ADULT ATTACHMENT PATTERNS, MENTAL REPRESENTATION OF SELF, AND FAITH: MEDIATORS OF CHILDHOOD TRAUMA AND AFFECT-BEHAVIOR REGULATIONS IN ADULTHOOD

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The purpose of this study was to investigate psychological mechanism by which four intra- and inter-personal characteristics of an individual (anxious and avoidant adult attachment patterns, images of self, and religious faith) mediate the relationship between childhood trauma and each of three affect-behavior regulation problems in adulthood (symptoms of depression, disordered eating behaviors, and substance abuse). A total of 401 college student participants completed a packet of 18 surveys including 10 surveys used in the present study. Structural equation modeling was used to test each of three hypothesized structural models (Depression, Eating Disturbances, and Substance Abuse). A series of multi-group analyses conducted to test if each of three hypothesized models is invariant across gender indicated no significant difference between females and males. Thus, the data were combined across gender to test for mediated effects in each of three hypothesized models.

The results indicated: (a) for the hypothesized model for depression, anxious attachment patterns, avoidant attachment patterns, and negative self-images, but not religious faith, fully mediated the relationship between childhood trauma and symptoms of depression; (b) for the model for eating disturbances, anxious attachment and negative images of self, but not avoidant attachment and religious faith, fully mediated the association between childhood trauma and disordered eating behaviors; and (3) for the mode for substance abuse, anxious attachment and poor religious faith, but not avoidant attachment and negative self-images, fully mediated the relationship between childhood trauma and substance abuse.
The findings of the present study have noteworthy implications for treatment. When clients who suffer from symptoms of depression, disordered eating behaviors, and/or substance abuse report a history of repetitive abuse and neglect by primary caregivers in childhood, clinicians need to assist clients in: (a) understanding an association of childhood maltreatment with affect-behavior regulation problems; (b) being aware of an impact of abuse and neglect by attachment figures in childhood on negative mental representations of self, insecure attachment patterns in close relationship, and poor religious faith; and (c) most importantly, deepening an understanding of how their negative images of self, anxious and avoidant adult attachment patterns, and/or poor religious faith and practices, rather than parental abuse and neglect in childhood itself, directly predict their presenting symptoms of depression, disordered eating behaviors, and/or substance abuse problems. In doing so, it is crucial for clinicians to provide clients with secure and comforting therapeutic atmosphere, focus on building trusting working relationship with clients, and be aware of how clients’ transference and clinicians’ own counter-transference interact with each other and influence therapeutic process and effectiveness. Several important limitations of the present study and implications for future studies were discussed.
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CHAPTER 1
LITERATURE REVIEW

Introduction

The topics of what characteristics of an individual contribute to a capacity for resilient adaptations to life adversities, as well as how to promote such a capacity both in the individual and on the societal levels have drawn the attention of researchers and clinicians over the years. The National Comorbidity Survey in the United States (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995) reported that more than a half of Americans were exposed to at least one potentially traumatic event in their lifetime. Less than one tenth of those who experienced a traumatic event, however, developed symptoms of post-traumatic stress disorder (PTSD) and other mental health problems, such as symptoms of depression, disordered eating behaviors, and substance abuse (Kessler et al., 1995; Stein, Walker, Hazan, & Forde, 1997).

A question following the results of the aforementioned survey on the prevalence of traumatic event and its impact on mental health problems is: “Why do some people exposed to a traumatic event cope with or possibly describe growth from it, while why do some people continue to suffer from the aftermath of the trauma for a substantial period of time or even for the rest of their lives?” Decades of clinical explorations and scientific research on answering the question have generated various theories and findings that explain bio-psycho-social mechanisms by which a traumatic event contributes to mental health problems, or inability to regulate various affects and behaviors: for example, hypothalamic-pituitary-adrenal axis (HPA; e.g., Bremner, 1999; Yehuda, 2001), temperament (e.g., Feldman, Greenbaum, & Yirmiya, 1999; Thomas & Chess, 1977), personality (e.g., Brennan & Shaver, 1998; Noftle & Shaver, 2006); mother-infant attachment (e.g., Bowlby, 1973, 1979, 1980, 1969/1982; Shore, 2002), adult romantic
relationship (e.g., Hazan & Shaver, 1987; Mikulincer & Shaver, 2007), social support (e.g., Sarason, Pierce, & Sarason, 1990; Thoits, 1982), religious faith (e.g., Bergin, Masters, & Richards, 1987; Koenig, 1997); and culture (e.g., Matsumoto, 2000; Wright & Masten, 2005).

Among those theories and findings, attachment theory proposed by Bowlby (1969/1982, 1973, 1979, 1980) has become one of the most comprehensive conceptual frameworks that account for bio-psycho-social mechanisms by which an individual develops mental capacities to regulate affects and behaviors. According to attachment theory, these capacities are engendered through secure emotional bonding with available, sensitive, and responsive primary caregivers in childhood and then continue to influence an individual’s bio-psycho-social functioning over the course of development. The primary caregiver’s consistent physical and emotional availability and sensitive responsiveness to the child’s needs provide the child with a deep-seated sense of safety and comfort, called “felt security” (e.g., Bretherton, 1985; Sroufe & Waters, 1977), and mental capabilities to regulate affects and behaviors, especially in times of distress. These felt security and a sense of self-controllability further engender so-called “internal working models,” or “mental representations” of positive images of self (e.g., “I’m good and lovable”), positive views of others and world (e.g., “People are trustworthy”), and flexible relationship patterns (e.g., balancing intimacy and independence in close relationship) (Allen, 2001; Ainsworth, 1989; Bowlby, 1982; Collins & Read, 1990; Mikulincer, Shaver, & Pereg, 2003; Pietromonaco & Barrett, 2000; Shore, 2002). These internal working models are believed to play a central role in social and personality development, mental capacity for affect-behavior regulation, and resilience to adversities not only in childhood but also across the lifespan (Cozzarelli, Karafa, Collins, & Tagler, 2003; Fraley, 2002; Hazan & Shaver, 1994; Waters, Merrick, Treboux, Crowell, & Albersheim, 2000; Williams, 2006).
In contrast, a failure to develop “felt security” and a sense of self-controllability leads to negative or dysfunctional mental representations of self (e.g., “I’m bad and unlovable”), others (“People are untrustworthy”), and relationship patterns (e.g., overdependence or excessive self-independence in close relationship), which in turn leave an individual more vulnerable to various affect-behavior regulation problems (e.g., depression, substance abuse, eating disturbances) over the course of development (e.g., Allen, 2001; Mikulincer & Shaver, 2007; Shore, 2001, 2002; van der Kolk, 1996). For example, Allen (2001) suggested that consistently harmonious mother-infant interactions establish a psychobiological synchrony that entrains the infant’s physiological and behavioral rhythms and promote the infant’s capacity to regulate emotions and behaviors. A failure to establish such a synchrony in the caregiver-infant interactions may shake the foundation of the infant’s bio-neuro-psycho-social development and capacities to cope with emotional distress in the face of adversities.

Shore (2002) also suggested that an infant’s experience of reciprocal regulatory interactions with empathic and reliable attachment figures allows the infant to maintain internal homeostatic equilibrium and learn how to regulate emotions. The attuned and synchronized interactions between mother and infant lead the infant to develop a sense of inter-subjectivity, or an ability to empathize with others’ feelings and learn how to communicate with others in more socially harmonious way. However, a failure to develop self-regulatory functions and inter-subjectivity due to maltreatment, or abuse and neglect, by primary caregivers, can lead to poor capacity for affect-behavior regulation and various mental health problems (Kernberg, 1985; Shore, 2001, 2002).

van der Kolk and colleagues contended that repetitive exposure to childhood trauma affects an individual at many levels of functioning: somatic, emotional, cognitive, behavioral,
and even characterological (van der Kolk, 1996; van der Kolk & McFarlane, 1996; van der Kolk, Weisaebeth, & van der Hart, 1996). They suggested that childhood abuse and neglect sets the stage for a wide range of emotional and behavioral regulation problems such as anxiety/mood disorders, eating disturbances, substance abuse, self-mutilation, relationship troubles, and personality disorders. A failure to develop emotional bond with a primary caregiver in childhood may be the single most important determinant of long-term psychosocial harm as well as short-term behavioral disturbances (van der Kolk, 1996). In the same light, Mikulincer and Shaver (2007) reviewed a host of research that investigated the impacts of traumatic experience in childhood on mental disorders, and suggested that insecure attachment with a primary caregiver in early childhood is the major contributor to emotional distress, suicidal tendency, eating disorders, conduct disorders, substance abuse, and personality disorders (e.g., antisocial, borderline).

Bowlby’s theoretical proposition of the centrality of infant-mother emotional bonding in early childhood and its influence on the infant’s capacities for affect-behavior regulation was expanded to romantic relationship with a partner in adulthood initially by Hazan and colleagues (e.g., Hazan & Shaver, 1987, 1994; Hazan & Zeifman, 1994). In their pioneering attempt to apply Bowlby’s proposition to adult romantic relationship, Hazan and Shaver (1987) identified three defining features of infant-caregiver attachment: proximity maintenance (staying near and resisting separation), safe haven (turning to comfort, support, and reassurance), and secure base (using an attachment figure as a base for exploration). They proposed that the structure and functions of infant-mother attachment are similar to those of close relationships across the lifespan, especially to pair bonds in adult romantic relationships. Results of numerous empirical studies have supported Hazan and Shaver’s (1987) proposition by demonstrating that, as with
infant-mother bonding in early childhood, secure attachment with a romantic partner in adulthood contributes to or ameliorates various affect-behavior regulation problems, such as depression (e.g., Riggs & Han, 2009; Shapiro & Levendosky, 1999), substance abuse (e.g., Doumas, Blasey, & Mitchell, 2006; Riggs, Sahl, Greenwald, Atkinson, Paulson, & Ross, 2007), and eating disturbances (e.g., O’Shaughnessy & Dallos, 2009; Troisi, Massaroni, & Cuzzolaro, 2005).

Bowlby’s theoretical proposition was applied not only to romantic relationship in adulthood but also to religious faith in God by several researchers (e.g., Kaufman, 1981; Kirkpatrick, 1992; Kirkpatrick & Shaver, 1990; Koenig, 1998, Koenig & McCullough, & Larson, 2001). Kirkpatrick and Shaver (1990) proposed that the idea and image of God, especially in most Christian traditions, corresponds very closely to that of a secure attachment figure. Faith in God provides believers with a sense of comfort, safety, and “secure base” that allow them to function effectively in everyday life and sustain optimistic and hopeful mindsets in the face of adversity (Kirkpatrick, 1992). When compared to human attachment figures who are, even at their best, fallible and not perfectly trustworthy, God is considered as an ideal attachment figure who is always reliable and available beyond time and space when needed (Kaufman, 1981).

Koenig and colleagues conducted a systematic review of studies on associations among religion, social support, substance abuse, and other mental disorders, and identified both negative and positive associations between religion and mental health (Koenig et al., 2001). They reported that nearly 80% of over 100 studies reviewed indicated that more religious faith and practices consistently related to more life satisfaction, optimism, meaning in life, less depression and substance abuse, and lower suicide rates. A multitude of studies suggested that religious faith and spiritual practices may play a buffering role against the impact of traumatic experience on affect-
behavior regulation problems, such as depression, substance abuse, and/or eating disorders (e.g., Berrett, Harman, O’Grady, & Richards, 2007; DeFronzo & Pawlak, 2001; Kendler, Gardner, & Prescott, 1997; Krejci, Thompson, Simonich, Crosby, Donalson, Wonderlich, & Mitchell, 2004; Parker, Roff, Klemmack, Koenig, Baker, & Allman, 2003; Richards, Berrett, Hardman, & Eggett, 2006). For example, Parker and colleagues examined potential effects of three dimensions of religiosity (organized, unorganized, and intrinsic) on depression and general mental health (Parker et al., 2003). They indicated that those high on all three dimensions of religiosity demonstrated few symptoms of depression and better mental health than did those who were low on three dimensions. DeFronzo and Pawlak (2001) also examined effects of religious practices on substance abuse with a national sample of 595 adults and reported that religious beliefs had significantly negative effects on smoking and alcohol abuse. Richards and colleagues explored the associations among trauma, eating disorders, and spirituality for female trauma survivors (Richards et al., 2007). They reported that spirituality played an important role in healing from trauma and eating disorders even though many women with eating disorders lost touch with their spirituality.

Taken together, the above brief review suggests that secure relationship with attachment figures (e.g., primary caregiver, romantic partner, and even God) may play a central role not only in engendering positive mental representations of self, others, and attachment relationship but also in mitigating a detrimental impact of traumatic events on capacities for affect-behavior regulation. Over the past decades, attachment theorists and researchers have elaborated on Bowlby’s theoretical proposition and proposed a series of psychological pathways in which attachment relationship between child and primary caregiver engenders internal working models of self, others, and attachment relationship patterns, which in turn contribute to psycho-social-
emotional functioning and various mental health issues across the lifespan (e.g., Allen, 2001; Mikulincer & Shaver, 2007; Shore, 2002). Only a handful of empirical studies, however, have attempted to test psychological mechanism by which damage in attachment relationship with primary caregivers, or abuse and neglect by parental figures, in childhood affects images of self, adult attachment patterns, and/or religious faith in God, which in turn contribute to affect-behavior regulation problems, such as symptoms of depression, disordered eating behaviors, and/or substance abuse (e.g., Bifulco, Kwon, Jacobs, Moran, Bunn, & Beer, 2006; Krejci et al., 2004; Riggs et al., 2007; Shapiro & Levendosky, 1999; Stein, Leslie, & Nyamathi, 2002).

For instance, Shapiro and Levendosky (1999) examined the pathway in which attachment styles and coping strategies mitigate the impact of childhood maltreatment on psychological and interpersonal functioning in adolescence. They reported that secure attachment with parents and friends fully mediated the relationship between childhood maltreatment by parental figures and symptoms of depression and Post-Traumatic Stress Disorder in adolescence, suggesting that childhood maltreatment in familial environment engenders insecure attachment relationship patterns, which in turn contributes to affect-behavior regulation problems in adolescence. Bifulco and colleagues also examined psychological pathways in which adult attachment styles link childhood maltreatment with major depression in adulthood for a community sample (Bifulco et al., 2006). They indicated that childhood abuse and neglect gives rise to fearful and dismissing attachment patterns in relationship with a romantic partner, which in turn predicts symptoms of depression.

Like its impact on symptoms of depression, childhood maltreatment also contributes to disordered eating behaviors and substance abuse in adulthood through mental representations of self, adult attachment patterns, or faith in God. Stein and colleagues explored the pathways in
which mental representations of self link childhood maltreatment with substance abuse and depression among homeless women (Stein et al., 2002). They reported that low self-esteem fully mediated the relationship between childhood maltreatment and adulthood substance abuse, indicating that it is poor self-image rather than childhood abuse and neglect itself that directly predicts substance abuse behaviors for homeless women. Riggs and colleagues investigated the impact of early family environment and adult attachment patterns on various mental health problems among inpatient child abuse survivors (Riggs et al., 2007). They indicated that anxious adult attachment patterns mediated the relationship between childhood family environment and adulthood substance abuse, suggesting that childhood abuse survivors abuse substances partly to cope with worries about separation and rejection by significant others. Krejci and colleagues explored a role that spirituality plays in linking childhood sexual abuse to adulthood mental health problems, such as eating disorders and symptoms of PTSD (Krejci et al., 2004). They reported that spiritual well-being protected sexually victimized women from developing disordered eating behaviors and symptoms of anxiety.

The aforementioned few studies are only studies published, based on this researcher’s literature review up until the completion of this research project, that attempted to test Bowlby’s theoretical proposition, or psychological mechanism by which childhood trauma engenders internal working models of self and relationship patterns, which in turn contribute to affect-behavior regulation problems in adulthood. Those studies, however, focused on simple pathways in which images of self, adult attachment patterns, or religious-spiritual practices mediated the relationship between childhood maltreatment and affect-behavior regulation problems over the course of development. No empirical studies have been reported yet to investigate psychological pathways in which childhood abuse and neglect by primary caregivers predict various affect-
behavior regulation problems (e.g., symptoms of depression, disturbed eating behaviors, substance abuse) in adulthood through both inter- and inter-personal characteristics of an individual (e.g., images of self, adulthood attachment, and religious faith).

Therefore, based on theoretical propositions of Bowlby and other attachment theorists, this study examined comprehensive psychological pathways in which four intra- and inter-personal characteristics of an individual (mental representation of self, anxious and avoidant adult attachment patterns, and religious faith) mediate the relationship between a collection of five childhood maltreatments (emotional/physical/sexual abuse, emotional/physical neglect) and each of three affect-behavior regulation problems (symptoms of depression, disordered eating behaviors, substance abuse) in adulthood, respectively. In doing so, this study used a rigorous hypothesis-testing statistical methodology, Structural Equation Modeling (SEM), due to the complexity of the meditational path models in the present study. SEM is known as one of the most scientifically grounded data analysis methodologies in that it enables to test a theory-based hypothesis by using both latent variables (constructs) and conceptually coherent multiple (usually three or more) observed variables.

Attachment

Definition and Systems of Attachment

An attachment is a unique form of emotional bond between an individual and a primary caregiver (Main, 1999). Like immature animals’ ties to their mothers, human infants’ reliance on and affective bond with their primary caregivers (usually mothers) are the results of a fundamental instinctual behavioral system. Human beings are born with an innate bio-psycho-social system (i.e., attachment behavioral system) that motivates them to seek proximity, security, and comfort with attachment figures in times of need. Bowlby (1982) defined attachment
behaviors in terms of four distinct but interrelated classes of behavior: proximity maintenance, safe haven, separation distress, and secure base. An infant continuously monitors the caregiver’s whereabouts and tries to maintain the desired degree of proximity, retreats to her as a haven of safety and protection in the event of perceived threat, is actively resistant to separations from her, and uses her as a base of security to explore the environment. The main purpose of attachment behaviors is to obtain physical safety and emotional security by establishing proximity to a protective attachment figure (Bowlby, 1982).

Theory of attachment, or emotional bond or tie between child and primary caregiver, proposed by Bowlby (1969/1982, 1973, 1979, 1980) grew out of his clinical experience with homeless children who suffered from maternal deprivation, or separation from or loss of their mother early in life, following World War II. Influenced by Lorenz’s (1952) idea about “imprinting” in ducklings’ behaviors, Bowlby viewed those homeless children’s emotional bond (either positive or negative) with their mother as the result of a fundamental instinctual behavioral system that is primarily relational. Attachment theory is basically a theory of goal-oriented behavioral systems for the purpose of survival, protection, and comfort. Attachment behavioral systems consist of two parts: “normative” system that is observed in all people and “individual” system that tailors to an individual’s unique experience (Milkulincer & Shaver, 2007, 2009).

Normative system.

Bowlby (1969/1982) borrowed from ethology the concept of behavioral system, or a species-universal, biologically evolved neural system that organizes behavior in ways that increase the chances of survival and reproduction, despite inevitable environmental challenges and demands. According to attachment theory, children’s behaviors such as vocalizing distress
and clinging to a caregiver when they encounter stressors or threats are due to a hard-wired attachment behavioral system (Mikulincer & Shaver, 2007). The primary function of the attachment system is to protect children from danger by ensuring that they maintain proximity to caring and supportive attachment figures, especially in dangerous situations. Attachment figures provide physical proximity, feelings of comfort and support, and a secure base to explore other things (Hazan & Shaver, 1994; Hazan & Zeifman, 1994). Children who maintain proximity to stronger and wiser caregivers are more likely to survive and eventually reproduce in the future. This attachment behavioral system is active over the entire course of life and is manifested in thoughts and behaviors in times of threat or need. Bowlby (1973) argued against the idea that dependence on others is immature or pathological at any age and that grieving a loss is undesirable. He suggested that mature autonomy is attained partly by internalizing positive interactions with primary caregivers; the ability to self-soothe or regulate affect is based largely on having been comforted by caring attachment figures early in life.

The behavioral strategy of proximity seeking under threats are largely innate in infancy, but as a child grows and enters more complex social relationships, the behavioral system has to become more flexible, context-sensitive, and skillful. A child who is appropriately coached and guided by primary caregivers is more likely to develop social skills (e.g., expressing and regulating emotions appropriately, communicating feelings and needs coherently and clearly) and is, therefore, more likely to be successful in getting his or her needs met in relationships (Mikulincer & Shaver, 2007). In adulthood, the primary attachment strategy does not necessarily require actual proximity seeking behavior but rather imaging, or mental representations, of attachment figures called “symbolic proximity” can bring a sense of comfort and feelings of security and safety.
The goal of the attachment system is to gain a sense of protection and security called “felt security” (Sroufe & Waters, 1977). The psychological state of felt security can bring many benefits. For example, when feeling secure or being well cared for, a person can better devote attention to matters other than self-protection (openness), appreciate the feeling of being loved and valued (affiliation), or take risks, being confident that help is readily available (exploration). Knowing for sure that assistance is available provides felt security, which in turn helps regulate emotions and cope with stress in the face of adversity. When the attachment system functions well in secure attachment relationships, a person learns that distance and autonomy are completely compatible with closeness and reliance on others; there is little tension between autonomy and relatedness (Mikulincer & Shaver, 2007).

*Individual system.*

Although all children are thought to be born with a biologically programmed, normal attachment system, which motivates them to pursue proximity and comfort in the face of adversity, their capacity to attain proximity and security depends on the external world, or the responsiveness of a particular attachment figure. When an attachment figure is available, sensitive, and responsive to a child’s proximity-seeking efforts in times of need, the child is more likely to experience “felt security” – a sense that the word is generally safe so it is possible to explore the environment curiously and confidently and to engage rewardingly with other people. This felt security leads the individual to build a capacity for reliable and effective affect regulation and acquire important procedural knowledge, called a “relational script,” about stress management in relationships (Waters & Waters, 2006). The relational script includes something like the following “if-then” approach: “If I encounter a challenge and/or become distressed, I can approach a significant other for help, who is likely to be available and supportive. Then, I can
deal with the challenge as a result of the support of the significant figure and experience relief and comfort and return to other activities.”

However, when a primary attachment figure proves not to be available in times of need and not responsive to the child’s attempt for proximity, the child does not experience felt-security and have questions inside like “Is there anyone whom I really trust in the world? Am I worthy to be loved and cared?” These worries and doubts about others and self can lead the child’s mind to become preoccupied with the need for protection, as well as interfere with functioning with other behavioral systems (Mikulincer & Shaver, 2007). As a result, the child is likely to adopt certain secondary attachment strategies: both/either hyperactivation and/or deactivation of attachment system (Main, 1990). Hyperactivating strategies are “fight” responses, as viewed from the famous fight-flight coping of Cannon (1939), to frustrated attachment needs. When an attachment figure is inconsistent in availability and responsiveness in times of need, it can place a child on a partial reinforcement schedule that rewards persistent proximity-seeking attempts. As a result, the child does not easily give up seeking proximity, leading the child to demand or force the attachment figure’s attention, support, and love.

In contrast, deactivating strategies are “flight” reactions to an attachment figures’ unavailability and unresponsiveness, which often develops in relationships with attachment figures who disapprove of and/or punish closeness and expression of need or vulnerability (Main, 1990). The child who uses deactivating strategies learns to suppress his or her need of proximity and support, and deals with challenges and threats alone, which is called “compulsive self-reliance” (Bowlby, 1969/1982). The primary goal of deactivating strategies is to keep the attachment system turned off or down-regulated so as to avoid frustration and distress caused by the attachment figure’s unavailability and unresponsiveness.
Mental Representation

Bowlby (1969/1982) implicated that variations in primary caregivers’ responses to children’s attempts for proximity and protection not only alter the operation of the attachment system in a particular interaction (or short-term series of interactions in relationships) but also gradually engender enduring and pervasive changes in children’s long-term associative memory network of mental representations of interactions with the attachment figure. Stored long-term memory and knowledge in childhood, called “internal working model” or “mental representation,” influences an individual to predict future interactions with other people (especially with a relationship partner in adulthood) and adjust proximity-seeking attempts without rethinking. Repeated attachment-related interactions result in increasingly stable mental representations of self (“I am good and lovable” or not), others (“Others or the world are trustworthy” or not), and interpersonal relationship (“I’m comfortable and confident in interacting with people” or not). The internal working models, as cognitive-affective structures that include both affect memories and cognitive appraisals and expectations that evoke memories (Shaver, Collins, & Clark, 1996), are tolerably accurate reflections of the experiences that an individual actually had in a relationship with a primary caregiver in the past (Bowlby, 1973). However, the internal working models can bias the ways in which an individual perceives, interprets, and stores memories of subsequent interactions with attachment figures through the operation of defensive attachment strategies (e.g., defensive exclusion of painful information from awareness) (Mikulincer & Shaver, 2007). Because of such biases, the internal working models of self, others, and relationship reflect only in part the ways the individual actually behaved in a given interaction with a particular attachment figure.
With the passage of time, the internal models of secure attachment, hyperactivation, and deactivation created in relationship with a particular attachment figure can either be reinforced or changed through relationships with other attachment figures, or secondary attachment figures such as siblings, friends, mentors, therapists, and romantic partners. As a result, with respect to a particular relationship and across different relationships, individuals tend to possess blended models of secure attachment, hyperactivation, and deactivation; sometimes they think about relationships in secure terms and at other times in less secure, more hyperactivating or deactivating terms. Due to differences in relationship histories, dominant working models may differ across individuals. At a generic level, nevertheless, the model that represents interactions with major attachment figures (e.g., parent, spouse) typically becomes the most representative, accessible mental representations of attachment and has the strongest effect on attachment system functioning across relationships over the course of life (Mikulincer & Shaver, 2007). The most chronically accessible, prototypical working models become part of an individual’s implicit procedural knowledge and tend to operate automatically and unconsciously (Bowlby, 1973).

**Attachment Styles**

Attachment styles can be defined as patterns of behaviors, emotions, thoughts, and needs that result from a history of attachment experiences, usually beginning in the relationship with a primary caregiver in childhood (Fraley & Shaver, 2000). An individual’s attachment style reflects his or her most chronically accessible working models and its manifestations in a specific relationship or across relationships. The concept of attachment style was first proposed by Ainsworth and colleagues to describe infants’ patterns of response to separation from and reunions with their mother in the laboratory during a procedure called Strange Situation (Ainsworth, Blehar, Waters, & Wall, 1978). During the Strange Situation, infants (10 to 18-
month-old) were placed in unfamiliar environment with their mothers and a stranger in a series of situations ranging from low anxiety (e.g., playing with mother) to high anxiety (mother leaving and child staying alone with the stranger). Infants’ behaviors were classified into one of three categories; secure, insecure-ambivalent (anxious), and insecure-avoidant (avoidant) attachment styles based on infants’ response to the mother’s departure and return as well as level of exploration in unfamiliar surroundings. Later, attachment researchers (Main & Solomon, 1990) added a fourth category, “disorganized/disoriented,” characterized by odd, awkward behavior and unusual fluctuation between anxious and avoidant attachment styles.

According to Ainsworth and colleagues (Ainsworth et al., 1978), infants classified as secure seemed to possess accessible internal working models of successful proximity-seeking attempts and security attainment. They tended to exhibit distress during separation from their mother, but then recovered quickly while continuing to explore the environment (e.g., playing with toys) with interest. When reunited with their mother, they greeted her with joy and affection, initiated contact with her, and responded positively to being held. During the home observations, mothers of these infants were emotionally available and responsive to their child’s proximity-seeking behavior in times of need.

Anxious infants seem to possess accessible internal working models related to one of the secondary attachment systems, hyperactivation, mentioned earlier. They were extremely distressed during separation and exhibited conflicted or ambivalent responses toward their mother during reunions; for example, they clung one moment and angrily resisted their mother’s attempts to comfort the next. During home observation, interactions between infants and their mothers were characterized by lack of harmony and lack of consistent responsiveness from the mothers (Ainsworth et al., 1978). In contrast, avoidant infants appeared to possess accessible
internal working models related to the other secondary attachment system, deactivation. They showed little distress when separated from their mother and tended to avoid her when she returned. In home observation, the infants’ mothers tended to be emotionally rigid and angry, while rejecting their infants’ proximity-seeking efforts (Ainsworth et al., 1978). Mothers of both anxious and avoidant infants seemed to thwart security attainment, which seemed to foster their infants’ adoption of secondary strategies.

Disorganized/disoriented infants seemed to suffer from a breakdown of organized attachment strategies, either primarily hyperactiving or deactivating (Main & Solomon, 1990). They often oscillated between two secondary strategies or did something bizarre, such as lying face-down on the floor without moving when their mother appeared following a separation or sitting passively under a table, evincing no clear proximity-seeking strategy at all (Main & Solomon, 1990). These odd behaviors seemed related to disorganized, unpredictable, and discomfiting behavior on the part of mothers who were likely to be suffering from unresolved losses or unresolved attachment-related traumas in the past. When their children approached them for comfort and reassurance, the mothers sometimes looked frightened, looked away, or “spaced out” in a dissociative way. That mothers’ response causes children to stop abruptly in confusion, or adopt a variety of distracting behaviors to reduce frustration and discomfort (Main & Solomon, 1999).

