacking insight into triggers of the stress response system, some agencies end up harming the clients they seek to help. TIC is an advocacy effort to equip agencies to better serve people who have endured trauma. This research provides support for continued work on implementing trauma-informed care throughout our service systems, especially with the information provided about the often-misunderstood trauma symptom of dissociation.

On a macro level, there are efforts to broaden the definition of "trauma." This augmentation calls for the inclusion of history and context, with the expressed purpose to develop policies that affirm the experiences of all people groups, especially those whose

voices have been marginalized. Personal victimhood, for instance, is more acceptable within the current mental health paradigm than historical and/or current collective trauma (Maxwell, 2014). Maxwell defined historical trauma as the memories of people groups who have been oppressed, marginalized, and exploited (2014). These memories are traumatic as they chronically activate the stress response system, thwarting the potential of these people groups (Maxwell, 2014).

The concept of social trauma adds to historical trauma by asserting people are traumatized when social systems fail to protect (Lijtmaer, 2014). This emphasizes the importance of trauma-informed care in our service systems even if individualized trauma has not been identified. Social trauma is complex and multifaceted and requires an understanding of the intersectionality of race, class, and gender when developing policies designed to treat trauma (Quiros & Berger, 2015). People are traumatized when systems fail to protect, but also when these very systems inflict pain and threat upon people. Examples might include genocide, police brutality, and laws denying rights to certain groups. Impingement on human rights, such as the right to work, health care, and food, can result in exacerbating the symptoms of trauma (Steel, Bateman Steel, & Silove, 2009). Racism and ethnoviolence are also trauma (Helms, 2010). Persons of color have higher rates of PTSD (Helms, 2010). Helms argued that assessments are inappropriate for assessing stress reactions to racism (Helms, 2010). Some of the experiences of these people groups can be overlooked and marginalized. The lack of adequate assessment can result in less than adequate intervention. Therefore, policy changes need to be considered that amend our methods in various service systems to better assess and intervene with

various types of trauma.

On a macro level, efforts to impact the education, juvenile justice, and child welfare system should be considered. With the educational system, this research provides implications for teachers and classroom management. Educators can be challenged by the behaviors of students in their classrooms, and often this results in pathologizing students who may already be traumatized. The results of this study could assist teachers in better assessing their students who present with dissociative tendencies. This study provides specific questions to explore that help predict where a person falls on the dissociative continuum. Teachers can use this information to identify and then join with the student versus more punitive measures of classroom management. We know the dissociative response is primarily mediated by the diencephalon. If this part of the brain is activated and dominant, then the cortex may be impaired or not fully functional. Learning requires the cortex. If a student has a history of trauma and employs dissociation as a coping response, this could prevent the student from fully engaging in the educational process. Punitive measures employed in education may only further exacerbate the problem by further inciting the stress response within the child, and immobilizing higher level cortical functioning that is required for engagement in learning. While teachers are not responsible for the mental health treatment of their students, this information is useful to alert the teacher to the unique needs of the student and therefore has implications for their classroom management. Upon recognition of these needs, the teacher can refer the student to the appropriate resource to enable the student to get the services they need to optimize their educational experience.

Professionals in the juvenile justice system could also potentially benefit from this study. Again, similar to the educational system, if the child has a history of trauma and utilizes dissociation as a coping response, punitive measures may only exacerbate the situation. When people are threatened, and the stress response is activated, and we respond subcortically. This means we are limbic, diencephalon, or brain stem system driven. Being trauma informed may help professionals in the corrections system intentionally engage the children in such a way as to reduce the stress response, which in turn can change the way behaviors are categorized and responded to by staff.

There are also implications for the child welfare system. Statistically, like the juvenile justice system, children involved in the child welfare system have significant rates of trauma. Rather than experiencing dissociation as "unnerving" and disturbing," child welfare professionals can more empathically attune to and join with their clients (Strait, 2016) if they are able to assess this symptom within a trauma-informed lens. De-stigmatizing this innate response can allow for stronger therapeutic rapports and hopefully lead to greater empathy, screening for treatment needs, and even corrective relating by child welfare workers.

Limitations

There are several limitations to this study, including sample considerations, concept ambiguity, outcomes, and clinical applications.

This study was a secondary analysis of pre-existing data. The data were collected for clinical purposes, not for research purposes from a clinical population. It was a sample from clinicians seeking help for their clients. There was no control group to

compare the sample with. The sample only included adolescents (ages 11 to 18), and the sample was not randomized; therefore, the results cannot be easily generalized to the other populations. Clinical populations have their own set of unique characteristics and challenges that impair their social, emotional, cognitive, and/or educational/vocational functioning. These should be kept in mind as people process the results of the statistical analyses.

The second limitation is a more ambiguous one. This study examined "dissociation," and there is a lack of uniformity as to what dissociation is. The definition belies specificity and consistency. There were various terms with different meanings cited in the literature and other research studies. As has been noted throughout this study, terms such "dissociation," "mind wandering," "day dreaming," "splitting," and "fragmentation" have been used and used somewhat interchangeably. This highlights part of the problem with our current understanding of dissociation and emphasizes the need for my study. Perhaps this study can contribute in a positive way to the dialogue around defining this term in a more concise and measurable way for both clinicians and researchers. For example, the *DSM-5* instituted a paradigm shift by moving from categories to continuums for some disorders. Perhaps a similar process can be applied to dissociation?

