

Development and Preliminary Validation of the Co-Addiction Scale

by

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Abstract

Addiction is an insidious disease that not only impacts the individual using drugs or alcohol, but the entire family system and society. Despite the systemic impact, the primary focus of research and treatment, as it relates to addiction or substance use disorders (SUDs) tends to be heavily individualized. While the systemic effects of addiction are largely neglected in treatment and research, the etiological factors that may contribute to the development of addiction also lack the inclusion of a systemic paradigm. The intention of this study was to begin the preliminary theoretical development and empirical support for a co-addiction scale, designed to further examine the dysfunctional relationship dynamics that occur when addiction is present within a system. Exploratory Factor Analyses were used to identify the common factors, guided by theory, that explain the co-addiction construct. Confirmatory Factor Analyses and Exploratory Structural Equation Modeling were used to further explore the identified factors and how they relate to other variables, such as gender, history of addiction, and relationship to a loved one with a SUD. This paper also offers guiding theoretical justification, clinical implications, and discussion on future directions.

Key Words: Addiction, Co-Addiction, Codependency, Scale Development, Exploratory Structural Equation Modeling.

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CHAPTER I

Introduction

Addiction is a nationwide epidemic that has detrimental impacts on the individual using drugs and alcohol, their loved ones, and society at large (Cavaiola, 2000). There is evidence to suggest that addiction is a brain disease with symptoms that lead to unfavorable and compulsive behaviors (Volkow, Koob, & McLellan, 2016). While the etiology of an addiction or substance use disorder (SUD) may vary, the negative behaviors and characteristics associated with the disease not only impact the individual, but the family system in which they belong (Orford, Templeton, Velleman, & Copello, 2010). The discord that addiction creates within a family system often motivates family members to alter their behaviors and develop a new way of functioning (Cooper, 1989; Rotunda, West, & O’Farrell, 2004; von Bertalanffy, 1972). The unhealthy interactions that exist among family members when a SUD is present contribute to shifts in theorizing addiction as an individualized problem to its recognition as a family disease (Klostermann & O’Farrell, 2013). Although the family disease model paradigm offers a more inclusive conceptualization of addiction, the focus and treatment efforts are still heavily focused on the individual deemed to have the SUD. The family systems and family disease models suggest that each family member is “ill” and needs to engage in individual recovery efforts (Atkins & Fischer, 1996; Klostermann & O’Farrell, 2013). While this is a step towards family healing, it lacks a strong systemic approach that would benefit the family by focusing on the maladaptive relational dynamics, promoting healthy connection and family healing (Lander, Howsare, & Byrne, 2013). Additionally, the recovery process may be more sustainable for the individual struggling with addiction

if the family members are committed to making changes as well. Family members, despite their often good intentions, will engage in maladaptive behaviors (e.g., enabling, rescuing, keeping secrets, and giving money) (Beattie 2009), that are not only harmful to the individual struggling with a SUD but also the wellbeing of the participating family member. In an effort to measure the impact of a SUD on the family, this study may provide insight for clinicians and inform systemic approaches and interventions to family healing. The purpose of the present study is to develop a measure that will begin to provide additional insight into the dysfunction that exists among family members impacted by addiction.

Addiction as a Family Disease

While the inclusion of family members into the treatment of those struggling with a SUD has been effective (Platter & Kelley, 2012; Shumway et al., 2011) for the individual's treatment, the focus of clinical care and current scholarly literature typically neglects family members' need for recovery (Orford, Templeton, Velleman, & Copello, 2010). The family system not receiving the clinical attention necessary suggests that if the individual struggling with a SUD finds and stays in recovery that the other members of the family will get well as a result (Beattie, 2009). Although it is imperative that the individual with a SUD receives appropriate care and finds recovery, understanding addiction as a family disease suggests that each member needs to engage in their own recovery efforts for the family to more fully heal (Klostermann & O'Farrell, 2013).

Considering the environmental influences on the etiology of addiction (Vassoler & Sadri-Vakili, 2014), there is a dearth of literature on understanding the cognitive, behavioral, psychological, and emotional processes associated with other family members in a system where a SUD is present. Nevertheless, within the framework of the

family disease model, various theoretical assumptions have been made to better recognize the maladaptive relationship patterns between family members and their loved ones with a SUD (Klostermann & O'Farrell, 2013). The terminology developed to understand these patterns have been labeled as "codependency" (Cullen & Carr, 1999; Lampis, Cataudella, Busonera, & Skowron, 2017), "enabling behaviors" (Orford, Velleman, Natera, Templeton, & Copello, 2013), and "co-addiction" (Carnes, 1983; Wright, 2008).

Codependency. Historically, codependency was a term developed to explain the enabling behaviors associated with a person connected to an individual with a SUD (Anderson, 1994). Codependency is characterized by an unhealthy amount of attention outside of the self, an inability to express emotions (Spann & Fischer, 1990), attempts to control another individual (Lampis, Cataudella, Busonera, & Skowron, 2017), and an addiction to another's maladaptive behavior like substance abuse (Peled & Sacks, 2008). While the term was initially coined within the context of addiction, it has since then been used to describe maladaptive patterns of relating to others, not only within the context of addiction, but with other issues that create dysfunction within a family system (e.g., domestic violence) (Knudson & Terrell, 2012; Murphy, O'Farrell, Fals-Stewart, & Feehan, 2001). I have found the term "codependency" to be heavily overused, specifically to describe behaviors that were never intended to be included in the original definition. For example, identifying someone as "codependent" when they have a difficult time making decisions, like where to go out to eat, in a relationship. Consequently, the misuse of the term muddles the meaning of the concept and minimizes the seriousness of the dysfunctional relationship dynamics that exist when addiction is present in a family.

Some current literature on codependency proposes that when addiction is present within the family system, maladaptive coping behaviors manifest (Beattie, 2009), implying that such behaviors are likely to dissolve when the substance use stops. This suggestion contradicts other scholars who suggest that codependency is a somewhat independent disorder that motivates an individual to seek out unhealthy relationships, such as individuals with a SUD (Peled & Sacks, 2008). Numerous attempts have been made to conceptualize codependency, both anecdotally and through scale development in academic literature (Dear & Roberts, 2000; Fischer & Spann, 1991; Harkness, Swenson, Madsen-Hampton, & Hale, 2001; Hughes-Hammer, Martsof, & Zeller, 1998). However, the debate among researchers regarding how codependency is defined (Knudson & Terrell, 2012), presents challenges to appropriately operationalize and measure the construct. Furthermore, the alternative terminology used to describe this concept (e.g., enabling behaviors and co-addiction) perpetuate the discrepancy in understanding, especially as it relates to families with addiction.

Enabling Behaviors. Contrary to the assumptions associated with codependency, some scholars would argue that individuals respond to a SUD by engaging in maladaptive coping mechanisms to manage the unwanted behaviors associated with their loved one's dependency on substances (Rotunda, West, & O'Farrell, 2004). The nature of enabling behaviors are intended to be helpful, attempting to reduce substance use and provide support to an individual with a SUD (Rotunda & Doman, 2001). The paradoxical implications associated with such behaviors is that while attempting to help, the individual is perpetuating the substance use, often making the addiction worse (Oakley, 2013). This behavioral approach to explaining the relationship

between an individual and their family member with a SUD neglects to acknowledge potential deeper internal processes that may have existed prior to the substance dependence. While this shifts the focus away from over pathologizing or blaming family members for the SUD, it also minimizes the insidious implications that addiction can have on a family system and that a family system can reciprocally have on the addiction. Additionally, suggesting that enabling behaviors are merely maladaptive coping skills challenges the family systems paradigm which infers that families will adapt to the addiction in the system, thus reinforcing the substance use (Marshall, 2003). Reciprocally, dysfunction in the family system may be a motivating factor for an individual to use substances to cope (Orford et al., 2013).

Co-Addiction. While codependency and co-addiction share similar characteristics, co-addiction is unique in that it specifically examines the relationships between individuals with a family member or partner struggling with a SUD. Although codependency originated within the context of relationships with alcoholism, the definition and understanding has since expanded and created a convoluted literature base that dilutes its legitimacy (Marks, Blore, Hine, & Dear, 2012; Rotunda, West, & O'Farrell, 2004). Co-addiction is a term used in scholarly articles to describe unhealthy patterns of functioning that exist in relationships between an individual with a substance or process (e.g. behavioral) addiction and a partner or other family member (e.g., spouse or parent) (Duggan, Dailey, & Le Poire, 2008; Wright, 2008). Although the terms “enabling behaviors”, “codependency”, and “co-addiction” are used synonymously throughout the literature, this study will refer to the unhealthy relational patterns that exist when a SUD is present as co-addiction.

The primary focus of this study is to gather in depth information about the family members with a loved one struggling with a SUD. As with other diseases or mental health disorders, there are unique characteristics associated with substance use disorders (Volkow, Koob, & McLellan, 2016). In response to these symptoms, and often unfavorable behaviors, the family system will alter their level of functioning to adapt to the SUD (Copello, Velleman, & Templeton, 2005). This adaptation possesses a set of relational dynamics that are typically unhealthy and may enable the SUD to thrive within the environment (Klostermann & O'Farrell, 2013). The process by which this occurs will be explained through the family systems paradigm, as it lends to the maladaptive relationship dynamics that are present among families with a SUD (Steinglass, 1985). Current literature on this topic often describes the co-addiction construct as a relational issue, yet the treatment of both the SUD and co-addiction are often focused on the individuals separately instead of relationally (Timko, Young, & Moos, 2012). While it is recommended that individuals in early recovery focus on themselves, especially when there are highly dysfunctional family relationships, researchers and clinicians should consider devoting more attention to balancing individualized care and relationship dynamics (Lewis, Allen-Byrd, & Rouhbakhsh, 2004).

Personal Narrative

As a systemic therapist and researcher, I have found there to be a lack of an equitable relationship between these two roles, as demonstrated by the inconsistencies in the literature on this topic (e.g., research without clinical experience or clinically driven theory unsupported by appropriate research methodology). My experiences working with individuals, couples, and families struggling with addiction have fortified me with insight to justify a need for more research on understanding co-addiction. Researchers and

clinicians focusing on addiction and families have primarily adopted an individualistic approach in developing explanations and treatment methodology, which is problematic considering how devastating the impacts of addiction can be on a family. Furthermore, researchers are responsible for balancing theory and practice, while using statistical methodology to empirically explain these relationships (Cohen, 1994). While reviewing the literature for the present study I have found many theory driven explanations for co-addiction, yet they often lack the statistical rigor necessary to produce empirical evidence. For example, the current measures that do exist are not designed for co-addiction, but for codependency. The measures are used with populations outside of families with addiction, which challenges the measures' internal and external reliability. In this study, I aimed to combine theory, clinical practice, and research methodology to aid in the explanation and measurement of co-addiction.

Purpose of the Study

The intention of this study was to design a measure that assesses co-addiction among family members whose loved ones are in residential treatment for a SUD. The study aimed to begin the development of a psychometrically sound measure, while trying to maintain the integrity of appropriate scale development procedures (DeVillis, 2003). The existing literature and measures developed to further understand the relationship between an individual with a SUD and another person have several shortcomings. First, the few measurement devices that have been developed to understand this phenomenon are psychometrically flawed, specifically related to the reliability of the measures, measurement invariance testing was not used to determine if the items selected produced the same results across groups (e.g., men and women) (Cheung & Rensvold, 2002). Next, the definitions developed to understand the relationship between a family member and

individual with a SUD are often rooted in anecdotal findings but lack empirical evidence, which presents problems with construct validity (Strauss & Smith, 2009). The present study will maintain validity by designing a measure exclusively for explaining co-addicted relationships when a SUD is present by examining the factors that apply only to this population. Moreover, there is debate among scholars regarding the etiology, symptomology, and dissolution of co-addiction which leads to inconsistent theory and conclusions on the subject. In response to these inconsistencies, the present study aims to fill the gap in the literature by beginning to develop a psychometrically sound scale, specifically examining the underlying systemic factors associated with co-addiction. While developing a scale to assess co-addiction does not resolve all the discrepancies in the literature, it provides a starting point for researchers and clinicians to better understand the concept.

Study Boundaries

While this study does not directly solve all the problems found in the current literature on the relationships between individuals struggling with a SUD and their loved ones, this study began the process of generating an empirically validated measure. The Surgeon General's Report on Alcohol, Drugs, and Health (2016) not only recognized addiction as a disease, but built a case for how family members contribute to the development of addiction and the recovery process. The development of this measure can pave the way for future researchers and clinicians to gain a clearer understanding of the relational patterns and pathology that exist among families with addiction.

This study offers a literature review that supports understanding addiction as a family disease and the specific symptoms associated with the loved ones of individuals battling a SUD. Furthermore, the present study will highlight the differences and

similarities between codependency or enabling behaviors and co-addiction. While attending to the discrepancies in the literature, this study will also address statistical methodology used in previous studies and present a more psychometrically appropriate procedure for developing a measure examining the co-addiction construct.

Research Questions

The present study was designed to be a preliminary examination of the underlying constructs and psychometric properties of a co-addiction scale. This research will attempt to address the following questions: (1) How many underlying factors best explain the construct of co-addiction? (2) Does the co-addiction scale developed for this study demonstrate adequate levels of reliability and validity? (3) How well does the proposed model fit the data for this population when using a confirmatory factor analysis?

In addition to preliminary scale development queries, the researcher of this study aims to explore the following: (4) Is there a significant difference in the relationship between gender and co-addiction? (5) Is there a significant difference in the relationship between those who have a family history of addiction compared to those who did not and co-addiction? (6) Is there a significant difference between parents and partners and co-addiction?

Hypotheses

The following is a list of hypotheses, in correspondence with the research questions developed for this study:

1. Using an exploratory factor analysis, there will be five underlying factors that will explain the co-addiction construct best.
2. The co-addiction scale developed for this study will have adequate reliability and validity, demonstrated by using appropriate scale development protocol, through confirmatory factor analysis and goodness of fit indices.

3. The data collected for this study will demonstrate an adequate goodness-of-fit per the proposed structural model.
4. Being female will be a more positive predictor of co-addiction than being male, as demonstrated by the results in the proposed structural model.
5. Family members who reported a family history of addiction will be a more positive predictor of co-addiction than those who did not, measured by the results in the structural model.
6. Parents will be a more positive predictor of co-addiction than partners, as demonstrated by the results in the proposed structural model.

CHAPTER II

Literature Review

The following literature review will begin by outlining the current literature available addressing how addiction impacts the family system. This chapter will also cover how family systems theory explains the relationship dynamics that are present among families with a SUD. Furthermore, the chapter will also address the existing literature on co-addiction and begin to theoretically develop the justification for a new measure on the topic.