Since Ainsworth’s pioneering proposition of attachment styles, researchers in the fields of developmental, social, personality, or clinical/counseling psychology have devised measures and scales designed to assess either childhood or adult attachment styles through semi-structured interviews (e.g., Adult Attachment Interview; George, Kaplan, & Main, 1985) or self-reported measures (e.g., Adult Attachment Scale: Collins & Read, 1990; Relationship Questionnaire:
Bartholomew, 1991; Experiences in Close Relationship Scale: Brennan et al., 1998). A multitude of studies that have been conducted up until recent years about adult attachment styles agree that there are two dimensions of insecurity underlying all self-report measures: anxiety and avoidance. The anxiety attachment dimension captures a strong desire for closeness and protection, doubts and worries about availability of attachment figure and one’s own value to the attachment figure, and use of hyperactivating attachment strategies to cope with distress and insecurity. The avoidance attachment dimension is concerned with discomfort with closeness and depending on attachment figure, preference for emotional distance and extreme self-reliance, and use of deactivating attachment strategies to cope with distress and insecurity.

Bartholomew (1990) provided an interpretation of these two dimensions based on Bowlby’s (1969/1982) ideas of internal working models of self and others. She proposed that the anxiety dimension be conceptualized as “model of self” (positive vs. negative) and the avoidance dimension be conceptualized as “model of others” (positive vs. negative). Combinations of the two dimensions can be viewed as defining four attachment styles: “secure” for people with positive models of self and others; “preoccupied” for those with positive models of others and negative models of self; “dismissing” for those with negative models of others and positive models of self; and “fearful” for those with both negative models of self and others. Securely attached people are characterized by secure internal working models, or trust in attachment figures and their availability and responsiveness, positive self-image, and comfort with closeness and interdependence, as well as the ability to cope with threat and stressors in constructive ways.

From a slightly different perspective, Pietromonaco and Feldman Barrett (1997) proposed a four-prototype model of attachment by combining two affect-process dimensions (intimacy and independence); secure, preoccupied, dismissing, and fearful. In seeking a sense of felt-security,
a single overarching goal of attachment, individuals with “secure” attachment patterns achieve a balance between establishing intimacy and maintaining independence. In doing so, they perform a good deal of flexibility when they apply intimacy or independence. Those with “preoccupied” patterns hold an overriding chronic goal to achieve intimacy as a way of attaining felt security, and part of that goal involves obtaining responsiveness from others. In contrast, people with “dismissing” patterns seem to hold an overriding chronic goal to maintain their independence from others as a way of achieving felt security, which may be further linked to a goal to protect the self from rejection and abandonment. Finally, people with “fearful” patterns seem to hold conflicting chronic goals to both achieve intimacy and maintain independence from others in their attempts to achieve felt security, but with less flexibility than secure individuals. Fearfully attached people may experience approach-avoidance conflicts by activating both goals at the same time.

Despite the conceptual simplicity of both Bartholomew’s (1990)’s and Pietromonaco and Feldman Barrett’s (1997) categorical classifications, however, attachment researchers (e.g., Brennan et al., 1998; Fraley & Waller, 1998; Mikulincer & Shaver, 2007) contend that adult attachment styles are not truly categorical but rather continuously distributed on two-dimensional space (anxiety and avoidance). For instance, Mikulincer and Shaver (2007) suggested that four attachment categories based on these two dimensions (anxiety and avoidance) would be more accurate and informative than three categories based on descriptive and qualitative measures (secure, insecure-ambivalent, and insecure-dismissing; e.g., Hazan & Shaver, 1987). Brennan and colleagues contended that adult romantic attachment styles can be measured along two roughly orthogonal dimensions, attachment anxiety and attachment avoidance (Brennan et al., 1998). Attachment anxiety reflects the degree to which a person worries that a relationship
partner may not be available or adequately responsive to his or her needs in times of distress. Attachment avoidance reflects the extent to which a person distrusts a partner’s goodwill and strives to maintain independence, autonomy, and emotional distance from him or her. People who score low on both dimensions are said to be securely attached.

**Developmental Continuity in Attachment**

Two of key propositions of Bowlby’s attachment theory are: (1) attachment patterns are a function of actual experiences within one’s family of origin during childhood; and (2) attachment patterns or internal working models are fairly stable from infancy to adulthood, but are nevertheless open to change (Mikulincer & Shaver, 2007). In fact, the concept of “working” model implies a potential change or tentativeness; an individual’s internal working models balance stability and change (Allen, 2001; Bretherton & Munholland, 1999). On the side of stability, internal working models formed in childhood allow an individual to generalize through assimilation process, or interpreting present experience in relation to the past, as implicated in Piaget’s (1953) theory of cognitive development. As are other cognitive schema, working models are inherently self-perpetuating by applying old working models to new situations. On the side of change, the process of accommodating to new experience allows an individual to update and revise old models, much like people endeavor to do in psychotherapy or through new experiences in other close relationships (e.g., friends, teachers, mentors).

In reality, people develop multiple working models and are challenged to employ them over the course of development. The development of an attachment patterns in adulthood is rooted in early infant-primary caregiver interaction, but new positive (e.g., secure attachment relationships with romantic partners, mentors, or therapists) or negative (e.g., spousal abuse,
a sudden death of significant others) life experiences can produce discontinuity in internal working models and attachment patterns (Mikulincer & Shaver, 2007).

Change in child attachment patterns.

One of the major causes of discontinuity in an attachment orientation during childhood is a primary caregiver’s experience of extreme stress (e.g., a sudden death of a significant other, loss of job, depression), which draws psychological resources away from caregiving and interferes with delivering sensitive and responsive care (Allen, 2001; Van der Kolk, 1996). In addition, family transition (e.g., frequent moving, parental divorce) can move a child toward insecurity when the changes are compounded by other personality and familial factors that derail sensitive caregiving of the attachment figure.

Several longitudinal studies provided evidence of lawful discontinuity in attachment patterns between infancy and adulthood (e.g., Fraley, 2002; Grossman et al., 2005; Hamilton, 2000; Lewis, Feiring, & Rosenthal, 2000; Sagi-Schwartz & Aviezer, 2005; Waters et al., 2000; Weinfield et al., 2000). These studies assessed infant attachment in the Strange Situation at 12 months of age and then adult attachment various years later. They also gathered data concerning attachment-related life events (e.g., death of a parent, experience of life-threatening illness, maternal depression, physical/sexual abuse by a family member, parental divorce) during the same period of time. The findings of these studies indicate that attachment-relevant stressful life events occurring during childhood or adolescence engender discontinuities in attachment patterns and internal working models and increase the likelihood that infants once classified as securely attached would become classified as insecurely attached in the Adult Attachment Interview (George et al., 1985).
Another cause of discontinuity in an attachment orientation relates to so-called “earned security” – developing secure internal working models over the course of development despite insecure childhood attachment. Attachment researchers (e.g., Bowlby, 1988; Main, 1995) suggested that adults who experienced trauma or had insecure attachment with a primary caregiver in childhood have the capacity to form secure attachment over the course of life. As individuals experience and gain an understanding of their emotions associated with painful childhood memories, they could make progress towards restructuring their frame of reference, becoming more behaviorally and cognitively flexible, and engraining in more adaptable behaviors in relationships (Bowlby, 1988). Corrective emotional experiences through supportive and caring relationships with secondary attachment figures (e.g., mentors, psychotherapists, close friends, intimate partners) are believed to help individuals build secure internal working models, which in turn contribute to capacities for self-regulation and secure attachment relationship with significant others (Bowlby, 1988; Main, 1995).

A few studies explored the process by which individuals who experienced insecure attachment in childhood earn secure attachment over the course of development (e.g., Cohen, 2005; Moller, McCarthy, & Fouladi, 2002; Paley, Cox, Burchinal, & Payne, 1999; Roisman, Padron, Sroufe, & Egeland, 2002). Moller and colleagues reported that 15% to 55% of general populations who had developed insecure attachment styles in childhood earned secure romantic attachment style in adulthood (Moller et al., 2002). Cohen (2005) studied the developmental process by which college students who reported insecure childhood attachment yet developed secure adult attachment by using both retrospective and concurrent methodologies. Cohen suggested that the earned-security process not only occurs through secure romantic attachment
relationship with a supportive partner in adulthood, but can also begin as early as childhood in relationships with secondary attachment figures (e.g., siblings, grandparents).

Taken together, the aforementioned studies suggest that continuity of attachment patterns from childhood to adulthood is a dynamic process resulting from successive interactions between person and environment over the course of life. Those findings are consistent with Bowlby’s proposition that internal mental models and attachment patterns are open to change through the process of both assimilation and accommodation throughout the course of development.

Change in adult attachment patterns.

Mikulincer and Shaver (2007) reviewed more than 30 published studies that examined the stability of attachment patterns during adulthood. Most of the studies examined the stability of attachment patterns over short period of time, ranging from 1 week to 1 year, while a few studies examined stability over 2 to 25 years. The findings of those studies suggested moderate to high stability in adulthood attachment patterns. For continuous ratings of attachment dimensions or styles, the test-retest correlations ranged between .47 and .70 with an average coefficient around .56, while for categorical attachment classification, test-retest concordances ranged between 44% and 90%. On average, around 70% of the participants received the same attachment classification or chose the same attachment category at different time points.

Fraley and Brumbaugh (2004) conducted a meta-analysis of 24 studies of 30 reviewed by Mikulincer and Shaver (2007) and compared the results of this meta-analysis with the results of another meta-analysis that Fraley (2002) conducted with many longitudinal data on childhood attachment stability. They concluded that the stability of attachment patterns in adulthood was higher ($r = .56$) than the stability in childhood attachment ($r = .39$). These findings are consistent with Bowlby’s (1973) proposition that attachment patterns or internal working models remain
relatively stable over the course of life. However, the fact that the average test-retest correlation is around .56 leaves considerable room for change, suggesting that adult attachment patterns are also sensitive to changing life circumstances.

Furthermore, Mikulincer and Shaver (2007) reviewed several studies that explored whether changes in adult attachment style can be explained by attachment-relevant experiences (e.g., abuse, separation). They reported that for people who started their adult life with a secure attachment style, stressful life experiences (e.g., separation from or loss of loved ones, a breaking of a romantic relationship, consistent rejection, disapproval, or criticism by significant others) tended to destabilize internal working models and secure attachment relationship patterns. In contrast, for those who entered into adult life with an insecure attachment patterns positive life experiences (e.g., stable, secure attachment relationship with a romantic partner, good marriage, social support, becoming a loving and caring parent, successful psychotherapy) tended to contradict their negative models of self and others and develop secure attachment. These findings suggest that as in childhood and adolescence, changes in life circumstances and experiences in adulthood can lead people to modifying their mental representations of self, others, and their relationship patterns.

Attachment and Development of Self-Regulation

The emergence of a sense of the self requires not just the inborn “a priori” to organize experience but also the presence of others or objects who provide certain types of experiences (Wolf, 1988). In explicating the childhood development of the self, Kohut (1977) proposed two important concepts; infant-mother pair and regulation. Early childhood development is characterized as interdependent, reciprocal interactions between infant (self) and mother\(^1\) (self-object) in a system of relationship, which is analogous to Bowlby’s proposition. The reciprocal

\(^1\) Use of “mother” here is for historical accuracy and current self psychologists would use term “caregiver.”
interactions with a sensitive, empathic mother provide the infant with a sense of self, self-regulation, and intersubjective affective experiences (Kohut, 1977, 1984; Schore, 2002).

In the similar context of Kohut’s propositions, Watson and colleagues (Gergely & Watson, 1996; Watson, 1994) discovered how infants gravitate toward the emotional attunement needed for development of the self and capacity for self-regulation in interactions with their mother. In the first few months of life, infants learn to switch from focusing on their own physical actions, or stimulus-response contingencies, to attending to the emotionally responsive social environment. As mothers soothe infants not only by direct physical ministrations but also by emotional communication (especially by emphatic responsiveness), infants develop a high degree of interest in the mothers’ responses to their emotional states. Once infants prefer to focus on their mother’s emotional responses, they can become soothed by their mothers’ emotional communication, which gives them a sense of control over their mothers’ emotional expression. This sense of control further affords a rewarding sense of self-agent, or capacity for self-regulation. Through interactions with the consistently emphatic mothers, infants can transform soothing interactions into self-soothing capacities through a process of internalization.

This transforming internalization entails the development of mental representations of emotional states, which enables individuals to reflect and experience emotional states as such (Allen, 2001). More specifically, infants’ mental representation of emotional states temper raw emotion arising from stress, by associating it with an image of mothers’ emphatic expression (‘That’s what I feel!’), a feeling of control over mothers’ expression (‘She’s responding to me!’), and a feeling of comfort in relation to mothers’ emphatic responsiveness (‘She understands and cares what I feel!’) (Gergely & Watson, 1996). Successful emotion-regulating interactions with emphatic caregivers (including parental affect-mirroring) contribute to the establishment of
a sense of self as self-regulating agent; empathic responsiveness of the mothers is key (Gergely & Watson, 1996).

In contrast, when the mothers’ responses to their infants’ needs are repeatedly unempathic, insensitive, and unreliable, infants cannot develop such a capacity for self-regulation, which makes them more vulnerable to a variety of affect-behavior regulation problems such as symptoms of depression, eating disturbances, substance abuse, relationship instability, and even self-mutilations (Kohut, 1977; Schore, 2002). The major psychological consequence of childhood abuse and neglect, or insecure attachment, is the breakdown of the infants’ adaptive mental processes (e.g., capacity for empathy) leading to the maintenance of an integrated sense of self and a capacity for self-regulation in relationships (Allen, 2001).

Sensitive, empathic responsiveness and emotional attunement of an attachment figure play a central role in developing not only a sense of self-agent, or capacity for self-regulation, but also a sense of primary intersubjectivity, or affect synchrony, within the infant. Feldman and colleagues observed the infant-mother dyadic interactions in which infants develop a sense of intersubjectivity (Feldman, Greenbaum, & Yirmiya, 1999). For instance, face-to-face interactions between infant and mother, emerging at approximately two months of age, are highly arousing, affect-laden moments to both infant and mother. To regulate the high arousal positively, the infant and mother need to synchronize the intensity of their affective behavior even within seconds. Both infant and mother match psychobiological states and then simultaneously adjust their social attention, stimulation, and accelerating arousal to each other’s response (Shore, 2002). In such affectively synchronized interactions with the caregiver in the context of mutually attuned selective cueing, called “affect synchrony,” the infant learns to send specific social cues to others and interpret others’ cues in social play, which leads to developing
a sense of primary intersubjectivity. Affect synchrony, a primary form of intersubjectivity, develops as consequences of each partner’s learning the rhythmic structure of the other and modifying his or her behavior to that structure (Lester, Hoffman, & Brazelton, 1985). Mutually attuned synchronized interactions are fundamental to the healthy affective development and capacity for affect regulation in relationships (Schore, 2002). In contrast, repeatedly unempathic, insensitive, and uncaring responsiveness of the primary caregiver, which often occurs in abusive, neglecting familial environments, jeopardizes the child’s capacity for empathic understanding of others’ needs in relationships as well as the development of a sense of confidence in relationships.

Trauma

Definition and Features of Trauma

Exposure to a traumatic event is ubiquitous in human history and lives (Van der Kolk & McFalane, 1996). The term “trauma” is often viewed as extreme stress from tragic events. The Webster’s Third International Dictionary (Merriam-Webster, 2002) defines trauma: 1) “an injury or wound to a living body caused by the application of external force or violence”; or 2) “a psychological or emotional stress or blow that may produce disordered feelings or behavior” (p. 2432). The online version of Oxford English Dictionary (OED, 2008) elaborates the meaning of trauma in the context of psychoanalysis and psychiatry: “a psychic injury, esp. one caused by emotional shock…a state or condition so caused.” The Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition (DSM-IV; American Psychiatric Association, 1994) set two criteria for the diagnosis of Post Traumatic Stress Disorder (PTSD), which is defined by Criterion A:
The person has been exposed to a traumatic event in which both of the following are present: (1) the person experienced, witnessed or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others; (2) the person’s response involved intense fear, helplessness, or horror. (pp. 427-428)

Given the definitions in the dictionaries and criteria in the DSM-IV, “trauma” is defined in this study as ‘a psychological damage caused by extremely stressful physical and/or mental events.’

Trauma is not an objective event but rather a subjective experience of extreme stress from an event that contributes to feelings of helplessness, fear, and lack of control (e.g., Allen, 2001; Van der Kolk, 1996). Foa and colleagues pointed out that ‘lack of controllability’ and ‘unpredictability’ are two core aspects of traumatic experiences (Foa, Zinbarg, & Rothbaum, 1992). Uncontrollability and unpredictability often compound one another but unpredictability underlies uncontrollability, because the inability to predict danger could lead to a generalization of fear (Allen, 2001). Uncontrollability and unpredictability are associated with increased arousal, heightened feelings of fear and anxiety, numbing, or avoidance.

*Types of Trauma*

Allen (2001) categorized types of traumatic events along a spectrum of interpersonal relatedness; at the low end of the spectrum is impersonal trauma (e.g., hurricane, earthquakes); in the middle of the spectrum is trauma caused by a stranger (e.g., a criminal assault); and at the high end of the spectrum is trauma taking place in a relationship with significant others (e.g., parental abuse/abuse, a sudden death of spouse/child). Traumatized people often experience multiple forms of trauma (e.g., physical/emotional/verbal abuse) that cover the whole spectrum.
Most traumatic events occur through interpersonal relatedness or at least involved such relatedness after the events (Allen, 2001).

Impersonal trauma is exemplified by natural disasters such as hurricanes, fires, tornadoes, earthquakes, and volcanoes, which are very commonplace around the world (e.g., Tsunami in Indonesia, Hurricane Katrina in the United States). Despite the label of natural disasters as “impersonal”, however, they often precede traumatic interpersonal impacts (e.g., loss, grief, and bereavement), which contribute to post-disaster psychopathology (Rubins, 2007). Moreover, the interpersonal effects of such disasters can go beyond immediate bereavement to include loss of social support systems (Koopman, Classen, & Spiegel, 1997). For example, the aftermath of Hurricane Katrina on the United States Gulf Coast tore tightly knit communities apart, which contributed to disruption of the community support system and left victims and their families demoralized. People are often affected by both impersonal and interpersonal trauma that often interacts. Trauma tends to accumulate in the form of sensitization; a relatively impersonal trauma may be “the last straw” that precipitates overt symptoms in an individual with a history of interpersonal trauma (Allen, 2001). A sense of helplessness and feelings of lack of control after an impersonal trauma may be rooted in accumulated prior experiences of interpersonal traumas.

Interpersonal traumas, which lie on the middle and far end of Allen’s spectrum of trauma, are defined as threats or injuries occurring in the context of an interpersonal interaction (Allen, 2001). Interpersonal trauma can be categorized into two groups depending on the involvement of an attachment figure (e.g., parents, spouse) in traumatic events: outside-attachment trauma and attachment trauma. Outside-attachment traumas include criminal assaults, sexual harassment or rape by acquaintances or strangers, combat, and political violence, whereas attachment traumas involve childhood maltreatment and adulthood abuse by an attachment figure. Numerous studies
reported detrimental impacts of interpersonal trauma, especially attachment trauma, on a variety of bio-psycho-social problems such as depression, anger, hostility, guilt, sleep problems, substance abuse, concentration disturbances, eating disorders, and social functioning (e.g., Bifulco et al., 2006; Brown & Winkelman, 2007; Finzi, Har-Even, Shnit, & Weizman, 2002; Krejci et al., 2004; Han, Kaminski, Riggs, & Neumann, 2007; Liem & Boudewyn, 1999; Marx & Sloan, 2003; Reynolds, Wallace, Hill, Weist, & Nabors, 2001; Riggs et al., 2007; Riggs & Kaminski, 2010; Ritter, Stewart, Bernet, Coe, & Brown, 2002; Shapiro & Levendosky, 1999; Stein, Leslie, & Nyamathi, 2002). In particular, childhood attachment trauma that occurs in relationships with primary caregivers is typically the most detrimental to mental health because it can damage the child’s capacity for self-regulation and engender a loss of trust and a fear of closeness to others (Allen, 2001).

**Attachment Trauma**

Attachment trauma, a type of trauma occurring in close relationship with an attachment figure (e.g., parent, spouse), contributes to an individual’s capacity for affect-behavior regulation and adaptability to adversity over the course of life (Allen, 2001; Ford, 2009). Given that the primary function of attachment is to provide safety and protection from danger and promote adaptive internal working models, attachment trauma especially endangers the fundamental biological need for protection and a deep-seated sense of self-confidence in regulating emotional distress.

*Childhood attachment trauma.*

Childhood attachment trauma can be construed as maltreatment (e.g., physical/sexual/psychological abuse, physical/psychological neglect) at the hands of attachment figures (Allen, 2001). Childhood physical abuse, or battering, can be distinguished from physical punishment
although the latter is often a precursor to the former. Severe violence toward a child consists of kicking, biting, or hitting with a fist; hitting with an object; burning or scalding; or threatening with a gun or knife (Allen, 2001). Child physical abuse has been associated with greater risk for a wide range of psychological and behavioral problems; approximately one out of ten American children has experienced severe physical abuse (Wolfner & Gelles, 1993). An extensive literature review conducted by Malinosky-Rummell and Hansen (1993) indicate consistent links between childhood physical abuse and violent behaviors from childhood into adulthood, as well as an increased risk of substance abuse and self-mutilating behaviors. According to a study of physically abused adolescents referred to the New York State Department of Social Services, the abused adolescents were seven times as likely to develop major depressive disorders or dysthymia, nine times as likely to show conduct disorders, and nineteen times as likely to abuse drugs when compared to a control group (Kaplan, Pelcovitz, Salzinger, Weiner, Mandel, Lesser, & Labruna, 1998).

In contrast to physical abuse, where both males (e.g., fathers) and females (e.g., mothers) may be abusive, sexual abuse is perpetrated far more often by males. Allen (2001) aggregated the varying prevalence rate of child sexual abuse across 25 community samples and reported prevalence estimates of 14.5% and 7.2% for males and females, respectively. Although the adverse effects of sexual abuse are well-demonstrated, the relationship between childhood sexual abuse and psychopathology is not invariant. For example, Kendall-Tackett and colleagues reported that two-thirds of sexually abused children showed various emotional disturbances (Kendall-Tackett et al., 1993), whereas Browne and Finkelhor (1986) noted that less than one fifth of women with a history of childhood sexual abuse showed psychopathology in adulthood. An extremely wide range of severity of abuse and the relationships to the perpetrator may play a
substantial role in the variant impact of the childhood sexual abuse (Allen, 2001). Moreover, it is difficult to disentangle the effects of sexual abuse from the family dysfunction and pathology in which it is often embedded (Rind, Tromovitch, & Bauserman, 1998). Sexual abuse is often accompanied by other forms of abuse and neglect in the family, so sexual abuse is not only a trauma in its own right, but also can be viewed as a marker for serious family dysfunction. Hill and colleagues found that a history of sexual abuse increased the risk of depression both in the presence and absence of poor maternal care (Hill, Pickles, Burnside, Byatt, Rollinson, Davis, & Harvey, 2001).

Compared to physical and sexual abuse, in recent years, psychological abuse has drawn clinicians’ attention (Bifulco & Moran, 1998). Psychological abuse encompasses a wide range of behaviors (Bifulco et al., 2002): for example, verbal abuse, humiliation (e.g., public shaming), extreme rejection (e.g., telling the child a wish for him or her to die), and emotional blackmail (e.g., threat to harm others if the child fails to comply). Although the effects of psychological abuse are often difficult to disentangle from other forms of abuse (e.g., high correlation with physical abuse), psychological abuse in childhood is uniquely associated with low self-esteem in adulthood (Breire & Runtz, 1990). Moreover, women with a history of psychological abuse showed higher levels of depression, anxiety, eating disorder, dissociation, and suicidal behavior, compared to a non-abused control group (Bifulco et al., 2002; Ferguson & Dacey, 1997; Kent, Waller, & Dave, 1999).

Just as various forms of childhood abuse co-occur, childhood abuse is often compounded by neglect (Allen, 2001). Childhood neglect represents the largest component of official cases of child maltreatment referred to the child protective services (Widom, 2000). A potential consequence of neglect is failure to thrive, evident in stunted growth, dejection and passivity,
and impaired cognitive functioning (Erickson & Egeland, 1996). According to Allen’s (2001) review of various types of neglect, childhood neglect can be divided into physical neglect (failure to provide and lack of supervision) and psychological neglect (failure to support psychosocial development). The psychological neglect can be further divided into emotional neglect (lack of responsiveness to the child’s emotional states), cognitive neglect (failure to nurture and support cognitive and educational development), and social neglect (failure to support interpersonal and social development).

In their longitudinal study, Erickson and Egeland (1996) underscored the potentially adverse developmental consequences of psychological neglect (e.g., anger, non-compliance, lack of persistence, negativism, impulsiveness, and dependency) by parents who are unresponsive to their children’s signals, particularly pleas for warmth and comfort. They indicated that the harm of psychological neglect in childhood is somewhat more profound than that of physical neglect and other forms of maltreatment. Psychological neglect in childhood is the most subtle form of maltreatment, but its consequences are the most harmful (Erickson & Egeland, 1996). Hill and colleagues (Hill et al., 2001) suggested that secure romantic adult relationships mediated the relationship between poor parental care in childhood and depression in adulthood among their community sample of women recruited from primary care practices.

*Adulthood attachment trauma.*

Attachment relationship plays a pivotal role over the course of life from the cradle to the grave (Bowlby, 1982). Just as the need for secure attachment does not end in childhood, neither does the potential for attachment trauma. Adult attachment traumas can be categorized into physical, sexual, and psychological abuses.
Domestic violence has had a long history in families, which is mostly perpetrated to women by men in intimate relationships; one of the characteristics of adulthood attachment trauma is that abuse in adulthood has an overwhelming gender bias – predominantly attacks on females by males. Walker (1978) conducted extensive interviews with over a hundred battered women and constructed battering as repeated coercion in intimate relationships. She identified a three-phase cycle of violence; 1) tension gradually escalates around minor battering; 2) an acute battering incident wherein controls give way; and 3) the aftermath of the battering incident characterized by a kindness and contrite loving behavior. Battering relationships often began in the context of kind and warm caregiving by men and ended up with gentle loving behaviors by the men (Walker, 1978, 2009), which helped explain how the battered women could feel love for their perpetrators. Burgess and Roberts (1996) reported that marital violence has its antecedents in premarital relationships, with estimates of dating violence ranging from 20% to 67% in the US. As with other forms of attachment trauma, the damages stemming from domestic violence are not just physical—at worst fatal—but also psychological: e.g., PTSD, depression, substance abuse, and suicidal behaviors (Browne, 1993; Lystad, Rice, & Kaplan, 1996).

Domestic violence may also involve sexual abuse by a partner. For example, marital rapes are often intertwined with violence and threats of violence (Burgess & Roberts, 1996; Lystad et al., 1996). Women are far more likely to be raped by an intimate partner than by a stranger; rape occurs in 10-14% of intimate relationships (Mahoney & Williams, 1998). The prevalence of rape in intimate relationships increases in high-risk populations; for example, ranging from 20-30% in couples seeking treatment to 50-70% of women seeking shelter from battering (Mahoney & Williams, 1998). In most cases, psychological consequences of marital rape are likely to be more severe than those of stranger rape because marital rape occurs in the
context of an attachment relationship, which is supposed to provide safety and comfort (Allen, 2001).

Although physical and sexual abuse has drawn most of the attention of clinicians and researchers, psychological abuse (e.g., verbal/emotional abuse) can be also detrimental in adulthood as well as childhood (Holtzworth-Munroe, Smutzler, & Sandin, 1997). In fact, physical abuse and psychological abuse are hardly separable in intimate relationships. Kemp and colleagues reported a high rate of co-occurrence of physical abuse and verbal abuse for physically battered and verbally abused women – 81% for physically abuse and 63% for verbally abused (Kemp, Rawlings, & Green, 1991). The essence of a battering relationship is coercion; psychological coercion is often backed up by the threat of physical and sexual violence, and severe emotional and economic deprivation is often employed in the service of coercion (Walker, 1978, 2009). Physical violence and psychological abuse are intertwined, but verbal threats of violence are far more frequent than actual resort to violence (Herman, 1992).

All of the aforementioned types of traumas are risk factors for a variety of psychological disorders so it is challenging to point out any specificity in the trauma-psychopathology relationship. Nevertheless, clinicians and researchers have documented that abuse and neglect occurring in attachment relationships tends to have the most devastating effects on trauma survivors. Herman (1992) captured the detrimental effects of attachment traumas in her term of “complex trauma”; the hallmarks of complex trauma are a multiplicity of psycho-physiological symptoms (e.g., somatization, dissociation, chronic depression), relationship disturbance (e.g., vacillations between close relationship and isolation), and a risk for experiencing other harms. Most severe post-traumatic symptoms are likely to result from traumas that took place in a previously safe or pleasant environment and relationship (Foa et al., 1992, Ford, 2009).
Masserman (1943) indicated in their pioneering animal research studies that pairing an aversive stimulus with an appetite response (reward) is especially stressful. Attachment trauma contains this problematic feature; that is, pleasant feelings of safety, protection, security, comfort, and companionship alternate with aversive feelings such as fear, lack of control, and helplessness. This interplay is characteristic not only of childhood maltreatment but also of the cycle of violence in adult battering relationships.