A third limitation has to do with outcomes. This is a large sample with many variables. No single variable demonstrated any strong effect size. The effect sizes only became meaningful when the variables were aggregated and when I filtered for "high confidence" scores. I tested the distributions to see if I introduced a bias by doing this

and ascertained that the distributions remained consistent, therefore suggesting no bias was introduced. However, further analyses may prove helpful to further ensure the outcomes are reliable and valid.

Lastly, there may be limitations in the clinical applicability of the findings. Succinctly, the more information a clinician can gather, the more helpful they can be to the client. However, time limitations, minimal resources, and the theoretical frame of the clinician may prevent applicability of the findings. There may not always be time in trauma work to collect all the necessary information identified as pertinent in this study. Time constraints may hamper a clinician's ability to utilize the results of these findings. A lack of resources may also deter the application of these findings. Clients may be amnestic, family histories may be lost, and supporting documents may not exist. This recall bias can result in a selective memory about past events. Their recollection may fit a narrative constructed by the person that distorts reality. Lastly, a clinician may operate from a theoretical frame where assessment is not utilized to a great extent. For example, Solution Focused Therapy (SFT) only uses an assessment process that explores the client's exceptions to and treatment of the problem, rather than etiology.

Future Research

The above noted limitations suggest several future areas to be explored by researchers. These include a greater variety of age groups, nonclinical populations, a randomized control study, and a detailed focus on people with poorly organized dissociation capacities.

The current study only accounts for adolescents, and therefore the inclusion of

adults would be a helpful future research endeavor. Determining if outcomes differ for adults versus children would also be helpful. Also, worth exploring would be whether the scores and the predictive power of the aggregated variables remain consistent or change, and in what direction. Many adults who have experienced trauma seek treatment; therefore, more research that includes this population could be helpful to clinicians.

Research on nonclinical populations would also be helpful. How does this group use dissociation in an adaptive way? Is there a qualitative or quantitative difference between a clinical and a nonclinical population? Are there different variables within this group that are more powerful predictors of dissociation? Understanding nonclinical populations may reveal strengths clinicians can employ with clinical populations in an effort to help their clients experience health and wholeness.

A randomized study would also be helpful. The generalizability of my findings is limited by the use of a clinically identified population. Randomization would allow the findings to be generalized and therefore more useful to clinicians.

Lastly, further research about the connection between dissociation and relational health would be helpful to identify other risk and protective factors that influence the adaptive capacity of dissociation. The CTA data set, used for this secondary analysis, has 36 adverse event variables and 36 relational health variables. These could be used in future research and potentially identify other predictor variables. The results of this exploration could be very helpful to clinicians in their work with people with dissociative disorders.

Conclusion

This research attempted to assess dissociation from a strengths perspective and explored variables that influence where a person might fall on the dissociation continuum. The results infer that dissociation may have adaptive capacities since both adversity and relational health impact the quality of an adolescent's dissociation.

I continue to be concerned that we as humans are quite vulnerable. Our stress response system was designed to be activated for short periods of time, i.e. running from a tiger in the wild where we either get away or we are finished. The chronic activation of the stress response system as the result of ongoing trauma and oppression has deleterious effects on individuals, groups, organizations, communities, and civilizations. These traumas collect and are subsequently transmitted onto future generations.

Dissociation has an adaptive capacity, but the capacity is a double-edged sword. According to van der Kolk (2014), Perry (2006) Rothschild, (2000) Schore (2003) and others, dissociation is a core component to trauma. The failure to integrate affects and cognitions in relation to painful events is a core problem with trauma. This splitting and fragmenting of experiences when done in a rigid and volitional fashion is not adaptive. When people dissociate without choice then the experience seems less of a coping mechanism and more of an impairment.

Mental health professionals may contribute to this in a parallel way. Their assessments and treatments of trauma are also fractured and fragmented. We treat the symptoms of the trauma as if they were singular, isolated, and disconnected. The literature revealed traumatized children are given various diagnoses, and a trauma

diagnosis is not always first. A study of 364 children with a history of abuse were diagnosed (in order) with (1) separation anxiety, (2) oppositional defiant disorder, (3) phobic disorders, (4) PTSD, and (5) AHDH (van der Kolk, 2005). There seems to be a failure to see the symptoms in a larger context of trauma. A broader view and a more integrated lens will improve diagnoses and treatments.

Dissociation possesses adaptive and maladaptive capacities. In the extreme, when dissociation is reflexive and unconscious, it is pathological. But, when a child has no choice, no power, cannot move away from, or problem solve an external threat, then the use of dissociation is resilient and adaptive. The child creates an option where no other options exist, “ex nihilo” or “something from nothing,” which according to the laws of science is impossible; therefore, it could be viewed as miraculous. However, when this process is chronically activated and becomes ingrained and reflexive, then it can be pathological and dysfunctional. It can be activated when it is not warranted nor in the best interest of the individual, including as a detriment to relationships which are a necessary healing element.