The Family Disease of Addiction

Historically, the disease of addiction was considered an individual problem and was treated as such (Mann, 2000). More recently the treatment protocol and scholarly activity has shifted to be somewhat more inclusive of the family system, regarding how other members of the system are impacted and how relationship factors may play a role in the etiology and treatment of a SUD (EnglandKennedy & Horton, 2011). This shift could be due to the acknowledgment of addiction as a brain disease that is often explained through genetics, implying that one individual struggling with a SUD may put future generations at a higher risk for developing the disease (Volkow, Koob, & McLellan, 2016). Finding new ways to treat the entire family system may promote prevention, which could reduce the global social, public health, and economic burdens

associated with addiction. Viewing addiction as an individual problem implies a linear effect, suggesting that the SUD causes the discord within the family system (Kahler, McCrady, & Epstein, 2003; Oreo & Ozgul, 2007). Other researchers suggest that family dysfunction is positively associated with substance use, which may suggest that the family caused the SUD. These two linear ways of understanding addiction are both unwarranted which may detour individuals and families from seeking out recovery and additional support for the systemic focus (Marshal, 2003). The disease of addiction within a family system should be viewed as a cyclical process that alters the entire system's way of functioning, suggesting that the entire family should seek recovery to heal from the aftermath of an addiction (Klostermann & O'Farrell, 2013; Minuchin, 1985).

Family Systems Theory

The relational impact that addiction has on a family system can be best explained by systems theory (Steinglass, 1985). According to family systems theory, the whole system is comprised of smaller parts that interact with one another and contribute to the way in which the system functions in its entirety. This theory suggests that the entire family has more power to create change than just one individual working alone (Bowen, 1975; Timko, Young, & Moos, 2012; von Bertalanffy, 1972). This concept supports the need for family member recovery, suggesting that if the individual struggling with a SUD finds recovery but no one else in their immediate environment changes, the power of the family may outweigh the individual's ability to sustain long term recovery (Bateson, 1972).

One core component explained by family systems theory is that a system will develop a state of normal functioning, or homeostasis, and individuals within the family

will alter their behaviors to accommodate the system's desire for such homeostasis or balance, despite how unhealthy it may be (Jackson, 1957). In families with addiction, while it may feel normal, the homeostasis that has developed within the system is driven by chaotic, rigid, and unpleasant patterns of interaction (Steinglass, 1985). These unhealthy patterns of interaction often include, but are not limited to, an inability to communicate in the family, unclear family roles (e.g., children taking on adult responsibilities), violence, child abuse, and financial difficulties (Barnard & McKeganey, 2004; Copello, Velleman, & Templeton, 2005).

Other fundamental concepts understood through the lens of family systems theory are transgenerational patterns of family functioning and the notion suggesting that families are supposed to pass through developmental stages of life appropriately, promoting healthy levels of growth and autonomy for each member of the system (Steinglass, 1985). This is important because addiction in a family system may stifle the developmental progress of each family member. More specifically, it is not uncommon for children who grow up in a home where addiction is present to exhibit immediate problems (e.g., behavioral problems, assuming parental roles, difficulties in school), as well as problems later in life (e.g., problems with substance use) (Copello, Velleman, & Templeton, 2005). Viewing addiction as a family disease using the family systems paradigm offers a better explanation for the ways in which family members of individuals with SUD's are different than families without addiction, including a loved one with a SUD and co-addiction among the members in the system (Benishek, Kirby, & Legett Dugosh, 2011; Marshal, 2003). While a SUD can drastically impact the way in which a family functions, there is also a positive relationship between unhealthy family

functioning and SUD's (Copello, Velleman, Templeton, 2005). Researchers have acknowledged that there is a distinguishable difference between families with and without a SUD, especially when examining which qualities are present among healthy families.

Some characteristics of healthy families are outlined in the circumplex model, later revised to create a six-factor measurement, called the FACES IV Scale (Olson & Gorall, 2006). This assessment examines different features of healthy family functioning, such as emotional bonds, cohesion, and adaptability. Researchers have used this scale to examine the relationship between family functioning and substance use (Doba, Nandrino, Dodin, & Antoine, 2014; Tafa & Baiocco, 2009). Doba and colleagues (2014) found that families with a SUD were less cohesive, more emotionally dependent on others, and demonstrated lower levels of closeness among family members. In the same study, researchers found that participants with a SUD reported higher levels of dissatisfaction with their family's rules and overall functioning. In addition to the circumplex model, other studies have used different measures to examine how family functioning influences substance use (Soloski & Berryhill, 2014). The positive relationship found between family functioning and addictive behaviors give credence to how the environment may contribute to the development of SUD (Cadet, 2014). While these findings are significant, there is still a lack of research supporting the necessity of family healing and the transgenerational patterns of family dysfunction that will not be resolved unless family members make changes, despite their addicted loved one's recovery (Orford, Templeton, Velleman, & Copello, 2010).

Transgenerational Patterns

Some scholars argue that when addiction is present in the family system, co-addictive behaviors will begin to emerge (Beattie, 2009). While this is probable, the assumption implies that co-addiction is merely a symptom of the emerging SUD, rather than understanding the concept as an impaired way of functioning with the potential to carry through multiple generations (Wright & Wright, 1991; Wright, 2008). If we continue to understand co-addiction as something that manifests within a family and neglects the potential for transgenerational diffusion of unhealthy functioning, it perpetuates the schema that if the addict or alcoholic is in recovery, the entire system will return to “normal” and co-addiction will cease to be an issue. Similarly, with other diseases like cancer, the individual diagnosed with a disease as well as other family members must adjust to cope with residual effects of such a traumatic experience, even after the individual struggling with the disease is in recovery (Palmer & Howells, 2014).

Furthermore, while genetics have been found to mostly explain the etiology of addiction, the social environment in which a person belongs can contribute to the activation of these genes, or epigenetics, suggesting that the scope of focus should expand from the individual struggling with addiction to the entire system (Vassoler & Sadri-Vakili, 2014). This poses the questions: which came first, the problematic drug use or the problematic family functioning dynamics that mirror behaviors associated with co-addiction (e.g., unhealthy boundaries, inconsistent roles, a lack of family cohesion)? And, is co-addiction, like substance use disorders, a mental health disorder with the propensity for transgenerational genetic transmission and devastating outcomes? These queries shine light on the necessity for more research on the systemic influences on the etiology and treatment of addiction/co-addiction, as from a systemic perspective both co-addiction and

problematic substance use mutually influence the other, further perpetuating the dysfunctional cycle. One step in the right direction to accomplish this would be the development of a measure that can aid in accurately assessing and defining the co-addiction construct.

Characteristics of Co-Addiction

While there is debate regarding the pathological nature of co-addiction, one of the consistent characteristics presented in current literature is that individuals struggling with co-addiction will often sacrifice their own needs or well-being to help another (Fuller & Warner, 2000). These behaviors, over a long period of time, can have devastating impacts on the individual's self-worth, identity, and prevent others from developing the skills necessary to take care of themselves (Lampis, Cataudella, Busonera, & Skowron, 2017). Oakley (2013) introduced the term "pathological altruism", which parallels the co-addiction construct. The author postulates that although altruism is a function of basic human behavior, when done in excess, it can have harmful consequences that often go overlooked. From a systemic perspective, one member of the family may enable or "over function" to make up for another member of the system that is under-functioning (Knudson & Terrell, 2012), which allows these maladaptive patterns to become the new "normal" within the system. This theory suggests that, like co-addictive behaviors, the good intentions to help a family member with a SUD may be initially mild but could escalate into something more deeply rooted and pathological. "Pathological altruism" is assessed in the present study with items inquiring about over functioning for others and neglecting one's own needs (e.g., Others tell me I do too much for my loved one; The addiction makes it difficult for me to have my own life).

The sacrificing of one's own needs and becoming responsible for the needs of someone else may be explained by an individual's inability to feel and articulate their own emotional experiences (Lampis, Cataudella, Busonera, & Skowron, 2017). The inability to display congruent emotional responses is another characteristic possessed by individuals struggling with co-addiction (Reyome, Ward, & Witkiewitz, 2010). This is due to the extreme focus on the moods and emotional responses of an individual with a SUD (Dear et al., 2005). The identity of individuals struggling with co-addiction becomes finding purpose in taking care of others, while neglecting their own needs (Reyome, Ward, & Witkiewitz, 2010). This type of dependency on another person can lead to blunted emotional responses (Osterman & Grubic, 2000), higher levels of anxiety and stress (Lampis, Cataudella, Busonera & Skowron, 2017), and feelings of shame, guilt, and fear (Rusnakova, 2014). These unhealthy patterns of relating to others may be learned in childhood, can be transmitted into adult relationships and passed on to future generations, whether a SUD is present or not (Knudson & Terrell, 2012). The presence of co-addictive behaviors even in the absence of a SUD may suggest that if a SUD is introduced to this family system, the co-addictive symptoms may escalate and could intensify the symptoms associated with a SUD. This process is cyclical and may continue if both the co-addiction and addiction go untreated, thus supporting the need for better assessment and treatment of family members struggling with co-addiction.

Substance Use Disorders

According to the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; American Psychiatric Association (APA), 2013), substance use disorders fall on a continuum with a range from *mild*, *moderate*, to *severe*. Where an individual falls on the continuum is dependent upon the number of criteria met. The *DSM-5* includes nine

different categories an individual can fall into, depending on their drug of choice (APA, 2013). These nine categories include: alcohol, caffeine, cannabis, hallucinogens, inhalants, opioid, sedatives (or hypnotics, or anxiolytics), stimulants, and tobacco (APA, 2013). The diagnostic criteria necessary to be diagnosed with a substance use disorder falls under four main categories: impaired control, social impairment, risky use, and tolerance and withdrawal (APA, 2013).

When examining addiction, Belin-Rauscent and colleagues (2016) suggests that researchers should adhere to following criteria when assessing the construct:

1) Protracted seeking responses that are 2) controlled by stimuli in the environment 3) eventually become compulsive 4) after protracted exposure to the drug 5) but only in some vulnerable individuals (p. 9).

In addition to the four diagnostic categories in the *DSM-5*, these additional five criteria aid in the explanation of addiction. Similarly, the co-addiction construct parallels the diagnostic criteria associated with substance use disorders. Starting with the first *DSM-5* category, impaired control, it is not uncommon for an individual struggling with co-addiction to make an attempt to cease the enabling behaviors, but fail to do so. Extreme measures are often taken in an attempt to resolve the addiction, such as removing the individual with a SUD from the home or denying the existence of a problem (Rusnakova, 2014). In regard to a social impairment, an individual with a SUD may report difficulties in school, at work, and with family members due to their drug or alcohol use (APA, 2013). Individuals with co-addiction also report difficulties fulfilling their obligations at school, work, and may neglect other relationships within the family

system (Lee, 2014), as they are too focused on their attempts to control their loved one and their substance use (Naylor & Lee, 2011).

The next diagnostic category is risky use. Individuals with a SUD will often continue to use drugs or alcohol despite any potential harm, such as risking prolonged physiological consequences or being in compromising situations to procure a drug of choice (Rose, Jones, Clarke, & Christiansen, 2014). Comparatively, individuals with co-addiction may stay in situations that compromise their well-being. For example, there is a positive correlation between domestic violence and substance use, putting everyone in the environment at risk (Dawson, Grant, Chou, & Stinson, 2007). Another example may be if an individual with co-addiction ventures into dangerous situations or neighborhoods to find their loved one struggling with addiction. The last diagnostic category relates to tolerance or withdrawal. An individual who meets the criteria for a SUD will often need to consume more alcohol or drugs to elicit the same effect as before (Sachdeva, Choudhary, & Chandra, 2015). Those with co-addiction may engage in more unhealthy behaviors as the SUD intensifies. Furthermore, as the SUD worsens, the co-addicted individual may become more fearful and motivated by anxiety to engage in enabling behaviors. Although these similarities have yet to be examined, to the extent of my knowledge, the symptoms between SUD's and co-addiction seem to significantly mirror one another.

The mental health diagnosis available to inform clinicians on the appropriate treatment for co-addiction like symptoms is dependent personality disorder (APA, 2013). Although the diagnostic criteria for dependent personality disorder and co-addiction have many similarities (e.g., emotional detachment, identity defined by their relationship,

conflict avoidant, etc.) (APA, 2013; Hoenigmann-Lion & Whitehead, 2007), there are many limitations associated with this diagnosis and it does not specifically relate to relationships with a SUD. The development of the co-addiction scale may aid researchers and clinicians in understanding more appropriate diagnoses for relational issues, specifically when a SUD is present.

Co-Addiction Continuum

In conjunction with the evolution of a SUD, ranging from abuse to dependence, co-addiction may escalate in similar ways (Hogarth, Balleine, Corbit, & Killcross, 2013). Consistent with the family systems theory philosophy that families are homeostatic, as the SUD escalates, the co-addiction symptoms will adapt to match the intensity. The opposite side of spectrum also applies, suggesting that if the co-addiction symptoms increase, the SUD will also worsen. An individual's drug use escalating from recreational use to dependency can be explained by a combination of neurological, psychological, and social theories (Hogarth, Dickinson, & Duka, 2010). The culmination of these three theories suggest that factors such as drug cues, reward responses, and the motivation to extinguish craving all play a role in the development of addiction. The reward responses triggered among some who use drugs and alcohol may be conditionally paired with aversive stimuli from the environment, such as high levels of stress or family conflict (Amlung & MacKillop, 2014). While cues, reward, and responses aid in the explanation of a SUD, these theories may also mirror the processes associated with co-addiction. A cue for an individual struggling with co-addiction could be seeing a loved one in recovery from a SUD come home later than usual. Even though the individual is in recovery, coming home late may serve as a reminder of when their loved one was active in their addiction. To cope with being triggered by the cue from the environment and the

accompanying anxiety, the individual may begin to focus only on the mannerisms, emotional responses, and behaviors of their loved one. This extreme external focus may provide a sense of relief, or reward, as the individual may feel more in control of their loved one and may believe they can prevent them relapsing. This example, although speculative, explains how co-addiction can exist on a continuum of severity and can mirror the similar processes used to explain addiction. Furthermore, if co-addiction goes untreated, the symptoms may be transmitted to future generations like the genetic transmission of addiction.

In accordance with family systems theory, transgenerational patterns of functioning are often embedded within the individual from their family of origin and brought into new relationships (Minuchin, 1985). This theory may support the idea that an individual with a family history of addiction may have adapted to the way of functioning in their family of origin and continued to engage in these co-addictive behaviors in their new family, regardless of whether others are using substances. Considering the high positive correlation between dysfunctional families and substance abuse, as such patterns of dysfunctional interactions continue, the use of substances may be introduced into the system. These patterns speak to the potential of how co-addiction may exist on a continuum, beginning with enabling behaviors and escalating to something more extreme with neurological, psychological, and social components. To better understand how substance use and co-addiction are not mutually exclusive scenarios, it is important to identify the associated symptoms.

Symptomology

To fully grasp the co-addiction construct and move away from the literature suggesting that it is a reactive based, learned set of behaviors (Rotunda et al., 2004), it is

important to further identify its root cause and symptomology. Suggesting that maladaptive behaviors may develop as coping mechanisms when addiction is present within the family system (Rotunda et al., 2004), while true in some cases, also neglects the underlying and more permanently ingrained nature of this condition. Although co-addiction has yet to be studied and explained in this way, researchers have found that even stress can be transmitted to new generations through epigenetic transmission (Franklin et al., 2010), postulating that co-addiction may also be explained by a genetic predisposition, demonstrated by a set of specific behaviors. While there is not yet literature to support the neurobiological or genetic aspects of co-addiction, understanding the unique behaviors associated with the concept is of equal importance. Not only is this concept categorized by a set of behaviors, often used to enable the individual with a SUD, it also represents issues related to the co-addict's identity and capacity for developing and maintaining healthy relationships (Dear & Roberts, 2000). Furthermore, more empirical evidence is needed in this area to better understand transgenerational patterns of co-addiction, passed on throughout generations and perhaps creating an environment that enables an addiction to thrive within the system (Fuller & Warner, 2000).