As implicated earlier, many individuals exposed to trauma, especially attachment trauma, tend to be victims of multiple traumas although many interpersonal traumas could take place as a single event (e.g., criminal assaults). Furthermore, although the magnitude, frequency, and duration of events that make up attachment trauma vary widely, attachment trauma is typically repeated because it occurs in the context of an enduring relationship (Allen, 2001). Trauma occurring in attachment relationships in childhood often entails multiple forms of abuse combined with neglect. Bifulco and colleagues explained the impact of child abuse on depression through a dose-response relationship; the more types of abuses, the higher risk of adult depression (Bifulco & Moran, 1998; Bifulco et al., 2002). For example, 38% of children who experienced two types of abuse became depressed compared to 26% of children with one type and 14% of no type (Bifulco & Moran, 1998), suggesting that future studies disentangle the effects of different types of maltreatment, singly and in combination in future studies.

Despite the link between childhood adversity and adulthood psychopathology, there is clear evidence for individual differences in reacting to stress and trauma (Weiner, 1992). Several studies on the relationship between childhood experience and adulthood outcome (Bifulco, Brown, & Harris, 1994; Stein, Fonagy, Ferguson, & Wisman, 2000; Hill, Fudge, Harrington, & Pickles, 1995) indicate the sheer diversity (even idiosyncratic) of outcomes associated with
adversity, coupled with the staggering array of factors that appear to mediate them. One of the major reasons for individual differences in reacting to traumatic events can be explained by the experience of close, supportive relationships over the course of development. Several researchers examined the central role that attachment relationship plays in mitigating the impact of traumatic events on various mental health problems.

For example, Hauck and colleagues reported that an affectionate bond with parental figures in childhood buffered against the impact of childhood rape on traumatic symptoms and acute stress disorder in adulthood (Hauck et al., 2007). Liem and Boudewyn (1999) also reported that adult attachment mediated the relationship between early childhood maltreatment and symptoms of depression and low self-esteem in adulthood. Likewise, Aspelmeier and colleagues indicated that secure adult attachment protected against the negative effects of childhood sexual abuse on symptoms of dysphoria in adulthood (Aspelmeier, Elliott, & Smith, 2007). The findings of those studies implicate that childhood maltreatment in attachment relationships could be offset by security and comfort provided in other attachment relationships in adulthood (e.g., secure attachment relationship with a romantic partner, strong social support network, religious faith in God).

Attachment Trauma and Affect-Behavior Regulations

Exposure to extremely stressful events affects people at many levels of functioning: somatic, emotional, cognitive, social, behavioral, and even characterological (Van der Kolk, 1988; Cole & Putnam, 1992). Particularly, trauma caused by attachment figures severely undermines an individual’s capacity for self-regulation, making the individual vulnerable to a variety of pathological problems such as depression, disordered eating behaviors, substance abuse, relationship instability, dissociation, suicidal attempts, and personality disorders (Allen,
To better understand social, psychological impact of trauma on self-regulation, Alarcon and colleagues proposed a cascade model of post-traumatic stress disorders, in which trauma symptoms, impairments in functioning, and environmental stressors are intertwined in vicious cycles (Alarcon, Glover, & Deering, 1999). For example, a woman with a history of severe physical and sexual abuse by her father in childhood who developed traumatic symptoms in the aftermath starts to use substances and binge eat to avoid the painful memories and control feelings of anger, guilt, and shame. Her substance abuse affects her relationships with coworkers and work performance, which leads to unemployment and affects her relationship with her partner, both of which in turn exacerbate her substance abuse and eating disturbances. Symptoms of depression occur and are further compounded by ongoing relationship difficulties with the partner, substance abuse, binge eating, and so on. This cascade model shows a good example of how trauma can contribute to the dysfunctional interactions between the traumatized individual and environment, with a snowballing of impairments and stressors.

Attachment trauma and depression.

Depression is one of the most common mental health problems (Young, Rygh, Weinberger, & Beck, 2008), and the lifetime prevalence for depression in the United States is approximately 20% (Kessler et al., 2005). Many clients who have a history of trauma often seek treatment due to emotional distress (e.g., depression) rather than to the traumatic experience itself (Allen, 2001). Extensive research demonstrates that a history of trauma substantially increases the likelihood of having chronic anxiety and depression (e.g., Breslau, Davis, Andreski, Federman, & Anthony, 1998; Finzi, Har-Evan, Shnit, & Weizman, 2002; Krupnick et al., 2004; Marx & Sloan, 2003; Sandin, Chorot, Santed, & Valiente, 2004; Turner & Lloyd, 1995). The
National Comorbidity Survey showed that 48% of men and 49% of women with a lifetime history of post-traumatic symptoms had a lifetime history of major depression (Kessler et al., 1995).

In their study of young adults, Breslau and colleagues found that 37% with a history of traumatic experience also had a history of major depression (compared to 11% of those without a trauma history) (Breslau et al., 1998). More specifically, Turner and Lyold (1995) examined the impact of twenty types of life trauma on mental health for a community sample and reported that accumulative life traumas substantially increased major depression and substance abuse/dependency. Krupnick and colleagues (Krupnick et al., 2004) investigated the impact of physical and sexual abuse during adolescence on the psychological outcomes in adulthood. They reported that exposure to trauma, especially cumulative exposure, contributed to mental health problems (e.g., acute stress disorder, lifetime posttraumatic symptoms, major depressive disorder, and substance abuse).

Researchers have identified several bio-psycho-social processes by which traumatic experience affects an individuals’ capacity for affect regulation. For example, hyperactivity in the Hypothalamic-pituitary-adrenal axis (Yehuda, 1997, 1998) and learned helplessness (Seligman, 1975) are two of the well-known neurological and psychological mechanisms that link stressful life events and trauma to anxiety and depressive symptoms. Repeated stress and exposure to uncontrollable traumatic events change the typical neurological structure in the brain and engender a deep feeling of helplessness (e.g., ‘all my efforts are futile’). Bifulco and colleagues examined the developmental intertwining of childhood maltreatment, associated stressors, and adulthood depression (e.g., Bifulco & Moran, 1998; Bifulco, Brown, & Adler, 1991; Bifulco, Harris, & Brown, 1992). They reported that a history of childhood abuse, neglect,
or loss of primary caregiver increases the risk of depression in response to stressful life events in adulthood. For example, death of the mother prior to the child’s sixth year predicted adulthood anxiety and depression; the relationship between loss and subsequent symptoms was mediated by lack of maternal care prior to the loss, lack of paternal or substitute care after the loss, and childhood helplessness (Bifulco et al., 1992).

Several researchers have paid more attention to psychological variables that link childhood maltreatment to symptoms of depression in adulthood. For example, Shapiro and Levendosky (1999) examined attachment style and coping strategies as potentially mediating variables between childhood abuse-neglect and psychological-interpersonal functioning for adolescent females. They reported that adult attachment styles fully mediated the relationship between childhood abuse-neglect and psychological distress such as symptoms of anxiety and depression. Stein and colleagues explored the relative effects of childhood abuse and parental substance abuse on depression and substance abuse for a sample of homeless women. They indicated that poor self-images mediated the relationship between childhood abuse and symptoms of depression in adulthood.

In the context of childhood maltreatment, vulnerability factors such as low self-esteem and relationships problems are associated with a higher risk of depressive episodes following stressors; those vulnerability factors are associated with a higher rate of stressful events as well as higher sensitivity to such events (Bifulco & Moran, 1998). Child attachment trauma not only contributes to physiological sensitization and impaired self-image but also leads to the likelihood of stressful interpersonal events in adulthood and to the risk of depression following such events (Allen, 2001). When an individual is exposed to an extremely stressful, or traumatic, event, especially when it occurs repetitively in the relationship with primary caregivers in childhood
(e.g., emotional/physical/sexual abuses, emotional/physical neglects), its detrimental impact on
the individual’s bio-psycho-social functioning lasts not just in childhood but also over the course
of development (Ford, 2009).

Attachment trauma and eating disturbances.

The frequent co-occurrence of trauma and eating disturbances is well known to clinicians
who treat clients with eating disorders (Zerbe, 1993). There are general consensus among
researchers that eating disorders are associated with various types of childhood maltreatments
(e.g., Hund & Espelage, 2005; Kent, Waller, & Dagnan, 1999; Rorty & Yager, 1996; Tereno,
Soares, Martins, Celani, & Sampaio, 2008; Wechselblatt, Gurnick, & Simon, 2000). For example,
Kent and colleagues examined the full range of potential childhood abuse (sexual, physical,
emotional) and neglect experiences in relation to eating disturbances in a non-clinical population,
and reported that all forms of childhood abuse (especially emotional abuse) were associated with
overall eating disturbances (Kent, Waller, & Dagnan, 1999). Tereno and colleagues examined
associations between memories of parental rearing in childhood and attachment styles and eating
disorders in adulthood (Toreno et al, 2008). They reported that the resort to disordered eating
behaviors in adulthood is strongly associated with insecure attachment relationship with a
primary caregiver in childhood. Disordered eating behaviors (e.g., bingeing, purging, starving)
are viewed as a means to regulate emotional pains and damaged self-images related to childhood
abuse and neglect (Rorty & Yager, 1996).

Disordered eating behaviors have been reported to have strong association with poor
regulation of emotional distress. Heatherton and Baumeister (1991) suggested that binge eating
(alone or in the context of bulimia) dampens aversive states by promoting a tentative emotional
escape from self-awareness. Rorty and Yager (1996) examined the impact of childhood abuse
and neglect on a complex post-traumatic syndrome including symptoms of eating disorders. They reported that people who suffer from eating disorders used bingeing and purging as a means of regulating stress and painful emotional states; bingeing is often associated with dissociative states while purging is motivated by its potential to reduce tension and restore a sense of equilibrium. Purging may serve to reestablish a sense of groundedness after the dissociative experience of bingeing. Swirsky and Mitchell (1996) explored the subjective experience of binge-purge cycle with bulimic women with and without a history of childhood sexual abuse. The majority of women reported dysphoria prior to the binge; about half of them felt soothed, relieved, or dissociated during the binge, but the end of the binge often brought feelings of guilt, shame, and disgust. These findings indicated that bingeing and purging are means to control and regulate unbearable emotional states.

Disordered eating behaviors may stem partly from a failure to develop secure attachment relationships that provide the bedrock for self-regulation (Allen, 2001). Mallinckrodt and colleagues compared sexually abused women with and without symptoms of eating disorders and reported that women with eating disorders had less warm and supportive relationship with their mothers, less secure attachments in adulthood, lower perceived social support, and more limited social networks (Mallinckrodt et al., 1995). Troisi and colleagues examined whether seventy eight women with eating disorders have a higher frequency of separation anxiety symptoms in childhood and a higher prevalence of insecure adult attachment styles than healthy sixty four women without eating disorders (Troisi et al., 2005). They reported that compared with the controlled group, women with eating disorders showed significantly more severe symptoms of separation anxiety in childhood and higher scores in insecure attachment styles. In doing so, both anorexic and bulimic women scored higher on the anxious adult attachment, but not on avoidant
attachment. More recently, Tasca and colleagues investigated the role of affect regulation strategies in linking the association between attachment patterns and symptoms of both depression and disordered eating for a sample of 300 women seeking treatment for eating disorders (Tasca et al., 2009). They reported that anxious attachment predicted both depression and symptoms of eating disorders while avoidant attachment predicted only eating disorders.

Despite some conflicting results about the association between attachment styles and eating disorders, O’Shaghnessy and Dallos (2009) conducted comprehensive literature review and suggested that severity of eating disorders are more important than types of eating disorders. In general, studies consistently showed that outpatient and inpatient women with eating disorders score higher than women without eating disorders (e.g., Latzer, Hochdorf, Bachar, & Canetti, 2002; Troisi, Massaroni, & Cuzzolaro, 2005). Both anxious and avoidant attachment styles are associated with more severe eating disorder symptoms and weight concerns in both community and college student sample of women (Brennan & Shaver, 1995; L. Evans & Wertheim, 2005).

Attachment trauma and substance abuse.

Nowhere is the failure of self-regulation more evident than in substance abusers who were maltreated by primary caregivers in childhood (Allen, 2001). An individual who was repetitively abused and neglected by primary caregivers in childhood often tends to feel that they are not worthy enough to be loved, exhibit strong needs for attention and neurotic worries for rejection by a partner, and/or avoid emotional intimacy with significant others. Explicit and implicit memories of being abused and neglected by primary caregivers in childhood prompt to do something, even destructive, to deal with unbearable emotional states; substance abuse is one of the most popular strategies used although it is extremely destructive (Widom, Weiler, & Cottler, 1999). Several psychological mechanisms have been proposed by researchers and
theorists to explain the linkage between childhood maltreatment and substance abuse in adulthood. Individuals who were traumatized in childhood often use substances to: (a) avoid or escape from emotional pains; (b) gain control over feelings of anxiety and depression; (c) reduce feelings of isolation and loneliness from a peer group, and/or (d) make low self-esteem better (Allen, 2001; Defronzo & Pawlak, 2001; Widom et al., 1999).

The prevalence of substance abuse is high in traumatized people, especially those diagnosed with posttraumatic stress disorder (PTSD). The US National Comorbidity Survey showed that for men with PTSD, the lifetime prevalence of alcohol and drug abuse/dependence were 52% and 34%, respectively, while for women with PTSD, the prevalence were 28% and 27%, respectively (Kessler et al., 1995). Substance abuse often alters states of mind. Most substance abusers report that drinking alcohol and/or doing drugs are temporarily helpful for intrusive and hyperarousal symptoms (Bremner, Southwick, Darnell, & Charney, 1996). Epstein and colleagues interviewed women who reported a history of childhood rape and compared them to women without this history (Epstein, Saunders, Kilpatrick, & Resnick, 1998). They indicated that women with childhood rape had twice the number of alcohol abuse symptoms and, among childhood rape victims, those with PTSD had double the alcohol-related symptoms. Painful emotions resulting from traumatic experiences can trigger substance abuse, which in turn contributes to interpersonal conflict, poor intimacy, or loss of job (Ruzek, Plusny, & Abueg, 1998).

Substance abuse by traumatized people is self-medication that backfires. Brown and colleagues examined the relation between PTSD and substance abuse symptoms on those undergoing detoxification in an inpatient setting (Brown, Stout, & Gannon-Rowley, 1998). They reported that reduced amount of substance abuse did not significantly ameliorate PTSD
symptoms while amelioration of PTSD symptoms substantially lowered substance abuse, which confirms that post-traumatic symptoms tend to drive substance abuse. The various pathways between traumatic experiences and substance abuse, however, are not mutually exclusive (McFarlane, 1998). Posttraumatic symptoms and substance abuse each tend to be more severe in the presence of each other, and once both problems are established, a vicious cycle comes into play where one disorder serves to sustain the other (Stewart, Pihl, Conrod, & Dongier, 1998). In fact, traumatic experience often intertwines with substance abuse. Traumatized people are more vulnerable to substance abuse, which contributes to problems that only increase their current stressors (e.g., impaired work performance, marital discord, interpersonal conflicts, and legal problems) (Allen, 2001).

Among various types of trauma across lifespan, impact of childhood abuse and neglect in familial environment on substance abuse in adulthood have drawn the attention of researchers in recent years. For instance, Bransteller and colleagues examined whether mental representations of secure attachment to parents are associated with adolescent substance abuse over time (Branstetter, Furman, & Cottrell, 2009). They reported that higher levels of secure attachment with parents predicted substance abuse over two years of period through maternal monitoring. Caspers and colleagues (Caspers, Yucuis, Troutman, & Spinks, 2006) also examined the association between mental representations of childhood attachment relationship with primary caregivers and adulthood substance abuse problems for a sample of adoptees participating in an ongoing longitudinal adoption study. They reported that individuals classified both dismissing and preoccupied attachment styles showed high rates of substance abuse and dependence; but, those classified with dismissing attachment style were much less interested in participating in substance abuse treatment than those with preoccupied attachment style. Riggs and colleagues
explored the role of early family environment and adult attachment style in explaining various affect-behavior regulation problems and personality dysfunction among inpatient abuse survivors (Riggs et al., 2007). They indicated that adult styles predicted most mental problems; particularly, anxious adult attachment patterns mediated the relationship between childhood family functioning and substance abuse in adulthood.

Faith

Religious beliefs and practices are prevalent and important to people in many countries around the world. Gallup polls indicated that over 90% of people living in the US believe in God and pray, 69% are church members, and 43% have attend church, synagogue, or temple within the past seven days (Princeton Religion Research Center, 1996). According to a recent issue of Newsweek, a vast majority of Americans (88%) identified themselves as religious or spiritual (Adler, 2005). Moreover, in recent years, religion has emerged as an important topic in such disparate domains as electoral politics, constitutional law, and psychological science (Pargament, 2002). An increasing number of studies reported a variety of positive aspects of religious faith and spirituality such as low substance use, positive affect, resilience to stress, social support, a sense of hope and meaning in life, and life satisfaction (Kendler, Gardner, & Prescott, 1997; Goerge, Ellison, & Larson, 2002; Koenig, 1998; Koenig & Larson, 2001; Pardini, Plante, Sherman, & Stump, 2000; Rindal, 1996; Richards et al., 2006; Tix & Frazier, 2005). To deepen an understanding of why religion plays such a central role in our lives and what mechanism underlies the psychology of religion, Kirkpatrick and colleagues (Kirlparick, 1992, 1997, 1999; Kirkpatrick & Shaver, 1990) applied Bowlby’s attachment theory to their conceptual framework for the psychology of religion.
The idea that religion is ultimately rooted in fear and the need for security and comfort is not new. Freud (1927/1961) argued that people yearn for the protection of the omnipotent parental figure and, therefore, create the image of God, suggesting that religious behaviors are inherently childish, immature, neurotic, or unhealthy. In contrast to Freud’s argument, Bowlby (1969/1982, 1973, 1979, 1980) proposed attachment theory, which posits that an individual seeks protection and security from an attachment figure under threatening situations as part of a normal, natural, and healthy activity at any age. Motivated by Bowlby’s emphasis on attachment and its impact on mental health over the course of life, researchers have applied attachment constructs to religious faith in God. For example, Kirkpatrick and Shaver (1990) conceptualized religious beliefs and behaviors from attachment theory; the image of God in most religions may correspond closely to the idea of secure attachment figure. Specifically, God is like a protective parent who is always reliable and available to its children in times of need. God represents an ideal attachment figure, while human attachment figures are, even at their best, fallible, not always available, and not perfectly trustworthy (Kaufman, 1981).

In depicting religion as a haven of safety and comfort, Kirkpatrick and Shaver (1990) implicated that the concept of “secure base” in attachment theory is particularly relevant to religious behaviors. As the perceived availability of a responsive, caring attachment figure is an antidote to fear and anxiety, faith in God provides believers with the same basic comfort, confidence, and security (Kirkpatrick, 1992, 1997). Moreover, the imagery, songs, and languages used by many believers, especially Christians, to represent their beliefs are strongly reminiscent of attachment phenomena: for example, part of lyrics in a Christian Gospel song is “You pass through raging waters in the sea…walk amid the burning flames, but you shall not be
drown...harmed” if you are with God. This kind of religious message inspires believers to cope with adversity and face the trials and tribulations of the world. Research findings about individual differences in images of God are also congruent with the attachment framework. Research findings about individual differences in descriptions about God-images (Broen, 1957; Tamayo & Desjardins, 1976) indicated that securely attached people described images of God more often by using words like “loving,” “protective,” and “comforting.”

Given that many aspects of personal, as opposed to institutional, Christian religion bear similarities to core aspects of Bowlby’s attachment theory, early attachment relationships in the family may exert important impact on subsequent religious behaviors and practices. Kirkpatrick and Shaver (1990) proposed two general classes of hypotheses on the impact of childhood attachment with a primary figure on adulthood religious practices: compensation and correspondence. The compensation hypothesis suggests that religious faith in a loving, personal, available God might serve as a substitute for the secure attachment relationship with primary caregivers that some people never had in the past. For instance, when individuals encounter loss of and separation from a significant other or other extremely stressful environment conditions (e.g., war) they might be more likely to turn to God for comfort and safety. In contrast, the correspondence hypothesis suggests that an attachment style that individuals developed in relationship with primary caregivers in childhood might provide the basis for constructing images of God and other religious faith. For example, individuals who hold “secure” attachment patterns tend to view a higher power as resources of security and comfort, while those who have avoidant attachment patterns tend to hold an atheistic standpoint and view a higher power as remote and inaccessible.
The findings of several studies supported both hypotheses. For example, Kirkpatrick and Shaver (1990) found support for the compensation hypothesis, but only for individuals raised in nonreligious families. For respondents with relatively nonreligious mothers, avoidant attachment styles in childhood were associated with higher religiousness in adulthood while the respondents with secure attachment in childhood showed lower religiousness in adulthood. For those who were raised in religious homes, however, attachment style was not related to adult religiousness. In contrast, McDonald and colleagues supported the correspondence hypothesis (McDonald, Beck, Allison, & Norworthy, 2005). Respondents who reported to grew up in emotionally cold and unreligious families exhibited higher avoidant relationship with God in adulthood while those who reported to grow up in overprotective, rigid, or authoritarian families showed fearful attachment with God in adulthood.

The findings of the aforementioned studies suggest the potential relationship between early childhood experience and subsequent development of religious faith. The hallmark of secure attachment (seeking proximity, providing a haven of safety, and serving as secure base of explorative behavior) exists not only in child-parent relationship but also in the believer-God relationship for those believers.

Religious Faith and Mental Health

Koenig and colleagues conducted a comprehensive review of numerous studies on religion and mental health and identified both negative and positive impact of religiousness (Koenig et al., 2001). Regarding the negative association of religiousness with mental health, a number of studies reported the relationship between religiousness and emotional distress. For example, Schafer (1997) surveyed 282 college students in a university in California and reported the positive relationship between religious involvement and level of psychological distress.
Sorenson and colleagues surveyed 261 teenage mothers (228 unmarried) in Ontario, following them before and after delivery (Sorenson, Grindstaff, & Turner, 1995). They found the associations between depressive symptoms and religious affiliation/church attendance/self-rated religiousness. Strawbridge and colleagues also reported that while religiousness buffered against the effects of financial and health stressors, it was associated with greater distress in participants facing family crisis (Strawbridge, Shema, Choen, Roberts, & Kaplan, 1998). They concluded that religious resources may be more helpful for problems originating outside the individual (e.g., poor health, financial worries) than for stressors perceived as resulting from personal failures (e.g., conflicts with children or relatives).

Besides, it is well known that religion can be used to rationalize hatred or prejudice or be found among those with excessive dependency, obsessive thinking, perfectionism, or excessive anxiety (Pruyser, 1977). Some religious people may have high expectations of themselves and of others, and may judge or exclude those who believe differently than they do. Other religious people may be hypocritical, putting on an external show but actually using religion as a means to another end – social status, business success, power, or influence. An unanswered question about the association between religiousness and mental health is “Do religious beliefs and rituals lead to mental disturbances, or does mental disturbance lead to greater religious activity?”

Many studies reviewed above, however, often failed to control covariates, involved college students or adolescents without mature religious faith, or employed cross-sectional designs, which do not determine causality (Koenig & Larson, 2001). In addition, those findings are in the minority; out of 100 studies identified in the comprehensive review, 79 studies (nearly 80%) found that religious beliefs and practices constantly related to life satisfaction, positive affect, and higher morale (Koenig & Larson, 2001). In fact, religious practices are a widely
prevalent means for Americans to cope with stress and adversity, particularly when stress is severe or out of control. According to Gallup surveys, about 83% of adults in the southern and mid-western parts of the US reported comfort or support through religious activities, compared to a still substantial percentage of people (i.e., 70%) in the east or the west (Princeton Religion Researcher Center, 1982). The results of numerous empirical studies indicated that religious beliefs and practices tend to mitigate the impact of life stress on affective disorder, substance abuse, or eating disorders (e.g., Kendler et al., 1997; Koenig, George, Meador, Blazer, & Ford, 1994; Koenig, Pargament, & Nielsen, 1998; Pardini et al., 2000; Richards et al., 2006; Razali, Hasanah, Aminah, & Subramaniam, 1998; William, Larson, Buckler, Heckmann, & Pyle, 1991).

More specifically, in their comprehensive review, Koenig and colleagues reported that approximately two-thirds of studies (60 out of 93) found that religiousness predicted less depression; those who were more religious (e.g., praying daily) had lower rates of depressive disorders (Koenig et al., 2001). William et al. (1991) conducted the association between religiousness and psychological distress among community members, and reported that level of religiousness predicted less fear or lower anxiety over time. Koenig et al. (1998) reported that the religious elderly who were hospitalized due to medical problems showed less depressed mood. Researchers have also reported that religious faith and spirituality are associated with lower rates of alcohol and drug abuse (Kendler et al., 1997; Koenig et al., 2001; Pardin et al., 2000). In their review of over 50 studies on the relationship between religion and substance abuse, Koenig et al. (2001) indicated that over 85% of studies demonstrated that religious persons were less likely to abuse alcohol or take illicit drugs. Pardin and colleagues examined the relations among religious faith, spirituality, and mental health outcomes in people recovering from substance abuse and reported that those who rated themselves more religious and spiritual were quicker in recovery
from substance abuse and more resilient to stress (Pardini et al., 2000). Kendler and colleagues reported that religious faith, especially personal devotion (e.g., frequency of prayer) not only reduced lifetime risk for substance abuse but also buffered the impact of stressful events on symptoms of depression (Kendler et al., 1997).

In recent years, researchers have demonstrated that religious faith and spirituality can serve as one of the important healing resources for those, especially women, who suffer from eating disorders (e.g., Berrett, Hardman, O’grady, & Richards, 2007; Richards et al., 2009; Taylor et al., 2003). For instance, Berrett and colleagues explored the role that spirituality can play in the treatment of eating disordered women who suffer from trauma (Berrett et al., 2007). They suggested that both trauma and eating disorders can distance people, especially women, from religious faith and spiritual practices, but mature faith and spirituality can serve as a healing resource for those who suffer from eating disorders. Richards and colleagues tested whether spiritual interventions are effective for those suffer from eating disorders (Richards et al., 2006). In doing so, they compared the effectiveness of a spiritual treatment group with cognitive and emotional support groups with female inpatients receiving an eating disorder treatment. They reported that those in the spirituality group not only showed significantly lower emotional distress and eating disorder symptoms but also improved more quickly from the eating disorder symptoms than the control group during the first four weeks of treatment.

In addition, religious-spiritual practices and network (e.g., Alcoholic Anonymous, Narcotics Anonymous) have been reported as one of the most effective treatment strategies for substance abusers (Delaney, Forcehimes, Campbell, & Smith, 2009). People often find a meaning or purpose in life and experience a sense of acceptance and comfort through relationship with a higher being (e.g., God, Allah, Buddha) and religious communities (Krause,
The findings of these studies implicate that religious practices (e.g., praying) and spirituality (e.g., feeling compassion for someone) often help eating disorder patients by providing a sense of life meaning, hope, and purpose as well as feelings that God loves and cares about them.

Mediators

Conceptual clarification of the term “mediator” and statistical testing of mediated effect has been thoroughly discussed, in comparison with the term “moderator” or moderated effects, by several researchers (e.g., Baron & Kenny, 1986; Frazier, Tix, & Barron, 2004; Holmbeck, 1997). According to Baron and Kenny (1986), a mediator can be defined as a variable that explains the relationship between a predictor/causer and a criterion/outcome. A mediator accounts for “how” or “why” one variable predicts or causes another variable, while a moderator addresses “when” or “for whom” a predictor is more strongly related to a criterion (Frazier et al., 2004).

Baron and Kenny (1986) explained a role of mediator through relationships among three variables (A, B, and C). A mediator (B) is a variable that falls in the causal pathway between a predictor (A) and a criterion variable (C). If A is significantly associated with C, and A influences B and B influences C, B is called a mediator that link A to C. Specifically, a variable functions as a mediator when it meets the following four conditions: (a) the predictor (A) must be significantly related to the criterion variable (C) (Path c); (b) the predictor (A) must be significantly associated with the hypothesized mediator (B) (Path a); (b) the mediator (B) must be significantly associated with the criterion variable (C) (Path b); and (d) when Paths a and b are controlled, the previously significant relationship
between the predictor and criterion variable is no longer significant, with the strongest demonstration of mediated effects when Path c is zero.

Holmbeck (1997) applied Baron and Kenny’s (1986) logic to testing mediated effects in structural equation modeling. According to Holmbeck (1997), three models must be estimated to test for mediation in SEM, assuming that there is a latent predictor variable (A), a hypothesized latent mediator variable (B), and a latent criterion variable (C). The first step to take is to assess the fit of the “direct” effect (A→C) model. Assuming an adequate fit in this model, the next step is to test the fit of the “overall” (A→B→C) model. The final step in assessing whether there is a mediated effect is to test the fit of the overall (A→B→C) model under two conditions: (1) when the A→C path is constrained to zero (“fully” mediated model), and (2) when the A→C path is not constrained (“overall” model).

In testing mediated effect, it is needed to examine whether the overall model provides a significant improvement in model fit over the fully mediated model by the test of significance of difference in chi-squares between the two models. If there is a fully mediated effect, the overall model fit should not significantly improve. The previously significant A→C path coefficient is reduced to non-significance; i.e., the addition of the A→C path to the model does not improve the fit of the model.