People who have overcome trauma are resilient. I continue to be amazed by how capable people are despite some horrific and overwhelming experiences. Having said that, it is clear trauma can have enduring effects. It can literally change structures in the brain. It impacts health outcomes decades later. It can impair the quality of relationships, which are so important to us as a highly social species.

Therefore, addressing trauma at the micro, mezzo, and macro level is needed. First and foremost, we must strive to prevent trauma. We should develop laws, policies,

and institutions that are trauma literate. We need safe communities, homes, and relationships. Secondly, we must enhance our treatment models to better serve those who will inevitably experience trauma. And this is where this study can contribute to the field. Therapies can be enhanced if dissociation is re-conceptualized as a continuum experience with the healthy, adaptive capacities on one end of the continuum.

Better understanding dissociation as a continuum experience can assist clinicians and victims alike. De-stigmatizing dissociation is a healthy first step. Helping clinicians understand that dissociation is not the problem but a solution to the problem would be beneficial. Clinicians could use dissociative experiences as invitations to create resonance. From this resonance, clinicians can strengthen and build the therapeutic rapport. As stated, the relationship is the central vehicle through which change occurs. Dissociation ought not to serve as an impediment to the therapeutic alliance.

Finally, we can advocate for a shift in paradigms. Viewing trauma from the medical model, which is an individualistic, symptom-based model, has not been completely helpful. Moving toward a public health, strengths based model would help. This could include assisting people who work with traumatized children learn that dissociative tendencies can be adaptive. Professionals who work with traumatized children could also educate the children they serve that dissociation is adaptive. It serves a function. If people understood how they were hardwired and then used dissociation in an intentional way, people could function at a higher and healthier level.

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Appendix A

Codebook A: Developed by the CTA

Adverse Events

&

Developmental Stages

Intrauterine

Maternal Factors

1-3 No known issues present.

4-6 Example: First child at age 45 (includes a variety of factors that increase the risk for intrauterine compromise); history of placenta previa; hypertension that is under control.

7-9 Example: Maternal history of diabetes; history of mental illness/psychopharmacology.

10-12 Example: 12-year-old mother who has an active physical health problem that is poorly controlled with current medications.

Drug/EtOH

1-3 No known issues present.

4-6 An occasional drink during pregnancy, or no alcohol or drugs but use of nicotine/cigarettes

7-9 Social drinking during pregnancy toward heavy end of moderate. Example: Mother who smoked marijuana every once and a while and engaged in social drinking.

10-12 Binge drinking, intoxication, poly-substance use during pregnancy.

Depression/Neglect

1-3 No known issues present.

4-6 History of depression that is only mildly manifested during pregnancy; neglect includes mother who did not go to any of her well doctor visits.

7-9 Mother experiencing profound depression and her physical health is neglected therefore the physical health of the fetus is impacted by poor nutrition, etc.

10-12 Includes unremitting depression that is unresolved.

Domestic Violence

1-3 No known issues present.

4-6 Mother experiences verbal humiliation, isolation and/or degradation during pregnancy.

7-9 Involves actual physical assault. The degree and severity increase with the number of incidences.

10-12 Physical assaults are almost pervasive throughout pregnancy.

Transitions/Chaos /Distress

1-3 No known issues present.

4-6 Inability of caregiver to maintain daily structure, economic stress in the family. Fewer number of stressful events.

7-9 Moderate levels of chaos and distress in the home. Multiple transitions and increased number of stressful events.

10-12 The presence of one or more of these items throughout the entire time period and having some of these items being significantly profound, such as constant distress in the home, continually moving from one community to another and/or permanent chaos in the home.

Other Trauma

1-3 No known issues present.

4-6 Example: Non-life threatening medical problems during pregnancy.

7-9 Example: Trauma to the mother (victim of assault or car accident).

10-12 Example: Prematurity and multiple painful medical procedures.

Genetic

1-3 No known genetic issues present.

4-6 Strong family presence of problems, behaviors, syndromes. Potential evidence for general vulnerability.

7-9 Heavy genetic load in some member of the child's family.

10-12 Presence of well-known genetic/abnormality in some member of the child's family.

Epigenetic

1-3 No known issues present.

4-6 Example: Parents experienced stress in their own childhood, adolescence or early adulthood.

7-9 Example: Shortages or excesses of food can lead to epigenetic changes that can lead to diabetes, obesity and/or early puberty in the parents' children and even grandchildren.

10-12 Example: Use of drugs, such as cocaine, or exposure to environmental chemicals prior to conception; exposure to domestic violence.

Perinatal (Birth - 2 months)

Maternal Factors

1-3 No known issues present.

4-6 Maternal caregivers were at times neglectful or emotionally unavailable.

7-9 Maternal caregiving was characterized by times of chaotic neglectful or abusive caregiving.

10-12 Maternal caregiving included regular incidences of severe neglect and or maltreatment.

Drug/EtOH

1-3 No known issues present.

4-6 An occasional drink from birth through the first few months of life, or no alcohol or drugs but use of nicotine/cigarettes.

7-9 Social drinking during first few months following birth toward heavy end of moderate. Example: Mother who smoked marijuana every once and a while and engaged in social drinking.