To the extent of this researcher's knowledge there have not been any other studies examining the concept of co-addiction or identifying the factors that explain the construct. Through professional research and clinical experience in the field of addiction and a thorough assessment of the existing literature available on the topic, researchers of the present study developed an initial co-addiction measure. Through the family systems theory paradigm, examining existing literature on relationships with addiction is present,

and through clinical exposure to the relational difficulties present with addiction, researchers identified five areas of disruption most prominent among individuals struggling with co-addiction. Those areas or factors are: boundaries, fear, identity, roles, and relationships.

Boundaries. Unhealthy boundaries are often too rigid (e.g., tense, excessively strict) or chaotic (e.g., poorly defined, lacking structure) which may stifle the individual and familial growth processes that should occur within a healthy system (Minuchin & Fishman, 1981). As families grow, previously set boundaries, or rules, will shift to accommodate the family's growth processes. Families with addiction tend to have issues related to boundary management within the system, which may hinder the growth process (Minuchin, 1985). For example, family members may have a difficult time saying "no" to their loved one with a SUD and may give in to their demands to avoid conflict.

Boundaries are important within a family system to protect the identity of each individual member and to maintain the delineation of important roles (Aponte, 1992; Minuchin, 1974). One characteristic identified among individuals with a loved one struggling with a SUD is the inability to maintain appropriate boundaries, thus sacrificing their own identity and well-being, and over functioning for their loved one (Kundson & Terrell, 2012).

Identity. One of the components of family systems theory is the notion that as healthy families grow, everyone within the system should develop and maintain a strong sense of self, outside of the family's identity. Bowen (1985) refers to this concept as differentiation of self, suggesting that if an individual has lower levels of differentiation their way of relating to others and functioning is through the feelings and actions of

others in the system. Families with addiction tend to have low levels of differentiation, or struggle with maintaining their own identities, as they are often too externally focused on the individual struggling with a SUD and lose sight of who they are without the SUD present (Fagan-Pryor & Haber, 1992; Lampis, Cataudella, Busonera, & Skowron, 2017).

These patterns of understanding oneself through the feelings and actions of others can be learned by children in homes where a SUD is present and can carry on into adulthood (Thomas, 2012), thus disseminating similar patterns of relating to others and neglecting one's own identity in a new system. In relation to co-addiction, when one sacrifices their own identity, their new identity is shaped by the actions and emotions of the individual with a SUD (Lampis, Cataudella, Busonera, & Skowron, 2017). An undifferentiated individual will typically struggle with making decisions independently, will often experience higher levels of stress and anxiety, and will struggle with healthy emotional regulation (Skowron, Holmes, & Sabatelli, 2003). An inability to maintain a healthy level of differentiation within a system can prevent the family from growing, which enables the addiction and can be detrimental to the well-being of everyone within the family (Borolon et al., 2016).

Fear. The strong external focus outside of the self, exhibited in families with addiction, is often motivated by fear. Fear is a learned response that motivates humans to behave in a certain way to avoid feeling discomfort, anxiety, or pain (Orazi & Pizzetti, 2015). Acting out of fear may be motivated by different reasons, one being that they do not intervene in the lives of their loved one struggling with a SUD, they may lose them (Rusnakova, 2014). Comparatively, fear plays a major role among persons with SUDs, especially related to the conditioned response to avoid pain and seek pleasure (Orazi &

Pizzeti, 2015). More specifically, an individual struggling with a SUD may continue their use of substances because they fear the physical, psychological, and emotional pain associated with withdrawal symptoms (Wise & Koob, 2014). Additionally, when an individual's identity is consumed with taking care of others and neglecting themselves, they may subconsciously fear that if their loved one with a SUD gets well, they are unsure of their own purpose within the system. Whether an individual is battling co-addiction or a SUD, they are both highly motivated by fear. Fear is a learned coping mechanism for self-preservation that will continue to grow over time if unmanaged, thus continuing to motivate unhealthy behaviors while attempting to avoid perceived painful experiences (Wise & Koob, 2014).

Roles. When a SUD is present within the system, family members tend to neglect their primary roles (e.g., spouse, mother, father, etc.) and attempt to play other roles (e.g., therapist, psychiatrist, sponsor) which creates tension within the system. The role an individual plays within the family system influences the formation of an identity (Shumway, Schonian, Bradshaw, & Hayes, in press). By neglecting one's primary role, engaging in the unhealthy roles may become part of their identity. Although family members who act out of their primary roles within a system have good intentions, engaging in these other roles creates tension and often enable the individual struggling with a SUD. When family members attempt to fulfill roles within the system other than their primary role, it may create emotional and physical distance between the members, while simultaneously not allowing for the individual struggling with a SUD to seek help and gain accountability (Uusitalo, 2015).

It is imperative that family members engage in their own recovery efforts and maintain their appropriate roles within the system. Individuals who struggle with co-addiction often believe that their role is to take responsibility for the lives of others and neglect their own personal needs (Lampis, Cataudella, Busonera, & Skowron, 2017). Family members struggling with co-addiction must learn how to manage their own lives and set healthy boundaries within the system by maintaining their role and allowing others to take responsibility for their own lives, despite the consequences.

Relationships. With everyone's focus within a system bent towards an individual's substance use disorder, other relationships may be neglected. Additionally, the shame and stigma related to SUD's may motivate individuals in a family with addiction to isolate themselves from others outside of their primary system, which prevents them from receiving the support they need to heal (Rusnakova, 2014). Furthermore, others who may not be co-addicted within the system, like children with a parent struggling with a SUD and co-addiction, are still impacted and their needs often go unmet (Thomas, 2012). When struggling co-addiction, the capacity to develop and maintain healthy relationships is a challenge (Shumway & Kimball, 2012). This presents a challenge when seeking recovery, as healthy and supportive relationships are paramount for sustaining long term recovery.

Parent-Child Relationship

The wealth of literature available on the family symptoms that manifest when addiction is present usually focus on the couple relationship within the system (Rotunda, West, & O'Farrell, 2004). More specifically, the literature addressing the co-addicted relationship typically focuses on the maladaptive patterns within the couple relationship and less attention is focused on the parent to child relationship. Although the focus has

been primarily on couple dynamics in relation to co-addiction, some studies focus on how family functioning can influence substance use among adolescents (e.g., Gromacki, 2016; Soloski & Berryhill, 2016). Adolescents who grow up in homes with lower family functioning (e.g., less support, poor community, less cohesive) are at a greater risk to develop a SUD and engage in more delinquent behaviors (Hummel et al., 2012). One study found that greater levels of parental support to the adolescent child predicted lower levels of alcohol use (Donovan, 2004). Despite the literature focusing on family functioning there is limited research available on the parent-child relationship and co-addiction.

Some scholars address the child-parent co-addicted relationships by examining children with substance using parents (Reyome, Ward, & Witkiewitz, 2010) and how those factors may contribute to the etiology of similar symptoms in adulthood. Additionally, not only are adult children of alcoholics or addicts at a greater risk for the development of a SUD in adulthood, but they also struggle with psychological distress (e.g., anxiety, depression), low self-esteem, and troubles with intimacy in adult relationships (Haverfield & Theiss, 2015). However, there is a dearth in the literature examining co-addicted parents with a child struggling with a SUD. The lack of research in this area could be due to the normalized parenting trends found in the current Western culture. When examining the current literature on parent-child relationships of the current generation, there are many characteristics that parallel co-addicted behaviors (Fingerman, Cheng, Wesselmann, Zarit, Furstenberg, & Birditt, 2012). The popular term used to coin these behaviors is “helicopter parenting” (Fingerman et al., 2012).

Helicopter parents, like those with co-addicted relationships, will do too much for their children preventing them from learning how to develop these skills on their own (Fingerman et al., 2012; Oakley, 2013). While children are supposed to receive support from their parents or primary caregivers from birth to adulthood, helicopter parents will continue to provide their children with this same kind of support well into their early 20s (Arnett, 2000). The same generation of children, or millennials, also report higher levels of mental health disorders, higher levels of stress, and are more likely to use substances to cope with these problems (Aikins, 2015; Bland, Melton, Welle, & Bigham, 2012). The results of one study found that higher levels of parental emotional over-involvement were more prevalent among children with a SUD (Doba, Nandrino, Dodin, & Antoine, 2014). Although parenting styles does not imply causation of substance use disorders, more research is needed to understand how the relationship dynamics between a parent and child are impacted co-addiction and addiction. Furthermore, despite the limited available literature examining the parent-child with a SUD relationship, the shift in parenting styles among this generation may indicate a stronger, positive relationship among the co-addiction scale and parents, as opposed to the couple relationship that has received more attention in the available literature.

Couple Relationships

The assortative mating theory suggests that individuals select partners with more similar traits than different (Leonard & Eiden, 2007). This theory supports the idea that individuals who engage in problematic substance use will find others who also engage in similar behaviors. Furthermore, individuals may find mates that complement their own ways of functioning, for example, an individual who grew up in a home with a SUD

present may be more inclined to select a partner who struggles with a SUD (McAweeney et al., 2005).

There are many problems that exist within a couple relationship when a SUD is present. Some of those problems include, but are not limited to, an increase in intimate partner violence (O’Leary & Schumacher, 2003), a lack of emotional expression and healthy connection (Lampis, Cataudella, Busonera, & Skowron, 2017), and generally lower reports of relationship satisfaction (Peled & Sacks, 2008). Many studies examine the relationship dynamics within heterosexual relationships when a male partner is struggling with a SUD, however, fewer studies examine the experience of a male with a female partner with a SUD (Naylor & Lee, 2011; Peled & Sacks, 2008). The lack of research on females struggling with a SUD supports the argument that women are often given labels like “codependent”, which has created discrepancy and bias within the literature on couple relationships and addiction. More research should be done in this area to more effectively discern between which relationship dynamics (e.g., couple or parent-child) are more positively associated with co-addiction, while being cognizant of gender roles.

Gender Differences

Historically, the literature on dysfunctional relationships and addiction is more frequently associated with females who have heterosexual partners struggling with a SUD (Noriega, Ramos, Medina-Mora, & Villa, 2008). A major criticism of this literature is that women are often labeled as pathological or blamed for their partner’s addiction (Rotunda, West, & O’Farrell, 2004). These gender biases presented in early studies on relationships when a SUD is present dilute the validity of the findings. While the over pathologizing of women is not particularly helpful, women may be socialized to adopt

more behaviors that are consistent with co-addiction than men, thus supporting my hypothesis that women will demonstrate a more positive relationship than men with co-addiction.

12-step programs, such as Al-anon, designed for family members to seek support when they have addicted loved ones, use language that refers to letting go of control or power (Timko, Brendan Young, & Moos, 2012). Some feminist scholars would argue that women in general have considerably less power than their male counterparts within a relationship (Cowan, Bommersbach, & Curtis, 1995). This may suggest that while Al-anon may be a valuable resource for partners or family members who have a loved one struggling with addiction, the language used to explain the concepts presented may be misleading for women specifically.

One theoretical study addressing women in recovery distinguished a difference between submission and surrendering, addressing power and control. This author articulated the difference between submission, which is essentially having power taken away, and surrendering, which is making an active decision to relieve oneself of the illusion of control they may have over others (Covington, 2002). The same standards should apply to the theoretical principles driving support and treatment for family members with addiction, specifically for women. One study found that women with partners who abused substances were more likely to be victimized and sustain injuries related to domestic violence (Dawson, Grant, Chou, & Stinson, 2007). While gendered considerations deserve attention, there is a general lack of professional and community resources for family members. More research is needed to understand the characteristics

of co-addiction, for both males and females, to determine the most effective treatment methods and supportive community resources.

Codependency Measurement

Several measures have been developed over the years to enhance researchers and clinicians' understanding of the codependency construct. Although the term codependency has expanded to be inclusive of dysfunctional ways of relating to others, the origin of the term was derived from examining relationships when a SUD is present (Knudson & Terrell, 2012). Despite the varied attempts at measuring this concept, the discrepancies in the literature and definitions of codependency challenge the external validity, or generalizability, of these measurement devices. For example, the term "codependency" was originally coined to explain relationship dynamics between individuals with an alcohol use disorder and their partners (Hopkins & Jackson, 2002), the understanding of this concepts has since been overgeneralized and misapplied to several other facets of relational dynamics. The over application of the codependency concept has blurred the definition and understanding of the unique relational dynamics that exist within family systems when addiction is present. Researchers have developed many scales to conceptualize this concept, the following are the most widely used across the literature:

Spann-Fischer Codependency Scale (1990). This scale is a fifteen-item scale designed to measure codependency (Fischer, Spann, & Crawford, 1991). A six-point Likert-type response format was used for the items on this measure. The items on this measure were intended to assess: an external focus onto others, an inability to express feelings, and how individuals find their own meaning through their relationships with others (Fischer, Spann, & Crawford, 1991). Reports of internal consistency were

provided using Cronbach's alpha (α) with scores ranging from .65 to .94, suggesting adequate results. Considering how frequently this measure is used in more recent studies on codependency (e.g., Cullen & Carr, 1999), the classical statistical tests used to validate this measure have many psychometric deficits (Sijtsma, 2009). Although this is a frequently used scale, more rigorous methods of psychometric modeling are needed to ensure reliability and internal validity. While some of the items developed for this measure explain the "codependency" construct well, there are additional factors that need to be examined to gain a more comprehensive understanding of co-addiction.

Composite Codependency Scale (CCS) (2012). This scale began as a 28-item, five point, Likert-type scale used to measure symptoms of codependency. After a factor analysis, researchers removed items on the measure, reducing the scale to 19-items (Marks, Blore, Hine & Dear, 2012). This scale assessed three different subscales: Self-sacrifice ($\alpha = .77$), interpersonal control ($\alpha = .80$), and emotional suppression ($\alpha = .83$) (Marks et al., 2012). Results of this study demonstrate limitations, specifically related to the psychometric properties of the measure and the sampling methods (Sijtsma, 2009). The researchers of this study shared some limitations of their findings in the study, specifically related to the need for a larger, more diverse sample size and the need for more advanced statistical methodology (Marks et al., 2012). Like the Spann-Fischer Codependency Scale (1990), this measure also seems to be missing some key factors to help explain co-addiction. Although the measures of codependency have been used several times in various studies, there is little research on a codependency, in the context of addicted families that looks at family members besides the partner of an addict.

Behavioral Enabling Scale (BES) (Rotunda, West, & O'Farrell, 2004). This measure was developed to examine the behaviors of individuals with partners diagnosed with a SUD. It is comprised of two subscales, assessing enabling behaviors and beliefs. The enabling behaviors subscale has 20 Likert-type items (1 = *not at all*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*, 5 = *very often*). The enabling beliefs subscale has 13-items and is measured on a four-point Likert-type scale (-2=disagree to 2=strongly agree). The researchers of this study reported to have found adequate internal consistency for the enabling behaviors ($\alpha=.81$) and beliefs ($\alpha=.81$) subscales.