Summary and Conclusions

The aforementioned literature review can be summarized with the following conclusions and areas of potential future research:

First, an exposure to trauma often endangers an individual’s capacity for affect-behavior regulations, which in turn contributes to various mental health problems. Particularly, childhood attachment trauma, or abuse and neglect by parental figures in childhood, has been reported as
the most detrimental contributor to affect-behavior regulation problems, such as depression, eating disturbances, and substance abuse, over the course of development (Allen, 2001; Ford, 2009; Schore, 2002; Van der Kolk, 1996). Repetitive maltreatments by attachment figures in childhood engender negative mental representation of self and dysfunctional interaction patterns in relationship with significant others (e.g., spouse, parent, or a higher being), which in turn undermine a capacity to regulate emotions and behaviors in a stressful situation and contributes to various mental health problems.

Only a few empirical studies were reported to examine psychological mechanism by which childhood attachment trauma predicts affect-behavior regulation problems (Bifulco et al., 2006; Krejci et al., 2004; Riggs et al., 2007; Shapiro & Levendosky, 1999; Stein et al., 2002). Those studies, however, examined simple pathways in which internal characteristics of an individual (e.g., self-esteem) or external environmental resources (e.g., adult attachment, religious faith) link a specific type of childhood trauma (e.g., sexual abuse, domestic violence) and self-regulation problems (e.g., anxiety, depression, substance abuse). No empirical studies have been reported yet about psychological mechanism by which both internal and external resources of an individual mediate the relationship between a collection of childhood maltreatment and several affect-behavior regulation problems, such as symptoms of depression, disordered eating behaviors, and substance abuse, in adulthood by using one of the rigorous statistical methodologies, structural equation modeling.

Next, the psychological mechanism of emotional bonding between infant and mother in early childhood, which was proposed originally by Bowlby (1969/1980, 1973, 1979, 1980), has been applied not only to intimate relationship with a romantic partner but also to religious relationship with a higher being. The core features of attachment (proximity-seeking, safe heaven,
secure base) have been suggested consistent across various close relationships (e.g., relationships with parent, partner, a higher being) (e.g., Hazen & Shaver, 1987; Kirkpatrick & Shaver, 1990). Secure attachment with significant others plays a central role in mitigating the detrimental impact of various types of traumas on an individual’s bio-psycho-social functioning. No empirical studies have been reported to examine the pathways in which both adult attachment patterns and religious faith link a collection of childhood maltreatments and three affect-regulation problems in adulthood (symptoms of depression, disordered eating behaviors, substance abuse), respectively.

Lastly, in the context of the above two points made, numerous trauma and attachment studies have reported the detrimental impact of childhood abuse and neglect in familial environment on each of three popular affect-behavior regulation problems (i.e., symptoms of depression, disordered eating behaviors, and substance abuse) in adulthood, respectively. No empirical studies have been reported on similarities and differences in psychological pathways in which a collection of childhood maltreatments predicts each of three affect-behavior regulation problems through both intra- and inter-personal characteristics of an individual.

Taken together, this study aimed to test theoretical proposition of Bowlby and other attachment researchers, or psychological pathways in which a collection of abuse and neglect by attachment figures in childhood contribute to an individual’s internal working models of self, interaction patterns in relationship with an intimate partner, and religious faith in a higher being, which in turn predict affect-behavior regulation problems. In doing so, this study used one of the hypothesis-testing statistical methodologies, Structural Equation Modeling, which enables to measure a psychological construct (latent variable) as closely as it can by using conceptually coherent multiple observed variables (manifest variables).
Research Questions and Hypotheses

Research Questions

In testing the psychological pathways in which mental representations of self, anxious and avoidant adult attachment patterns, and religious faith in a higher being mediate the associations between childhood maltreatment and each of three affect-behavior regulation problems in adulthood (i.e., symptoms of depression, disordered eating behaviors, substance abuse), this study examined the following three questions:

(1) Through what pathways and to what extent do mental representations of self, anxious and avoidant adult attachment patterns, and religious faith mediate the relationship between childhood maltreatment and symptoms of depression in adulthood, respectively?

(2) Through what pathways and to what extent do mental representations of self, anxious and avoidant adult attachment patterns, and religious faith mediate the relationship between childhood maltreatment and disordered eating behaviors in adulthood, respectively?

(3) Through what pathways and to what extent do mental representations of self, anxious and avoidant adult attachment patterns, and religious faith mediate the relationship between childhood maltreatment and substance abuse in adulthood, respectively?

Hypotheses

To answer each of three questions, this study hypothesized:

1. Attachment trauma in childhood will predict symptoms of depression in adulthood through mental representation of self, anxious adult attachment, avoidant adult attachment, and religious faith, respectively in a structural model entitled “Hypothesized structural model for depression” (see Figure 1). More specifically:
Figure 1. Hypothesized structural model for depression

Figure 2. Hypothesized structural model for eating disturbances

Figure 3. Hypothesized structural model for substance abuse
(a) Mental representation of self is hypothesized to mediate the relationship between attachment trauma in childhood and symptoms of depression in adulthood.

(b) Anxious adult attachment is hypothesized to mediate the relationship between attachment trauma in childhood and symptoms of depression in adulthood.

(c) Avoidant adult attachment is hypothesized to mediate the relationship between attachment trauma in childhood and symptoms of depression in adulthood.

(d) Religious faith is hypothesized to mediate the relationship between attachment trauma in childhood and symptoms of depression in adulthood.

2. Attachment trauma in childhood will predict disordered eating behaviors in adulthood through mental representation of self, anxious adult attachment, avoidant adult attachment, and religious faith, respectively in a structural model entitled “Hypothesized structural model for eating disturbances” (see Figure 2). More specifically:

(a) Mental representation of self is hypothesized to mediate the relationship between attachment trauma in childhood and disordered eating behaviors in adulthood.

(b) Anxious adult attachment is hypothesized to mediate the relationship between attachment trauma in childhood and disordered eating behaviors in adulthood.

(c) Avoidant adult attachment is hypothesized to mediate the relationship between attachment trauma in childhood and disordered eating behaviors in adulthood.

(d) Religious faith is hypothesized to mediate the relationship between attachment trauma in childhood and disordered eating behaviors in adulthood.

3. Attachment trauma in childhood will predict substance abuse in adulthood through mental representation of self, anxious adult attachment, avoidant adult attachment, and religious
faith, respectively in a structural model entitled “Hypothesized structural model for substance abuse” (see Figure 3). More specifically:

(a) Mental representation of self is hypothesized to mediate the relationship between attachment trauma in childhood and substance abuse in adulthood.

(b) Anxious adult attachment is hypothesized to mediate the relationship between attachment trauma in childhood and substance abuse in adulthood.

(c) Avoidant adult attachment is hypothesized to mediate the relationship between attachment trauma in childhood and substance abuse in adulthood.

(d) Religious faith is hypothesized to mediate the relationship between attachment trauma in childhood and substance abuse in adulthood.
CHAPTER 2

METHODS

Participants

Originally, a total of 415 participants at a large university in the southwest United States were recruited for a research project titled “Impact of positive and traumatic experience on mental health.” Four hundred and eight college students were recruited from psychology or health education courses while seven adult clients were recruited from a community psychology clinic affiliated in the university. Only college student sample was used for this study due to the small number of the clinic clients represented. Among 408 student sample, seven participants did not answer either Background Information or one of ten questionnaires given, so the seven participants were removed from the data pool.

The final total of four hundred and one participants (274 females, 68.3%; 127 males, 31.7%) were undergraduate students, whose age ranged from 17 to 44 years ($M = 20.4$; $SD = 3.3$). Participants consisted of 161 first-years (40.1%), 88 sophomores (21.9%), 87 juniors (21.7%), 59 seniors (14.7%), and 6 others (1.5%). Represented ethnicities were African American ($n = 78$, 19.5%), European American ($n = 227$, 56.6%), Hispanics ($n = 54$, 13.5%), Asian or Pacific Islander ($n = 27$, 6.7%), or others ($n = 15$, 3.7%). In respect to current job status, few college student participants reported working full-time ($n = 19$, 4.7%), but a large number held part-time job ($n = 182$, 45.4%), and nearly a half of participants were not employed ($n = 200$, 49.9%). As for current financial stress or difficulty, few participants ($n = 21$, 5.2%) reported that their circumstances were extremely difficult; about one fifth students ($n = 82$, 20.4%) moderately; close to one half ($n = 184$, 45.9%) slightly; and more than one forth ($n = 114$, 28.4%) not at all. The vast majority of
respondents described their current relationship status as “single” \( n = 347, 86.5\% \), while the rest of respondents described married \( n = 19, 4.7\% \), living in marriage-like relationship \( n = 31, 7.7\% \), and divorced \( n = 4, 1\% \), respectively.

**Measures**

A total of ten measures in a packet of surveys were used for the present study to assess six latent variables across three hypothesized models, such as childhood trauma, anxious and avoidant adult attachment patterns, mental representations of self, religious faith, symptoms of depression, disordered eating behaviors, and substance abuse.

**Childhood Trauma**

Childhood trauma was measured by the Childhood Trauma Questionnaire - Short Form (CTQ-SF: Bernstein et al., 2003). The CTQ-SF is a 28-item retrospective self-report measure designed to assess a range of childhood maltreatment experience on a 5-point Likert scale, ranging from *never true* (1) to *very often true* (5). The CTQ-SF consists of six subscales: Emotional Abuse (EA; e.g., “People in my family called me things like ‘stupid,’ ‘lazy,’ or ‘ugly.’”), Physical Abuse (PA; e.g., “I got hit so hard by someone in my family that I had to see a doctor or go to the hospital”), Sexual Abuse (SA; e.g., “Someone threatened to hurt me or tell lies about me unless I did something sexual with them”), Emotional Neglect (EN; e.g., “There was someone in my family who helped me feel that I was important or special”), Physical Neglect (PN; “I didn’t have enough to eat”), and a validity scale, Minimization/Denial (MD; “There was nothing I wanted to change about my family”). There are 5 items on each subscale except for the Minimization/Denial subscale (3 items), which was designed to identify individuals with a tendency to respond in a socially desirable manner.
The psychometric properties of the CTQ-SF have been reported in diverse groups, including community and substance-abusing samples. Bernstein et al., (2003) reported adequate internal consistency reliabilities for: EA, $\alpha = .84 - .89$; PA, $\alpha = .83 - .86$; SA, $\alpha = .92 - .95$; EN, $\alpha = .85 - .91$; and PN, $\alpha = .61 - .78$. For current sample, internal consistency reliabilities are: EA, $\alpha = .86$; PA, $\alpha = .72$; SA, $\alpha = .93$; for EN, $\alpha = .88$; and PN, $\alpha = .62$. For SEM, five subscales of the CTQ except for MD were used as five indicators of a latent variable, Childhood Trauma.

*Adult Attachment*

Adult attachment was measured by the Experiences in the Close Relationships Scale (ECR; Brennan et al., 1998). The ECR is a 36-item self-report measure designed to assess adult romantic attachment styles. Participants are asked to rate descriptions of how they generally experience relationships, rather than their specific experience in a current relationship, on a 7-point Likert scale ranging from disagree strongly (1) to agree strongly (5). The ECR contains two subscales that measure orthogonal dimensions of adult romantic attachment: Anxious Attachment (18 items; e.g., “I worry about being rejected and abandoned”) and Avoidant Attachment (18 items; e.g., “I don’t feel comfortable opening up to romantic partner”). High internal consistency (near or above $\alpha = .90$) and adequate test-retest reliability (.50 to .75) have been reported for both subscales by several studies (e.g., Brennan et al., 1998; Mikulincer, Doleve, & Shaver, 2004; Brennan, Shaver, & Clark, 2000). For the current sample, the internal consistency reliability was $\alpha = .94$ for anxious attachment and $\alpha = .91$ for avoidant attachment.

For SEM, items on each attachment style were grouped into “item parcels” to create multiple indicators of each construct (see Russell, Khan, & Altmaier, 1998). For each style,
the principle component analysis was performed on the 18 items in which all of the items were loaded on one factor. Items were then rank-ordered on the factor from highest to lowest loadings and assigned successively to the three parcels; each parcel consists of 6 items. Three parcels of anxious attachment style consisted of: (a) 6, 12, 14, 20, 24, and 32 ($\alpha = .76$); (b) 2, 8, 10, 28, 30, and 34 ($\alpha = .77$); and (c) 4, 16, 18, 22, 26, and 36 ($\alpha = .77$), while three parcels of avoidant attachment style consisted of: (a) 3, 5, 17, 23, 29, and 33 ($\alpha = .82$); (b) 1, 11, 13, 19, 21, and 27 ($\alpha = .83$); and (c) 7, 9, 15, 25, 31, and 35 ($\alpha = .84$).

These three parcels of anxious attachment were used as three indicators of a latent variable, Anxious Attachment while three parcels of avoidant attachment were used as three indicators of a latent variable, Avoidant Attachment.

*Mental Representation of Self*

Mental representation of self, referred to as “images of self” or “internal working model of self” by attachment researchers, were measured by three instruments: the Rosenberg’s (1965) Self-Esteem Scale (RSES) and General Self-Efficacy and Social Self-Efficacy subscales of the Self-Efficacy Scale (SES; Sherer, Maddux, Mercadante, Pretice-Dunn, Jacobs, & Rogers, 1982). The Rosenberg’s Self-Esteem Scale (RSES) is a 10-item self-report measure designed to assess a person’s overall evaluation of his or her worthiness as a human being (e.g., “I feel that I’m a person of worth, at least on an equal basis with others”). Responses are coded on a 4-point Likert scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). The RSES consists of an equal number of positively and negatively worded items and has two subcomponents of self-competence (i.e., feelings of efficacy) and self-liking (i.e., feelings of acceptance) (Schmitt & Allik, 2005; Tafarodi & Milne, 2002). Rosenberg (1979) reported good internal consistency ($\alpha = .89$) and test-retest
reliability over a two-week interval (.85). For current sample, the internal consistency reliability was $\alpha = .91$.

The General Self-Efficacy (GSE) subscale is a 17-item scale that measures an individual’s beliefs in personal abilities and expectations of personal mastery (e.g., “If I can’t do a job the first time, I keep trying until I can”). Participants respond using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Sherer et al. (1987) reported good internal reliability ($\alpha = .86$) and adequate construct validity by providing significant correlations with measures of ego strength, personal control, social desirability, and interpersonal competency ($r_s = .29$ to .45). For current sample, the internal consistency reliability was $\alpha = .90$.

The Social Self-Efficacy (SSF) subscale is a 6-item scale that assesses a person’s social confidence (e.g., “I have acquired my friends through my personal abilities at making friends”). Like GESE, participants respond using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Adequate internal reliability ($\alpha = .71$) was reported by Sherer et al., (1987). For current sample, the internal consistency reliability was $\alpha = .71$). For SEM, the RSE, GES, and SES were used as three indictors of a latent variable, Images of Self.

Religious Faith

Religious faith was measured by the Santa Clara Strength of Religious Faith Questionnaire (SCSRF; Plante & Boccaccini, 1997a, b) and two 10-point Likert items constructed by Pardini et al., (2000). The SCSRF consists of 10 items designed to assess a non-denominational, religious faith pertaining to participants’ religious behaviors and beliefs (e.g., “I pray daily”). It is scored on a 4-point Likert scale, with higher scores
indicating increased levels of religious faith. The SCSRF was reported to have high internal consistency (\(\alpha = .94\) to .96) and adequate convergent and discriminant validity among both community and college samples (Plante & Boccaccini, 1997a, b). For current sample, the internal consistency reliability was \(\alpha = .98\).

In addition to the SCSRF, two items designed to measure participants’ perception of their own spirituality and religiosity were also used due to the multidimensional nature of the construct, “faith.” Maselko and colleagues examined relationships between three types of religiousness (religious practices, religious wellbeing, existential wellbeing) and major depression and reported differences in the size of correlation coefficient between each of three religious constructs and symptoms of depression (Maselko, Gilman, & Buka, 2009). They suggested that it is important to take into account the multidimensional nature of the construct, religiousness, when examining associations between religiousness and mental health problems. Participants were asked to place themselves on a 10-point Likert scale from not spiritual/not religious (1) to very spiritual/very religious (10) on two items. The two items are: “Do you consider yourself a spiritual person?” and “Do you consider yourself a religious person?” Pardini et al. (2000) reported medium to high correlations among the SCSRF and the two statements, ranging from \(r = .45\) to \(r = .62\). For the current sample, the correlations ranged from \(r = .57\) to \(r = .76\). For SEM, the SCSRF, one-item religiosity, and one-item spirituality were used as three indicators of a latent variable, Religious Faith.

**Depression**

Symptoms of depression were measured by the Center for Epidemiologic Studies Depression Scale (CES-D Scale; Radloff, 1977) and the Depression subscale of Brief
Symptom Inventory (BSI-Depression; Derogatis, 1993). The CES-D is a 20-item self-reported measure designed to assess depressive symptoms in the past week in the general population (e.g., “I thought my life had been a failure”). Participants respond on a 5-point Likert scale ranging from 1 (rarely or none of the time) to 4 (most or all of the time), with higher scores indicating more depressed. Radloff (1977) reported high internal consistency (around $\alpha = .85$ for the general population; around $\alpha = .90$ for the patient population) and adequate test-retest reliabilities (.51 to .67) for community samples over two- to eight-week intervals. For current sample, the internal consistency reliability was $\alpha = .89$.

The BSI is a 53-item measure designed to assess clinically relevant nine psychological symptoms and three global indices of distress in adolescents and adults during the previous week. Nine clinical symptoms are Somatization, Obsession-Compulsion, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism, while three global indices of distress are Global Severity Index, Positive Symptom Distress Index, and Positive Symptom Total. Participants respond on a 5-point Likert scale ranging from 0 (not at all) to 4 (extremely). Derogatis (1993) reported adequate internal consistency reliability for the nine domains, ranging from $\alpha = .71$ on Psychoticism to $\alpha = .85$ on Depression. Test-retest reliability over two weeks for the nine domains ranges from $\alpha = .68$ on Somatization to $\alpha = .91$ on Phobic Anxiety. For current sample, the internal consistency reliability of the Depression subscale was $\alpha = .87$.

For SEM, two parcels were created from the CES-D according to the parceling procedure mentioned prior on the Adult Attachment (each parcel has 10 items, respectively). One parcel consists of Items 3, 4, 5, 6, 11, 13, 14, 15, 17, and 20 ($\alpha = .82$), while the other parcel
consists of Items 1, 2, 7, 8, 9, 10, 12, 16, 18, and 19 (α = .78). These two parcels of the CES-D and the BSI-Depression were used as three indicators of a latent variable, Depression.

**Eating Disturbances**

Disturbed eating behaviors were measured by the 26-item Eating Attitude Test (EAT-26; Garner, Olsted, Bohr, & Garfinkel, 1982). The EAT-26 is designed to assess different levels and types of eating disordered behaviors and consists of three subscales; Dieting Tendencies (13 items; e.g., “I am terrified about being overweight”), Bulimia and Food Preoccupation (6 items; e.g., “I find myself preoccupied with food”), and Oral Control (7 items; e.g., “I avoid eating when I am hungry”). Participants respond to each item with one of six choices – *never* (0), *rarely* (0), *sometimes* (0), *often* (1), *very often* (2), or *always* (3); the higher scores indicate greater disturbances in eating attitudes and behaviors. Garner et al. (1982) reported high internal consistency of the EAT-26 (.91 for a college sample; .90 for a clinical sample). Test-retest reliability of the EAT-26 was .86 over three weeks for a college-age sample (Mazzeo, 1999). For current sample, the internal consistency reliability alpha was: .91 for all 26 items, .92 for Dieting, .75 for Bulimia and Food Preoccupation, and .64 for Oral Control. For SEM, three subscales of the EAT-26 were used as 3 indicators of a latent variable, Eating Disturbances.

**Substance Abuse**

Substance abuse was measured by the Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST; World Health Organization ASSIST Working Group, 2002). The ASSIST is an 8-item interview or self-report measure designed to screen psychoactive substance abuse in individuals who are involved in using a variety of substances in varying degrees in lifetime. The question 1 asks about lifetime use of 10
types of substances in yes or no format, respectively. If yes on any type of substance in the question 1, participants are asked to answer the following seven questions on each type of substance they used.

For the questions 2 through 6, participants respond on a 5-point scale; 0 (never), 1 (once or twice), 2 (weekly), 3 (monthly), and 4 (daily or almost daily). The question 2 asks about frequency of use of a particular substance in the past 3 months; the question 3 about psychological dependence, or frequency of compulsion to use substances in the past 3 months; the question 4 about impact of the particular substance use on health, social, legal, or financial problems in the past 3 months; and the question 5 about whether to fail to meet role obligations due to substance use in the past 3 months. For the questions 6, 7, and 8, participants respond on a 3-point scale; 0 (no, never), 1 (yes, but not in the past three months), and 2 (yes, in the past three months). The questions 6 through 8 ask about lifetime and recent problems, including whether friends or relatives have expressed concern, prior attempts at controlling drug use, and prior injection of drugs during the past 3 months.

In the present study, a slight change was made in answering the questions 2 through 8 due to the length and complexity of answering each of those questions. Participants were asked first to choose only two major, rather than all, substances that they have ever used most right after they answered the question 1, and then answer the following questions 2 through 8 on each of the two major substances that they used most.

The ASSIST was reported to demonstrate significant correlations with a diversity of measures of substance abuse ($r = .71$ to $.89$) and life stress ($r = .21$ to $.70$), and adequate discriminant and predictive validities (see Newcombe, Humeniuk, & Ali, 2005 for details). The average test-retest reliabilities were reported to range from $.58$ (regretted what was
done under influence of substance) to .90 (consistency reporting ‘ever’ use of substance) (WHO ASSIST Work Group, 2002). For SEM, 10 types of substance on the question 1 were factor analyzed by the principle components and varimax methods and grouped into two types of substance; Type 1 (tobacco, alcohol, cannabis) and Type 2 (other 7 substances). These two types of substances used lifetime and a total score of the questions 2 through 8 were used as 3 indicators of a latent variable, Substance Abuse.

Procedures

Participants were recruited continuously from the spring semester of 2009 through the fall semester of 2009 by three avenues: (1) research participation pool in psychology department; (2) research announcement in a large health education class; and (3) flyers posted in a reception area at the on-campus community mental health clinic housed in the Department of Psychology. In the beginning of each session, participants were given a packet of surveys, which consisted of an Informed Consent Form (see Appendix), seventeen questionnaires, a bundle of answer sheets resembling Scantron forms, and a sheet of Background Information asking about age, gender, ethnicity, classification, job status, financial stress, and interest in follow-up studies. Participants read the ICF approved by the university internal review board and signed up on it before starting to answer each of questionnaires. All questionnaires were counterbalanced to preclude systematic order effect in the data.

Numerous data collection sessions were conducted in two research rooms in the psychology department building. Each data collection session was limited to 1-15 participants to provide adequate guidance and assistance in case participants have questions about the surveys. In the beginning of each session, this researcher or a research assistant
(a college graduate preparing to apply for a graduate school in psychology) made a brief announcement about the purpose of the study, issues of confidentiality, potential risk of participation, methods of compensation, and importance of honest response to all questionnaires.

At the end of each session, the researcher had a brief conversation with each of the participants when they turned in their packet of completed surveys to the researcher. In doing so, the researcher first obtained each participant’s permission in separating a bundle of answer sheets from the ICF, the questionnaires, and the sheet of Background Information in front of them to keep confidentiality. And then, the researcher double checked if all answer sheets were properly marked (i.e., answers were adequately bubbled in) after obtaining each participant’s permission; otherwise, answer sheets might not be accurately read by a test scoring machine in the university research data entry office. When some answers were found poorly marked or left unanswered, participants were asked to fully mark or answer them. The researcher paid close attention to the aforementioned post-survey-double-checking process to reduce a chance that participants’ hard work could be invalidated and removed from the pool due to unintentional mistakes made in answering the questionnaires.

Nevertheless, when all answer sheets were double checked again after each of the data collection sessions on the collection date, the researcher found that a total of seven answer sheets or Background Information sheets had no answer on a portion of items or questions. Thus, those seven answers sheets were removed from the data pool. Thus, only four hundred and one answer sheets and Background Information sheets were used for data analysis. Despite this thorough data-collection process, the researcher found that five
participants’ answer sheets had a few items sporadically left unanswered over ten answer questionnaires (a total of 175 items). Thus, an average score on each of those few items was filled in according to Tabachnick and Fidell’s (1996) suggestion.

As for compensation for participation, each of student participants who take class with a research participation requirement was given four “research credits,” while each of clinic client participants was provided $10 cash for completing a packet of surveys. The researcher originally planned to collect data both from college population and outpatient clinic client population in intent to compare similarities and differences between two populations. However, only seven clinic clients participated in this study despite various recruitment efforts so the researcher decided to use only college students sample for the present study primarily due to the homogeneity of sample.

Data Analysis

Several statistical methods were used in this study. Pearson bivariate correlations were first conducted to assess the relationships both among latent variables and among observed variables, respectively. Next, a series of one-way ANOVAs were used to examine gender differences across all observed variables. Exploratory factor analysis was also conducted to extract the components underlying each of several measures for the purpose of SEM. Specifically, principal component analysis was performed to create multiple indicators on each of four latent variables, such as Anxious Attachment (ECR-Anxiety), Avoidant Attachment (ECR-Avoidance), Depression (CES-D), and Substance Abuse (ASSIST question 1), respectively. Lastly, structural equation modeling (SEM) was conducted to test the fit of each of the hypothesized models to the data.
SEM has advantages in enabling to analyze data for inferential purposes, to assess and correct for measurement error, and to incorporate observed and latent variables (Byrne, 1994, 2006). When the phenomena of interest are complex and multidimensional in a complicated model, SEM allows complete and simultaneous tests of all the relationships among variables (Tabachnick & Fidell, 1996). In this study, maximum likelihood (ML) estimation method in EQS 5.3 (Bentler, 1995) was used. To test the fit of the hypothesized models to the data, several model fit criteria are available: the chi-square ($\chi^2$) value and its significance, the Satorra-Bentler chi-square value ($S-B\chi^2$) and its significance, the Non-Normative Fit Index (NNFI, often referred to as TLI – the Tucker-Lewis Index), the Comparative Fit Index (CFI), the Robust CFI (RCFI), the Standardized Root Mean Square Residual (SRMR), and the Root Mean Square Error of Approximation (RMSEA). Fit indices such as $S-B\chi^2$, NNFI, RCFI, and RMSEA are more appropriate for non-normally distributed data (Hu & Bentler, 1998; Byrne, 1994). Conventionally, values greater than .90 for the NNFI and CFI and values lower than .08 – .10 for RMSEA are accepted as relatively good model fit by SEM experts (e.g., Bentler, 1989; Bentler & Bonett, 1980; Steiger, 1989).

However, Hu and Bentler (1998, 1999) evaluated the sensitivity of a variety of fit indexes to model misspecification, under conditions that varied sample size and distribution (so-called Monte Carlo simulations) by using two types of confirmatory factor models; each model consisted of three factors and 15 indicators (5 indicators per factor). Hu and Bentler (1998) reported that standardized root-mean-square residual (SRMR) was the most sensitive index to models with misspecified factor covariance(s), and TLI (NNFI), CFI, and RMSEA were the most sensitive indexes to models with misspecified factor
loadings. Following their report in 1998, Hu and Bentler (1999) further examined the adequacy of the conventional cut-off and several new alternatives for fit indexes to evaluate model fit in practice. They proposed a two-index presentation strategy, which includes using the maximum likelihood (ML) method: 1) SRMR as primary; and 2) either TLI (NNFI), CFI, or RMSEA as supplementary. In doing so, Hu and Bentler (1999) suggested more rigorous model fit cut-off criteria than the conventional for the ML method; a cut-off value close to .95 for NNFI (TLI) and CFI; close to .08 for SRMR; and close to .06 for RMSEA, which has been used as golden model-fit criteria by increasing numbers of researchers.

Since Hu and Bentler’s (1999) influential suggestion of new cut-off values, however, several SEM experts (e.g., Barrett, 2007; Fan & Sivo, 2007; March, Hau, & Wen, 2004) have recently warned a danger of the overgeneralization of Hu and Bentler’s (1999) findings because most model fit indices are sensitive to model misspecifications and model types. For example, March and his colleagues (March et al., 2004) re-analyzed the same two types of confirmatory factor models that Hu and Bentler (1998, 1999) used. They contended that the hypothesis-testing type of rationale (i.e., judging the fit of a model as acceptable or unacceptable) underlying Hu and Bentler’s cut-off criteria tends to make incorrect rejection of various types of acceptable models.

Fan and Sivo (2007) examined if model fit indices are sensitive to different types of models (e.g., measurement models vs. structural models) and reported that most model fit indices including RMSEA (one of the most recognized fit indices) appear to be sensitive to sample size and different types of models that have the same degree of specification error. Thus, they suggested that it would be difficult to establish the hypothesizing-testing type of
clear cut-off criteria (acceptable vs. acceptable) for most fit indices. In a stronger tone than other SEM experts, Barrett (2007) argued that it is simply neither plausible nor possible to use a single-valued threshold approach (i.e., cut-off criteria) without taking into consideration sample size, characteristics of measurement, and data conditions. Barrett contended that “χ² test is the only statistical test for SEM models” (p. 818) to determine if a model fits to data (acceptable vs. unacceptable). He suggested that models should be constructed on some kind of theory linked to “real-world” criteria rather than simply “statistical” models (or statistically produced alternative models without theoretical foundation).