10-12 Binge drinking, intoxication, poly-substance use from birth through the second month of life.

Depression/Neglect

1-3 No known issues present.

4-6 History of depression that is only mildly manifested following the birth. Disengagement includes mother who may meet the infant's needs but who at times fails to engage in behaviors that would promote attachment/bonding.

7-9 Mother experiencing profound depression and who may only occasionally engage in appropriate caregiving behaviors.

10-12 Includes unremitting depression that is unresolved leaving mother unable to engage with the infant in any meaningful way.

Domestic Violence

1-3 No known issues present.

4-6 Mother experiences verbal humiliation, isolation and/or degradation during the infant's first month of life.

7-9 Involves actual physical assault. The degree and severity increase with the number of incidences.

10-12 Physical assaults are almost pervasive throughout from birth through the first months of the child’s life.

Transitions/Chaos /Distress

1-3 No known issues present.

4-6 Inability of caregiver to maintain daily structure, economic stress in the family. Fewer number of stressful events.

7-9 Moderate levels of chaos and distress in the home. Multiple transitions and increased number of stressful events

10-12 The presence of one or more of these items throughout the entire time period and having some of these items being significantly profound, such as constant distress in the home, continually moving from one community to another and/or permanent chaos in the home.

Other Trauma

1-3 No known issues present.

4-6 Example: Non-life threatening medical problems at birth or within the first two months of life.

7-9 Example: Infant is exposed to trauma within the first months of life (yelling, some physical abuse).

10-12 Example: Prematurity and multiple painful medical procedures and/or emotional maltreatment, shaking.

Infancy (First Year: 3 months to 12 months)

Primary Caregiving

1-3 No known issues present

4-6 Primary caregiving is less than optimal. Caregiver may be distracted by unemployment, poverty and potential loss of living environment.

7-9 Primary caregiving may be impacted by mental illness that is somewhat controlled by medication, caregiver may be intermittently physically and emotionally available.

10-12 Primary caregiver is emotionally or physically abusive; may include sexual abuse by adult in the household or lack of protection from sexual predator.

Drug/EtOH

1-3 No known issues present

4-6 Occasional drinking by the child's caregivers/adults living in the home, or no alcohol or drugs by use of nicotine/cigarettes.

7-9 Social drinking by the child's caregivers/adults in the home leaning toward heavy end of moderate. Example: Caregivers who smoked marijuana once and a while and engaged in social drinking.

10-12 Binge drinking, intoxication, poly-substance use by caregivers/adults in the child's home.

Depression/Neglect

1-3

4-6 Example: Episodic periods of neglect due to periods of depression in the primary caregiver.

7-9 Chaotic neglect that may include a lack of physical, emotional, social or cognitive stimulation.

10-12 Global neglect. Example: History of sensory deprivation in more than one domain such as minimal exposure to language, touch or social interactions.

Domestic Violence

1-3 No known issues present.

4-6 Mother experiences verbal humiliation, isolation and/or degradation during the infant's first year of life.

7-9 Involves actual physical assault. The degree and severity increase with the number of incidences.

10-12 Physical assaults are almost pervasive throughout first year of life.

Transitions/Chaos/Distress

1-3 No known issues present.

4-6 Inability of caregiver to maintain daily structure, economic stress in the family. Fewer number of stressful events.

7-9 Moderate levels of chaos and distress in the home. Multiple transitions and increased number of stressful events

10-12 The presence of one or more of these items throughout the entire time period and having some of these items being significantly profound, such as constant distress in the home, continually moving from one community to another and/or permanent chaos in the home.

Other Trauma

1-3 No known issues present.

4-6 Example: Non-threatening medical problems.

7-9 Example: Infant is exposed to trauma during the first year of life (yelling, some physical abuse).

10-12 Example: Multiple painful procedures; physical and/or emotional maltreatment

Early Childhood (Second year to age 4: 13 months to 48 months)

Primary Caregiving

1-3 No known issues present

4-6 Primary caregiving is less than optimal. Caregiver may be distracted by unemployment, poverty and potential loss of living environment.

7-9 Primary caregiving may be impacted by mental illness that is somewhat controlled by medication, caregiver may be intermittently physically and emotionally available.

10-12 Primary caregiver is emotionally or physically abusive; may include sexual abuse by adult in the household or lack of protection from sexual predator.

Drug/EtOH

1-3 No known issues present

4-6 Occasional drinking by the child's caregivers/adults living in the home, or no alcohol or drugs but use of nicotine/cigarettes.

7-9 Social drinking by the child's caregivers/adults in the home leaning toward heavy end of moderate. Example: Caregivers who smoked marijuana once and a while and engaged in social drinking.

10-12 Binge drinking, intoxication, poly-substance use by caregivers/adults in the child's home.

Depression/Neglect

1-3 No known issues present.

4-6 Example: Episodic periods of neglect due to periods of depression in the primary caregiver.

7-9 Chaotic neglect that may include a lack of physical, emotional, social or cognitive stimulation.

10-12 Global neglect. Example: History of sensory deprivation in more than one domain such as minimal exposure to language, touch, or social interactions.

Domestic Violence

1-3 No known issues present.