The scale used in this study has several psychometric shortcomings, which poses threats to internal and external reliability and validity (Sijtsma, 2009). The scale used for this study was a series of questions generated by the researcher, but failed to adhere to appropriate guidelines for scale development (DeVillis, 2003). Furthermore, the researchers did not examine the underlying factors associated with items developed using a factor analysis. This poses a problem with the findings in this study, as it is anecdotally driven, not empirically based. It is also unclear as to whether the items selected for the scale are measuring the construct of enabling behaviors (Sijtsma, 2009). While the content of the items selected for this measure list enabling behaviors, there does not appear to be any consistent theories or themes that guided how these items were developed. Also, the way in which the items are worded seem to perpetuate the external focus from the individual to their partner with a SUD, which may represent the behaviors but neglects to acknowledge the deeper pathology associated with co-addiction.

Holyoake Codependency Index (2000). This scale was developed as a 28-item, Likert-Type scale with three subscales (external focus, self-sacrifice, and reactivity)

(Dear & Roberts, 2000). After researchers performed a factor analysis, the final scale was comprised on 13-items and reported adequate internal consistency ($\alpha = .74$ to $.84$). The population sampled to validate this measure was biased, in that out of the 313 participants, 268 were female. Furthermore, more rigorous statistical methods should be used to confirm the findings in this study, which was acknowledged by the researchers who developed the measure. However, the subscales identified to explain the construct were general and did not aid in explaining the relationship dynamics that exist when addiction is present.

To maintain internal validity, more research is needed to examine the causes and effects of this construct. The broad range of measures and definitions of codependency that currently exist speaks to the need for a new measure devoted to understanding co-addiction, or relationship dynamics that exist when addiction is present within the system. To maintain construct validity, researchers should examine other factors that should relate to the co-addiction construct. On the contrary, the construct should also be tested against constructs that should have no relationship to maintain discriminant validity. The present study will address some of these deficits in the preliminary analyses by examining the relationship between family functioning and co-addiction. Because co-addiction is a relational disorder, low family functioning scores should display a positive relationship with co-addiction.

Present Study

The intention of the present study is to begin to develop a scale that specifically examines co-addiction, or the patterns that exist among relationships when an addiction is present. The study began the preliminary stages of measurement development by identifying how many underlying factors best explain the co-addiction construct using

exploratory factor analysis (EFA). The study will present a discussion regarding the reliability and validity of the measure. The researcher will also propose a confirmatory factor analysis (CFA) measurement model to confirm the factor structure provided by the results of the EFA. Next, a structural path model will be used to test the effects of gender, family history of addiction, and relationship to loved one with a SUD on co-addiction.

CHAPTER III

Methods

The items in the measure were reviewed by a team of experts in the field of addiction, with experience in both clinical and research practices. Researchers collected a sample from family members participating in a structured family program, as part of a larger study, to begin preliminary analyses for the validation of the co-addiction scale (CAS). The target sample size and adequate power were determined by conducting a Monte Carlo study (Muthén & Muthén, 2002; Paxton, Curran, Bollen, Kirby, & Chen, 2001).

Participants

Data for this study were collected from family members participating in a structured family program ($N=254$) at a residential treatment center for SUD in the southwestern region of the United States. The proposed study is part of a larger study designed to understand the efficacy of the structured family program and to further examine family members who have a loved one struggling with a SUD. As part of the larger study, data were collected from this population measuring three different time points (pre-family program, post family program, and follow-up assessments).

Participants of this study were required to be above the age of 18. The mean age of participants was 48.98 years old ($SD=13.5$; observed range=18-84). More than half of

the sample was predominantly female ($n = 147, 57.4\%$), Caucasian ($n=232, 90.6\%$), not of Hispanic or Latino decent ($n=218, 85.2\%$), and mostly Christian ($n=216, 84\%$). Family members were attending the family program in support of a client on the “collegiate” treatment track with ages ranging from 18 to 25 years old or the “traditional” treatment track, which is inclusive of the adult client population above the age of 25. The sample was predominantly family members in support of a client on the “traditional” track ($n=166, 64.8\%$). Data were collected on what the family relationship was to the client in treatment and the client’s gender. The family members were mostly there in support of a male client ($n=165, 64.5\%$). Much of the sample was comprised of parents, including step parents ($n=144, 56.3\%$). Others identified as partners of the clients (e.g., spouses, fiancé, significant other) ($n=60; 23.4\%$) and some reported another relationship (e.g., grandparent, aunt, uncle, child, sibling, family friend, etc.) ($n=52, 20.3\%$). A very small portion of the sample reported that they did not have a family history of addiction ($n=21, 8.2\%$), some participants were unsure ($n=14, 5.5\%$), and the remaining participants reported that addiction in their family was *not common* ($n=71, 27.7\%$), *somewhat common* ($n=85, 33.2\%$), and *very common* ($n=61, 23.8\%$). Of the participants who reported a history of addiction, aside from the individual currently in treatment, some reported only one family member who has struggled ($n=96, 37.5\%$), whereas the others reported multiple known family members with an addiction ($n=110, 43\%$). The majority reported that they had never struggled with their own addiction ($n=200, 78.1\%$).

Measures

Co-Addiction Scale (CAS). The original measure given to participants was comprised of 24 items with Likert-type response options ranging from 1 (strongly agree) to 6 (strongly disagree) (see Appendix A). The questions were developed based on five

different themes: (1) boundaries, (2) fear, (3) role, (4) identity, and (5) relationships. The underlying constructs and psychometric properties of this measure are further explored through the use of statistical analyses. After determining which items load best on each factor through exploratory analyses, the items that make up each factor were summed and divided by the number of total items to create composite variables for further analyses.

Demographic Information. Data were collected on the participants' gender, track (collegiate or traditional) and gender of the client participants are there in support of, relationship to client, age, race and ethnicity, religious affiliation and commitment to religious beliefs. Additionally, family member participants were asked questions related to their loved one struggling with a SUD, such as, knowledge of loved one's addiction (e.g., length of time in active addiction) and perception about loved one's recovery and commitment level. Data on participant personal and family history questions about addiction and recovery were also collected. For example, participants were asked, "how common is addiction in your family history?" Responses were generated for this item ranging from 1 (very common), 2 (not common), 3 (no one has ever struggled with addiction in your family), and 4 (do not know).

Other Measures. The scale of interest for the present study (CAS) was accompanied by several other measures, as this study is part of a larger study. The other measures used in this study were: Hope and coping skills (HCRM) (Shumway et al., 2014) used to assess individual levels of hope and coping skills, as it relates to recovery from addiction. Readiness to Change (Nock & Photos, 2006), assessing the family member's readiness to act as it relates to changing their own personal behavior, within the context of addiction in the family system (e.g., engage in individual recovery efforts).

Relationship satisfaction, used to assess the current satisfaction of the relationship between the family member and their loved one struggling with addiction. Locus of Control, used for family members to assess the thoughts related to their addicted loved one, adapted to be applicable within context of addiction (Marsh & Richards, 1986). Family Functioning was measured using the family assessment device (FAD) (Baldwin & Bishop, 1983 as cited in Ryan, Epstein, & Keitner, 2005).

Procedures

Approval was provided to conduct this study through the Institutional Review Board (IRB) at Texas Tech University. Participants were recruited through a residential treatment center for substance use disorders in the Southwestern region of the United States. Potential participants were presented with the research and advised that participation in the study was voluntary and they could withdraw from completing the survey at any time. Paper copies of the survey are then distributed to the willing participants. The survey was created for a larger study aiming to examine the experiences of family members who have a loved one in treatment for SUD.

Data for this study were collected retrospectively, meaning that participants completed two-time points of the survey after exposure to the clinical interventions during the structured family program. The third-time point is collected from participants sixty days after completing the family program. The time point of focus for this study was the first-time point, where the participants were asked to respond based on their mindset prior to the family program. This time point was selected for analyses because the CAS was designed to assess family member co-addiction prior to receiving treatment, with the intention of developing a case for the necessity of family member recovery. Additionally, previous research conducted with this structured family program found that

participants improved in areas (e.g., hope, coping, readiness to change, family functioning) after the intervention (between the first and second time points of data collected), but results declined in many areas when assessed at the third time point approximately 50 days after leaving the residential treatment center (Shumway, Schonian, Bradshaw, & Hayes, in press). Therefore, to develop a better understanding of the co-addiction construct without treatment, data were used from the first time point.

Initial Scale Development

Researchers of the present study sought to develop a measure to better understand the co-addiction phenomenon. Although there are many guiding theories that contribute to the best practices for scale or measurement development (Brown, 1983; DeVillis, 2003; Friedenber, 1995), the most common factors to consider during this process are: a valid justification for the development of the scale, appropriate guiding theoretical framework, and empirically supported evidence. Because the data used for the purpose of this study were initially collected for the purpose of a larger study, the appropriate protocol for scale development may have been compromised in the early development stages. The procedures followed for this study were based on DeVillis' (2003) scale development recommendations (as cited in Worthington & Whittaker, 2006, p. 813):

- (a) Determine clearly what you want to measure, (b) generate an item pool, (c) determine the format of the measure, (d) have experts review the initial item pool, (e) consider inclusion of validation items, (f) administer items to a development sample, (g) evaluate the items, and (h) optimize scale length.

Following the aforementioned scale development criteria, we did the following to develop the CAS. After careful review of current empirical articles on family relationships and addiction, as well as theory derived from clinical experience with this

population, a pool of items was generated to present to a research team (DeVillis, 2003). The research team was comprised of doctoral level addiction researchers, instructors, clinicians, and research center and institute directors. A team of experts in this area were selected to collectively review the scale items to maintain content validity, which contributes to the validity of the measure (Furr & Bacharach, 2014). Next, the team examined 36 initial items and removed items that did not fit well with the construct or lacked clarity. The items developed were further discussed by the research team to determine how the items related to one another. The research team identified a total of five underlying themes to best explain the co-addiction construct. The identified themes are: boundaries (e.g., I have a hard time setting and enforcing limits), fear (e.g., If I knew they were not using, I could move on with my life), roles (e.g., Taking care of them helps me feel better about myself), identity (e.g., I am more concerned about their feelings than my own), and relationships (e.g., I isolate myself to keep others from knowing about the addiction). A total of 24-items was decided upon and used to complete the scale.

Next, researchers examined the length and clarity of each item on the scale. Each item was shortened, allowing for participants with varying intellectual capacities and reading levels to interpret each item and respond appropriately (DeVellis, 2003). Participants will be provided with Likert-type item responses ranging from 1 (Strongly Disagree) to 6 (Strongly Agree). While it is important to be cognizant of convergent and discriminant validity by including a comparable scale in the initial piloting of the study, it has also been recommended that the length of the entire survey should not be too long, as it may prevent participants from completing the survey (Worthington & Whittaker, 2016). Furthermore, Converse and Presser (1986) posit that if there are other measures in

one study that are too similar, it could cause confusion and impact participants' responses. The following preliminary analyses address the empirical factors that are recommended for initial scale development procedures (e.g., EFA, CFA).

Analyses

Statistical Analyses for this study were conducted using SPSS v. 22 (IBM Corp, 2013) and Mplus v7.11 (Muthén & Muthén, 2012). A Monte Carlo Power Analysis was used to determine the sample size needed to get adequate power for the analyses of this study. Based on the results of the Monte Carlo Power Analysis, the target sample size to achieve adequate power was N=175. After data were collected (N=254), SPSS v. 22 was used to run descriptive statistics and frequencies on the demographic variables (e.g., gender, race, ethnicity, relationship to client, client gender, client track, history of addiction) and to analyze the items on the CAS. Reliability tests were ran using SPSS v. 22 on the hypothesized subscales on the CAS (boundaries, fear, role, identity, and relationships).

Next, the following analyses were used to address the research questions developed for this study: (1) How many underlying factors best explain the construct of co-addiction? This question was addressed using an exploratory factor analysis (EFA) to do a preliminary examination of the number of constructs and identify the underlying factor structure of the CAS (Fabrigar, Wegener, MacCallum, & Strahan, 1999). A categorical EFA was selected over other analyses (e.g., principal components analysis (PCA) because the goal of this study is to identify latent variables that account for the pattern of correlations among the measured variables, not to reduce the data (Fabrigar, Wegener, MacCallum, & Strahan, 1999). Additionally, the EFA assumes that the identified latent variables are correlated, whereas PCA techniques often assume that the

principal components (not latent variables) are orthogonal (uncorrelated) (Bentler & Kano, 1990). Also, the recommendation for best scale development procedures is to use an EFA over other analyses (Worthington & Whittaker, 2016). To avoid overestimation of the number of factors retained (Kaiser, 1960; Zwick & Velicer, 1986) and considering the use of categorical indicators (Muthén & Muthén, 1998-2012), the best factor structure for these data were selected using goodness-of-fit indices, including root mean square of approximation (RMSEA), the comparative fit index (CFI), Tucker Lewis index (TLI), and chi-squared (χ^2) (Hu & Bentler, 1999). Hu and Bentler (1999) recommend that the RMSEA should not exceed .06. For a categorical EFA, Yu (2002) suggested that the CFI should be greater or equal to .96 to determine an adequate model fit. Items that did not significantly load (i.e., $\lambda < .32$) on any factor were removed and items that significantly loaded on two or more factors (i.e., $\lambda < .32$ and/or $p < .05$) were noted and considered for removal (Osborne & Costello, 2009; Tabachnick & Fidell, 2013).

(2) Does the co-addiction scale developed for this study demonstrate adequate levels of reliability and validity? Cronbach's alphas were calculated using SPSS v. 22 on all 24 items originally selected for the CAS and each hypothesized subscale. Correlations of the subscales were also calculated.

(3) How well does the proposed model fit the data for this population when using a confirmatory factor analysis? A categorical confirmatory factor analysis (CFA) is a theory based approach used to examine whether a proposed model fits the data well (Marsh, Morin, Parker, & Kaur, 2013). After the underlying factors have been determined using EFA, a categorical confirmatory factor analysis (CFA) was used to confirm the factor structure of the CAS. Model fit statistics were used to determine

goodness-of-fit in the model, the fit indices that were used in this study are: Chi-square, Root Mean Square Error of Approximation (RMSEA), the Tucker-Lewis Index (TLI), and the Comparative Fit Index (CFI) (Bentler & Bonnett, 1980). Recommended model fit indices and cut-offs were determined according to Hu and Bentler (1999).

The results of the CFA (see below) did not fit the data well (Hu & Bentler, 1999). To resolve this, an exploratory structural equation model (ESEM) was used (Asparouhov, Muthén, & Muthén, 2009). It is not uncommon for a well-defined EFA model to not be consistent with a CFA (Marsh et al., 2009). There are many strategies that researchers use to compensate for poor CFA results (e.g., item parceling, modification indices), but these techniques can be problematic or incorrect (Boffo, Mannarini, & Munari, 2012; Marsh et al., 2009; 2010). The ESEM analysis is exploratory and combines the EFA framework with the benefits of CFA and SEM analyses (e.g., MIMIC models, CFA parameters, standard errors, etc.) (Morin, Marsh, & Nagengast, 2013). The ESEM was conducted using an oblique Geomin rotation method (Boffo, Mannarini, & Munari, 2012).