Following the recommendations of those experts, this study used a variety of model fit indices; χ² value and its significance, S-Bχ² value and its significance, NNFI, CFI, RCFI, SRMR, and RMSEA. In doing so, Hu and Bentler’s (1999) cut-off criteria (close to .95 for NNFI and CFI; close to .08 for SRMR; close to .06 for RMSEA) were used to test for the fit of measurement models, while the conventional model fit criteria (higher than .90 for NNFI and CFI; lower than .08 - .10 for RMSEA) were used for the fit of structural models and multi-group invariance analysis. The reason for using Hu and Bentler’s criteria only for the measurement model evaluation was twofold: (1) their model cut-off criteria were developed by using two types of measurement (confirmatory factor) models rather than either structural models or multi-group invariance analysis; and (2) their cut-off criteria may make incorrect rejection of acceptable structural models or acceptable group invariance in multi-group models particularly when those structural models are complex and multidimensional as March and his colleagues (2004) pointed it out.
CHAPTER 3

RESULTS

Preliminary Analyses

Structural equation modeling, a primary data analysis method in this study, recommends multiple (at least three) observed variables (indicators) per latent variable to adequately test the fit of a hypothesized model to the data according to the results of Monte Carlo studies (e.g., Anderson & Gerbing, 1984; Gerbing & Anderson, 1985). Thus, in each of three hypothesized models, three indicators were created for each of three latent variables (Anxious Attachment, Avoidant Attachment, and Depression) that were not measured by three independent observed variables. Those indicators were created by using the “parceling method” described in the Methods section. Thus, each of the three hypothesized models became composed of a total of 20 indictors for six latent variables. Correlation coefficients, means, standard deviations, skewness, kurtosis, and internal consistency reliability for all 20 indicators across three hypothesized models are listed on Table 1. Correlation coefficients among six latent variables across three hypothesized models are listed on Table 2.

The univariate kurtosis and skewness estimates on a total of 26 observed variables including three criterion variables (Depression, Eating Disturbances, Substance Abuse) revealed that fourteen indicators including five childhood trauma subscales were not normally distributed, which violates the underlying assumption of normal distribution for the maximum likelihood (ML) estimation used in this study. In addressing the problem of non-normal distribution of data, Bentler and his colleagues (Chou, Bentler, & Satorra, 1991; Hu, Bentler, & Kano, 1992) suggested use of an estimation method that assumes an underlying normal distribution (e.g., ML) but bases evaluation of model fit on a test
<table>
<thead>
<tr>
<th>Table 1: Correlation Coefficient, Mean, Standard Deviation, Skewness, Kurtosis, and Internal Consistency Reliability of Indicators for Total (N = 401)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Childhood Trauma</strong></td>
</tr>
<tr>
<td>1. CTQ - Emotional Abuse</td>
</tr>
<tr>
<td>2. CTQ - Physical Abuse</td>
</tr>
<tr>
<td>3. CTQ - Sexual Abuse</td>
</tr>
<tr>
<td>4. CTQ - Emotional Neglect</td>
</tr>
<tr>
<td>5. CTQ - Physical Neglect</td>
</tr>
<tr>
<td><strong>Anxious Attachment</strong></td>
</tr>
<tr>
<td>6. ECR - Anxiety 1</td>
</tr>
<tr>
<td>7. ECR - Anxiety 2</td>
</tr>
<tr>
<td>8. ECR - Anxiety 3</td>
</tr>
<tr>
<td><strong>Avoidant Attachment</strong></td>
</tr>
<tr>
<td>9. ECR - Avoidance 1</td>
</tr>
<tr>
<td>11. ECR - Avoidance 3</td>
</tr>
<tr>
<td><strong>Images of Self</strong></td>
</tr>
<tr>
<td>12. Rosenberg Self-Esteem</td>
</tr>
<tr>
<td>13. General Self-Efficacy</td>
</tr>
<tr>
<td>14. Social Self-Efficacy</td>
</tr>
<tr>
<td><strong>Religious Faith</strong></td>
</tr>
<tr>
<td>15. Santa Clara Faith</td>
</tr>
<tr>
<td>16. Spirituality</td>
</tr>
<tr>
<td>17. Religiosity</td>
</tr>
<tr>
<td><strong>Depression</strong></td>
</tr>
<tr>
<td>18. CES-D1</td>
</tr>
<tr>
<td>19. CES-D2</td>
</tr>
<tr>
<td>20. BSI-Depression</td>
</tr>
<tr>
<td><strong>Eating Disturbances</strong></td>
</tr>
<tr>
<td>21. EAT - Dieting</td>
</tr>
<tr>
<td>22. EAT - Bulimia</td>
</tr>
<tr>
<td><strong>Substance Abuse</strong></td>
</tr>
<tr>
<td>24. Substance Type 1</td>
</tr>
<tr>
<td>25. Substance Type 2</td>
</tr>
<tr>
<td>26. Substance Impact</td>
</tr>
<tr>
<td><strong>M</strong></td>
</tr>
<tr>
<td><strong>SD</strong></td>
</tr>
<tr>
<td><strong>Skewness</strong></td>
</tr>
<tr>
<td><strong>Kurtosis</strong></td>
</tr>
<tr>
<td><strong>Number of item</strong></td>
</tr>
</tbody>
</table>

Note. CTQ = Childhood Trauma Questionnaire; ECR = Experiences in Close Relationships; CES-D = Center for Epidemiologic Studies Depression Scale; BSI-Depression = Brief Symptom Inventory-Depression subscale; EAT = Eating Attitude Test; p < .05 (equal to or higher than .10); p < .01 (higher than .13)
Table 2
Correlations Among Latent Variables for Depression, Eating Disturbances, and Substance Abuse Measurement Models for Total (N = 401)

<table>
<thead>
<tr>
<th>Latent Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
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<tbody>
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<td>1. Childhood Trauma</td>
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<td></td>
<td></td>
<td></td>
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<td>2. Anxious Attachment</td>
<td>.24***</td>
<td>1.00</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3. Avoidant Attachment</td>
<td>.30***</td>
<td>.18**</td>
<td>1.00</td>
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<td></td>
</tr>
<tr>
<td>4. Images of Self</td>
<td>-.35***</td>
<td>-.56***</td>
<td>-.28***</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>5. Religious Faith</td>
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<td>-.01</td>
<td>-.16**</td>
<td>.17**</td>
<td>1.00</td>
</tr>
<tr>
<td>Depression</td>
<td>.31***</td>
<td>.52***</td>
<td>.33***</td>
<td>-.73***</td>
<td>-.11</td>
</tr>
<tr>
<td>Eating Disturbances</td>
<td>.18**</td>
<td>.36***</td>
<td>.14*</td>
<td>-.45***</td>
<td>.03</td>
</tr>
<tr>
<td>Substance Abuse</td>
<td>.15*</td>
<td>.17**</td>
<td>.15*</td>
<td>-.17**</td>
<td>-.32***</td>
</tr>
</tbody>
</table>

*p < .05; ** p < .01; *** p < .001

statistics that has been corrected to take non-normality into account. Satorra and Bentler (1998) developed such a statistic, called the Satorra-Bentler Scaled Statistic (S-B $\chi^2$), that incorporates a scaling correction for the $\chi^2$ statistic when normal distribution assumptions are violated; its computation takes into account the model, the estimation method, and the sample kurtosis values. The S-B $\chi^2$ has been shown to be the most reliable statistical test for evaluating covariance structure models under various distributions and sample sizes (Byrne, 1994, 2006). Given the non-normality of more than half of 26 observed variables, therefore, this study used S-B $\chi^2$ rather than $\chi^2$ to test the fit of a model to the data when needed.

Gender differences in the prevalence of traumatic experience and its potential impact on psycho-social-behavioral functioning were reported by many researchers (e.g., Barlow, 1988; Dohrenwend, 2000; Hankin & Abramson, 1999; Kessler et al., 1999; Orsillo, Raja, & Hanmond, 2002). Thus, gender differences were examined for all 26 observed variables by a series of one-way ANOVAs. Nine of 26 indicators significantly differ in their mean scores between females and males (see Table 3). Females reported significantly higher scores than males in five observed
<table>
<thead>
<tr>
<th>Observed Variables</th>
<th>Female $(n = 274)$</th>
<th>Male $(n = 127)$</th>
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<tr>
<td></td>
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<td>$SD$</td>
<td>$M$</td>
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<td><strong>Childhood Trauma</strong></td>
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<tr>
<td>CTQ - Physical Abuse</td>
<td>1.41</td>
<td>.56</td>
<td>1.57</td>
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<td>CTQ - Sexual Abuse</td>
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<td>1.13</td>
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<td>CTQ - Emotional Neglect</td>
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<td>.88</td>
<td>1.79</td>
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<td>CTQ - Physical Neglect</td>
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<td>1.41</td>
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<tr>
<td>ECR – Anxiety 1</td>
<td>3.90</td>
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<td>ECR – Anxiety 2</td>
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<td><strong>Avoidant Attachment</strong></td>
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<td></td>
</tr>
<tr>
<td>ECR - Avoidance 1</td>
<td>3.11</td>
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<td>3.00</td>
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<td>ECR - Avoidance 2</td>
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<td>1.36</td>
<td>3.12</td>
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<tr>
<td>ECR - Avoidance 3</td>
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<td>1.30</td>
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<td></td>
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<tr>
<td>Rosenberg Self-Esteem</td>
<td>3.16</td>
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<td>3.21</td>
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<td>.66</td>
<td>3.67</td>
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<td>Social Self-Efficacy</td>
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<td>.72</td>
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<td>Religious Faith</td>
<td>2.87</td>
<td>.96</td>
<td>2.58</td>
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<td>Spirituality</td>
<td>6.73</td>
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<td>6.32</td>
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<tr>
<td>Religiosity</td>
<td>5.48</td>
<td>2.95</td>
<td>5.16</td>
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<tr>
<td><strong>Depression</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CES - D1</td>
<td>1.85</td>
<td>.57</td>
<td>1.69</td>
</tr>
<tr>
<td>CES - D2</td>
<td>1.78</td>
<td>.50</td>
<td>1.69</td>
</tr>
<tr>
<td>BSI – Depression</td>
<td>.75</td>
<td>.82</td>
<td>.62</td>
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<tr>
<td><strong>Eating Disturbances</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EAT – Dieting</td>
<td>2.60</td>
<td>1.01</td>
<td>1.98</td>
</tr>
<tr>
<td>EAT – Bulimia</td>
<td>1.87</td>
<td>.91</td>
<td>1.51</td>
</tr>
<tr>
<td>EAT - Oral Control</td>
<td>2.13</td>
<td>.72</td>
<td>1.92</td>
</tr>
<tr>
<td><strong>Substance Abuse</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substance Type 1</td>
<td>1.81</td>
<td>1.09</td>
<td>2.13</td>
</tr>
<tr>
<td>Substance Type 2</td>
<td>.79</td>
<td>1.48</td>
<td>.99</td>
</tr>
<tr>
<td>Substance Impact</td>
<td>6.20</td>
<td>6.69</td>
<td>7.88</td>
</tr>
</tbody>
</table>

*p < .05  **p < .01  ***p < .001
variables: three indicators of Eating Disturbances – Dieting ($F = 39.42, p < .001$), Bulimia ($F = 16.42, p < .001$), and Oral Control ($F = 8.19, p < .01$); one of Depression indicators (CES-Depression 1; $F = 7.88, p < .01$); and Religious Faith ($F = 7.28, p < .01$). Males reported significantly higher scores than females in four observed variables: Physical Abuse ($F = 7.42, p < .01$), Physical Neglect ($F = 4.29, p < .05$), Substance Type 1 (smoking, drinking, and cannabis; $F = 7.70, p < .01$), and impact of substance use on Psychosocial Functioning ($F = 5.38, p < .05$).

**Preparation for Multi-Group Invariance Analyses**

Prior to testing for the fit of each of three hypothesized models to the data, tests needed to be run on to examine whether the aforementioned gender differences in scores of nine observed variables affect the structural relationships among the components of each hypothesized mode; that is, whether the components of the measurement model or the structural model, or both are invariant (i.e., equivalent) across gender. In doing so, a series of multi-group analyses were conducted to investigate the equivalence of hypothesized measurement and structural models, respectively according to Byrne’s (1994, 2006) suggestion. Byrne suggested that testing for equivalence across groups encompasses a series of hierarchical steps that begin with the separate determination of a “baseline model” for each group. The baseline model presents the one that best fits the data from the perspectives of parsimony and substantive meaning; the estimation of baseline models involves no between-group constraints (Byrne, 2006).

**Baseline Models**

The structure of the baseline model for each of three hypothesized models was formulated the same across gender based on attachment-related theories and studies mentioned earlier in the Introduction section. Six interrelated latent variables (Childhood Trauma, Anxious and Avoidant Adult Attachment Patterns, Images of Self, Faith, and Depression/
Eating Disturbances/Substance Abuse) consist of twenty indicators, respectively for each of three hypothesized models; each latent variable has 3-5 indicators (see Figures 4-6). Correlation coefficients, means, standard deviations, skewness, and kurtosis of all 26 indicators over three hypothesized models are listed for females and males on Tables 4 and 5, respectively. Regarding the normal distribution of the observed variables, twelve of a total of 26 indicators were not normally distributed for females, while ten did not meet the assumption of normal distribution. Correlation coefficients among six latent variables across three hypothesized models are described for females and males on Tables 6 and 7, respectively.

In respect to the estimation of model fit, several fit criteria ($S-B\chi^2$ and its significance, NNFI, CFI, RCFI, SRMR, and RMSEA) were used to evaluate the fit of a model to the data. In doing so, as referred to earlier, Hu and Bentler’s (1999) cut-off criteria (close to .95 for NNFI and CFI; close to .08 for SRMR; close to .06 for RMSEA) were used to test for measurement models, while the traditional model fit criteria (higher than .90 for NNFI, CFI, RCFI; lower than .08 - .10 for RMSEA) were used for baseline models, multi-group invariance analyses, and mediated structural models.

Results of the fit estimation of the female baseline model for Depression indicated that the model has an adequate fit to the data; $S-B\chi^2 (161) = 340.79, p < .001; \text{NNFI} = .93; \text{CFI} = .939, \text{RCFI} = .94; \text{and RMSEA} = .071 (90\% \text{ CI}: .062 - .080).$ The results for the male also indicated an adequate model fit to the data; $S-B\chi^2 (161) = 227.97, p < .001; \text{NNFI} = .93; \text{CFI} = .939, \text{RCFI} = .95; \text{and RMSEA} = .067 (90\% \text{ CI}: .050 - .082).$ These results show that the baseline models for Depression were suitable for testing multi-group invariance between females and males.

Results of testing the fit of the female baseline model for Eating Disturbances indicated a good model fit to the data; $S-B\chi^2 (161) = 322.51, p < .001; \text{NNFI} = .92; \text{CFI} = .932, \text{RCFI}$
Figure 4. Baseline model for depression.

Figure 5. Baseline model for eating disturbances.

Figure 6. Baseline model for substance abuse.
<table>
<thead>
<tr>
<th>Table 4</th>
<th>Correlation Coefficient, Mean, Standard Deviation, Skewness, Kurtosis, and Internal Consistency Reliability of Indicators for Female (n = 274)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Childhood Trauma</td>
<td></td>
</tr>
<tr>
<td>1. CTQ - Emotional Abuse</td>
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<td>Avoidant Attachment</td>
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<td>9. ECR - Avoidance 1</td>
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<td>10. ECR - Avoidance 2</td>
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<td>18. CES - D1</td>
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<tr>
<td>21. EAT – Dieting</td>
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<td>22. EAT – Bulimia</td>
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<td>23. EAT - Oral Control</td>
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<td>24. Substance Type 1</td>
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</tr>
<tr>
<td>25. Substance Type 2</td>
<td></td>
</tr>
<tr>
<td>26. Substance Impact</td>
<td></td>
</tr>
<tr>
<td>Note. CTQ = Childhood Trauma Questionnaire; ECR = Experiences in Close Relationships; CES-D = Center for Epidemiologic Studies Depression Scale; BSI-Depression = Brief Symptom Inventory-Depression subscale; EAT = Eating Attitude Test; p &lt; .05 (equal to or higher than .10); p &lt; .01 (higher than .14)</td>
<td></td>
</tr>
</tbody>
</table>
Table 5
Correlation Coefficient, Mean, Standard Deviation, Skewness, Kurtosis, and Internal Consistency Reliability of Indicators for Male (n = 127)

| Childhoo d Trauma | 1. CTQ - Emotional Abuse | .00 | 1.00 |
| 2. CTQ - Physical Abuse | .54 | 1.00 |
| 3. CTQ - Sexual Abuse | .44 | .34 | 1.00 |
| 4. CTQ - Emotional Neglect | .56 | .36 | .11 | 1.00 |
| 5. CTQ - Physical Neglect | .51 | .48 | .25 | .57 | 1.00 |

Anxious Attachment
6. ECR - Anxiety 1 | .15 | .12 | .09 | .22 | .19 | 1.00 |
7. ECR - Anxiety 2 | .14 | .11 | .05 | .20 | .22 | .81 | 1.00 |
8. ECR - Anxiety 3 | .25 | .15 | .07 | .29 | .31 | .83 | .78 | 1.00 |

Avoidant Attachment
9. ECR - Avoidance 1 | .21 | .06 | .20 | .19 | .21 | .04 | .10 | .06 | 1.00 |
10. ECR - Avoidance 2 | .24 | .06 | .19 | .29 | .25 | .23 | .24 | .81 | 1.00 |
11. ECR - Avoidance 3 | .18 | .06 | .11 | .19 | .20 | .03 | .08 | .02 | .80 | 1.00 |

Images of Self
12. Rosenberg Self-Esteem | -.28 | -.14 | -.15 | -.41 | -.26 | -.28 | -.25 | -.38 | -.28 | -.58 | -.24 | 1.00 |
13. General Self-Efficacy | -.01 | -.01 | -.10 | -.12 | -.19 | -.14 | -.17 | -.15 | -.20 | -.26 | -.20 | .56 | 1.00 |
14. Social Self-Efficacy | -.10 | .01 | .09 | .15 | .07 | .07 | .08 | -.29 | -.24 | -.29 | .13 | .18 | .22 | 1.00 |

Religious Faith
15. Santa Clara Faith | .10 | .21 | .23 | -.12 | -.02 | -.03 | -.01 | -.04 | -.21 | -.24 | -.29 | .13 | .18 | .22 | 1.00 |
16. Spirituality | .04 | .14 | .16 | -.05 | -.05 | -.07 | .08 | .04 | -.21 | -.15 | -.26 | .07 | .15 | .10 | .72 | 1.00 |
17. Religiosity | -.07 | .11 | .17 | -.15 | -.08 | .01 | .06 | -.02 | -.17 | -.15 | -.22 | -.27 | -.20 | .21 | .78 | .65 | 1.00 |

Depression
18. CES-D1 | .13 | .05 | .04 | .20 | .12 | .40 | .35 | .37 | .21 | .38 | .19 | -.56 | -.45 | -.25 | -.14 | -.04 | .17 | 1.00 |
19. CES-D2 | .08 | .05 | .03 | .14 | .09 | .37 | .34 | .36 | .19 | .33 | .18 | -.56 | -.36 | -.18 | -.08 | -.01 | -.17 | .74 | 1.00 |
20. BSI - Depression | .04 | -.09 | .01 | .21 | .05 | .38 | .32 | .38 | .17 | .31 | .16 | -.62 | -.42 | -.28 | -.12 | -.06 | -.18 | .79 | .69 | 1.00 |

Eating Disturbances
21. EAT - Dieting | -.08 | -.14 | .01 | -.04 | -.01 | .26 | .21 | .17 | .08 | .20 | .10 | -.23 | -.21 | -.13 | -.05 | -.08 | -.09 | .18 | .20 | .24 | 1.00 |
22. EAT - Bulimia | .04 | -.01 | .18 | .08 | .07 | .25 | .09 | .11 | -.02 | .09 | .01 | -.09 | .13 | -.08 | -.03 | .04 | -.02 | .09 | -.01 | .10 | -.62 | 1.00 |
23. EAT - Oral Control | .22 | -.05 | .07 | .07 | .18 | .13 | .15 | .21 | .25 | .18 | -.17 | -.08 | .00 | .01 | .01 | -.06 | -.10 | -.01 | .13 | -.21 | .31 | 1.00 |

Substance Abuse
24. Substance Type 1 | .08 | .00 | -.15 | -.06 | .04 | .04 | .04 | .01 | -.01 | -.11 | .09 | .14 | .04 | .12 | .15 | .11 | .18 | -.18 | .08 | -.05 | .05 | .24 | .17 | .08 | 1.00 |
25. Substance Type 2 | .01 | -.03 | -.08 | .14 | .07 | .18 | .11 | .14 | .10 | .18 | .14 | -.14 | -.03 | -.06 | .15 | -.02 | -.16 | .24 | .19 | .21 | .32 | .31 | .04 | .43 | 1.00 |
26. Substance Impact | -.05 | -.07 | -.04 | -.17 | .00 | .17 | .10 | .07 | .01 | .06 | .05 | .03 | -.01 | .20 | .07 | .07 | -.15 | .24 | .17 | .23 | .30 | .28 | .11 | .60 | .43 | 1.00 |

Note. CTQ = Childhood Trauma Questionnaire; ECR = Experiences in Close Relationships; CES-D = Center for Epidemiologic Studies Depression Scale; BSI-Depression = Brief Symptom Inventory - Depression; EAT = 26-item Eating Attitude Test; p < .05 (higher than .17); p < .01 (higher than .24)
Table 6

**Correlation Coefficient Among Latent Variables in the Depression, Eating Disturbances, and Substance Use Measurement Models for Female (n = 274)**

<table>
<thead>
<tr>
<th>Latent Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tr>
<td>1. Childhood Trauma</td>
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<tr>
<td>2. Anxious Attachment</td>
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<td>3. Avoidant Attachment</td>
<td>.30***</td>
<td>.21**</td>
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</tr>
<tr>
<td>4. Images of Self</td>
<td>-.34***</td>
<td>-.64***</td>
<td>-.23**</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>5. Religious Faith</td>
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<td>-.00</td>
<td>-.12</td>
<td>.13*</td>
<td>1.00</td>
</tr>
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<td>.53***</td>
<td>.34***</td>
<td>-.73***</td>
<td>-.11</td>
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<td>.13</td>
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<td>.00</td>
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<tr>
<td>Substance Abuse</td>
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<td>.20**</td>
<td>.19**</td>
<td>-.29**</td>
<td>-.36***</td>
</tr>
</tbody>
</table>

*p < .05;  ** p < .01;  *** p < .001

Table 7

**Correlation Coefficient Among Latent Variables in the Depression, Eating Disturbances, and Substance Use Measurement Models for Male (n = 127)**

<table>
<thead>
<tr>
<th>Latent Variables</th>
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<th>5</th>
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<td>1. Childhood Trauma</td>
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<td></td>
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</tr>
<tr>
<td>2. Anxious Attachment</td>
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<td>1.00</td>
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</tr>
<tr>
<td>3. Avoidant Attachment</td>
<td>.30***</td>
<td>.09</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Images of Self</td>
<td>-.39***</td>
<td>-.36***</td>
<td>-.39***</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>5. Religious Faith</td>
<td>.04</td>
<td>-.00</td>
<td>-.28**</td>
<td>.23*</td>
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<td>Substance Abuse</td>
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<td>.13</td>
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</table>

*p < .05;  ** p < .01;  *** p < .001

= .93; and RMSEA = .069 (90% CI: .060 - .078). The results for the male also indicated an acceptable model fit to the data; \( S-B \chi^2 (161) = 249.06, p < .001; \) NNFI = .88; CFI = .901, RCFI = .92; and RMSEA = .079 (90% CI: .063 - .093). These results suggest that the baseline models for Eating Disturbances were suitable for the next step, or testing of multi-group equivalence across gender.

Results of testing for the female baseline model for Substance Abuse showed a good model fit to the data; \( S-B \chi^2 (161) = 338.94, p < .001; \) NNFI = .92; CFI = .928, RCFI = .93; and RMSEA = .071 (90% CI: .062 - .080). The results for the male also showed an
acceptable model fit to the data as well; $S-B\chi^2 (161) = 246.96, p < .001$; NNFI = .90; CFI = .912, RCFI = .92; and RMSEA = .075 (90% CI: .058 - .089). These results indicate that the baseline models for Substance Abuse were suitable as well for testing of multi-group equivalence across gender. Table 8 shows fit indices of the baseline models of each of the three hypothesized models for both females and males.

Testing for Multi-Group Invariance

Established baseline models for both females and males in each of the hypothesized models enabled to move forward testing for the invariance across gender in both measurement and structural models. According to Byrne (1994), the following sets of parameters are typically of interest in answering questions related to group equivalence: factor loading paths; factor variances/covariances; structural regression paths; factor residuals; and error variances/covariances. The equality of error variances and covariances, however, is the least important hypothesis to test, and it is widely accepted to not include error variances and covariances for group invariance test (Bentler, 1992; Byrne, 1994). In testing group invariance, Byrne (2006) suggested three steps of equivalence test: 1) configural invariance; 2) measurement invariance; and 3) structural invariance.

Configural Invariance

The initial step in testing for group invariance requires that the number of factors and factor-loading patterns be the same across groups; no equality constraints are imposed on the parameters (Byrne, 2006). All factor loadings, factor variances/covariances, factor residuals, and error variances/covariances were freed for both females and males in each of three hypothesized models; that is, no parameters were constrained equal across females and males. In reporting on evidence of invariance, it has been customary to report the difference in $\chi^2$ values ($\Delta\chi^2$) derived from the comparison of $\chi^2$ values of various models under test with the
baseline configural model (Byrne, 2006). Researchers (e.g., Cheung & Rensvold, 2002; Marsh, Hey, and Roche, 1997) have contended that Δχ² values are as sensitive to sample size and non-normality as the χ² statistic itself. Therefore, it is impractical and unrealistic to use Δχ² for evidence of equivalence.

Two alternative criteria were suggested by Byrne (2006) and Cheung and Rensvold (2002): (a) the multi-group should show an adequate fit to the data; and (b) differences in CFI values (ΔCFI) between models should be negligible. As for cut-off criterion for difference in CFI, traditionally ΔCFI that does not exceed a value of .05 was accepted. Recently, however, Cheung and Rensvold (2002) pointed out that the .05 criterion has neither strong theoretical nor empirical support and suggested a new criterion that the ΔCFI should not exceed .01, which was supported by Byrne (2006). Given the non-normality of several indicators for both females and males and the small sample size of males (N = 128), ΔCFI .01 was used as a fit criterion, in conjunction with the traditional model cut-off values referred to earlier, for evidence of gender invariance in the present study.

Results of testing for the configural invariance across gender indicated that all three hypothesized models have an adequate fit to the data, respectively; for Depression, χ² (322) = 632.99, p < .001; NNFI = .93; CFI = .939, and RMSEA = .049 (90% CI: .043 - .055); for Eating Disturbances, χ² (322) = 658.36, p < .001; NNFI = .91; CFI = .923, and RMSEA = .051 (90% CI: .045 - .057); and for Substance Abuse, χ² (322) = 655.23, p < .001; NNFI = .91; CFI = .924, and RMSEA = .051 (90% CI: .045 - .056). These results suggest that the basic internal structure of each of three hypothesized models is properly represented across gender; each hypothesized model for both females and males consists of six latent variables and twenty indicators. Table 8 shows the results of the test of the configural invariance of each of three hypothesized models across gender.
Table 8
Fit Indices for Baseline Models and Multi-group Invariance for Depression, Eating Disturbances, and Substance Abuse
(Female, \( n = 274 \); Male, \( n = 127 \))

<table>
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<tr>
<th>Type of model</th>
<th>( \chi^2 )</th>
<th>Df</th>
<th>S-B( \chi^2 )</th>
<th>df</th>
<th>( p )</th>
<th>S-B( \chi^2 )/df</th>
<th>NNFI</th>
<th>CFI</th>
<th>RCFI</th>
<th>RMSEA</th>
<th>RMSEA 90% CI</th>
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<th>Type of model</th>
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<th>Df</th>
<th>( \Delta \chi^2 )</th>
<th>\Delta df</th>
<th>( p/p \Delta \chi^2 )</th>
<th>( \chi^2 )/df</th>
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Note. NNFI = Bentler-Bonett Nonnormed Fit Index; CFI = Comparative Fit Index; RCFI = Robust Comparative Fit Index; SRMR = Standardized Root-Mean-Square Residual; RMSEA = Root-Mean-Square Error Average
Measurement Model Invariance

This step addresses the question of equality of factor loading paths across gender. Testing for the equivalence of factor loadings entails specification of equality constraints for all freely estimated factor loadings that are consistently specified in the baseline models (Byrne, 2006). According to Byrne’s (2006) suggestion, two criteria were set for testing for the measurement model invariance across gender: (a) the goodness of fit of the measurement model should be adequate; and (b) there should be minimal difference in fit between the measurement model and the baseline model (i.e., $\Delta$CFI should not exceed .01). These criteria were used in the testing of subsequent invariance models.