4-6 Mother experiences verbal humiliation, isolation and/or degradation during ages 2-4.

7-9 Involves actual physical assault. The degree and severity increase with the number of incidences.

10-12 Physical assaults are almost pervasive throughout first year of life.

Transitions/Chaos/Distress

1-3 No known issues present.

4-6 Inability of caregiver to maintain daily structure, economic stress in the family. Fewer number of stressful events.

7-9 Moderate levels of chaos and distress in the home. Multiple transitions and increased number of stressful events

10-12 The presence of one or more of these items throughout the entire time period and having some of these items being significantly profound, such as constant distress in the home, continually moving from one community to another and/or permanent chaos in the home.

Other Trauma

1-3 No known issues present.

4-6 Example: Non-life-threatening medical problems.

7-9 Example: Child is exposed to trauma (yelling, some physical abuse).

10-12 Example: Multiple painful procedures; physical and/or emotional maltreatment

Childhood (Age 4 through age 10: 49 months to 132 months)

Primary Caregiving

1-3 No known issues present.

4-6 Primary caregiving is less than optimal. Caregiver may be distracted by unemployment, poverty and potential loss of living environment.

7-9 Caregiving may be impacted by mental or physical illness. The caregivers are only intermittently physically or emotionally available. Multiple changes in caregivers (such as frequent moves in foster care) can also result in moderate caregiving compromise.

10-12 Caregiving involves emotional, physical or sexual abuse in the home. Inability or unwillingness to protect the child in this abusive household is also considered 'severe'.

Drug/EtOH

1-3 No known issues present

4-6 Occasional drinking by the child's caregivers/adults living in the home, or no alcohol or drugs by use of nicotine/cigarettes.

7-9 Social drinking by the child's caregivers/adults in the home leaning toward heavy end of moderate. Example: Caregivers who smoked marijuana once and a while and engaged in social drinking.

10-12 Binge drinking, intoxication, poly-substance use by caregivers/adults in the child's home.

Depression/Neglect

1-3 No known issues present.

4-6 Example: Episodic periods of neglect due to periods of depression in the primary caregiver.

7-9 Chaotic neglect that may include a lack of physical, emotional, social or cognitive stimulation.

10-12 Global neglect. Example: History of sensory deprivation in more than one domain such as minimal exposure to language, touch or social interactions.

Domestic Violence

1-3 No known issues present.

4-6 Mother experiences verbal humiliation, isolation and/or degradation.

7-9 Involves actual physical assault. The degree and severity increase with the number of incidences.

10-12 Physical assaults are almost pervasive.

Transitions/Chaos/Distress

1-3 No known issues present.

4-6 Inability of caregiver to maintain daily structure, economic stress in the family. Fewer number of stressful events.

7-9 Moderate levels of chaos and distress in the home. Multiple transitions and increased number of stressful events

10-12 The presence of one or more of these items throughout the entire time period and having some of these items being significantly profound, such as constant distress in the home, continually moving from one community to another and/or permanent chaos in the home.

Other Trauma

1-3 No known issues present.

4-6 Example: Non-life-threatening medical problems.

7-9 Example: Child is exposed to trauma (yelling, some physical abuse).

10-12 Example: Multiple painful procedures; physical and/or emotional maltreatment

Youth (Age 11 through age 18)

Community/School Violence

1-3 No known issues present

4-6 Typical challenges of growing up with episodic exposure to a bully or small amounts of instability in the community.

7-9 Living in a community with organized gang activity and/or drug related violence where child may not be directly impacted but may witness community violence or know others directly impacted. Increased level of stress related to instability within the community.

10-12 Example: Being the direct target of organized gang activity where the child is the direct victim of violence or witnesses significant violence against other children/youth. Community is characterized by tremendous unpredictability and/or drug related violence. Could also include situations such as war/refugee, other community disruptions such as natural disasters (hurricanes, earthquakes, etc.)

Drug/EtOH

1-3 No known issues present.

4-6 Occasional drinking by the child's caregivers/adults living in the home, or no alcohol or drugs but use of nicotine/cigarettes.

7-9 Social drinking by the child's caregivers/adults in the home leaning toward heavy end of moderate. Example: Caregivers who smoked marijuana once and a while and engaged in social drinking.

10-12 Binge drinking, intoxication, poly-substance use by caregivers/adults in the child's home.

Depression/Neglect

1-3 No known issues present.

4-6 Example: Episodic periods of neglect due to periods of depression in the primary caregiver.

7-9 Chaotic neglect that may include a lack of physical, emotional, social or cognitive stimulation.

10-12 Global neglect. Example: History of sensory deprivation in more than one domain such as minimal exposure to language, touch or social interactions.

Domestic Violence

1-3 No known issues present.

4-6 Mother experiences verbal humiliation, isolation and/or degradation.

7-9 Involves actual physical assault. The degree and severity increase with the number of incidences.

10-12 Physical assaults are almost pervasive.

Transitions/Chaos/Distress

1-3 No known issues present.

4-6 Inability of caregiver to maintain daily structure, economic stress in the family. Fewer number of stressful events.

7-9 Moderate levels of chaos and distress in the home. Multiple transitions and increased number of stressful events.