The next three research questions were addressed through a bivariate correlation and an exploratory structural model. (4) Is there a significant difference in the relationship between gender and co-addiction? (5) Is there a significant difference in the relationship between those who have a family history of addiction compared to those who did not and co-addiction? (6) Is there a significant difference between parents and partners and co-addiction? Gender, family history (e.g., personal and how common addiction is in the family), and binary parents (i.e., 0=not a parent, 1=mother, father, and step parents) were used as exogenous predictor variables in the exploratory model.

Additionally, correlation analyses were also conducted on the summed manifest variable subscales of the CAS with these identifying variables of interest.

CHAPTER IV

Results

Monte Carlo Power Analysis

Monte Carlo study was used to determine the sample size necessary to achieve adequate power for the proposed analyses. This type of analysis was selected to estimate a sample size necessary to reject the null hypothesis (Wang & Wang, 2012).

Additionally, finding an adequate sample size is imperative in structural equation modeling, as it effects how well the data fit the proposed model (Wolf, Harrington, Clark & Miller, 2013). The Monte Carlo analysis was conducted using Mplus v7.11 (Muthén & Muthén, 2012) using the maximum likelihood (ML) estimator. A confirmatory factor analysis (CFA) model was selected (Hu & Bentler, 1998), with five factors and twenty-four indicators. The first four factors had five factor indicators and the fifth factor with four indicators, with 82 free parameters and 242 degrees of freedom. 1,000 replications and various numbers of observations were used to generate the desired power. The data generated for this study had the following estimated population values: population specifications were manipulated for each sample size in this study ranging from high (.9) to low (.3) (Collins & Wugalter, 1992), residual variances were set to .3, and the variance of all five of the latent factors were set to 1.00. The factor correlations were all set to .4, which was selected based on the theoretical assumption that the underlying constructs in the CFA would demonstrate a low to moderate correlation (Paxton et al., 2001).

These data were simulated based on the population estimates determined by the researcher, thus suggesting that the actual population estimates will differ from these

using real data collected for this study. Conservative population estimates were selected and the model was over identified to provide the best estimates for sample size and adequate power. This researcher ran the Monte Carlo CFA model six different times with varying numbers of observations (150, 175, 200, 220, 230, and 250) to determine what the adequate sample size would be for this study (see Table 1). When deciding on sample size, Cohen (1992) suggests that the power should be no less than .80, to avoid a Type II error. The CFA model assumed that there were not any missing data and these data were normally distributed, thus no considerations were made for nonnormality (Tabachnick & Fidell, 2008). The researcher of this study is aware that there may be other models that fit these data, however, based on the theoretical assumptions used to formulate this scale, the five-factor CFA model seemed most appropriate (Paxton, Curran, Bollen, Kirby, & Chen, 2001; Tomarken & Waller, 2003).

The results of this study found that the better quality of indicators (greater than .4) for each latent construct demonstrated greater power for the proposed CFA model. Furthermore, if the quality of factor indicators increases, the target sample size ($N = 175$) can still achieve sufficient power, as these data will fit the proposed model well (see Table 1). The large number of indicators used in this Monte Carlo study may present issues with the real data when examining goodness-of-fit indices as they relate to sample size (Langeheine et al., 1996).

Table 1
Indicator Parameter Specifications, Sample Size, and Power

N	Parameter Specifications				
	Low	Moderate		High	
	0.3	0.4	0.5	0.7	0.9
150	0.77	0.89	0.97	0.97	0.98
175	0.81	0.93	0.97	0.98	0.99
200	0.84	0.96	0.99	0.99	0.99
220	0.88	0.96	0.99	1.00	1.00
230	0.89	0.98	1.00	1.00	1.00
250	0.94	0.99	1.00	1.00	1.00

Note. Sufficient power > .80 (Cohen, 1992)

Measurement Model

All factor analyses were conducted using Mplus Version 7.11 (Muthén & Muthén, 1998-2012). Estimation using weighted least squares means and variances (WLSMV) were used for the EFA and CFAs (Muthén & Muthén, 1998-2012). Because the items on the CAS contained an ordinal response scale, categorical EFAs and CFAs were conducted to avoid distorted results (Lubke & Muthén, 2004). While some scholars say that Likert-type scales can be continuous (Lubke & Muthén, 2004), the items for the CAS were analyzed as ordinal because the distance in between each response option (e.g., 1-Strongly Disagree to 6-Strongly Agree) cannot be measured (Sullivan & Artino, 2013).

After initial examination of each item designed for the CAS in the total sample, the items indicated that the last two levels of the Likert-type responses available (i.e., 1-Strongly Disagree and 2- Disagree), contained less than 15% of the observations for the respective items, as the majority of the participant responses ranged between the first two responses (i.e., 6-Strongly Agree and 5-Agree) (Likert, 1932). Therefore, prior to analyses, the 6-level ordinal response scale of the CAS was collapsed into the following

5-level scale: 1=Disagree, 2=Somewhat Disagree, 3=Somewhat Agree, 4=Agree, 5=Strongly Agree (Allen & Seaman, 2007).

Table 2

<i>Descriptive Statistics for CAS Items</i>		
	<i>M</i>	<i>SD</i>
I have a hard time setting and enforcing limits.	3.39	1.24
I want to say “no”, but often do not.	3.34	1.27
Others tell me I do too much for my loved one.	3.32	1.41
I do things for my loved one that I should not.	3.4	1.34
Even when I am told “no”, I still try to help.	4.04	1.25
I am often worried they will die.	4.24	1.2
If I knew they were not using, I could move on with my life.	3.18	1.08
My concern for the consequences causes me to give them what they want.	3.29	1.46
If I do not manage their life, they will likely relapse.	3.09	1.43
It is my job to protect their reputation.	3.51	1.51
The addiction makes it difficult for me to have my own life.	3.61	1.34
I feel empty if I cannot help.	3.31	1.32
Taking care of them helps me feel better about myself.	3.5	1.41
I make better decisions for their life than they do.	3.01	1.33
I have forgotten who I am and things I enjoy doing.	2.75	1.41
I am more concerned about their feelings than my own.	3.23	1.52
I sacrifice my own needs to keep them from using.	3.36	1.43
I care for my loved one even when they do not care for me.	3.35	1.42
My other relationships are suffering.	3.35	1.38
I isolate myself to keep others from knowing about the addiction.	2.85	1.55
The relationship with my loved one would be better if it was not for the addiction.	4.15	1.18
I do not have time to invest in other relationships.	2.78	1.48

Note. All item responses range from 1-5.

Validity and Reliability. Internal consistencies were examined for the CAS subscales based on the four factor solution, as explained below, of the CAS in the study: Boundaries subscale (Chronbach’s $\alpha=.85$), Role subscale (Chronbach’s $\alpha=.81$), Identity subscale (Chronbach’s $\alpha=.68$), and Relationship subscale (Chronbach’s $\alpha=.82$). The fear

subscale, while clinically relevant, was excluded from these analyses due to a lack of empirical support. Convergent validity was examined through Pearson's bivariate correlations. These analyses were conducted using SPSS v.22. The CAS total scale (22-items), subscales (e.g., boundaries, role, identity, and relationships), and other variables of interest (e.g., family assessment device and the hope and coping measure) were included in the analysis (see Table 3).

Table 3

<i>Bivariate Correlations Table</i>		1	2	3	4	5	6	7
1	CAS	1						
2	Bound SS	.74**	1					
3	Role SS	.78**	.54**	1				
4	Ident SS	.79**	.50**	.69**	1			
5	Rel SS	.77**	.51**	.63**	.65**	1		
6	FAD	-.18**	-.18**	-.16*	-.26**	-.32**	1	
7	HCRM	-.41**	-.29**	-.33**	-.37**	-.55**	.25**	1

Note. ** $p < .01$ and * $p < .05$; SS=subscale (*Boundaries, Role, Identity, Relationships*); FAD=Family Assessment Device; HCRM=Hope/Cope Recovery Measure

Additionally, an independent samples t-test was conducted to compare gender differences and the co-addiction subscales (boundaries, role, identity, and relationships). There was a significant difference in the scores for *boundaries* and men ($\mu=3.0$, $SD=.97$) and women ($\mu=3.59$, $SD=.96$); $t(243)=-4.79$, $p < .05$, *role* and men ($\mu=3.18$, $SD=.99$) and women ($\mu=3.47$, $SD=.99$); $t(244)=-2.10$, $p < .05$, *identity* and men ($\mu=3.47$, $SD=.86$) and women ($\mu=3.93$, $SD=.78$); $t(242)=-4.33$, $p < .05$, and *relationships* and men ($\mu=2.76$, $SD=.99$) and women ($\mu=3.24$, $SD=1.14$); $t(243)=-3.48$, $p < .05$.

Furthermore, results of an independent t-test demonstrated that there is a significant difference between partners and parents for the subscales role (parents: $\mu=3.40$, $SD=1.01$ and partners: $\mu=3.70$, $SD=1.00$; $t(194)=-1.81$, $p < .05$, $d=.30$), identity

(parents: $\mu=3.70$, $SD=.86$ and partners: $\mu=4.1$, $SD=.73$; $t(193)=-3.13$, $p < .05$, $d=.50$), and relationships (parents: $\mu=3.07$, $SD=1.07$ and partners: $\mu=3.49$, $SD=1.11$; $t(194)=-2.46$, $p < .05$, $d=.40$). The boundaries subscale demonstrated no significant mean difference across groups.

Exploratory Factor Analysis. A categorical EFA was used to look at the lower order structure of the 24 indicators selected. This analysis explored how each indicator fits with the latent constructs, identified to explain co-addiction. A weighted least squares means and variances (WLSMV) estimator was used (Rhemtulla, Brosseau-Liard, & Savalei, 2012), as this estimator produces less biased results when compared to a maximum likelihood (ML) estimator for ordinal items (Finney & DiStefano, 2013). Additionally, in attempt to design a parsimonious model, while avoiding over- or under-factoring, six factors were selected for the factor analysis to decide upon the optimum factor structure (Fabrigar, Wegener, MacCallum, & Strahan, 1999). Although the hypothesized model (see Figure 1, Appendix B) only included five factors, when doing an EFA, the recommendation is to include more factors to avoid under identifying the model (Fabrigar, Wegener, MacCallum, & Strahan, 1999). Results were evaluated using goodness-of-fit indices (e.g., RMSEA, CFI, TFI, χ^2) to determine how many factors best fit the data. The robust chi-square test statistic and parameter estimates were considered, but not used due to the WLSMV estimator and ordinal indicator variables. Items with factor loadings that cross-loaded onto multiple factors or that had standardized factor loading less than $\lambda = .32$ were examined and were considered to be dropped from the study. Next, the EFA was conducted again to see if the alterations demonstrated a better model fit using goodness of fit indices (Hu & Bentler, 1998; Fabrigar et al., 1999). Items

that loaded significantly ($p < .05$) and relatively high ($\lambda > .32$) on multiple factors were assigned to the factor with the highest loading. In total, there were six items on various factors that demonstrated significant cross-loadings on more than one factor. The high number of item cross-loadings may indicate poor item content or ambiguous factor structure design (Osborne & Costello, 2009; Furr & Bacharach, 2014). Factor loadings from the EFA are provided in Table 6 and include one through six factor solutions. Model fit indices were not acceptable for factor solutions one through three, but were good for factor solutions four through six (see Table 4). The four factor solution evidenced the best model fit, considering the goodness of fit indices, factor loadings, and theoretical justification. Items 8 and 20 were dropped from the scale, as they did not have factor loadings that met the criteria ($\lambda > .32$) on any of the factors (Osborne & Costello, 2009) (see Appendix A).

Table 4
Model Fit Indices from the Categorical Exploratory Factor Analysis

Factors	Chi-Square			RMSEA	CFI	TLI	SRMR
	χ^2	(df)	p				
1	1106.56	(252)*		0.12	0.86	0.84	0.1
2	748.84	(229)*		0.09	0.91	0.89	0.07
3	517.81	(207)*		0.08	0.95	0.93	0.05
4	384.45	(186)*		0.06	0.97	0.95	0.04
5	310.71	(166)*		0.06	0.98	0.96	0.04
6	222.04	(147)*		0.05	0.99	0.98	0.03

Note. χ^2 = chi square goodness of fit statistic; *df* = degrees of freedom; RMSEA = Root-Mean-Square Error of Approximation; CFI = Comparative Fit Index; TLI = Tucker Lewis Index; SRMR = Standardized Square Root Mean Residual; *Indicates χ^2 are statistically significant ($p < .001$).

Factor 1 (Boundaries) consisted of seven items, Factor 2 (Roles) consisted of five items, Factor 3 (Identity) consisted of five items, and Factor 4 (Relationships) consisted of five items. Some items were moved from their hypothesized placement to a new

subscale, per the results of the EFA and theoretical justification. For example, one item stated, “My concern for the consequences causes me to give them what they want” was originally hypothesized to be placed under the “fear” subscale, which was dropped due to poor factor loadings and goodness-of-fit indices. However, after careful consideration and consultation with the original scale development team, the language used for this particular item would be better assigned under the “boundaries” subscale, as family members often violate their own boundaries to avoid creating chaos in the family system. The reassignment of these variables improves the face validity of the CAS (Holden, 2010). The four factor solution was selected for the purpose of this study, although the five factor solution demonstrated a good fit to the data, after careful consideration, there were too few items that loaded onto the fifth factor to warrant its placement in the model and the four factor solution was more parsimonious (Osbourne & Costello, 2009). Furthermore, the items that loaded onto the fifth factor were theoretically uninterpretable, which made the inclusion of this factor unjustifiable.