Results of testing for the equivalence of the measurement model for Depression between females and males revealed that the measurement model is invariant across gender, $\chi^2$ (336) = 656.90, $p < .001$, NNFI = .93, CFI = .937, and RMSEA = .049 (90% CI: .043 - .053). The difference in CFI between the measurement model and the baseline model was negligible, $\Delta$CFI = .002. Despite the invariance in the model, which parameters (if any) are not equivalent across gender was examined by the multivariate Lagrange Multiplier (LM) Test. The purpose of the LM Test is to determine whether the specification of certain parameters as free rather than fixed/constrained would lead to a model that better represents the data (Byrne, 1994). The LM Test showed significant difference in two factor loading paths between females and males, which accounts for the difference, even if negligible, between the measurement model and the baseline model overall ($\Delta$CFI .002); Childhood Trauma $\rightarrow$ Physical Neglect, $\chi^2 = 9.98, p < .01$; Childhood Trauma $\rightarrow$ Physical Abuse, $\chi^2 = 6.63, p = .01$. These results indicated that in the measurement model for Depression, the factor loading paths are nearly equivalent across gender despite the difference in the two factor loading paths from childhood trauma to physical neglect and physical abuse.
Results of the equivalence test for the measurement model for Eating Disturbances indicated that the model is equivalent across gender, $\chi^2 (336) = 683.42, p < .001$, NNFI = .91, CFI = .920, and RMSEA = .051 (90% CI: .045 - .056). The difference in CFI between the measurement model and the baseline model was minimal, $\Delta$CFI = .003. Like in the measurement model for Depression, the LM Test showed the same significant difference in two factor loading paths; Childhood Trauma $\rightarrow$ Physical Neglect, $\chi^2 = 9.53, p < .01$; Childhood Trauma $\rightarrow$ Physical Abuse, $\chi^2 = 6.70, p = .01$. These results indicated that in the measurement model for Eating Disturbances the factor loading paths are invariant across gender despite the difference in the two factor loading paths.

The equivalence test for the measurement model for Substance Abuse between females and males showed similar results to the aforementioned two models, $\chi^2 (336) = 680.45, p < .001$, NNFI = .91, CFI = .921, and RMSEA = .051 (90% CI: .045 - .056). The difference in CFI between the measurement and baseline models was minimal as well, $\Delta$CFI = .003. The LM Test showed significant difference in three factor loading paths; Childhood Trauma $\rightarrow$ Physical Neglect, $\chi^2 = 9.65, p < .01$; Childhood Trauma $\rightarrow$ Physical Abuse, $\chi^2 = 6.52, p < .05$; and Religious Faith $\rightarrow$ Spirituality, $\chi^2 = 3.96, p < .05$. These results indicated that in the measurement model for Substance Abuse, the factor loading paths are nearly equivalent across gender despite the difference in three factor loading paths. These results of the invariance tests across gender for each of the three hypothesized measurement models allowed the researcher to move ahead in testing for the invariance of the hypothesized structural model across gender. Table 8 shows the results of the testing for the invariance of each of the three measurement models across gender.
**Structural Model Invariance**

In testing for the equivalence of the structural model across gender, focus of interest is on the structural regression paths and factor variances/covariances; the factor variances were tested although they are typically of little interest (Byrne, 2006). The important point to note at this stage is that the equality of the structural parameters is tested while concomitantly maintaining equality of measurement parameters across groups (Byrne, 2006).

Results of testing for the invariance in the structural model for Depression indicated that the structural model is equivalent across gender, $\chi^2 (346) = 678.50, p < .001$, NNFI = .93, CFI = .934, and RMSEA = .049 (90% CI: .043 - .054). The difference in CFI between the measurement model and the structural model was negligible, $\Delta$CFI = .003. Like in the invariance test for measurement models, the researcher investigated which (if any) parameters may not be equivalent between females and males, despite the overall gender equivalence, by the multivariate Langue Multiplier (LM) Test. The LM Test showed that there are significant differences in one factor variance, two factor loading paths, and one structural regression path in the structural model for Depression; (1) Childhood Trauma, $\chi^2 = 7.58, p < .01$; (2) Childhood Trauma $\Rightarrow$ Physical Neglect, $\chi^2 = 7.18, p < .01$; (3) Childhood Trauma $\Rightarrow$ Depression, $\chi^2 = 5.83, p < .05$; and (4) Childhood Trauma $\Rightarrow$ Physical Abuse, $\chi^2 = 5.23, p < .05$. These results indicate that the structural regression paths in the structural model for Depression are nearly equivalent across gender despite several differences.

Results of the gender invariance test for the structural model for Eating Disturbances indicated that this structural model is also invariant across gender, $\chi^2 (346) = 704.70, p < .001$, NNFI = .91, CFI = .918, and RMSEA = .051 (90% CI: .045 - .056). The difference in CFI between the measurement model and the structural model was negligible, $\Delta$CFI = .002. The
LM Test indicated that there are significant differences in one factor variance, two factor loading paths, and one structural regression path between females and males in the model for the Eating Disturbances; (1) Childhood Trauma, $\chi^2 = 7.55, p < .01$; (2) Childhood Trauma $\rightarrow$ Physical Neglect, $\chi^2 = 7.34, p < .01$; (3) Images of Self $\rightarrow$ Eating Disturbances, $\chi^2 = 7.14, p < .01$; and (4) Childhood Trauma $\rightarrow$ Physical Abuse, $\chi^2 = 5.27, p < .05$. These results indicate that the structural regression paths in the structural model for Eating Disturbances are nearly equivalent across gender despite a few differences.

Results of the invariance test for the structural model for Substance Abuse indicated that the structural model is invariant across gender, $\chi^2 (346) = 704.13, p < .001$, NNFI = .91; CFI = .918, and RMSEA = .051 (90% CI: .045 - .056). The difference between the structural model and the measurement model was minimal, $\Delta$CFI = .003. The LM Test indicated that there are significant differences in one factor variance, three factor loading paths, and one structural regression path between females and males in the model for Substance Abuse; (1) Childhood Trauma, $\chi^2 = 7.60, p < .01$; (2) Childhood Trauma $\rightarrow$ Physical Neglect, $\chi^2 = 7.28, p < .01$; (3) Images of Self $\rightarrow$ Substance Abuse, $\chi^2 = 7.01, p < .01$; (4) Childhood Trauma $\rightarrow$ Physical Abuse, $\chi^2 = 5.31, p < .05$; and (5) Religious Faith $\rightarrow$ Spirituality, $\chi^2 = 4.32, p < .05$. These results indicate that the structural regression paths in the Substance Abuse structural model are nearly equivalent across gender despite several differences. Table 8 shows the results of the tests for the invariance of each of three structural models across gender.

Testing for Mediation

Because both multi-group measurement and structural models showed no significant difference between females and males, the data were combined across gender for all subsequent analyses in testing mediated effect in each of three hypothesized models. As
referred to earlier, the correlation coefficient, mean, standard deviation, skewness, and kurtosis of the 26 observed variables for three hypothesized models are listed on Table 1, while correlations among six latent variables for each of three hypothesized models are on Table 2.

In respect to testing the mediated effects, each of three hypothesized structural models were estimated according to Holmbeck’s (1997) suggestion, as referred to in the Introduction section, that there should be three variables to test mediated effects: a latent predictor variable (A), a hypothesized latent mediator variable (B), and a latent criterion variable (C). The first step is to assess the fit of the “direct” effect (A→C) model. If this model has an adequate fit to the data, the next step is to test the fit of the “overall” (A→B→C) model. If this model has an adequate fit to the data, the final step is to assess whether there is a mediated effect, or to test the fit of the A→B→C model in the condition in which the direct path (A→C) is constrained to zero (“fully mediated” model). If there is a mediated effect, the previously significant direct path (A→C) coefficient becomes insignificant.

Hypothesized Measurement Model

Prior to testing for the mediated effects, the researcher first tested the fit of the hypothesized measurement model to the data for each of three hypothesized model. If the measurement model has an adequate fit to the data, the next step for the meditational structural model can be taken. The structure of the measurement model is the same as that of the baseline model in the multi-group invariance test referred to earlier except that the data were combined across gender (see Figures 7, 8, and 9). Standardized path coefficients and measurement errors for the hypothesized measurement model are listed on Table 9.

Results of testing for the fit of each of three measurement models to the data showed an adequate fit to the data: for the measurement model for Depression, S-Bχ² (155)
Figure 7. Hypothesized measurement model for depression.

Figure 8. Hypothesized measurement model for eating disturbances.

Figure 9. Hypothesized measurement model for substance abuse.
<table>
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<tr>
<th>Observed Variables</th>
<th>Path Coefficients</th>
<th>Errors</th>
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*Note.* CTQ = Childhood Trauma Questionnaire; ECR = Experiences in Close Relationships; CES-D = Center for Epidemiologic Studies Depression Scale; BSI-Depression = Brief Symptom Inventory-Depression subscale; EAT = 26-item Eating Attitude Test
= 336.65, \( p < .001 \), NNFI = .96, CFI = .96, RCFI = .96, SRMR = .046, and RMSEA = .054 (90% CI: .046 - .062); for the Eating Disturbance, S-B \( \chi^2 \) (155) = 332.47, \( p < .001 \), NNFI = .95, CFI = .96, RCFI = .96, SRMR = .052, and RMSEA = .054 (90% CI: .045 - .061); and for the Substance Abuse, S-B \( \chi^2 \) (155) = 387.45, \( p < .001 \), NNFI = .95, CFI = .96, RCFI = .96, SRMR = .049, and RMSEA = .054 (90% CI: .046 - .062). These results revealed that all three hypothesized measurement models have a good fit for the data, which allowed the next step of testing the mediated models. Table 10 shows the fit indices of each of three hypothesized measurement models.

*Hypothesized Structural Models*

In evaluating the structural models, the path coefficient of the first indicator for each of six latent variables was fixed to 1.0 to aid in identification of each model tested (Byrne, 1994, 2006; Joreskog & Sorbom, 1993). The structural model was designed to have three sequential paths; \( A \) (a predictor variable) \( \rightarrow \) \( B \) (four hypothesized mediating variables) \( \rightarrow \) \( C \) (a criterion variable) (see Figures 1, 2, and 3). Specifically, four hypothesized latent variables (\( B \); Anxious Attachment, Avoidant Attachment, Image of Self, and Faith) mediate the relationship between one predictor latent variable, Childhood Trauma (\( A \), and one criterion latent variable (\( C \), Depression, Eating Disturbances, or Substance Abuse, in each of three mediated structural models, respectively.

*Mediated model for depression.*

Three models were estimated to test mediated effects according to Holmbeck’s (1997) suggestion as referred to earlier; (1) “direct” path model, (2) “overall” model; and (3) “fully mediated” model. First, the “direct” path model tested the direct impact of Childhood Trauma on Depression in the absence of four mediators (Anxious Attachment, Avoidant Attachment, Image of Self, and Faith). If this model yields an adequate fit, then
further steps are warranted. Results revealed an adequate fit to the data, S-Bχ² (19) = 73.69, p < .001, NNFI = .96, CFI = .97, RCFI = .97, SRMR = .043, and RMSEA = .085 (90% CI: .065 - .105). The path coefficient in the direct model was .31 (p < .001).

The second step involves testing for the “overall” model. The overall model retains a free path for direct effects of Childhood Trauma on Depression, and adds four paths from Childhood Trauma to each of four mediators and another four paths from each of four mediators to Depression. If the overall model shows an adequate fit, the next step is allowed to take. Results of the test for the overall model revealed an adequate fit to the data, S-Bχ² (161) = 441.64, p < .001, NNFI = .93, CFI = .944, RCFI = .942, SRMR = .096, and RMSEA = .066 (90% CI: .059 - .073). The path coefficient from Childhood Trauma to each of four mediators was all significant; to Anxious Attachment, .26, p < .001, to Avoidant Attachment, .31, p < .001, to Image of Self, -.38, p < .001, and to Faith, -.10, p < .05. The path coefficient from each of three mediators to Depression was significant; from Anxious Attachment, .27, p < .001, from Avoidant Attachment, .17, p < .001, and from Image of Self, -.58, p < .001), while one path coefficient from Faith to Depression was insignificant (-.02, p > .05). The direct path coefficient from Childhood Trauma to Depression became insignificant (.00, p > .05).

The final step involves comparing the “overall” model with the “fully mediated” model. The fully mediated model was the same as the overall model except that the direct path from Childhood Trauma to Depression was constrained to zero. Results of testing for the fully mediated model revealed an adequate fit to the data, S-Bχ² (162) = 441.62, p < .001, NNFI = .94, CFI = .945, RCFI = .943, SRMR = .096, and RMSEA = .066 (90% CI: .058 - .073). All path coefficients in this model except for a negligible change in the
path coefficient from Image of Self to Depression (\(-.58 \rightarrow -.59\)) were the same as those in the overall model.

The test of chi-square difference indicated no significant difference between the “overall” model and the “fully mediated” model, \(\Delta S-B \chi^2 = .70 \, (p > .05)\) and \(\Delta \chi^2 = .02 \, (p > .05)\). According to the parsimony rule in SEM (Byrne, 2006; Loehlin, 2001), the “fully mediated” model is a better alternative to the “overall” model in testing for the fit of the hypothesized structural model for Depression to the data. This alternative structural model suggests that anxious and avoidant attachment patterns and image of self, but not religious faith, fully mediate the relationship between attachment trauma in childhood and symptoms of depression in adulthood. The predictor (Childhood Trauma) and four mediating variables (Anxious Attachment, Avoidant Attachment, Image of Self, and Faith) accounted for 51% of the total variance of the criterion variable (Depression) \(R^2 = .49\). Figure 10 shows all path coefficients of the “fully mediated” model for Depression. Fit indices of all three models for Depression are on Table 10.

Mediated model for eating disturbances.

Like in the mediated model for Depression, the direct impact of Childhood Trauma on Eating Disturbances was first tested in the absence of all four mediators (Anxious Attachment, Avoidant Attachment, Image of Self, and Faith). Results of the test for the direct path indicated an adequate fit to the data, \(S-B \chi^2 (19) = 85.22, \, p < .001, \, NNFI = .91, \, CFI = .94, \, RCFI = .92, \, SRMR = .053, \) and \(RMSEA = .093 \, (90\% \, CI: \, .073 - .113)\). The path coefficient in this “direct” model was significant, \(.18 \, (p < .01)\).

Results of the test for the overall model for the Eating Disturbances also showed an adequate fit to the data, \(S-B \chi^2 (161) = 438.15, \, p < .001, \, NNFI = .93, \, CFI = .938, \, RCFI = .937, \, SRMR = .091, \) and \(RMSEA = .066 \, (90\% \, CI: \, .058 - .073)\). The path coefficients
### Table 10
**Fit Indices for Measurement and Structural Models for Depression, Eating Disturbances, and Substance Abuse (N = 401)**

<table>
<thead>
<tr>
<th>Type of model</th>
<th>χ²</th>
<th>df</th>
<th>S-Bχ²</th>
<th>df</th>
<th>P</th>
<th>S-Bχ²/df</th>
<th>NNFI</th>
<th>CFI</th>
<th>RCFI</th>
<th>SRMR</th>
<th>RMSEA</th>
<th>RMSEA 90% CI</th>
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<td>.96</td>
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<td>.054</td>
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*Note.* NNFI = Bentler-Bonett Nonnormed Fit Index; CFI = Comparative Fit Index; RCFI = Robust Comparative Fit Index; SRMR = Standardized Root-Mean-Square Residual; RMSEA = Root-Mean-Square Error Average
Figure 10. Fully mediated structural model for depression.

Figure 11. Fully mediated structural model for eating disturbances.

Figure 12. Fully mediated structural model for substance abuse.
from Childhood Trauma to each of four mediators in this model were the same as those in the mediated model for Depression; to Anxious Attachment, .26, \( p < .001 \); to Avoidant Attachment, .31, \( p < .001 \); to Image of Self, -.38, \( p < .001 \); and to Faith, -.10, \( p < .05 \). The path coefficients from two mediators to Eating Disturbances were significant, respectively; from Anxious Attachment, .21, \( p < .001 \); from Image of Self, -.35, \( p < .001 \), while the path coefficients from another two mediators to Eating Disturbances were not significant; from Avoidant Attachment, .03, \( p > .05 \); from Faith, 08, \( p > .05 \). The direct path coefficient from Childhood Trauma to Eating Disturbances in this model became insignificant, .01, \( p > .05 \).

Results of the “fully mediated” model for Eating Disturbances revealed an adequate fit to the data, S-B\( \chi^2 \) (162) = 438.17, \( p < .001 \), NNFI = .93, CFI = .936, RCFI = .939, SRMR = .091, and RMSEA = .065 (90% CI: .058 - .073). All path coefficients in this model except for a negligible change in the path coefficient from Anxious Attachment to Eating Disturbances (.21 \( \rightarrow \) .22) were the same as those in the overall model. The test of chi-square difference indicated no significant difference between the “overall” model and the “fully mediated” model, \( \Delta \text{S-B}\chi^2 = 3.23 \) (\( p > .05 \)) and \( \Delta\chi^2 \) was .02 (\( p > .05 \)).

Given the parsimony rule in SEM, the “fully mediated” model is a better alternative to the “overall” model in testing for the fit of the hypothesized structural model for Eating Disturbances. This alternative structural model suggests that only anxious adult attachment patterns and image of self, but not avoidant attachment patterns and religious faith, fully mediate the relationship between attachment trauma in childhood and disordered eating behaviors in adulthood. In this study, the predictor (Childhood Trauma) and four mediating variables (Anxious Attachment, Avoidant Attachment, Image of Self, and Faith) accounted for 19% of the total variance of the criterion variable (Eating Disturbances) \( (R^2 = .81) \).
Figure 11 shows the path coefficients of the “fully mediated” structural model for Eating Disturbances. Fit indices of all three models for Eating Disturbances are on Table 10.

Mediated model for substance abuse.

Like in the mediated models for both Depression and Eating Disturbances, the direct effects of Childhood Trauma on Substance Abuse were first tested in the absence of all four mediators (Anxious Attachment, Avoidant Attachment, Image of Self, and Faith). Results of the direct path revealed an adequate fit to the data, S-B\(\chi^2\) (19) = 67.06, \(p < .001\), NNFI = .93, CFI = .95, RCFI = .95, SRMR = .041, and RMSEA = .080 (90% CI: .059 - .074). The path coefficient in the “direct” model was .15 (\(p < .05\)).

Results of testing for the “overall” model for Substance Abuse also indicated an adequate fit to the data, S-B\(\chi^2\) (161) = 443.98, \(p < .001\), NNFI = .92, CFI = .934, RCFI = .935, SRMR = .087, and RMSEA = .066 (90% CI: .059 - .074). The path coefficients from Childhood Trauma to each of four mediators in this model are all significant; to Anxious Attachment, .26, \(p < .001\); to Avoidant Attachment, .31, \(p < .001\); to Image of Self, -.38, \(p < .001\); and to Faith, -.11, \(p < .05\). Two path coefficients from two mediators to Substance Abuse were significant; from Anxious Attachment, .13, \(p < .05\); from Faith, -.30, \(p < .001\), while path coefficients from another two mediators to Substance Abuse were not significant; from Avoidant Attachment, .06, \(p > .05\); from Images of Self, -.02, \(p > .05\). The direct path coefficient from Childhood Trauma to Eating Disturbances in this model became insignificant; .06, \(p > .05\).

Results of testing for the fit of the “fully mediated” model to the data revealed an adequate fit to the data as well, S-B\(\chi^2\) (162) = 444.87, \(p < .001\), NNFI = .92, CFI = .935, RCFI = .936, SRMR = .086, and RMSEA = .066 (90% CI: .059 - .073). All path
coefficients in this model are the same except for a negligible change in four path coefficients (from Childhood Trauma to Faith, -.10 → -.11; from Anxious Attachment to Substance Abuse, .13 → .14; from Avoidant Attachment to Substance Abuse, .06 → .07; from Image of Self to Substance Abuse, -.02 → -.04) as those in the overall model. The test of chi-square difference revealed no significant difference between the “overall” model and the “fully mediated” model, $\Delta S-B \chi^2 = .87 \ (p > .05)$ and $\Delta \chi^2$ was .89 $(p > .05)$.

According the parsimony rule in SEM, the “fully mediated” model is a better alternative to the “overall” model in testing for the fit of the hypothesized structural model for Substance Abuse. This alternative structural model suggests that only anxious adult attachment patterns and religious faith fully mediate the association between attachment trauma in childhood and substance abuse in adulthood. In the present study, the predictor (Childhood Trauma) and four mediating variables (Anxious Attachment, Avoidant Attachment, Image of Self, and Faith) accounted for 14% of the total variance of the criterion variable (Substance Abuse) $(R^2 = .86)$. Figure 12 shows the path coefficients of the fully mediated model for Substance Abuse. Fit indices of all three models for Substance Abuse are on Table 10.
CHAPTER 4
DISCUSSION

Overview

The purpose of this study was to investigate psychological mechanism by which four intra- and inter-personal characteristics of an individual (anxious and avoidant attachment patterns, images of self, and religious faith) mediate the relationship between childhood trauma and three affect-behavior regulation problems in adulthood (symptoms of depression, disordered eating behaviors, and substance abuse). National surveys in the United States indicated that more than a half of Americans were exposed to at least one traumatic event in their lifetime, but less than one tenth of those who experienced a traumatic event developed symptoms of PTSD and other mental health problems, such as depression, eating disorders, and substance abuse (Kessler et al., 1995; Stein et al., 1997). The question arising from the results of those surveys is “Why do some people exposed to a traumatic event cope with or describe growth from it, while why do some people continue to suffer from the aftermath of the traumatic event?”

Many theories and studies have been dedicated to answering the above question over the years. Among them, attachment theory proposed by Bowlby (1969/1982, 1973, 1979, 1980) has been one of the most influential in its theoretical comprehensiveness (e.g., social, psychological, neurobiological, developmental, and even theological) and clinical applicability to various mental health issues (e.g., PTSD, depression, bipolar disorders, substance abuse, eating disorder, borderline personality disorder). The most unique contribution that attachment theory has made to the field of mental health lies in its account of the powerful influence of “emotional bond or ties” with attachment figures (e.g., a primary caregiver, a romantic partner, and even a higher power) over the course of development. Consistently safe and trusting relationship with available,
sensitive, and responsive attachment figures instills a deep sense of “felt security” within an individual and engenders “internal working models” or “mental representations” of self, others, and behavioral patterns in close relationship; for example, a sense of self-worth, a spirit of “I can,” resilient adaptability, and interpersonal sensitivity.

An individual’s sense of “felt security” and “internal working models” established in early childhood are relatively stable over the course of development but open to change depending on life events experienced, especially traumatic events that occur in relationship with primary caregivers in childhood (e.g., parental abuse and neglect). Only a handful of empirical studies have been reported to test Bowlby’s theoretical proposition, or psychological mechanism by which childhood maltreatment by primary caregivers endanger mental representations of self, others, relationship patterns, and faith in a higher being, which in turn contribute to affect-behavior regulation problems, such as symptoms of depression, eating disturbances, and substance abuse, in adulthood (e.g., Bifulco et al., 2006; Krejci et al., 2004; Riggs et al., 2007; Shapiro & Lenvendosky, 1999; Stein et al., 2002).

Most studies, however, examined simple pathways in which either intra- or inter-personal characteristics of an individual (e.g., adult attachment patterns, religious faith) mediate the relationship between childhood maltreatment and psychosocial problems either in adolescence or in adulthood. For example, Shapiro and Levendosky (1999) reported that attachment relationship with parents and friends mediated the association between childhood abuse and neglect and symptoms of depression in adolescence. Riggs and colleagues indicated that anxious adult attachment patterns linked childhood familial environment with substance abuse in adulthood (Riggs et al., 2007). Krejci and colleagues reported that spiritual well-being mitigated the impact of childhood sexual abuse on disordered eating behaviors in adulthood (Krejci et al., 2004). No
empirical studies, however, have been reported yet, based on this researcher’s literature review, on the psychological pathways in which both intra- and inter-personal characteristics (images of self, adult attachment patterns, and religious faith) mediate the relationship between a collection of childhood maltreatment (physical/emotional/sexual abuse, physical/emotional neglect) and each of three affect-behavior regulation problems (symptoms of depression, disordered eating behaviors, substance abuse).

To that cause, this study constructed three hypothesized mediated models based on a well-grounded theory (i.e., Bowlby’s attachment theory) and tested each of them by one of the rigorous hypothesis-testing statistical methodologies (i.e., Structural Equation Modeling). Each of three mediated models consisted of one predictor (childhood trauma), four mediators (anxious and avoidant adult attachment patterns, images of self, and religious faith), and one criteria variable (symptoms of depression, disordered eating behaviors, or substance abuse). Structural equation modeling was used to test the fit of each of three hypothesized models to the data collected because it enables to measure a psychological construct (latent variable) as closely as it can by using conceptually coherent multiple observed variables and assess and correct for measurement error (Bentler, 2007). In doing so, a series of multi-group analyses were first conducted to test for invariance of each hypothesized model across gender, and then another series of analyses were conducted to test for mediated effects in each of three hypothesized models.

The results of the multi-group invariance analyses revealed no significant gender difference for each hypothesized model so the data were combined across gender for subsequent data analyses. The results of testing for three hypothesized structural models showed similarities and differences in the pathways in which childhood maltreatment
predicts affect-behavior regulation problems in adulthood through four characteristics of an individual. For the mediated model for Depression, anxious attachment patterns, avoidant attachment patterns, and images of self, but not religious faith, fully mediated the relationship between childhood maltreatment and symptoms of depression in adulthood. For the Eating Disturbances, only anxious attachment patterns and images of self, but not avoidant attachment patterns and religious faith, fully mediated the association between childhood trauma and disordered eating behaviors in adulthood. For the Substance Abuse, anxious attachment patterns and religious faith, but not avoidant attachment patterns and images of self, fully linked childhood attachment trauma to substance abuse in adulthood. Following are full discussion of the findings of each of three hypothesized structural models, clinical implications of those findings, limitations of the present study, and implications for future studies.

Hypothesized Structural Model for Depression

The results of testing for the hypothesized structural model for Depression demonstrated that both anxious and avoidant adult attachment patterns and images of self, but not religious faith, fully mediated the relationship between attachment trauma in childhood and symptoms of depression in adulthood, respectively. These findings suggest that a collection of childhood maltreatments (i.e., emotional/physical/sexual abuse, emotional/physical neglect) by primary caregivers contribute to symptoms of depression in adulthood through maladaptive internal working models, such as negative image of self, lack of self confidence, and anxious and avoidant relationship patterns with significant others, which is consistent with Bowlby’s (1969/1980, 1973, 1979, 1980) theoretical proposition and results of the past studies (e.g., Bifulco & Moran, 1998; Shapiro & Levendosky, 1999; Stein et al., 2002).
Specifically, the findings suggest that individuals who were abused (emotionally, physically, sexually) and neglected (emotionally, physically) by parental figures in childhood tend to develop not only negative self-image and poor self-confidence but also insecure interpersonal interaction “patterns” with significant others in adulthood (e.g., romantic partner), such as strong desires for emotional closeness, intense worries about one’s value to a partner, discomfort with emotional intimacy, and/or excessive independence. In particular, what is worthy of note is that it is poor images of self and insecure attachment patterns, rather than childhood maltreatment itself, that give rise to symptoms of depression in adulthood.

Traumatic experience of repetitive abuse and neglect by primary caregivers in childhood, referred to as “complex trauma” by researchers (e.g., Ford & Courtois, 2008; Herman, 1992), inhibits an individual’s potential to develop a positive self-image and spirit of self-confidence (e.g., “I am a nice person” “If I try, I can”) and balance independence and intimacy in a close relationship (Milkulincer & Shaver, 2009). The poor self-images, negative internal self-talks, strong desires for enmeshed relationships, and/or excessive self-independence called “compulsive self-reliance” (Bowlby, 1969/1982) may in turn contribute to symptoms of depression in adulthood.

The important role that both negative self-images and insecure attachment patterns play in linking attachment trauma in childhood to symptoms of depression in adulthood further suggests that positive mental representations of self and secure adult attachment relationship patterns stem from a sense of “felt security” achieved through repetitive secure interactions with primary caregivers in childhood. According to Bowlby (1973, 1979, 1980), achievement of a sense of “felt security” in childhood is the bedrock of development of positive internal working models of self, others, and intimate relationship patterns not only in childhood but also over the
course of development. When an internal sense of “felt security,” however, is underdeveloped or undermined by repetitive abuse and neglect by attachment figures in childhood, an individual comes to develop two types of “secondary” interpersonal interaction patterns; either strong desires for an enmeshed relationship and unrealistic worries about rejection and abandonment by a romantic partner (anxious attachment patterns) or excessive self-reliance and avoidance of emotional intimacy with a romantic partner (avoidance attachment patterns), or both (Milkulincer & Shaver, 2007, 2009).