10-12 The presence of one or more of these items throughout the entire time period and having some of these items being significantly profound such as constant distress in the home, continually moving from one community to another and/or permanent chaos in the home.

Other Trauma

1-3 No known issues present.

4-6 Non-life threatening medical problems.

7-9 Child is exposed to trauma (yelling, some physical abuse).

10-12 Example: Multiple painful procedures; physical and/or emotional maltreatment

Early Adult (age 19 through age 24)

Work/Community Violence

1-3 No known issues present

4-6 Bullying or small amounts of instability in the community.

7-9 Living in a community with organized gang activity and/or drug related violence where the individual may not be directly impacted but may witness community violence or know others directly impacted. Increased level of stress related to instability within the community.

10-12 Being the direct target of organized gang activity where the individual is the direct victim of violence or witnesses significant violence against others. Community is characterized by tremendous unpredictability and/or drug related violence. Could also include situations such as war/refugee, other community disruptions such as natural disasters (hurricanes, earthquakes, etc.)

Drug/EtOH

1-3 No known issues present.

4-6 Occasional drinking by the individual and/or others in the home, or no alcohol or drugs by use of nicotine/cigarettes.

7-9 Social drinking in the home leaning toward heavy end of moderate. Example: Individuals who smoked marijuana once and a while and engaged in social drinking.

10-12 Binge drinking, intoxication, poly-substance use by people in the home.

Depression/Neglect

1-3

4-6

7-9

10-12

Domestic Violence

1-3

4-6 Experiences of verbal humiliation, isolation and/or degradation.

7-9 Involves actual physical assault. The degree and severity increase with the number of incidences.

10-12 Physical assaults are almost pervasive.

Transitions/Chaos/Distress

1-3

4-6 Inability to maintain daily structure, economic stress. Fewer number of stressful events.

7-9 Moderate levels of chaos and distress in the home. Multiple transitions and increased number of stressful events.

10-12 The presence of one or more of these items throughout the entire time period and having some of these items being significantly profound such as constant distress in the

home, continually moving from one community to another and/or permanent chaos in the home.

Other Trauma

1-3

4-6

7-9

10-12

Appendix B

Codebook B: 32 Brain-Mediated Functions

BRAINSTEM:

1. **Cardiovascular/ANS** Refers to cardiac or circulatory functioning as regulated by the autonomic nervous system. Indicators include resting heart rate (HR) or blood pressure (BP). Evidence of dysregulation may include tachycardia (resting HR over 100), bradycardia (resting HR below 60), highly variable beat to beat intervals, high blood pressure, or altered peripheral circulation. Difficulty in returning to normal values following challenge or arousal may also indicate dysregulation. Score in the normal range if no apparent cardiovascular regulation problems are noted on conventional physiological measures; mild range if borderline or episodic cardiovascular regulation issues are present; moderate if cardiovascular dysregulation is frequently noted and severe if noted continuously or in multiple cardiovascular domains.
2. **Autonomic Regulation** Refers to a range of autonomic nervous system regulated functions (excluding cardiovascular which is scored in a separate item); these include input to lung, skin, gut, pancreas and the immune system. Problems in these functions may manifest as sleep apnea, history of SIDS-like episodes, sighing, excessive yawning, asthma, diabetes, diarrhea, constipation, irritable bowel, dermatitis, hives, skin sensitivities and other ANS-related symptoms.
3. **Temperature Regulation/Metabolism** Refers to a range of metabolic and temperature regulation functions and may manifest as abnormal body temperature (high, low or erratic). Metabolic problems may manifest as increased or decreased BMR manifesting as eating without gaining weight, or conversely obesity. Manifestations of problems in these areas may include picky eating, hoarding, gorging, purging, vomiting, reflux disorder/rumination disorder.
4. **Extraocular Eye Movements** Refers to a range of functions including eye-blink and eye movement. Abnormalities may manifest as tics, fast or slow eye-blink rates (see in dissociation), difficulty with smooth eye movements, noted by jerky (saccades) or irregular movements as the child tracks vertically, horizontally or in circular motions. Also, possible difficulty with near point convergence of the eyes as an object moves closer to eyes. The eye-roll test score of 3 or greater suggests dissociation may be a factor.
5. **Suck/Swallow/Gag** Refers to a range of functions relating to smooth regulation of mouth, tongue and throat functioning. Problems in these functions may manifest in excessive sucking, swallowing, gulping, reflux, regurgitation,

rumination or gagging when eating or drinking, difficulty chewing food, taking pills, demands for soft or smooth textures, pica, mouthing and tasting objects, the need to chew gun, or have something in the mouth.

6. **Attention/Tracking** Refers to the capacity to focus and track contextually-appropriate content. This set of core functions is inter-related to other attention related functions such as hypervigilance and other AROUSAL related functions. Both capacity to focus and distractibility are elements of this item. Manifestations of difficulty in these areas include the inability to attend and all of the related academic and social consequences. Attention refers to irregularities focusing attention for sustained periods, maintaining focus for at least three minutes at age three. Attention is distracted easily by extraneous environmental stimuli, causing failure to complete tasks. Difficulty shifting attention from one focus to another is a smooth, coordinated, and regulated manner, such as following directions or ending one activity and beginning another.