Table 5

Rotated Loadings for Categorical EFA 4-Factor Model

Items	F1	F2	F3	F4
I have a hard time setting and enforcing limits.	0.63	-0.03	-0.01	0.31
I want to say “no”, but often do not.	0.76	-0.03	-0.24	0.32
Others tell me I do too much for my loved one.	0.68	0.18	-0.003	0.02
I do things for my loved one that I should not.	0.78	0.05	0.11	0.03
Even when I am told “no”, I still try to help.	0.44	0.45	0.07	-0.1
I spend too much time worrying about my loved one.	0.43	0.01	0.59	-0.05
My concern for the consequences causes me to give them what they want.	0.54	0.16	0.07	0.13
If I do not manage their life, they will likely relapse.	0.08	0.53	0.37	0.021
It is my job to protect their reputation.	0	0.54	0.33	0.1
I feel empty if I cannot help.	-0.05	0.64	0.15	0.09
Taking care of them helps me feel better about myself.	-0.09	0.84	-0.07	-0.03
I sacrifice my own needs to keep them from using.	0.13	0.35	0.3	0.29
I am often worried they will die.	0.33	0.035	0.5	-0.04
The addiction makes it difficult for me to have my own life.	-0.02	0.22	0.59	0.32
I make better decisions for their life than they do.	0.02	0.28	0.53	-0.1
I isolate myself to keep others from knowing about the addiction.	0	0.11	0.38	0.34
The relationship with my loved one would be better if it was not for the addiction.	-0.08	-0.08	0.52	0.2
I struggle with how I feel about myself.	-0.02	0.17	0.01	0.77
I have forgotten who I am and things I enjoy doing.	0.04	0.07	0.15	0.78
I am more concerned about their feelings than my own.	0.08	0.5	-0.08	0.49
My other relationships are suffering.	0.06	-0.13	0.56	0.42
I do not have time to invest in other relationships.	-0.13	-0.01	0.52	0.53

Confirmatory Factor Analysis. Categorical confirmatory factor analyses were used to examine the factor structure of the CAS. Per the results of the EFA conducted, the CFA included a 4-factor model (e.g., boundaries, role, identity, and relationships). According to Little's (2013) fixed factor method, the CFA loadings were freely estimated and the variances of each latent variable were constrained to one. The four factor model tested did not demonstrate a good fit to the data, it included 114 free parameters, $\chi^2(229, N=254)=1334.78, p < .001, CFI=.80, RMSEA=.14, TLI=.78,$ and $WRMR=2.18$ (Hu & Bentler, 1998). The use of modification indices (MI's) was considered, but ultimately decided against, as the intention of this study is a preliminary exploration of the CAS and using MI's may have jeopardized the true representation of the model and parsimony (Bowen, 2014). While the CFA is a theory driven approach, it can be very limiting, as items are typically only allowed to load on one factor. The restrictive nature of the CFA (e.g., set parameters, no cross-loadings, etc.) may pose a threat to the discriminant validity of the scale (Marsh, Morin, Parker, & Kaur, 2014). To resolve this issue in the present study, an alternative analysis was used to examine factor structure and model fit.

Exploratory Structural Equations Model. Although the four factor model provided the best fit to the data in the EFA, results from the CFA suggested that the data did not fit the proposed model. Therefore, an exploratory structural equation model was also estimated in which the items were allowed to load across the different factors, unlike in the CFA. Marsh et al (2013) recommended that both a CFA and ESEM should be conducted using the same data set to examine factor structure, item loadings, cross-

loadings, and factor correlations. This resulted in a better fitting model with the data, as demonstrated in Table 6 (Hu & Bentler, 1998).

Table 6
Exploratory Structural Equation Models Goodness-of-Fit Indices

Factors	Chi-Square			RMSEA	CFI	TLI	WRMR
	χ^2	<i>df</i>	<i>p</i>				
1	1088.50	(230)*		0.12	0.85	0.83	1.72
2	735.23	(208)*		0.1	0.91	0.89	1.24
3	505	(187)*		0.08	0.94	0.93	0.89
4	366.59	(167)*		0.06	0.97	0.95	0.69
5	290.63	(148)*		0.06	0.98	0.96	0.57
6	211.88	(130)*		0.05	0.99	0.97	0.44

Note. χ^2 =chi square goodness of fit statistic; *df*=degrees of freedom; RMSEA= Root-Mean-Square Error of Approximation; CFI= Comparative Fit Index; TLI= Tucker Lewis Index; WRMR= Weighted Root Mean Residual; *Indicates χ^2 are statistically significant ($p < .001$).

Similar to the results on the EFA, both the four and five factor solutions demonstrated a good model fit to the data. While the data fit both the four and five factor solutions well, after reviewing the factor loadings for each item, there were too few items that loaded onto the fifth factor to justify its inclusion in the final analyses, as it is recommended that each factor have at least three observed variables to achieve good model fit (Wang & Wang, 2012). Additionally, the few items that loaded onto the fifth factor did not appear to have any theoretical relationship with one another to represent a single factor. When items 8 and 20 were added to the ESEM, the results were consistent with the original EFA, concluding that the items did not significantly load onto any factor.

Table 7

ESEM Standardized Factor Loadings

		F1	F2	F3	F4
1	I have a hard time setting and enforcing limits.	0.63*	-0.04	-0.01	0.31
2	I want to say “no”, but often do not.	0.76*	-0.03	-0.24	0.32
3	Others tell me I do too much for my loved one.	0.68*	0.18	0	0.02
4	I do things for my loved one that I should not.	0.78*	0.05	0.11	0.03
5	Even when I am told “no”, I still try to help.	0.44*	0.45*	0.07	-0.01
6	I spend too much time worrying about my loved one.	0.43*	0.01	0.59*	-0.05
7	I am often worried they will die.	0.33	0.04	.50*	-0.04
8	If I knew they were not using, I could move on with my life.	0.13	0.29	0.24	-0.03
9	My concern for the consequences causes me to give them what they want.	0.54*	0.16	0.07	0.13
10	If I do not manage their life, they will likely relapse.	0.07	0.53*	0.37	0.02
11	It is my job to protect their reputation.	0	.54*	0.33	0.1
12	The addiction makes it difficult for me to have my own life.	-0.02	0.22	.60*	0.32
13	I feel empty if I cannot help.	-0.05	.64*	0.15	0.09
14	Taking care of them helps me feel better about myself.	-0.09	.84*	-0.07	-0.03
15	I make better decisions for their life than they do.	0.03	0.28	.53*	-0.1
16	I struggle with how I feel about myself.	-0.02	0.17	0.01	0.77*
17	I have forgotten who I am and things I enjoy doing.	0.04	0.07	0.15	.78*
18	I am more concerned about their feelings than my own.	0.09	.50*	-0.08	.49*
19	I sacrifice my own needs to keep them from using.	0.13	0.35*	0.3	0.29
20	I care for my loved one even when they do not care for me.	0.06	0.25	0.23	0.23
21	My other relationships are suffering.	0.06	-0.13	0.56	.42*
22	I isolate myself to keep others from knowing about the addiction.	0	0.11	0.38	.34*
23	The relationship with my loved one would be better if it was not for the addiction.	-0.08	-0.08	.52*	0.19
24	I do not have time to invest in other relationships.	-0.13	-0.01	.52*	.53*

Note. * $p < .001$

Additionally, the correlation between factors was examined. Because these factors are used to explain the co-addiction construct, it is assumed that the latent variables would be correlated.

Table 8

<i>ESEM Interfactor Correlations</i>				
	Boundaries	Role	Identity	Relationships
	F1	F2	F3	F4
F1	1			
F2	0.42*	1		
F3	0.33*	0.46*	1	
F4	0.36	0.34	0.28	1

Note. * $p < .001$

The other variables of interest were gender, a family history of addiction, and relationship to the client. Gender was coded as a binary variable (0 =male, 1 =female), relationship to the individual with a SUD was dummy coded to include two separate categorical variables, one for parents (0 =not parents, 1 =parents) and one for partners (0 =not a partner, 1 =partner). Family history of addiction was added to the model including the item assessing for how common addiction was in the participant's family history and if the participant had one or more people in the family with a SUD (0 =one person, 1 =more than one person) (see ESEM figure in Appendices).

An ESEM with the inclusion of these predictors is better known as a multiple-indicator multiple-cause (MIMIC) model, without the typical restrictions used in the CFA framework (e.g., specifying the structure within the model) (Asparouhov, Muthén, & Muthén, 2012). The hybrid MIMIC and ESEM approach works well with the predictor variables used for the purpose of this study, as they are categorical variables regressed onto the latent factors in model (Marsh et al., 2014). The results of the MIMIC model

within the ESEM framework demonstrated a good fit to the data, which included 190 free parameters, $\chi^2(239, N=254)=408.25, p < .001, CFI=.96, RMSEA=.06, TLI=.94,$ and $WRMR=.74$ (Hu & Bentler, 1998). Results of the ESEM MIMIC model are displayed in the following table.

Table 9
ESEM with Exogenous Predictor Variables

	Gender	Family HX	Who in the Family	Parents	Partners
Boundaries	0.74*	0.14	0.09	.47*	.52
Role	.50*	.08	.16	.60*	1.15*
Identity	.40	-.011	-.04	.56*	.71*
Relationship	.17	.12	.02	-.02	-.08

Note. Gender: 0=Male, 1=Female; Family History: 0=No one to 4=Very common; Who in the Family=0=one other family member w/SUD, 1= multiple family members w/SUD; Parents: 0=no, 1=parent, partners: 0=not a partner, 1=partner; $p < .01$.

The results of the MIMIC ESEM demonstrated a significantly positive relationship for *boundaries* with gender and parents ($p < .01$), for *role* with gender, parents, and partners ($p < .01$), and for *identity* with parents and partners ($p < .01$). There were no statistically significant results with the *relationship* subscale and the predictor variables. The addition of exogenous predictor variables includes each path in the model to be included for all exploratory variables, which may make the model less parsimonious (Asparouhov, Muthén, & Muthén, 2012).

Discussion

Developing a valid and reliable measure to assess co-addiction among family members with addiction is imperative in the field, as gathering information on other members of the system may provide researchers and clinicians with more information on the etiology and treatment of addiction. The co-addiction construct, unlike “codependency” and “enabling”, focuses on relationship dynamics where addiction is

present (Lampis, Cataudella, Busonera, & Skowron, 2017; Rotunda, West, & O'Farrell, 2004). While the term "codependency" originated within the context of addiction, it has since expanded to explain other patterns of unhealthy relationship dynamics, which could potentially be confusing for researchers and clinicians working with addiction (Beattie, 2009; Knudson & Terrell, 2012). While the measure developed for the purpose of this study is far from completion, this provides a good start to advance the understanding of clinicians and researchers working in with families with addiction. The intention of the present study was to do a preliminary analysis of a scale developed to measure co-addiction. Developing a valid and reliable measure in the field of social science can be an arduous and time-consuming process, as there are many steps and best practices to adhere to (DeVillis, 2003). One of the underlying goals of this study was to address the inequitable relationship between research and clinical practice. Historically, many scales developed to examine the relationships between family members and their loved ones struggling with addiction lacked either appropriate psychometric properties or underdeveloped theory to explain the identified factors.

The following portion of this section will discuss the results as they relate to the proposed hypotheses of this study.

- 1. Using an exploratory factor analysis, there will be five underlying factors that will explain the co-addiction construct best.*

Although the hypothesized five factor model fit the data well, as demonstrated by the results of the EFA, the best solution was a four-factor model. The fear subscale was dropped, as a four-model solution fit the data better and was more theoretically justifiable than the five-factor solution. The element of fear, while important to consider, may be a

motivating principle among individuals with a loved one struggling with addiction, but was not empirically supported. It is important to note that while the *fear* subscale was not empirically supported, the concept is still valuable for clinicians and researchers to consider. Fear is an innate response that humans possess, designed to avoid painful experiences and increase pleasure (Orazi & Pizzetti, 2015).

2. *The co-addiction scale developed for this study will have adequate internal reliability and validity, demonstrated by using appropriate scale development protocol, through confirmatory factor analysis and goodness of fit indices.*

Cronbach (1971) posited that a measure's reliability and validity requires the use of the measure in several studies. The results of the present study suggest that the four identified factors found to explain the construct of co-addiction demonstrated good internal reliability but more research should be done to ascertain the scale's true internal reliability and validity. The results of the bivariate correlation also yielded results consistent with what would be assumed when examining the relationship between co-addiction and the FAD and HCRM, increasing the convergent validity of the CAS. There was a significantly negative relationship between family functioning and the co-addiction subscales, suggesting that the more dysfunctional the family is, the more likely they are to score higher on the CAS. Similarly, there was also a significantly negative correlation between the CAS and all of its respective subscales and the HCRM. These results imply that as participants report higher levels of co-addiction, they also report lower levels of hope and coping skills.

To determine external validity of this measure, further examination using a more diverse sample will be necessary, as one preliminary study cannot determine appropriate findings to support construct validity (Cronbach, 1971).

3. *The data collected for this study will demonstrate an adequate goodness-of-fit per the proposed structural model.*

While the results of the CFA did not demonstrate an adequate model fit, the results of the ESEM with a four factor solution provided a good fit to the data. The ESEM combines the EFA, CFA, and SEM framework and is less restrictive than the CFA or other structural equation models (Marks, Morin, Parker, & Kaur, 2013). While it is important to examine how each item loads onto each factor, as done in an EFA, the “number and pattern of loadings between the observed variables and the latent factor variables” are not identified (Bollen, 2002, p. 615). The typical resolution to this would be to conduct a CFA, however, as aforementioned, this method is too specific and restrictive, especially for an exploratory, preliminary study (Bollen, 2002). Although the ESEM is imperfect and a relatively new form of data analysis, its flexibility allows for a better model fit than a restrictive CFA. ESEM has been used in other social science studies examining scales with factor structures and items that do not always yield the best results within the CFA framework, such as the Big Five Personality scale (Marsh et al., 2010), the six-factor Adolescent Peer Relations Instrument (Marsh et al., 2011), resolving some issues related to poor model fit through the use of a CFA (Marsh, Morin, Parker, & Kaur, 2014). It is not uncommon for a well-fitting EFA to not demonstrate an adequate model fit with a CFA, which leads researcher to use post hoc modification indices to achieve a better data fit. While these techniques are adequate, they can lead to problems,

including a misrepresentation of results and model misspecification (Asparouhov, Muthén, & Muthén, 2012). Many researchers agree that another solution to a poor fitting CFA would be to use item parceling techniques (Little et al., 2002), however, this could create several problems:

- (a) The basic assumption of pure unidimensionality is rarely met; (b) biased parameter estimates (e.g., inflated factor correlations) evident in analyses at the item level are not corrected; and (c) results provide such misleadingly good fit indexes that applied researchers, reviewers, and readers might be misled into believing that misspecification problems are resolved (Marsh et al., 2013 as cited in Marsh, Morin, Parker, & Kaur, 2014, p. 92).

Considering the nature of the data collected for this study, the items that comprised each factor were often correlated with other factors. A CFA possesses simple measurement structure, where each item is restricted to load on only one factor. This restrictive data analysis technique can pose as a problem when doing social science research, as the factors that are found to explain a construct are often correlated and have items that cross-load onto multiple factors (Marsh et al., 2010).

- 4. *Being female will be a more positive predictor of co-addiction than being male, as demonstrated by the results in the proposed structural model.*

Historically, the available literature on relationships when addiction is present has been heavily focused on women (Cowan & Warren, 1994). These biases in the literature tend to overly pathologize women for enabling their male partners, promoting feelings of guilt and shame (Dear & Roberts, 2002). While there are unique characteristics associated with relationships when addiction is present, it is important to examine gender

differences to determine whether the scale is valid and reliable across different populations. Results of the MIMIC ESEM found there to be a significantly positive relationship ($p < .01$) between gender and all subscales, with the exception of *relationships*.

The results of the independent samples t-test and ESEM suggest that gender really does have an effect on the co-addiction subscales. In this particular study, women tend to have higher mean scores on the co-addiction subscales than men, supporting this hypothesis. While these results allow researchers and clinicians to be mindful of gender differences, it is important to recognize that there may be other confounding factors that influence such results. For example, women are often socialized to be the family caretakers, as opposed to their male counterparts who are socialized to be the family's primary breadwinners (Coltrane, 2009). Cultural influences may also play a part in identifying roles within the family system. Considering that the majority of this sample identified their religious affiliation as Christian and these data were collected in the southwestern region of the United States, these cultural factors may have influenced the relationship between gender and co-addiction.