More specifically, individuals with anxious attachment patterns develop behavioral tendencies to desire strong emotional connectedness with and be overly dependent on a romantic partner due to fear of potential separation, rejection, or abandonment by the partner, which stem from the experience of abuse and neglect by primary caregivers in childhood. In contrast, individuals with avoidant attachment patterns develop alternative behavioral tendencies to be overly independent and keep emotional distance from a romantic partner due to the same reasons as those with anxious attachment patterns, or fear of abandonment and rejection by the partner. Researchers indicated that the combination of higher attachment anxiety and higher attachment avoidance (called “fearful” attachment patterns) is strongly associated with various mental health problems, such as depression, bipolar disorders, substance abuse, eating disorders, borderline personality disorder, and suicidal attempts (e.g., Allen, 2001; Bifulco et al., 2002; Doumas et al., 2006; Murphy & Bates, 1997; Shore, 2002).

Inconsistent with the hypothesis of the present study, religious faith did not mediate the relationship between childhood attachment trauma and symptoms of depression in adulthood. More exposure to abuse and neglect by attachment figures in childhood may contribute to less involvement in religious practices and more symptoms of depression in adulthood. However,
there was no association between religious faith and depressive symptoms in adulthood. These results suggest that those more abused and neglected by primary caregivers in childhood are less likely to get involved in religious faith and practices. These results are more consistent with the correspondence theory than the compensation theory (Granqvist, 1998; Kirkpatrick, 1998). That is, people raised by primary caregivers who were less available, less sensitive, and less responsive in childhood tend to be less trusting in a higher being in adulthood (Granquist, 1998; Granqvist, Mikulincer, & Shaver, 2010), implicating that images of a higher being (e.g., God, Allah, Buddha, others) may be closely related to images of parental figures (Dickie, Ajega, Kobylak, & Nixon, 2006).

Theorists and researchers suggested that religious faith and practices are useful for dealing with depressed mood. Carl Jung (1933) suggested that religion is helpful for emotional stability and resolution of mental conflict. In their comprehensive review of studies that examined the association between religion and mental health, Koenig and Larson (2001) indicated that about 80% of 100 studies reviewed reported positive impact of religious practices on life satisfaction, happiness, and positive affect. However, the opposite results were also reported. Some studies indicated that more religious people tend to develop lower self-esteem and more depressive symptoms (e.g., Ellis, 1988; Watters, 1992). Koenig and Larson (2001) noted, despite the general support of the positive impact of religion on mental health, that religion does not always promote positive outcomes, or it can induce low self-esteem, guilt, shame, fear, or depressed mood in those who do not conform to religious standards.

In an attempt to explain the reasons for these contradictory results, Maselko and colleagues (2009) examined independent influence of religious practices and two types of spiritual well-being (religious, existential) on the lifetime risk for major depression. They
reported that religious services attendance was associated with 30% lower odds of depression, while those in the top one third of existential well-being had 70% lower odds of depression when compared to those in the bottom one third. However, religious well-being was not associated with depressive symptoms. They suggested that the conceptual complexity and indistinctiveness between the “religiosity” and “spirituality” may contribute to the differential results, and warned of using a single domain measure in examining an association between religiousness-spirituality and depression. In examining religious-spiritual impact on mental health, thus, it is important to remain sensitive to the multidimensional nature of the “religiousness” and the complex interactions between religiousness and measures of mental health problems (Parker et al., 2003).

The multidimensionality of the construct “religiousness” and its complex relationships with mental health indices were reflected in the results of the present study as well. For example, the magnitude of the association between childhood maltreatment and religious in the fully mediated models was statistically significant but not strong (path coefficients ranged from .10 to .11, \( p < .05 \)) in the present study. The reason for the significant but weak association between these two constructs may relate to the wide range of correlation coefficients between five indicators (emotional/physical/sexual abuse and emotional/physical neglect) of Childhood Trauma and three indicators (faith, spirituality, and religiosity) of Religious Faith (see Table 1). Specifically, the size of correlations among the eight indicators ranged from \( r = .00, p > .05 \) (between faith and physical abuse) to \( r = .19, p < .01 \) (between religiosity and emotional neglect). Overall, the indicator of sexual abuse showed lowest correlations with three indicators of Religious Faith (\( r = .03 \) with faith, \( r = .04 \) with spirituality, and \( r = -.02 \) with religiosity), whereas the indicator of emotional neglect has highest correlations with three indicators of Religious Faith (\( r = -.17 \) with faith, \( r = .06 \) with spirituality, and \( r = -.19 \) with religiosity). These
findings support the multidimensionality of both constructs (religiousness, childhood trauma) and the complexity of the association between them. Further studies are needed to investigate what types of abuse and neglect in childhood are most detrimental to “what” aspects of religiousness and “how” and “why.” In doing so, it is also needed to take into consideration potential moderating variables such as gender and age.

Hypothesized Structural Model for Eating Disturbances

The results of the test for the hypothesized structural model for Eating Disturbances showed that anxious attachment patterns and images of self, but not avoidant attachment patterns and religious faith, fully mediated the relationship between childhood maltreatment and disordered eating behaviors in adulthood, respectively. These findings suggest that those who were abused and neglected by parental figures in childhood tend to develop negative image of self, poor self-confidence, and strong desires for emotional closeness with an intimate partner due to worries about the likelihood of rejection and separation, which in turn engender symptoms of depression in adulthood. Noteworthy is that it is negative mental representations of self and anxious attachment patterns in adulthood, rather than parental abuse and neglect in childhood itself, that directly predict disordered eating behaviors in adulthood. These findings further suggest that people who were abused and neglected in childhood by parental figures may develop disordered eating behaviors (e.g., bingeing, purging, and/or starving) in an attempt to cope with unacceptable negative self-images and worries about rejection, separation, or abandonment by significant others (e.g., primary caregiver, romantic partner). People who are more unsatisfied with themselves and more worried about separation, rejection, and abandonment by significant others are more likely dependent on binging, purging, and/or starving behaviors as part of coping strategies (e.g., avoidance).
These findings are consistent with both trauma researchers’ contention and findings of several past studies (e.g., Fairburn et al., 2008; Ringer & Crittenden, 2007; Tereno et al., 2008; Troisi et al., 2005). For instance, Fairburn and colleagues (2008) suggested that one of distinctive core issues of eating disordered people regardless of subtypes relate to their poor self-images, especially misjudgment of self-worth exclusively based on their physical shape and weight and their ability to control them. Troisi and colleagues (2005) reported that those who suffer clinically more severe symptoms of eating disorders demonstrated higher rates of separation anxiety, stronger needs for approval from significant others, and more fear of rejection from a relationship partner (Troisi et al., 2005). They suggested that those who suffer from eating disorders tend to show so-called “push-pull” relationship patterns, referred to by Ward et al. (2000), of oscillating between the overwhelming desires for approval and compulsive self-reliance, which is often observed in women with eating disorders (O’Shaughnessy & Dallos, 2009). Ringer & Crittenden (2007) also examined attachment relationship patterns (measured by the Adult Attachment Interview) and several types of eating disorders for 64 young adult women with an eating disorder (19 with anorexia nervosa, 26 with bulimia nervosa, and 17 with bulimic anorexia). They reported that all women with eating disorders were classified as having anxious attachment relationship patterns, and most grew up in hidden family conflict between parents, who (especially mother) had unresolved trauma or loss in the past.

Inconsistent with the hypothesis of this study and results of past studies (Latzer et al., 2002; Tasca et al., 2009), avoidant attachment patterns and religious faith did not mediate the relationship between childhood trauma and disordered eating behaviors in adulthood. Latzer and colleagues explored potential associations between adult attachment styles and eating disorder symptoms for female patients in an eating disorder clinic (Latzer et al., 2002). They reported that
a vast majority of women who reported high scores on both anorexia and bulimia nervosa were classified as either anxious or avoidant attachment style; but, avoidant style was two times more than anxious style. More recently, Tasca and colleagues examined psychological pathways in which both anxious and avoidant adult attachment patterns predict symptoms of eating disorders for women who seek eating disorder treatment (Tasca et al., 2009). They reported that anxious attachment patterns predicted eating disturbances through emotional reactivity, while avoidant attachment patterns predicted eating disorder symptoms directly without emotional reactivity.

One of the possible explanations for the inconsistency in the results between the present study and the aforementioned past studies (Latzer et al., 2002; Tasca et al., 2009) may relate to difference in sample (e.g., college students vs. patients). The association between attachment patterns and disordered eating behaviors may rely on severity of symptoms of eating disorders. In other words, attachment behavior patterns of those with severe symptoms of eating disorders may differ from those with mild symptoms of eating disorders. Cole-Detke & Kobak (1996) reported that those who receive treatment for eating disorders suffered other mental health issues (e.g., depression) and showed more insecure attachment patterns than those who don’t have eating disorder. In addition, participants of the aforementioned two studies were patients in eating disordered clinics while participants in the present study was college students; less than one tenth of student participants (8.5%, $N = 34$) in the present study scored equal to or higher than a total score of 20 (the criterion for potential treatment) on the 26-item Eating Attitudes Test used.

O’Shaughnessy and Dallos (2009) reviewed numerous studies that examined the association between adult attachment styles and eating disorder types. They found that the relationship between attachment styles and eating disorders depends on the severity of eating
disorder symptoms rather than eating disorder types. Those who seek treatment for eating
disorders in outpatient clinics may have more insecure attachment patterns (e.g., fearful) than
college students who participated in this study (e.g., anxious or avoidant). Future studies are
needed to examine similarities and differences in psychological mechanism that links attachment
patterns with symptoms of eating disorders between clinical and non-clinical populations.

Another possible explanation for the inconsistent results may relate to measurement and
sample size. For instance, the present study used a Likert-type self-report measure of adult
attachment (i.e., ECR) to assess 401 college students’ adult attachment patterns, while some of
the past studies (Ringer & Crittenden, 2007; Ward et al., 2001) used a narrative and interview
measure (i.e., AAI) on small number of eating disordered female patients ($N_s = 20 - 60$). An
important difference between ECR and AAI is that the former measures current romantic
attachment patterns by participants’ self-report on a 36-item questionnaire while AAI was
designed to measure childhood attachment relationship with parental figures by an intensive
semi-structured interview. In their comprehensive literature review, O’Shaughnessy and Dallos
(2009) noted that most of the studies reviewed used different measures of attachment (e.g., AAI
vs. AAS) on various size of samples ($N = 20$s to 200$s$). They pointed out that results of the
studies that used interview types of attachment measures (e.g., AAI) differed from those that
used Likert-scale types of self-report measures (e.g., AAS).

The inconsistency in the results of various studies reiterates a well-known important issue
in psychological research; validity of measurement and size of sample matter especially when
investigating complex psychological phenomena. Future studies are needed to examine
similarities and differences in the association between attachment patterns and eating disorder
symptoms by using a large sample and various adult attachment measures (e.g., both AAI and
ECR). In that sense, structural equation modeling may have more advantages than other methodologies (e.g., multiple regression) due to its requirements of using multiple measures (at least three) per construct and its emphasis on a large sample (at least 200 for a simple model).

The relationships between trauma, religious faith, and eating disorders are complex (Berrett et al., 2007). The results of the present study indicated that religious faith did not mediate the association between childhood maltreatment and disordered eating behaviors in adulthood. More repetitive abuse and neglect by parental figures in childhood leads to less involvement in religious faith and practices, but religious faith did not predict disordered eating behaviors in adulthood, which is inconsistent with the hypothesis of this study and the results of past studies. As referred to in Introduction section, the results of several recent studies suggested positive impact of religious treatment on reduction of eating disorder symptoms. For example, Berrett and colleagues (2007) noted that both traumatic experience and eating disorders tend to undermine an individual’s religious faith and a sense of spirituality, especially for women; however, mature religious faith and practices can serve as an important resource of recovery for those who suffer from disordered eating behaviors and symptoms of PTSD. Richards and colleagues reported that people who participated in a treatment program for spiritual growth demonstrated significantly lower eating disorder symptoms than those who participated in a comparison group, or a cognitive-emotional support group (Richards et al., 2006). These results implicate that religious faith and spiritual growth may ameliorate symptoms of eating disorders.

One of the possible accounts for the inconsistency between the past studies (Berrett et al., 2006; Richards et al., 2006) and the present study may relate to differences in research method (e.g., qualitative vs. quantitative) and sample (e.g., clinic patients vs. college students). As
discussed earlier, characteristics of participants, size of sample, validity of measures, and method of data analysis often affect results of studies. For instance, the present study used SEM as method of data analysis on a sample of 401 colleague students while Berrett and colleagues’ (2007) study relied on literature reviews. In the present study only 8.5% of participants met the criterion for eating disorder treatment as reported earlier, while the participants in Richards and colleagues’ (2006) study were eating disordered female inpatients. Given that, it is possible that psychological mechanism by which people with severe symptoms of eating disorders benefit from religious-based treatment may differ from the mechanism by which people with mild or little symptoms of eating disorders do. It is needed to further investigate not only the impact of religious faith on eating disorders but also psychological mechanism by which religious faith contributes to reduction of disordered eating behaviors by using both various samples and rigorous research methods.

Hypothesized Structural Model for Substance Abuse

The results of testing for the hypothesized structural model for Substance Abuse revealed that anxious attachment patterns and religious faith, but not avoidant attachment and images of self, fully mediated the relationship between childhood trauma and substance abuse in adulthood. These results suggest that people who experienced more abuse and neglect by primary figures in childhood are more likely to develop anxious attachment patterns (e.g., strong desires for enmeshed relationship, intense worries about separation and rejection) in close relationship and less likely to get engaged in religious faith and practices, which in turn contribute to substance abuse in adulthood. Noteworthy is that it is anxious adult attachment patterns and poor religious faith and practices, rather than parental abuse and neglect in childhood, that directly predict
substance abuse problems in adulthood, which is consistent with the results of the past studies (e.g., Doumas, Blasey, & Mitchell, 2006; Riggs et al., 2007).

People who experience more anxiety and worry about rejection and abandonment in close relationship and get less involved in religious faith and practices are more likely to use various substances to deal with negative emotions. After examining the association between adult attachment patterns, emotional distress, and interpersonal problems for substance abusers, Doumas and colleagues reported that anxious and fearful attachment styles were overrepresented than secure or avoidant attachment styles in the substance abusers (Doumas et al., 2006). Riggs and colleagues explored the role that early family environment and adult attachment style play in explaining various affect-behavior problems due to childhood abuse and neglect survivors (Riggs et al., 2007). They reported a strong association between anxious adult attachment and substance abuse behaviors. The results of those studies suggest that people who experienced a range of abuse (e.g., emotional/sexual/physical) and neglect (e.g., emotional/physical) repetitively by primary caregivers in childhood tend to develop substance abuse behaviors to cope with feelings of anxiety and worry about potential separation and rejection from an intimate partner.

Like anxious attachment, religious faith mediated the relationship between parental abuse and neglect in childhood and substance abuse in adulthood. This finding suggests that childhood maltreatment survivors who are more engaged in religious practices are less likely to abuse alcohol and other substances due to a sense of hope, purpose, meaning in life, and belongingness that they developed through religious faith and practices (Delany et al., 2009; Koenig & Larson, 2001). Particularly noteworthy is that magnitude of the impact of religious faith on substance abuse was much larger than impact of anxious attachment patterns. The positive impact of religious faith and practices on substance abuse revealed in the present study is consistent with
the well-known effectiveness of community substance abuse programs (e.g., Alcoholic Anonymous, Narcotic Anonymous), suggesting that religious faith and practices may be useful for assisting people in dealing with substance abuse problems.

Inconsistent with the hypothesis of the present study and the results of several past studies (e.g., Caspers et al., 2009; Stein et al., 2002), avoidant attachment patterns and images of self did not link childhood trauma with substance abuse in adulthood. For instance, Caspers and colleagues (2009) examined a potential association between adult attachment patterns and substance abuse for a sample of adoptees with affect-behavior regulation problems in their ongoing longitudinal adoption study. They reported that both anxious and avoidant adult attachment style were significantly related to substance abuse/dependence; but, those with avoidant attachment patterns showed lower rates of treatment participation than those with anxious attachment patterns. Stein and colleagues (Stein et al., 2008) examined impact of psychological and situational variables on substance abuse among 664 homeless people and reported that low self-esteem predicted greater emotional distress and more alcohol use.

One of the possible explanations for the inconsistency in results between the past studies and the present study may relate to differences in types of sample and measure used as discussed earlier. The present study tested the association between adult attachment and substance abuse by using a large number of college students and one of the well-validated self-report adult attachment measures (ECR). The results indicated that only anxious, but not avoidant, attachment patterns predicted substance abuse problems. In contrast, Doumas and colleagues’ (2006) study examined the same association by using patients in intensive substance abuse outpatient treatments and another validated self-report measure, the Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991). The results of their study indicated that a vast majority
of substance abusers were classified as fearful or preoccupied/anxious, rather than secure or dismissing/avoidant, in attachment style. Caspers and colleagues’ (2006) study used a semi-structural interview measure Adult Attachment Interview (AAI; George et al., 1985) for a sample of adoptees with various mental health issues (e.g., alcohol abuse, antisocial personality). They reported that both anxious and avoidant attachment styles were significantly associated with substance abuse problems.

In respect to the difference in results between those two past studies, it is important to note that one study (i.e., Douman et al., 2006) used a self-reported measure (RQ) with four category model (secure, preoccupied/anxious, dismissing-avoidant, and fearful-avoidant) while another study (i.e., Caspers et al., 2006) used a semi-structured measure (AAI) with three category model (secure, ambivalent/anxious, and dismissing/avoidant). Conceptual and methodological differences in categorizing attachment styles between those two measures make it complicated to compare the results. According to Bartholomew and Horowitz’s (1991) model, avoidant attachment style is further divided into two styles: dismissing-avoidant and fearful-avoidant. Several studies that examined similarities and differences among four adult attachment styles (e.g., Bartholomew & Horowitz, 1991; Collins & Read, 1990; Griffin & Bartholomew, 1994) reported that individuals with secure or dismissing-avoidant attachment style perform significantly better than those with preoccupied/anxious or fearful-avoidant attachment style across various mental health measures (e.g., depression, anxiety, self-esteem, and self-efficacy).

Given that the participants of this study are college students who relatively function well it is possible that behavioral characteristics of college students with “avoidant” attachment style can be more similar to those with “dismissing-avoidant,” than “fearful-avoidant,” attachment style. In comparison to other populations (e.g., clinic patients), college students with avoidant
attachment style might have developed a variety of coping skills (e.g., studying, doing exercise at
gym, attending social gatherings), rather than just rely on alcohol and other substances, to deal
with stress, which could be another reason for no association between avoidant attachment
patterns and substance abuse in the present study. Further studies are needed to test this
hypothesis.

As for the association between images of self and substance abuse, childhood abuse and
neglect by primary caregivers in childhood predicted both negative images of self (e.g., low self-
esteeem, lack of self-confidence) and substance abuse problems in adulthood; however, negative
images of self did not predict substance abuse problems, which is inconsistent with results of
past studies (e.g., Stein et al., 2000; Stein, Leslie, & Nyamathi, 2002). Stein and colleagues
(2002) examined potential impact of childhood abuse on several affect-behavior regulation
problems (e.g., depression, substance abuse) for homeless women residing in shelters and sober
recovering rooms (Stein et al., 2002). They reported that low self-esteem fully mediated the
relationship between childhood trauma and substance abuse in adulthood. One of the possible
explanations for the different results between this study and Stein et al.’s (2000, 2002) study may
relate to differences in the characteristics of sample and measures used. For example, those who
participated in Stein and colleagues’ (2002) study were homeless women in mid 30s of age who
often use substances, whereas the participants of this study were college students in early 20s of
age majoring in psychology and education. As suggested earlier, college students may not use
substances (e.g., alcohol) as much and often as homeless women do.

Besides, this study used a substance abuse measure that assesses many types of
substances (e.g., alcohol, tobacco, marijuana, cocaine, etc.) and their impact on psychosocial
function, whereas Stein and colleagues’ (2002) study used a measure that assesses only alcohol
abuse. Moreover, this study used three measures for the construct of self-image (i.e., self-esteem, general self-efficacy, and social self-efficacy), while Stein and colleagues’ (2009) study used only one measure (i.e., self-esteem), suggesting that the association between self-image and substance abuse depends on types and number of measures used to assess the same construct. For instance, the size of the correlations between three observed variables of self-image (self-esteem, general self-efficacy, and social self-efficacy) and three observed variables of substance abuse (soft substances - tobacco/alcohol/cannabis, hard substances - cocaine/opiates/others, and impact of substance abuse on psychosocial functioning) varied. Interestingly, only three out of nine correlation coefficients were significant (at least $p < .01$): $r = -.16$ for self-esteem and hard substances; $r = -.16$ for self-esteem and impact; and $r = -.16$ for general self-efficacy and impact of substance abuse. Those findings confirm the well-known issue that results of a study depend on types of measure and sample used in the study. Future studies need to further examine differences and similarities in relationships between subtypes of self-image and subtypes of substance used for both clinic samples and non-clinical samples.

Comparison of Three Hypothesized Structural Models

The results of three hypothesized structural models showed similarities and differences in the pathways from childhood trauma through four mediators to each of three affect-behavior regulation problems (depression, eating disturbances, and substance abuse). There are three major similarities across the results of three models: (1) a significant path coefficient from childhood trauma to each of four mediators (anxious attachment, avoidant attachment, images of self, and religious faith); (2) a role that anxious attachment patterns play in mediating the relationship between childhood trauma and each of three affect-behavior regulation problems; and (3) a significant direct path coefficient from childhood trauma to each of three affect-
behavior problems disappeared when the four mediators were placed between childhood trauma and each of affect-behavior problems in adulthood. Despite the similarities, however, each hypothesized structural model revealed its own unique mediating pathways.

Consistent with attachment theory and results of the past studies (e.g., Bowlby, 1969/1982, 1973, 1979, 1980; Kirkpatrick, 1997; Mikulincer & Shaver, 2007; Shapiro & Levendosky, 1999), childhood maltreatment predicted both anxious and avoidant adult attachment patterns, negative mental representations of self, and poor religious faith. Repetitive abuse and neglect by primary caregivers in childhood contributed to: (a) strong desires for emotional closeness and constant worries about separation or rejection in close relationship (anxious attachment patterns); (b) discomfort with emotional intimacy and excessive self-reliance in relationship with a partner (avoidant attachment patterns); (c) low self-esteem and poor self-confidence (negative images of self); and (d) poor faith in a higher being (poor religious faith). These findings demonstrate that repetitive abuse and neglect by attachment figures in childhood endanger an individual’s core images of self, inhibit ability to build trusting relationship with significant others, and draw away from religious faith and practices in adulthood.

Next, one of the most noticeable findings in this study is the role that anxious attachment patterns plays in linking childhood trauma with each of three affection-behavior regulation problems in adulthood. When an individual is repetitively abused and neglected by primary caregivers in childhood, he or she comes to develop “anxious interaction patterns” in relationships not only with primary caregivers in childhood but also with significant others in adulthood (e.g., romantic partner). An individual with anxious attachment patterns often experiences feelings of anxiety, insecurity, doubts of his/her ability to draw significant other’s
attention and care, and mistrust in the availability and responsiveness of significant others in times of need, which engenders a sense of “felt insecurity” deep inside. This internal “felt insecurity” in turn leads the individual to develop coping strategies, referred to as “hyper-activating strategies” (Main, 1990; Mikulincer & Shaver, 2007) or “fight” responses (Cannon, 1939) to deal with unmet attachment needs.

When an attachment figure is inconsistent in their availability and responsiveness to an individual’s need, it can place the individual on a partial reinforcement schedule that rewards persistent proximity-seeking attempts, or anxious interaction patterns in close relationship. As a result, the individual does not easily give up seeking proximity and comfort, which leads him or her to demand or force the attachment figure’s attention, support, and love. This anxious attachment interaction patterns are manifested in strong desires for emotional closeness with a romantic partner, doubts in one’s value to the partner, and constant worries about potential rejection and abandonment by the partner, which in turn contribute to affect-behavior regulation problems, such as symptoms of depression, disordered eating behaviors (e.g., binging, purging, and/or starving), and substance abuse.

Another important finding across the results of three hypothesized models is that the direct influence of the predictor (childhood trauma) on each of three criterion variables (depression, eating disturbances, substance abuse) disappeared when four mediators (anxious and avoidant attachment patterns, images of self, religious faith) were located between the predictor and each of the criterion variables. These results suggest that it is anxious and avoidant attachment patterns, negative self-images, and/or poor religious faith and practices, rather than childhood abuse and neglect by parental figures itself, that directly affect depressive symptoms, disordered eating, and substance abuse in adulthood. This finding has an important clinical
implication. In treating those who has a history of repetitive abuse and neglect by attachment figures in childhood and suffer from symptoms of depression, disordered eating behaviors, and/or substance abuse problems, it is needed for clinicians to focus more on images of self, behavioral interaction patterns in close relationships, and/or religious faith and practices than painful memories of abuse and neglect in childhood.

In addition to the aforementioned similarities across the three hypothesized models, each of three hypothesized model demonstrated its own unique pathways. For the hypothesized model for Depression, avoidant attachment patterns and images of self uniquely mediated the relationship between childhood trauma and symptoms of depression in adulthood; for the model for Eating Disturbances, images of self uniquely mediated the relationship; and for the model for Substance Abuse, religious faith uniquely mediated the association. Negative images of self (e.g., lower self-esteem, poor self-confidence) played a unique role in linking parental abuse and neglect in childhood to symptoms of depression and disordered eating behaviors, but not to substance abuse problems, in adulthood. These findings implicate that an increase in positive self-image and self-confidence can ameliorate an impact of childhood abuse and neglect of primary caregivers in childhood on symptoms of depression and disordered eating behaviors, such as bingeing, purging, and/or starving, in adulthood. More specifically, in addition to the role of anxious attachment patterns, an individual’s internal view of self (e.g., “I’m a lovable and capable person”) also plays a central role in buffering against impact of childhood trauma on symptoms of depression and disturbed eating behaviors in adulthood, which is consistent with propositions of Bowlby and other attachment researchers (e.g., Mikulincer & Shaver, 2009).

Unlike its significant role in regulating depressed mood and disturbed eating behaviors, images of self did not predict substance abuse problems in this study. As suggested earlier, one
of the possible explanations for the lack of the association between images of self and substance abuse may relate primarily to characteristics of sample used in this study. Compared to substance abusers who seek treatment in outpatient clinics, for college students the primary reasons for using substances may be not due to issues of low self-esteem and poor self-confidence but rather due to other factors, such as college campus cultures (e.g., paternity, sonority), stress from academic competitions, and psychological and financial pressure to be independent from parents.

Another unique finding of this study is the role that avoidant attachment patterns plays in linking childhood trauma with depressive symptoms, but not with eating disturbances and substance abuse, in adulthood. Repetitive exposure to abuse and neglect by primary caregivers in childhood leads not only to engendering anxious attachment patterns referred to above but also to developing avoidant behavior interaction patterns in close relationship, called “deactivating strategies” (Main, 1990) or “flight’ response (Cannon, 1939), to deal with caregivers’ insensitivity, unavailability, and unresponsiveness in times of need. Avoidant attachment patterns usually arise in relationship with primary caregivers who often disapprove of and/or punish closeness and expression of need or vulnerability (Main, 1990). An individual who grew up in such a disapproving environment often develop so-called “deactivating” or compulsively self-reliant strategies, or suppressing his or her need for proximity and support and dealing with challenges and threats “alone” (Mikulincer & Shaver, 2007). The primary goal of these strategies is to turn off or down-regulate attachment needs to avoid frustration and distress in relationship with unavailable and unresponsive attachment figures. These deactivating strategies, however, are effective only for mild or moderate level of stress but not for complex and severe level of stress (Mikulincer, Shaver, & Pereg, 2003).
One of the possible explanations for the reasons why avoidant attachment patterns link childhood maltreatment only to depression, but not to eating disturbances and substance abuse, in this study may relate to sample and measure used in this study. As discussed earlier, results of several empirical studies (e.g., Caspers et al., 2006; Douman et al., 2006) suggest that the association between attachment patterns (anxious vs. avoidant) and disordered eating behaviors/substance abuse are inclusive yet. That is, the association changes depending on measures used to assess attachment patterns (e.g., AAI vs. RQ or ECR) and characteristics of participants (e.g., clinic patients vs. college students). Further studies, both retrospective and prospective, are needed to investigate similarities and differences in psychological mechanism by which avoidant attachment patterns links childhood trauma to affect-behavior regulation problems between clinical population and non-clinical population. In case that it is difficult to collect a large clinical sample, it could be alternative to compare similarities and differences between top one third and bottom one third of a large number of college students for each of affect-behavior regulation problems, such as symptoms of depression, disordered eating behaviors, and substance abuse.

Finally, another noteworthy finding in this study is the significant role that religious faith plays in mediating the relationship between childhood attachment trauma and substance abuse behaviors, but not depressive symptoms and disordered eating behaviors, in adulthood. As discussed earlier, there is a strong empirical evidence on the association between religious practices and substance abuse (e.g., Alcoholic Anonymous, Narcotic Anonymous), but the association either between religious faith and depression or between religious faith and disordered eating behaviors varies. One of the possible explanations for the inconsistency in the relationships between religious faith and various affect-behavior regulation problems may relate
to complexity or lack of clarity in conceptualizing the construct, “religious faith.” People often use religiosity, spirituality, and faith interchangeably due to conceptual overlap among them. Besides, religious faith itself often relies on subjective and personal experience so it is not easy to define it in measurable terms and assess it by using objective tools. Conceptual differentiation and boundary between faith, religiosity, and spirituality are still unclear despite various theoretical and empirical efforts made (Zinnbauer et al., 2001).