DIENCEPHALON/CEREBELLUM

7. **Feeding/Appetite** Refers to a set of appetite and eating related functions. Problems in this area may include rumination, odd food preferences, food refusal, anorexia and related behaviors, insatiable cravings, and pica, among others. Excessive use of food to sooth is scored both here and contributes to the score on the REWARD item.
8. **Sleep** Refers to the quality, quantity and pattern of sleep. Dysfunction may manifest as difficulty falling asleep, staying asleep, sleeping alone or such sleep related problems such as hypnogogic phenomenon, nightmares, night terrors, sleep apnea. May manifest as waking at night and wandering into caregiver bed or around the home, excessive sleepiness during the day, sleep cycle reversal and related problems.
9. **Fine Motor Skills** Refers to the range of functions related to fine motor control, regulation and maturity. Abnormalities in these functions manifest as age-inappropriate capacity to grasp, manipulate, reach and handle objects with hands. Tremors, difficulty drawing and with handwriting may be indicators of immature or dysfunction in this item. Child has age appropriate skill in drawing circles, squares, triangles and people. Writes with pencil or crayons. Cuts with scissors and uses glue normally for age. Uses utensils correctly for age. Feeds and drinks with little trouble. Handles manipulatives (blocks, stringing beads and construction activities). Folds paper, manages buttons, zippers, puts on/ties shoes. Creates rolls/shapes with play dough/clay.
10. **Coordination/Large Motor Functioning** Refers to ability to crawl, walk, run, skip, hop and stand normally. Able to balance self normally for age. Walks heel toe forward/back. Able to age-appropriately kick or throw a ball. Demonstrates

steady beat consistency or basic rhythm. Dislikes or becomes dizzy when spinning, turning, swinging or feet leaving ground. Difficulties include stiff awkward movements and clumsiness.

11. **Dissociative Continuum** Refers to the range of inter-related adaptive responses to stress and distress broadly referred to as dissociation. Manifestations of activation of dissociative systems includes changes in physical signs such as low heart rate and eye-blink rate, hypalgesia or insensitivity to pain, frequent headache, constipation or diarrhea and symptoms such as daydreaming, pseudoseizure or apparent absence seizures, cutting, picking and self-abuse or mutilation.
12. **Arousal Continuum** Refers to a range of inter-related functions involved in the freeze-flight-fight responses to stress and distress. Manifestations of problems in these areas include physical signs such as high and variable heart rate, increased muscle tone and motor activity and symptoms such as hypervigilance, sleep problems, impulsivity, difficulties with transitions, misperception of social interactions among others.
13. **Neuroendocrine/Hypothalamic** Refers to the regulation of a wide range of neurohormonal functions including growth hormones, sex steroids, stress-related hormones such as cortisol, and the neuroimmune systems. Difficulties may manifest as premature puberty, growth abnormalities such as FTT or obesity, loss of hair, body temperature regulation problems and a wide range of other symptoms. Endocrine problems are expressed in body temperature, blood pressure, feeding/hunger, thirst, fatigue and circadian cycles. Problems with too much or too little growth (anomalies in height and weight). Onset of puberty too early or late. Cold intolerance, depression, fatigue, hair or skin changes, weight gain or loss. Dizziness, weakness, body temperature problems, emotional problems, excessive thirst, obesity, excessive weight loss, uncontrolled urination, inability to smell.
14. **Primary Sensory Integration** Refers to a set of functions involving the processing and integration of primary sensory input such as touch, sound, vision, smell and taste. Problems in these areas may manifest as touch hypersensitivity and defensiveness, persistence of immature taste and smell processing of objects, being easily overwhelmed by loud or chaotic experiences (e.g., birthday parties, malls). Traditional sensory integration problems are scored in this item. Child displays noticeable sensory seeking or avoidant behaviors. Difficulty gaining information from sensory experiences or using this information (touch, smell, sound, sight). Mouths objects (pencils, shirt, hands). Chews, licks non-food items. Touches, pokes, pushes objects or others incessantly. Dislikes being touched. May dislike shoes, clothing tags, textured material, and messy things.