Another interesting and noteworthy observation that may aid in the explanation of the relationship between women, men, and the co-addiction subscales is that there were more women in this study who reported having multiple family members struggling with addiction ($\mu=.59$, $SD=.49$) than the men ($\mu=.46$, $SD=.50$). While the results of the independent samples t-test for gender and family members with addiction was not significant, it is still worth mentioning, as a family history of addiction may suggest that the females in this study were more exposed to addiction in their families of origin than

men. Thus, suggesting that the women may have inherited certain behaviors or characteristics associated with co-addiction than the men in the study. The inheritance of such behaviors could be associated with transgenerational patterns of family functioning (Steinglass, 1985). Through the lens of a family systems theory perspective, behaviors are often passed on throughout many generations and changing such behaviors may disrupt the homeostatic harmony within the family system (Bateson, 1972).

5. *Family members who reported a family history of addiction will be a more positive predictor of co-addiction than those who did not, measured by the results in the structural model.*

The results of the MIMIC ESEM with family history were not significant. Although the results of the study were not significant, the purpose of this study was to begin a preliminary evaluation of the co-addiction construct, however, future research should include which family history variables most influence co-addiction among the participants.

6. *Parents will be a more positive predictor of co-addiction than partners, as demonstrated by the results in the proposed structural model.*

This hypothesis was supported by the MIMIC ESEM, as the results for parents demonstrated a significantly positive relationship among all of the CAS subscales with the exception of *relationship*. Additionally, there was a significantly positive relationship with the co-addiction subscales *role* and *identity* and partners.

The effect size measures were calculated using Cohen's *d*, ranging from small ($d=.2$) to medium ($d=.5$) effect sizes (Cohen, 1994). For the roles subscale, between the parents and partners groups, with a Cohen's *d* of 0.3, 62% of the participants from the

parent group will be above the mean of the partners group, 88% of the two groups will overlap, and there is a 58% chance that a person picked at random from the parent group will have a higher score than a person picked at random from the partner group. For the identity subscale, with a Cohen's d of 0.5, 69% of the parent group will be above the mean of the partner group, 80% of the two groups will overlap, and there is a 64% chance that a person picked at random from the parent group will have a higher score than a person picked at random from the partner group. For the relationship subscale, with a Cohen's d of 0.4, 66% of the parent group will be above the mean of the partner group, 84% of the two groups will overlap, and there is a 61% chance that a person picked at random from the parent group will have a higher score than a person picked at random from the partners group. Although both the parents and partners groups were both significant for the roles, identity, and relationships subscales, the effect size results support the hypothesis that parents will demonstrate a more positive relationship with the CAS than partners.

These results offer new insight into the relationship dynamics among families with addiction. Although the hypothesis was supported, it is important to consider the unique dynamics that distinguish the difference between parent-child relationship and a committed couple relationship (Turner, Irwin & Millstein, 2014). One explanation of why partners who have loved ones struggling addiction may have a more positive relationship with the co-addiction subscales could be due to the partner's inability to set limits with their loved ones in fear that they may lose the relationship (Knudson & Terrell, 2012). Parents with children struggling with addiction may be able to set limits with their children because they do not fear the loss of the relationship in the same way as in a

romantic partnership. Partners could also fear that if they alter their behaviors or stop sacrificing their own wellbeing for their loved ones, that they will lose the relationship (Knudson-Martin, 2015). This fear of loss may motivate some to stay in an unhealthy relationship, as their new purpose in life may be to care for their partner struggling with addiction. While there may be the fear of their loved one dying across groups, family relationships between a parent and child may seem more permanent than a committed partnership.

Furthermore, while only the parent group demonstrated a significant relationship with the *boundary* subscale, the other subscales (e.g., roles, identity, and relationships) should be further examined to understand the unique differences between parents and partners in relation to the co-addiction construct. For example, although it is not necessarily healthy, parents may perceive their behaviors to be more acceptable as it relates to their parental identity, role as a parent, and relationship with their child. Whereas partners with a loved one struggling with a SUD may perceive their relationship dynamics as it relates to these subscales as more problematic. Moreover, it is important for clinicians to consider the differences between partners and parents when working with this population.

Clinical Implications

The co-addiction scale provides information for clinicians working with individuals, couples, and families struggling with addiction. Examining the factors that explain co-addiction can aid clinicians in which areas to focus on in treatment and how to help family members with an addicted loved one. Unfortunately, I have found there to be an inequitable relationship among researchers and clinicians, especially as it relates to understanding addiction. The development of the co-addiction scale could not only aid

researchers in developing a more comprehensive understanding of addiction, but it could also provide clinicians with insight to inform best treatment practices.

Whether the clinician is working with the individual struggling with addiction, or with multiple dyads within a system, it is important to be mindful of the relational implications that may have contributed to the etiology of addiction and may perpetuate the cyclical nature of the disease within the family system. While the current treatment standard has been more inclusive of the family in the treatment of addiction, the vast majority of clinical work and research is focused on the individual. More research in this area needs to be done to inform clinicians of both gender differences and variations in relationships (e.g., partners, parents, etc.) when working with this population. Additionally, clinicians may benefit from doing an assessment on whether their clients have a family history of addiction, as this information may provide more insight into their presenting problems.

Limitations and Future Directions

When addressing the limitations and future directions of this study, it is important to note that while this was a preliminary study, the co-addiction scale as is fails to generate a reliable and valid factor structure. The data fit both a four and five-factor model, but the items were highly correlated and potentially ambiguous. Regarding convergent validity, this scale will need to be tested across various samples (e.g., a less homogenous sample) to hopefully gain less positively skewed results (Cronbach, 1971). The items on the Likert-type scale had to be collapsed to create a more normal distribution for each item (West, Finch, & Curran, 1995). While it is often difficult to predict, researchers should aim to have items on a scale that are less likely to generate non-normal distributions (Horn, 1965). This could be resolved during scale development

by expanding the pool of questions, inclusive of positively and negatively worded items (DeVillis, 2003). Moreover, while trying to adhere to appropriate scale development protocol, it is not recommended to use a sample size that is too homogenous, as the results may compromise the stability and generalizability of the overall scale (Tabachnick & Fidell, 2001; Worthington & Whittaker, 2016). The data used for the purpose of this study were secondary, which challenged our ability to select a less homogenous group and follow the most appropriate scale development protocol (DeVillis, 2003). Although addiction can impact anyone, regardless of gender, sexual orientation, race, and ethnicity, collecting a more diverse sample from a residential treatment center may be a challenge, as those who are in a residential treatment center typically have the resources (e.g., financial, insurance coverage) to cover the cost.

Regarding the items developed for the preliminary analysis of the scale, many of the items were ambiguously worded or were “double barreled” questions, meaning that they were asking about two concepts in one question (DeVillis, 2003). For example, one item on the measure asked, “I have forgotten who I am and things I enjoy” which is asking about two separate concepts: 1) who I am and 2) what are things I enjoy. These types of questions may be confusing for participants, which may result in inaccurate responses or provide motivation for the participant to not respond to the question. An example of an ambiguously worded question was, “I am often worried they will die.” Although we are assuming that based on the context of the assessment items that the participants understand that they are responding about their loved one dying from an addiction, the question is still misleading. Future research should reevaluate the items generated for the CAS and make adjustments based on the results of this study.

Additionally, while the *fear* subscale was removed from the final model, the concept is still of value and is worth consideration from both researchers and clinicians. More research should be done to examine the physiological fear responses among individuals with a loved one struggling with addiction.

Another limitation of this study is that nonindependence was not considered during data analysis. These data were collected from family members of clients in a residential treatment center for a SUD. Many of the clients had multiple family members present to support them, whereas others only had one. This would suggest that many of the participants would have been answering questions in relation to one person, meaning that these data were dyadic in nature. In future studies, the methodology should be mindful of the dyadic nature of the data and conduct analyses that distinguish between inter and intra person correlations and whether it affects the outcomes of the study (Kashy & Snyder, 1995).

While conducting a retrospective study has some benefits, it may have been a limitation of this study. Some of the limitations may be that the results generated from the study could be biased and confounding (Correa, 2011). The participants of the current study were already exposed to the information during the structured family program, which may have influenced the way in which they responded. Furthermore, the nature of the structured family program is therapy intensive and is often emotionally exhausting for the participants. At the end of the family program, having participants recall their experiences and behaviors prior to attending the family program and after may have been challenging for some, as they may have experienced fatigue while completing the lengthy survey. The retrospective sampling method for the purpose of this study may have posed

a threat to the scale's reliability. Additionally, considering the way in which we have presented the insidious nature of co-addiction in this study, a quantifiable change from time point one to time point two in this sample after two and a half days seems improbable. I believe it would be comparable to an individual struggling with addiction to improve after two and a half days of residential treatment. Based on these reasons, both time points were not used in the preliminary analyses to examine how these data fit the co-addiction model.

Although the ESEM has many benefits and is far less restrictive than the frequently used CFA, it does have some limitations. One limitation is that because the type of analysis is so new, more research is needed to determine how applicable goodness-of-fit indices are to determine adequate factor structure (Asparouhov, Muthén, & Muthén, 2012). Another limitation is that the ESEM cannot regulate model parsimony (Marsh et al., 2010). This suggests that a proposed model may fit the data well, but it is difficult to determine which model to select due to the discrepancy in the literature regarding appropriate fit indices. However, because the ESEM is a combination between a CFA and an EFA, both theory and empirically supported evidence should both be considered.

Conclusion

In summary, addiction is a disease that impacts not only the individual dependent on substances (e.g., drugs and/or alcohol), but the entire family system (Cavaiola, 2000). While this was only a preliminary evaluation of the co-addiction scale, the factors identified that explain the construct may inform the work of researchers and clinicians. Future research on this topic should include the revision of the scale items (e.g., double barreled questions), collecting data from a nonclinical sample (e.g., family members who

have an addicted loved one who has not sought treatment), and attending other issues listed in the limitations section of this paper (e.g., retrospective research, nonindependence). This scale started with 24 items and per the results of the analyses conducted for this study, ended with 22 items and a four factor solution.

References

- Aikins, R. D. (2015). From recreational to functional drug use: The evolution of drugs in american higher education, 1960-2014. *Historical Education*, 44(1), 25-43.
- Allen, I. E. and Seaman, C. A. (2007). Likert scales and data analyses. *Quality progress*, 40(7), 64.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
- Amlung, M. and MacKillop, J. (2014). Understanding the effects of stress and alcohol cues on motivation for alcohol via behavioral economics. *Alcoholism: Clinical and Experimental Research*, 38(6), 1780-1789.
- Anderson, S. C. (1994). A critical analysis of the concept of codependency.
- Aponte, H. J. (1992). Training the person of the therapist in structural family therapy. *Journal of Marital and Family Therapy*, 18(3), 269-281.
- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, 55, 469-480.
- Asparouhov, T. and Muthén, B. (2009). Exploratory structural equation modeling. *Structural Equation Modeling*, 16, 397-438.

- Atkinson, S. J. and Fischer, J. L. (1996). Factors affecting codependent's support group attendance. *Alcoholism Treatment Quarterly*, 14(1), 11-20.
- Barnard, M. and McKeganey, N. (2004). The impact of parental problem drug use on children: What is the problem and what can be done to help? *Addiction*, 99(5), 552-559.
- Bateson, G. (1972). *Steps to an ecology of mind*. New York, NY: Ballantine.
- Beattie, M. (2009). *The new codependency*. New York, NY: Simon & Schuster.
- Belin-Rauscent, A., Fouyssac, M., Bonci, A., and Belin, D. (2016). How preclinical models evolved to resemble the diagnostic criteria of drug addiction. *Biological Psychiatry*, 79(1), 39-46.
- Benishek, L. A., Kirby, K. C., and Legget Dugosh, K. (2011). Prevalence and frequency of problems of concerned family members with a substance using loved one. *American Journal of Drug and Alcohol Abuse*, 37(2), 82-88.
- Bentler, P. M. and Bonnet, D. G. (1980). Significance tests and goodness-of-fit in the analysis of covariance structures. *Psychological Bulletin*, 88, 588-606.
- Bentler, P. M. and Kano, Y. (1990). On the equivalence of factors and components. *Multivariate Behavioral Research*, 25, 67-74.
- Borsboom, D. (2006). The attack of the psychometricians. *Psychometrika*, 71(3), 425-440.
- Bortolon, C. B., Signor, L., Moreira, T. C., Figueiro, L. C., Benchaya, M. C., Machado, C. A., Ferigolo, M., and Barros, H. M. T. (2016). Family functioning and health issues associated with codependency in families of drug users. *Ciencia & Saude Coletiva*, 21(1), 101-107.

- Bollen, K. A. (2002). Latent variables in psychology and the social sciences. *Annu. Rev. Psychol.*, 53, 605-634.
- Bowen, M. (1974). Alcoholism as viewed through family systems theory and family psychotherapy. *Annals of the New York Academy of Sciences*, 233(1), 115-122.
- Bowen, M. (1985). *Family therapy in clinical practice*. New York: Jason Aronson.
- Bland, H. W., Melton, B. F., Welle, P., and Bigham, L. (2012). Stress tolerance: New challenges for millennial college students. *College Student Journal*, 46(2), 362-376.
- Brown, F. G. (1983). *Principles of educational and psychological testing* (3rd ed.). New York: Holt, Rinehart, & Winston.
- Cadet, J. L. (2014). Epigenetics of stress, addiction, and resilience: Therapeutic implications. *Molecular Neurobiology*, 53, 545.
- Carnes, P. J. (1983). *The sexual addiction*. Center City, MN: Hazelden.
- Chang, L. (1994). A psychometric evaluation of 4-point and 6-point likert-type scales in relation to reliability and validity. *Applied Psychological Measurement*, 18(3), 205-215.
- Cheung, G. W. and Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, 9(2), 233-255.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112(1), 155-159.
- Cohen, J. (1994). The earth is round. *American Psychologist*, 49(12), 997-1003.
- Collins, L. M., and Wugalter, S. E. (1992). Latent class models for stage-sequential dynamic latent variables. *Multivariate Behavioral Research*, 27, 131-157.

- Coltrane, S. (2004). Elite careers and family commitment: It's (still) about gender. *The Annals of the American Academy of Political and Social Science*, 596, 214-220.
- Converse, J. M. and Presser, S. (1986). *Survey questions: Handcrafting the standardized questionnaire*. Newbury Park, CA: Sage.
- Correa, P. R. (2011). Limitations of retrospective research *American Journal of Psychiatry*, 168(4), 436-437.
- Covington, S. (2000). *Awakening your sexuality: A guide for recovering women*. Center City.
- Cowan, G. and Warren, L. W. (1994). Codependency and gender-stereotyped traits. *Sex Roles*, 30(9-10), 631-645.
- Cronbach, L. J. (1971). "Test Validation," in *Educational measurement*, 2nd ed., Thorndike, R. L., ed. Washington D.C.: American Council on Education, 443-507.
- Cronbach, L. J. and Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin*, 52(4), 281-302.
- Cullen, J. and Carr, A. (1999). Codependency: An empirical study from a systemic perspective. *Contemporary Family Therapy*, 21, 505-526.
- Dawson, D. A., Grant, B. F., Chou, S. P., and Stinson, F. S. (2007). The impact of partner alcohol problems on women's physical and mental health. *Journal of Studies on Alcohol and Drugs*, 68, 66-75.
- Dear, G. E. (2002). The Holyoake codependency index: further evidence of factorial validity. *Drug and Alcohol Review*, 21, 47-52.