Another possible explanation may relate to potential differences between several religious constructs (e.g., faith, religiosity, spirituality). The present study used three observed variables (faith, spirituality, and religiosity) to measure a latent variable “Religious Faith” according to suggestions of researchers (e.g., Maselko, Gilman, & Buka, 2009). Maselko and colleagues (2009) examined the complex relationship between three types of religiousness (religiosity, spiritual-religious well-being, and spiritual-existential well-being) and the risk of life-time depression. They reported differential correlations between each of three religiousness variables and symptoms of depression and suggested using a collection of religious-spiritual measures, rather than a single domain of religiosity or spirituality, in examining the relationship between religious faith and the risk of depression. In contrast, other studies (e.g., Hill & Pargament, 2008; Parker et al., 2003) contended potentially distinctive contributions of religiosity and spirituality to both physical and mental health and suggested using two constructs separately. The results of the present study with a college student sample indicated that “faith” and “religiosity” were significantly related to some symptoms of depression, but “spirituality” was not related to those symptoms at all, for both females and males (see Tables 1, 4, and 5). Further studies are needed to investigate the relationships among three constructs (faith, religiosity, spirituality) and their association with various affection-behavior regulation problems.
Implications for Treatment

The results of testing for three hypothesized structural models in the present study have noteworthy implications for treatment in the following four major respects: (1) direct impact of the predictor (childhood trauma) on each of three criterion variables (symptoms of depression, disordered eating behaviors, substance abuse) when no mediators were placed; (2) significant association between childhood trauma and each of four mediators (anxious attachment patterns, avoidant attachment patterns, images of self, and religious faith); (3) a mediating role that anxious attachment patterns play across three hypothesized models; (4) unique pathways within each of three mediating models.

First, a significant direct path from childhood maltreatment to each of all three affect-behavior regulation problems suggest that repetitive exposure to parental abuse and neglect in childhood contributes to symptoms of depression, disordered eating behaviors, and substance abuse problems in adulthood. This finding confirms the theoretical proposition of traditional psychodynamic schools including Bowlby’s attachment theory; that is, the importance of attachment relationship with primary caregivers in childhood and its consistent influence on psychosocial functioning over the course of development. This finding suggests that those more abused (emotionally, physically, and sexually) and neglected (emotionally, physically) by primary caregivers in childhood are more likely to develop affect-behavior regulation problems, such as symptoms of depression, disordered eating behaviors, and substance abuse, in adulthood.

Thus, when assisting clients who seek treatment for symptoms of depression, disordered eating behaviors like bingeing, purging, and/or starving, and problems of substance abuse, clinicians need to explore clients’ history of maltreatment in childhood and its impact on their presenting affect-behavior regulation problems. In doing so, clinicians need to: (1) provide
secure and comforting therapeutic container and focus on building trusting working relationship with clients; (2) facilitate clients’ exploration of maltreatment experience in childhood and its potential impact on their affect-behavior regulation patterns in adulthood; and (3), if needed, educate clients to understand psychological mechanism by which repetitive exposure to abuse and neglect by primary caregivers contribute to bio-psycho-social functioning not only in childhood but also over the course of development (Allen, 2001; Courtois & Ford, 2009). In doing so, it is important for clinicians to be aware of potential impact of both clients’ transference and clinicians’ own counter-transference on therapeutic relationship and treatment effectiveness.

Next, across three hypothesized models there was a significant association between childhood maltreatment and each of four mediators (anxious attachment patterns, avoidant attachment patterns, images of self, religious faith). This finding is consistent with propositions of Bowlby (1973, 1980, 1969/1982) and other attachment researchers (e.g., Kirkpatrick, 1998; Kirkpatrick & Shaver, 1990); that is, abusive and neglecting family environment in childhood leads an individual to develop: (a) negative mental representations of self (e.g., “I’m not lovable and capable”); (b) anxious and avoidant attachment behavior patterns in close relationships (e.g., strong needs for emotional enmeshment, worries about rejection and abandonment, excessive self-reliance, and/or discomfort with emotional closeness); and/or (3) poor faith in a higher being. These findings clearly demonstrate detrimental impact of abuse and neglect by primary caregivers in childhood on a variety of mental health problems over the course of development.

Therefore, in treating clients who grew up in abusive and neglecting familial environment in childhood, clinicians need to pay a particular attention not only to potential impact of childhood maltreatment on adulthood symptoms of depression, disordered eating behaviors, and/
or substance abuse problems in adulthood but also to its implicit and toxic influence on core self-images, ability to build mutually supportive and trusting relationship with significant others (e.g., a romantic partner), and religious-spiritual growth. Thus, clinicians need to develop treatment strategies both for presenting affect-behavior regulation problems and for destructive internal self-talks (e.g., “I’m unlovable and incapable”), strong desires for emotional enmeshment or compulsive self-reliance in close relationships, and/or poor engagement in religious-spiritual practices. In doing so, clinicians also need to assist clients in being aware of psychological mechanism by which repetitive exposures to abuse and neglect by primary caregivers in childhood affect their psychosocial functioning and various affect-behavior regulation problems. Clients may benefit from deepening an understanding of “how” and “why” their painful maltreatment experience in childhood influence the ways they view themselves, interact with significant others (e.g., partner, spouse), get involved in religious practice, and suffer from depressed mood, disordered eating behaviors (bingeing, purging, and/or starving), and substance abuse problems in adulthood.

Next, the most noteworthy findings of the present study relate to similarities and differences in the mediating pathways among three hypothesized structural models. Some paths are consistent across all three models, while others are unique for a particular model. First of all, the role that anxious attachment patterns plays in mediating the relationship between childhood maltreatment and each of the three affect-behavior regulation problems in adulthood draws attention. Childhood attachment trauma, or repetitive abuse and neglect by attachment figures in childhood, engenders anxious attachment relationship patterns, which is characterized strong desires for emotional closeness, worries about rejection and abandonment, and demands for constant availability and responsiveness in close relationships, which engender symptoms of
depression, disordered eating behaviors, and/or substance abuse problems. Particularly noteworthy is that it is anxious attachment patterns, but not childhood attachment trauma itself, that “directly” predicts each of three affect-behavior regulation problems.

This finding has an important clinical implication. When clients who seek treatments for depressive symptoms, disordered eating behaviors, and/or substance abuse problems report a history of repetitive abuse and neglect by primary caregivers in childhood, clinicians need to assist clients first in exploring their adult attachment patterns and being aware of potential impact of the attachment behavior patterns on their current affect-behavior regulation problems. In doing so, clinicians also need to assist clients in deepening an understanding of how their childhood experience of abuse and neglect by parental figures contribute to current symptoms of depression, eating disturbances, and/or substance abuse behaviors through anxious attachment behavior patterns in relationships with significant others, especially with a romantic partner or spouse. Important is that clients need to know that it is excessive desires for emotional closeness and constant worries about a likelihood of being rejected and abandoned by a partner, but not childhood maltreatment itself, that directly leads to their current affect-behavior regulation problems. When a romantic partner is unavailable and irresponsible in times of need or does not meet their strong desires for emotional closeness, those who have anxious attachment patterns tend to get more easily frustrated and depressed, turn into dysfunctional eating behaviors (e.g., bingeing, purging, and/or starving), and abuse substances (e.g., alcohol, drugs). For them, “hyperactiviting” attachment strategies (e.g., constant worries about separation, rejection, and abandonment by the partner) are automatically activated in times of distress. This hyperactivated state of mind, which stems from actual experience of separation, abuse, and neglect by primary
caregivers in childhood, is the one that leads them to feel depressed, binge or purge, and/or abuse substances.

This psychological mechanism can be applicable for treating clients not just in individual therapy but also in couple therapy. If reasons for referral in couple therapy relate to either or both partners’ symptoms of depression, disordered eating behaviors, and substance abuse, clinicians may need to explore not only partner(s)’ history of abuse and neglect by attachment figures in childhood but also their adult attachment behavior patterns in their relationship. If a history of childhood maltreatment is reported, clinicians need to assist them in exploring potential impact of painful memories of abuse and neglect in childhood on their attachment patterns in their intimate relationship and how their attachment behavior patterns contribute to their affection-behavior regulation problems.

In particular, when symptoms of depression of one or both partners are the major issues in their couple relationship, it may be important for clinicians to draw the couples’ attention to their negative images of self (e.g., low self-esteem, poor self-confidence) and insecure adult attachment patterns. For instance, if one partner who grew up in abusive and neglecting familial environment in childhood and developed anxious attachment patterns, he or she is likely to get more easily frustrated and depressed when his or her partner becomes insensitive, unavailable, and unresponsive to his or her strong needs for emotional closeness in their relationship. In contrast, if another partner grew up in the same abusive and neglecting childhood environment and developed avoidant attachment patterns, he or she may tend to avoid emotional closeness with the partner and be overly self-reliant in relationship due to fear of a likelihood that the partner breaks up with him or her after they became emotionally close. It is his or her current avoidant attachment behavior patterns that make him or her feel empty, lonely, and depressed in
their relationship. In either case, it is important for clinicians to assist partners in exploring where their attachment relationship patterns and negative self-images stem from and how each other’s insecure behavioral interaction patterns (both/either anxious and/or avoidant) and negative self-image (e.g., “I’m unlovable”) contribute to the discords in their verbal and nonverbal communication and feelings of emptiness, helplessness, and depression in their relationship.

Results of some couples studies (e.g., Gottman, 1993; Gottman & Gottman, 2008; Johnson, 2010; Johnson & Whiffen, 2003) suggested that marital discord is more likely to occur when one partner has anxious attachment patterns (e.g., worries about separation and rejection) while the other partner has avoidant attachment patterns (e.g., stone walling, discomfort with emotional intimacy). In other words, one partner uses “hyperactivating” or “fight” strategies for relational stress while the other partner uses “deactivating” or “flight” strategies (Mikulincer & Shaver, 2009), their marital relationship is more likely to get in trouble. The behavioral dynamics between these partners may be somewhat similar to the dynamics of chemical interaction between “water” and “oil.”

In coordination with anxious attachment patterns, negative images of self played a major role in mediating the relationship between childhood maltreatment and eating disturbances in adulthood. This finding suggests that it is low self-esteem and poor self-confidence as well as worries about rejection and abandonment, rather than parental abuse and neglect in childhood, that directly predict disordered eating behaviors in adulthood. Thus, as suggested in earlier discussion, in treating clients who report parental abuse and neglect in childhood and disordered eating behaviors, clinicians need to direct focus of treatment to clients’ tendencies to misjudge self-worth solely based on their shape and weight (Fairburn et al., 2008) and constant worries about potential rejection and abandonment by significant others (e.g., a romantic partner). In
doing so, clinicians also need to assist clients in deepening an understanding of psychological pathways in which childhood attachment trauma contributes to negative self-images and anxious attachment patterns, which are the direct contributors of disordered eating behaviors. Important is that clients need to be aware that it is their poor self-images and dysfunctional attachment patterns, but not childhood treatment itself, that directly predict their problematic behaviors of bingeing, purging, and/or starving.

Finally, the findings in the mediational model for Substance Abuse suggest that religious faith and practice, in coordination with anxious attachment patterns, plays a central role in ameliorating the impact of childhood abuse and neglect by primary caregivers on substance abuse problems in adulthood. This finding supports practical usefulness of well-known substance abuse treatment models like AA and NA. In treating clients who have substance abuse problems and report a history of childhood maltreatment, clinicians may need to assist clients in developing a sense of hope and meaning in life and learning how to balance intimacy and independence in relationship with significant others (e.g., a romantic partner).

In sum, the findings of this study clearly demonstrate a central role that adult attachment patterns, mental representation of self, and religious faith play in mitigating the detrimental impact of childhood attachment trauma on affect-behavior regulation problems, such as depressive symptoms, disordered eating behaviors, and substance abuse, in adulthood. Thus, clinical treatment for those who present affect-regulation problems and report a history of childhood maltreatment by parental figures needs to focus more on increasing positive self-esteem and self-confidence, changing anxious and avoidant attachment interaction patterns, and/or exploring a sense of hope, purpose, and meaning in life through religious faith and
practices, than on painful memories of repetitive abuse and neglect by parental figures in childhood.

Limitations and Implications for Future Studies

The present study has several important limitations to note. First of all, this study was a retrospective, correlational study. This study was designed to examine psychological mechanism by which childhood trauma contributes to each of three affect-behavior regulation problems in adulthood through four mediators by using a rigorous hypothesis-testing statistical methodology, SEM. However, participants’ report of abuse and neglect by primary caregivers in childhood were based on their childhood memories. Thus, questions remain about accuracy and objectiveness of their memories of childhood trauma. Moreover, it is inaccurate to interpret the reported association between childhood trauma and three affect-behavior regulation problems in adulthood as causal. Causal relationships can be tested only by prospective or longitudinal studies (Cook & Campbell, 1979). Future studies are needed, although it would be challenging, to investigate psychological mechanism by which an individual develops mental representations of self, others, and attachment patterns through repetitive interactions with significant others (e.g., parents, partner) from a longitudinal perspective. In particular, it is needed to conduct systematic research on social-emotional development (e.g., intersubjectivity, empathy) of children over the course of development as Piaget (1953) did on cognitive development of his own children.

Another limitation of this study is that all data were collected by using self-report measures. Even though participants were encouraged to answer the surveys as honest as they can, it was difficult to determine whether participants responded to the items honestly, especially those items inquiring about childhood experience of abuse and neglect by
parental figures. For example, the Childhood Trauma Questionnaire-Short Form (CTQ-SF) manual suggested a possibility of a validity problem for participants whose score is higher than 1 on the Minimization/Denial (MD) subscale (the score ranges from 0 to 3). A total of 85 participants (21%) in the present study scored higher than 1 on the MD subscale. Conceptually, there may be several reasons why a participant’s score is high on the MD subscale: (a) he or she had an exceptionally wonderful and supportive family and their answers are valid; (b) he or she is ignorant about how much better families and children could be and naively believe their childhood was great; (c) he or she is in a state of psychological defenses (e.g., denial, minimization) because he or she is not in a position to face the realities of their childhood; and (d) he or she is consciously distorting their response in an effort to appear social desirable.

In dealing with the limitation of using self-report measures, so-called ‘triangulation’ method is often used; that is, collecting data from three different sources (e.g., participants, objective observers, and friends or family members who know the participants well). Future studies are needed to use various data collection methodologies and strategies to deal with this limitation. For example, childhood maltreatment can be measured not only by self-report measures (e.g., CTQ-SF) but also by semi-structured interviews of the participants and their family members.

Another important limitation of the present study is that all participants were undergraduate students who attend a large state university in a metropolitan area in the South West United States. Their average age was twenty years old and a majority of them were European American descents. As discussed earlier in part, the prevalence and severity of parental abuse and neglect in childhood and its impact on affect-behavior regulation
problems in adulthood can vary depending on characteristics of samples: for example, populations (e.g., clinical patients vs. college students), SES (low vs. middle vs. high), regions (e.g., urban vs. suburb; North America vs. South America vs. Asia vs. Europe vs. Africa), or ethnicities (e.g., African American vs. European American vs. Hispanics vs. Asians). Therefore, it is difficult to generalize the results of this study to samples other than college students in South West United States. Future studies are needed to cross-validate the results of this study with other samples, especially with clinical patients diagnosed with major depression, eating disorders, and/or substance abuse/dependence.

Small sample size of male participants ($N = 127$) used for multi-group invariance analysis was another limitation of this study. Some statistics experts suggest a ratio of as low as 5 subjects (10 subjects better) per observed variable (e.g., Bentler & Chou, 1987) or at least 100 subjects and three indicators per latent variable as minimum requirements for SEM (Loehlin, 1998). However, an increasing number of experts recommend at least sample size of 200 or more to eliminate all potential estimation errors in SEM (e.g., Barrett, 2007; Tabachnick & Fidell, 1996). To reduce, to a certain degree, the likely impact of small sample size on model estimation, this study used the Satorra-Bentler Scaled Statistics ($S-B\chi^2$), the most reliable statistic test for evaluating structural models under various distributions and sample sizes according to Byrne (1994, 2006). The results of testing for the multi-group analysis indicated no statistically significant difference in the structure of each hypothesized model across gender. Small sample size of males affected statistical power, however; for example, in an unreported, separate analysis for each of three hypothesized models only with male participants, several path coefficients higher than .20 were not significant due to small sample size, or large variances of variables concerned.
In the future studies that use SEM, impact of sample size on parameter estimation should be taken into account, especially when the structure of the hypothesized model is complex like in this study. In doing so, large sample size is particularly important for multi-group analysis (e.g., gender) because researchers and clinicians (e.g., Kessler et al., 1995; Stewart et al., 2002) reported gender differences in prevalence and types of trauma and mental disorders. For example, in their National Comorbidity Survey, Kessler and colleagues (1995) reported that men are universally more exposed to trauma than women, but women are typically more distressed from trauma than men; for a national sample of ages 15-54, 10.4% of women exposed to trauma met the DSM-IV criteria for PTSD while only 5.0% of men met the criteria. Gender differences were also reported in the patterns of specific disorders; women are more likely than men to be diagnosed with mood and anxiety disorders, whereas men are much more likely to be diagnosed with substance abuse and conduct/antisocial disorders.

Similar patterns of gender differences were also found in the results of the present study. Female college students reported significantly higher scores than males on five observed variables that measure symptoms of depression, each of three disordered eating behaviors (dieting, bulimia, oral control), and religious faith, whereas male students scored significantly higher than females on four observed variables that measure physical abuse, physical neglect, lifetime use of substance type 1 (smoking, drinking, and cannabis), and impact of substance abuse on psychosocial functioning.

Nevertheless, as referred to earlier, the results of the multi-group analyses in this study indicated no significant gender difference for each of three hypothesized structural models, suggesting that those gender differences made negligible impact on the structure of
each hypothesized model. Specifically, for the latent variable Childhood Trauma, which consists of five observed variables (emotional/physical/sexual abuse, emotional/physical neglect), female participants reported more sexual abuse while males reported more physical abuse. However, the latent variable Childhood Trauma was measured by a collection of all five types of abuse and neglect so the impact of gender difference in one subscale (sexual abuse for female, physical abuse for male) on the entire structure of each hypothesized model became minimal in the multi-group variance test.

Given several gender differences mentioned above, however, it is possible that psychological mechanism by which a particular type of childhood trauma contributes to a particular affect-behavior regulation problem for females may differ from the psychological mechanism for males. Future studies are needed to further investigate similarities and differences in potential psychological mechanism by which different types of childhood traumas contribute to different types of affection-behavior regulation problems between females and males. For instance, it may be interesting to examine the pathways in which mental representation of self, adult attachment patterns, and religious faith mediate the relationships between each of five childhood maltreatments (physical abuse vs. emotional abuse vs. sexual abuse vs. emotional neglect vs. physical neglect) and each of three affect-behavior problems (depression vs. eating disorders vs. substance abuse).

Another limitation of this study relates to the way in which multiple indicators were created to represent a particular latent variable. In this study, three latent variables (Anxious Attachment, Avoidant Attachment, and Depression) used so-called “parceling method” to create multiple indicators, respectively. In addition, two indicators (spirituality,
religiosity) for one latent variable (Religious Faith) have only one item, respectively. Parceling method is often used as an acceptable strategy for creating multiple indicators in SEM if a measure used for a latent variable consists of many items and has strong reliability and validity. Some SEM experts (e.g., Bandalos, 2008), however, criticized this method because parceling is to artificially divide one observed variable into multiple indicators, which is contradictory to the idea underlying SEM; that is, conceptually coherent, but independently interpretable, multiple observed variables are recommended to measure a particular latent variable in SEM.

As for using only one item for an observed variable, if an item (e.g., age, height) accurately and reliably measures a particular construct, it is often allowed to use one item for a particular latent variable. If a psychological construct is neither directly observable nor clearly defined, however, conceptually coherent multiple items with adequate internal consistent reliability (usually higher than .70) are recommended to measure a particular construct (DeVellis, 2003; Urbina, 2004). In this study, two observed variables (religiosity and spirituality) for the latent variable “Religious Faith” had only one item, respectively, and two observed variables (physical neglect for “Childhood Trauma,” oral control for “Eating Disturbances”) had relatively poor internal consistency reliability ($\alpha = .62$ and $\alpha = .64$), respectively. According to suggestions of SEM experts (e.g., Loehlin, 1998) and results of Monte Carlo studies (e.g., Gerbing & Anderson, 1993), future studies that use SEM for data analysis need to use multiple observed variables for a latent variable, and each observed variable needs to have multiple items and demonstrate adequate internal consistency reliability.
Conclusions

Despite the aforementioned limitations, this study is the first study that tested psychological pathways in which four intra- and inter-personal characteristics of an individual (anxious attachment patterns, avoidant attachment patterns, images of self, religious faith) mediate the relationship between a collection of childhood trauma and each of three popular affection-behavior regulation problems (symptoms of depression, disordered eating behaviors, and substance abuse), respectively. In doing so, each of three hypothesized structural models was constructed based on Bowlby’s attachment theory and tested by a rigorous statistical methodology, Structural Equation Modeling.

The results revealed that: (a) anxious and avoidant attachment patterns and negative images of self, but not poor religious faith, fully mediated the relationship between childhood trauma and symptoms of depression in adulthood; (b) anxious attachment patterns and negative images of self, but not avoidant attachment and poor religious faith, fully mediated the association between childhood trauma and disordered eating behaviors; and (c) anxious attachment and poor religious faith, but not avoidant attachment and negative images of self, fully mediated the relationship between childhood trauma and substance abuse.

The findings of this study have several noteworthy implications for treatment. When clients seek treatment for symptoms of depression, disordered eating behaviors, and/or substance abuse and report a history of repetitive abuse and neglect by primary caregivers in childhood, clinicians need to assist clients in: (a) understanding an association between abuse and neglect by parental figures in childhood and affect-behavior regulation problems in adulthood; (b) being aware of implicit impact of repetitive exposure to abuse and neglect by attachment figures in childhood on deep-seated negative images of self, anxious and avoidant behavior patterns in
close relationships, and poor engagement in religious practices; and (c) most importantly, deepening an understanding of psychological mechanism that it is negative mental representations of self, dysfunctional attachment behavior patterns, and poor religious faith and practices, rather than parental abuse and neglect in childhood itself, that directly predict their presenting affect-behavior regulation problems. In doing so, it is crucial for clinicians to provide clients with secure and comforting therapeutic atmosphere, focus on building trusting working relationship with them, and be aware of how clients’ transference and their own counter-transference interact with each other and influence therapeutic process and effectiveness.
APPENDIX

INFORMED CONSENT FORM
Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose, benefits and risks of the study and how it will be conducted.

**Title of Study: Impact of Positive and/or Stressful Experiences on Mental Health**

**Principal Investigator:** GiBaeg Han, M.Ed., a graduate student at the University of North Texas (UNT) Department of Psychology.

**Co-Investigator:** Patricia L. Kaminski, Ph.D., an associate professor at the University of North Texas (UNT) Department of Psychology

**Purpose of the Study:** You are being asked to participate in a research study which aims to examine impact of positive and/or stressful experiences on psychological health of college students and adult community members.

**Study Procedures:** You will be asked to complete a packet of 18 surveys related to your thoughts and feelings about your life experiences including demographic information (e.g., age, sex, and ethnicity), which will take about 90-110 minutes of your time or less. The names of the surveys and brief descriptions are as follows:

- Parental Bonding Instrument (PBI) – questions about your relationship in childhood with each of your parents
- Experiences in Close Relationship (ECR) – how you generally experience relationships now
- Connor-Davison Resilience Scale (CD-RISC) – your confidence in coping with stress
- Stressful Life Events Screening Questionnaire (SLESQ)– your experience of very stressful/traumatic events over the course of your life (e.g., natural disaster, death of a parent)
- Distressing Event Questionnaire (DEQ) – your reactions to the most stressful event you have experienced
- Self-Efficacy Scale (SES) – your overall belief in your personal control and social confidence
- Childhood Trauma Questionnaire-Short Form (CTQ-SF) – your experience of childhood maltreatment in familial environment
- Santa Clara Strength of Religious Faith Questionnaire (SCSRFQ) – your experience of spirituality and non-denominational, religious faith
- Revised NEO Personality Inventory-Trust Scale (NEO-PI-R-Trust) – your perceptions of others as honest and trustworthy
- Rosenberg’s Self-Esteem Scale (RSES) – your overall evaluation of your worthiness as a human being
- Center for Epidemiological Studies-Depression Scale (CES-D) – your mood and the way you feel about yourself
- Brief Symptom Inventory (BSI) – how much you are bothered by a variety of psychological symptoms
• Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) – your experience with a variety of substances
• 26-item Eating Attitudes Test (EAT-26) – your experience of different types of eating disturbance behaviors
• Multidimensional Scale of Perceived Social Support (MSPSS) – your perceived social support from family, friends, and a significant other
• Dysfunctional Attitude Scale (DAS) – your attitudes about your daily life
• Marlowe-Crown Social Desirability Scale-Form C (MCSD-Form C) – your tendencies to respond in a manner that emphasizes positive traits
• Background Information Sheet – your demographic information such as age, gender, ethnicity, etc.

After completing the 18 surveys you will deposit your survey packet in a sealed collection box at the front of the room. Then, in order to be entered in our ‘raffle’ or receive ‘research credits’ in your psychology course, you will write your name and contact information on a raffle ticket or credit list before you leave today. In addition, if you are interested in the results of this study, let the researcher know and he or she will put your name and email address on another list. Your comments or questions regarding this research are also welcome.

Please be aware that you are free to withdraw from participation at any time without penalty. If you are a student, your decision to participate in this study or not will not have any effect on your standing in your psychology course, as you may choose to complete the alternative research activity described on your class. If you are a client at the Psychology Clinic, your decision to participate or not will not have any effect on your therapy.

**Foreseeable Risks:** The potential risks of this study are no greater than would be encountered in daily life; but, some discomfort may be experienced when you complete the surveys that cover issues of stressful/traumatic experiences and eating disturbances. If excessive discomfort is experienced, you may choose to stop answering questions at any time without penalty and let the researcher know about it. The researcher may guide you, if wanted or needed, to discuss your discomfort with a counselor on campus (e.g., Counseling & Testing Center, Psychology Clinic).

**Benefits to the Subjects or Others:** We expect you to benefit from having an opportunity to think about your beliefs, thoughts, and feelings about yourself and your experiences. In addition, your participation in this study is likely to help us gain useful information about what positive and/or stressful experiences in childhood influence self-images, relationships, spirituality, and emotional-behavioral self regulation in adulthood. We hope that the results of this study would make a valuable contribution by providing useful information on psychological health of college students and community members.

**Compensation for Participants:** You will (option 1) receive 4 research participation points in the psychology class you take (this option is applied only to college students enrolled in certain psychology courses) or (option 2) receive $10 cash for completing all 18 surveys (this option is applied only to community members who seek services in the UNT Psychology Clinic).
Procedures for Maintaining Confidentiality of Research Records: All of your responses on the surveys will be completely anonymous and confidential. That is, you will NOT be asked to write your name or any other personally identifying information on any of the surveys. Should you choose to participate, your name and signature will appear on this Informed Consent form, but these forms will be stored separately from your survey packet, in a locked file cabinet in the Dr. Kaminski’s research office. Only the investigators of this project will have access to the data. The contact information you may choose to provide for research credit, the raffle, and/or study results will also be kept in a separate and secure location. When the results of this research are reported, participants’ responses will be summarized and grouped together so that no one person could possibly be identified. That is, the confidentiality of your individual information will be maintained in any publications or presentations regarding this study.

Questions about the Study: If you have any questions about the study, you may contact GiBaeg Han at telephone number 940-369-7369 or by e-mail gh0022@unt.edu or his faculty advisor, Dr. Patricia L. Kaminski, UNT Department of Psychology at telephone number 940-565-2650.

Review for the Protection of Participants: This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-3940 with any questions regarding the rights of research subjects.

Research Participants’ Rights: Your signature below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

- GiBaeg Han or a research assistant has explained the study to you and answered all of your questions. You have been told the possible benefits and the potential risks and/or discomforts of the study.
- You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your participation at any time.
- You understand why the study is being conducted and how it will be performed.
- You understand your rights as a research participant and you voluntarily consent to participate in this study.
- You are aware that you make keep a copy of this form for your records.

________________________________
Printed Name of Participant

________________________________                                ____________
Signature of Participant                                     Date

For the Principal Investigator or Designee: I certify that I have reviewed the contents of this form with the participant signing above. I have explained the possible benefits and the potential risks and/or discomforts of the study. It is my opinion that the participant understood the explanation.

________________________________________               ___________
Signature of Principal Investigator or Designee  Date
REFERENCES


Weinfield, Nancy S.; Sroufe, L. Alan; Egeland, Byron; C. Attachment from infancy to early adulthood in a high-risk sample: Continuity, discontinuity, and their correlates. *Child Development, 71*(3), 695-702.