LIMBIC

15. **Reward** Refers to a set of functions related to the neural systems regulating "reward" and pleasure. These include the capacity to feel pleasure from healthy relational interactions including touch, engaging in value-consistent behavior, music, and sexual behavior. Unhealthy forms of "reward" such as, over-eating, cutting, compulsive promiscuity, alcohol and drug abuse should be considered when scoring this item. Attachment problems and trauma can often impair this capacity. Inability to gain pleasure from interactions with others, to become absorbed in age-appropriate play; to express joy may all indicate abnormalities.
16. **Affect Regulation/Mood** Refers to the ability to appropriately express and modulate emotional experiences. Displays the normal range of emotions (mad, sad, glad, afraid). Emotions are congruent with situations. Recognizes correctly/responds to own feelings and those of others. Child understands nonverbal communication. Becomes overly anxious, aggressive or withdrawn when upset. Calms down within 15 minutes when upset & after a period of exciting activity.
17. **Attunement/Empathy** Refers to the capacity, interest in and accuracy of reading the non-verbal and verbal cues of others. This capability to be aware of the intentions and feelings of other is closely related to the capacity to be empathic. Likely related to relational history. Manifestations of problems in this area are selfish or inconsiderate behavior, self-serving and oblivious social interactions. Scores on this item are inter-related to the Relational/Attachment scores. Acknowledge caregiver’s presence. Makes eye contact when spoken to. Shares feelings/experiences. Demonstrates affectional feelings toward others (verbally & physically). Comforts others when distressed. Has close associations with others, a group, family, friends, school and classmates. Responds to caregiver's singing, telling stories or playing with them. Plays with or near favored adults. References caregiver while exploring new places or meeting new people.
18. **Psychosexual** Refers to a range of functions involved in the maturation and manifestation of sexual identity and behaviors. Central to these functions is the development of associations between intimacy and sexuality; attachment problems and sexual abuse in childhood will often impact these significantly. Problems may manifest as gender confusion, abnormal preoccupation with sexual play, sexual predatory behaviors, compulsive or indiscrete masturbation, pre-occupation with pornography and other sexualized acting out.
19. **Relational/Attachment** Refers to the fundamental capacity to form and maintain relationships. Manifestations of these functions are in typical attachment and bonding behaviors. Common symptoms seen with problems in these functions include impaired capacity to share, form and maintain age-appropriate friendships, desire and capacity to engage others, relational cues

elicit fear or self-soothing behaviors, indiscriminate affection, "autistic" like behaviors.

20. **Short-term memory/Learning** Refers to the capacity to remember daily interactions and experiences and to use "active working memory, short term memory and translate that to long-term memory, i.e., the capacity to learn. Problems in these areas include the need to repeat simple directions or provide multiple trials or repetitions before a concept, fact or command is internalized.

CORTEX

21. **Somato/Motorsensory Integration** Refers to a set of integrated multisensory capacities which allow the creation of a complex multidimensional representation of experience; these derive from the capacity to organize various physical sensations from the body and the environment mediated by systems in lower parts of the brain. Reciprocal cerebellar and thalamic input key to these functions. Abnormalities in these functions can manifest as fine or large motor dyscoordination, various dyspraxias and unusual mis-wiring of various sensory inputs. In addition, sensory misperceptions, hypnogogic phenomenon, hallucinations would be manifestations of abnormal sensory integration and processing.
22. **Sense Time/Delay Gratification** Refers to the child's ability to gauge time and time passing. Is able to engage in one behavior/activity in order to earn reward later and understands/trusts that reward will come at a later date/time.
23. **Communication Expressive/Receptive** Refers to the ability to communicate in both non-verbal and verbal ways. Both the capacity to convey intent, meaning and purpose as well as accurately perceive and process the intent, meaning and purpose of the communication of others are important in scoring this item. Problems with these functions may include a variety of communication disorders or problems.
24. **Self-Awareness/Self Image** Refers to a range of functions related to body image, self-esteem, competence relative to others, and how realistic and accurate these self-appraisals are. Problems in these domains may manifest as body image distortions, narcissistic or self-defeating or self-loathing behaviors.
25. **Speech/Articulation** Refers to the set of functions involved in oral communication. Problems in these areas may include problems with the volume, clarity and accuracy of speech, difficulties making certain sounds, unclear enunciation, mumbling, muttering, stuttering and related speech problems.
26. **Concrete Cognition** Refers to a range of cognitive capabilities that emerge during development that are shaped by experience with actual objects and events. These capacities allow for simple associations regarding causality,

permanence and motivation but are simpler, more linear and non-abstract than the range of abstract cognitive capabilities that emerge later in development.

27. **Non-verbal Cognition** Refers to a range of functions related to non-verbal processing, planning and sequencing of information. This includes the capacity to understand and interpret non-verbal complex relational interactions (e.g., street smarts). Traditional IQ testing items in the Performance domains reflect functioning in these processes.
28. **Modulate Reactivity/Impulsivity** Refers to the ability to regulate behavior or to act on thought rather than impulse.
29. **Math/Symbolic Cognition** Refers to thinking with numbers, imagery and language and includes dual coding. Dual coding in math includes symbol/numeral imagery - parts/details and concept imagery - whole/gestalt.
30. **Reading/Verbal** Refers to the ability to use language in written and spoken form; these functions are related to the verbal sub-scale scores on traditional psychological IQ testing.
31. **Abstract/Reflective Cognition** Refers to a set of functions related to abstract cognition including insight, self-awareness and the ability to take previously stored information and reconstruct it in creative and abstract ways.
32. **Values/Beliefs** Refers to the development of the child's value system and behavior code. Moral reasoning is a good predictor of moral action, including honesty, altruistic behavior, resistance to temptation and non-delinquent behavior. This item is inter-related with abstract cognition. The level and complexity of belief system, capacity for moral reasoning, sense of connectedness to others and the development of complex spiritual and cultural concepts are part of this item. The internalization and understanding of their culture's code of ethics and acceptable behavior should be considered as well. Please note that scoring this lower IS NOT SAYING THE CHILD is "immoral" or "bad" - it is more a comment on the maturation of complex forms of abstract cognition.