- Dear, G. E. and Roberts, C. M. (2000). The Holyoake codependency index: Investigation of the factor structure and psychometric properties. *Psychological Reports, 87*, 991-1002.
- Doba, K., Nandrin, J-L., Dodin, V., and Antoine, P. (2014). Is there a family profile of addictive behaviors? Family functioning in anorexia nervosa and drug dependence disorder. *Journal of Clinical Psychology, 70*(1), 107-117.
- Donovan, J. E. (2004). Adolescent alcohol initiation: A review of psychosocial risk factors. *Journal of Adolescent Health, 35*(6), 529-e7.
- Duggan, A. P., Dailey, R. M., & Le Poire, B. A. (2008). Reinforcement and punishment of substance abuse during ongoing interactions: A conversational test of inconsistent nurturing as control theory. *Journal of Health Communication, 13*, 417-433.
- England Kennedy, E. S. and Horton, S. (2011). "Everything that I thought they would be, they weren't:" Family systems as support and impediment to recovery. *Social Science & Medicine, 73*, 1222-1229.
- Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., and Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods, 4*(3), 272-299.
- Fagan-Pryor, E. C. and Haber, L. C. (1992). Codependency: Another name for bowen's undifferentiated self. *Perspectives in Psychiatric Care, 28*(4), 24-28.
- Fingerman, K. L., Cheng, Y. P., Wesselmann, E. D. Zarit, S., Furstenberg, F. and Birditt, K. S. (2012). Helicopter parents and landing pad kids: Intense parental support of grown children. *Journal of Marriage and Family, 74*(4), 880-896.

- Finney, S. J. and DiStefano, C. (2013). Non-normal and categorical data in structural equation modeling. In G. R. Hancock & R. O. Mueller (Eds.), *Structural equation modeling: A second course, 2nd Edition* (pp. 439-492). Charlotte, NC: Information Age Publishing.
- Fischer, J. L., Spann, L., and Crawford, D. (1991). Measuring codependency. *Alcoholism Treatment Quarterly*, 8(1), 87-100.
- Friedenberg, L. (1995). *Psychological testing: Design, analysis, and use*. Boston, MA: Allyn and Bacon.
- Fuller, J. A. and Warner, R. M. (2000). Family stressors as predictors of codependency. *Genetic Social and Genetic Psychology Monographs*, 126(1), 5-22.
- Gadermann, A. M., Guhn, M., and Zumbo, B. D. (2012). Estimating ordinal reliability for likert-type and ordinal item response data: A conceptual, empirical, and practical guide. *Practical Assessment, Research, and Evaluation*, 17(3), 1-13.
- Glowacki, E. M. (2016). Communication about problematic drinking between young adults and their parents: An application of inconsistent nurturing as control theory. *Health Communication*, 31(9), 1135-1144.
- Haverfield, M. C. and Theiss, J. A. (2015). A theme analysis of experiences reported by adult children of alcoholics in online support forums. *Journal of Family Studies*, 20(2), 166-184.
- Hogarth, L., Balleine, B. W., Corbit, L. H., and Killcross, S. (2013). Associative learning mechanisms underpinning the transition from recreational drug use to addiction. *Annals of the New York Academy of Sciences*, 1282(1), 12-24.

- Hoenigmann-Lion, N. M. and Whitehead, G. I. (2007). The relationship between codependency and borderline and dependent personality traits. *Alcoholism Treatment Quarterly*, 24(4), 55-77.
- Holden, R. R. (2010). Face validity. *Corsini Encyclopedia of Psychology*, 1-2.
- Hopkins, L. M. & Jackson, W. (2002). Revisiting the issue of codependency in nursing: Caring or caretaking? *Canadian Journal of Nursing Research*, 34(4), 35-46.
- Hu, L. and Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods*, 3, 424-453.
- Hummel, A., Shelton, K. H., Heron, J., Moore, L. and van den Bree, M. B. M. (2012). A systematic review of the relationship between family functioning, pubertal timing and adolescent substance use. *Addiction*, 108, 487-496.
- Jackson, D. D. (1957). The question of family homeostasis. *Psychiatric Quarterly Supplement*, 31, 79-90.
- Kahler, C. W., McCrady, B. S., Epstein, E. E. (2003). Sources of distress among women in treatment with their alcoholic partners. *Journal of Substance Abuse Treatment*, 24(3), 528-540.
- Kashy, D. A. and Snyder, D. K. (1995). Measurement and data analytic issues in couples research. *Psychological Assessment*, 7(3), 338-348.
- Klostermann, K. and O'Farrell, T. J. (2013). Treating substance abuse: Partner and family approaches. *Social Work in Public Health*, 28, 234-247.

- Knudson-Martin, C. (2015). When therapy challenges patriarchy: Undoing gendered power in heterosexual couple relationships. In *Socio-emotional relationship therapy* (pp. 15-26). Springer International Publishing.
- Knudson, T. M. and Terrell, H. K. (2012). Codependency, perceived interparental conflict, and substance abuse in the family of origin. *The American Journal of Family Therapy, 40*, 245-257.
- Lampis, J., Cataudella, S., Busonera, A., and Skowron, E. A. (2017). The role of differentiation of self and dyadic adjustment in predicting codependency. *Contemporary Family Therapy, 39*, 69-72.
- Lander, L., Howsare, J., and Byrne, M. (2013). The impact of substance use disorders on families and children: From theory to practice. *Social Work in Public Health, 28*, 194-205.
- Langeheine, R., Pannekoek, J., and Van De Pol, F. (1996). Bootstrapping goodness-of-fit measures in categorical data analysis. *Sociological Methods Research, 24*, 492-516.
- Lee, B. K. (2014). Where codependency takes us: A commentary. *Journal of Gambling Issues, 29*, 1-5.
- Leonard, K. E. and Eiden, R. D. (2007). Marital and family processes in the context of alcohol use and alcohol disorders. *Annual Review of Clinical Psychology, 3*, 285-310.
- Lewis, V., Allen-Byrd, L., and Rouhbakhsh, P. (2004). Understanding successful family recovery in treating alcoholism. *Journal of Systemic Therapies, 23*(4), 39-51.

- Likert, R. (1932). A technique for the measurement of attitudes. *Archives of Psychology*, 22(140), 1-55.
- Lindley, N. R., Giordano, P. J., and Hammer, E. D. (1999). Codependency: Predictors and psychometric issues. *Journal of Clinical Psychology*, 55(1), 59-64.
- Little, T. D. (2013). *Longitudinal structural equation modeling*. Guilford Press.
- Little, T. D., Cunningham, W. A., Shahar, G., and Wildaman, K. F. (2002). To parcel or not to parcel: Exploring the questions and weighing the merits. *Structural Equation Model*, 9, 151-173.
- Lubke, G. H. and Muthén, B. O. (2004). Applying multigroup confirmatory factor models for continuous outcomes to likert scale data complicates meaningful group comparisons. *Structural Equation Modeling*, 11, 514-534.
- Mann, K. (2000). One hundred years of alcoholism: The twentieth century. *Alcohol and Alcoholism*, 35, 10-15.
- Marks, A.D. G., Hine, D. W., and Dear, G. E. Development and validation of a revised measure of codependency. *Australian Journal of Psychology*, 64, 119-127.
- Marsh, H. W., Ludtke, O., Nagengast, B., Morin, A. J. S., and Von Davier, M. (2013a). Why item parcels are (almost) never appropriate: Two wrongs do not make a right – camouflage misspecification with item parcels in CFA models. *Psychological Methods*, 18, 257-284.
- Marsh, H. W. and Richards, G. E. (1986). The rotter locus of control scale: The comparison of alternative response formats and implications for reliability, validity, and dimensionality. *Journal of Research in Personality*, 20, 509-558.

- Marshal, M. P. (2003). For better or for worse? The effects of alcohol use on marital functioning. *Clinical Psychology Review*, 23, 959-997.
- McAweeney, M. J., Zucker, R. A., Fitzgerald, H. E., Puttler, L. I., and Wong, M. M. (2005). Individual and partner predictors of recovery from alcohol-use disorder over a nine-year interval: Findings from a community sample of alcoholic married men. *Journal of Stud. Alcohol*, 66, 220-228.
- Minuchin, P. (1985). Families and individual development: Provocations from the field of family therapy. *Child Development*, 56, 289-302.
- Minuchin, S. and Fishman, H. C. (1981). *Family Therapy Techniques*. Cambridge, MA: Harvard University Press.
- Morin, A. J. S., Marsh, H. W., and Nagengast, B. (2013). Exploratory structural equation modeling. In G. R. Hancock & R. O. Mueller (Eds.), *Quantitative methods in education and the behavioral sciences: Issues, research, and teaching. Structural equation modeling: A second course* (pp. 395-436). Charlotte, NC: IAP Information Age Publishing.
- Murphy, C. M., O'Farrell, T. J., Fals-Stewart, W., Feehan, M. (2001). Correlates of intimate partner violence among male alcoholic patients. *Journal of Consulting Clinical Psychology*, 69(3), 528-540.
- Muthén, L. K. and Muthén, B. (2002). How to use a monte carlo study to decide on sample size and determine power. *Structural Equation Modeling*, 9(4), 599-620.
- Naylor, M. E.. and Lee, B. K. . (2011). The dawn of awareness: Womens claiming of self in couple relationship with substance abusers.. *International Journal of Mental Health and Addiction*, 9(6), 627–644.

- Noriega, G., Ramos, L., Medina-Mora, M. E., and Villa, A. R. (2008). Prevalence of codependence in young women seeking primary health care and associated risk factors. *American Journal of Orthopsychiatry*, 78(2), 199-210.
- O'Leary, K. D. & Schumacher, J. A. (2003). The association between alcohol use and intimate partner violence: Linear effect, threshold effect, or both? *Addictive Behavior*, 28, 1575-1585. s
- Olson, D. H. and Gorall, D. M. (2006). FACES IV & the circumplex model.
- Orazi, D. C. and Pizzetti, M. (2015). Revisiting fear appeals: A structural re-inquiry of the protection motivation model. *International Journal of Research in Marketing*, 32, 223-225.
- Oreo, A. and Ozgul, S. (2007). Grief experiences of parents coping with an adult child with problem substance use. *Addiction Research and Theory*, 15(1), 71-83.
- Orford, J., Templeton, L., Velleman, R., and Copello, A. (2010). Methods of assessment for affected family members. *Drugs: education, prevention and policy*, 17(S1), 71-85.
- Orford, J., Velleman, R., Natera, G., Templeton, L., & Copello, A. (2013). Addiction in the family is a major but neglected contributor to the global burden of adult ill-health. *Social Science & Medicine*, 78, 70-77.
- Palmer, H. and Howells, L. (2014). Family resilience and cancer: A grounded theory investigation into the experiences of families positively adjusting post cancer treatment. *Psycho-Oncology*, 23, 294-295.

- Paxton, P., Curran, P. J., Bollen, K. A., Kirby, J., and Chen, F. (2001). Monte carlo experiments: Design and implementation. *Structural Equation Modeling*, 8(2), 287-312.
- Peled, E. and Sacks, I. (2008). The self-perception of women who live with an alcoholic partner: Dialoging with deviance, strength and self-fulfillment. *Family Relations*, 57(3), 390-403.
- Reyome, N. D., Ward, K. S., and Witkiewitz, K. (2010). Psychosocial variables as mediators of the relationship between childhood history of emotional maltreatment, codependency, and self-silencing. *Journal of Aggression, Maltreatment & Trauma*, 19, 159-179.
- Rhemtulla, M., Brosseau-Liard, P. É., & Savalei, V. (2012). When can categorical variables be treated as continuous? A comparison of robust continuous and categorical SEM estimation methods under suboptimal conditions. *Psychological methods*, 17, 354-373.
- Rotunda, R. J. and Doman, K. (2001). Partner enabling of substance use disorders: Critical review and future directions. *The American Journal of Family Therapy*, 29, 257-270.
- Rotunda, R. J., West, L., O'Farrell, T. J. (2004). Enabling behavior in a clinical sample of alcohol-dependent clients and their partners. *Journal of Substance Abuse Treatment*, 26, 269-276.
- Rusnakova, M. (2014). Codependency of the members of a family of an alcohol addict. *Social and Behavioral Sciences*, 132, 647-653.
- Ryan, C. E., Epstein, N. B., & Keitner, G. I. (2005). *Evaluating and treating families:*

The McMaster approach. Taylor & Francis.

- Sachdeva, A., Choudhary, M., and Chandra, M. (2015). Alcohol withdrawal syndrome: Benzodiazepines and beyond. *Journal of Clinical and Diagnostic Research*, 9(9), VE01-VE07.
- Shumway, S. T., Dakin, J. K., Smock Jordan, S. A., Kimball, T. G., Harris, K. S., and Bradshaw, S. D. (2014). The development of the hope and coping in recovery measure (HCRM). *Journal of Groups in Addiction & Recovery*, 9(4), 280-293.
- Shumway, S. T., Schonian, S., Bradshaw, S. and Hayes, N. (in press). A revised multifamily group curriculum: The need for family member recovery from addiction. *Journal of Groups in Addiction and Recovery*.
- Shumway, S. T. and Kimball, T. G. (2012). *Six essentials to achieve lasting recovery*. Hazelden: Minnesota.
- Sijtsma, K. (2009). On the use, the misuse, and the very limited usefulness of cronbach's alpha. *Psychometrika*, 74(1), 107-120.
- Skowron, E. A., Holmes, S. E. and Sabatelli, R. M. (2003). Deconstructing differentiation: Self-regulation, interdependent relating, and well-being in adulthood. *Contemporary Family Therapy*, 25(1), 111-129.
- Soloski, K. L. and Berryhill, M. B. (2014). Gender differences: Emotional distress as an indirect effect between family cohesion and adolescent alcohol use. *Journal of Child and Family Studies*, 25, 1269-1283.
- Steinglass, P. (1985). Family systems approaches to alcoholism. *Journal of Substance Abuse Treatment*, 2, 161-167.

- Strauss, M. E. and Smith, G. T. (2009). Construct validity: Advances in theory and methodology. *Annual Review in Clinical Psychology*, 5, 1-25.
- Sullivan, G. M. and Artino, A. R. (2013). Analyzing and interpreting data from likert-type scales. *Journal of Graduate Medical Education*, 5(4), 541-542.
- Tabachnick, B. G. and Fidell, L. S. (2008). Using multivariate statistics. Boston, MA: Pearson.
- Tafà, M. and Baiocco, R. (2009). Addictive behavior and family functioning during adolescence. *The American Journal of Family Therapy*, 37, 388-395.
- Thomas, D. S. (2012). Children of alcoholic fathers: An explorative survey. *GSTF International Journal of BioSciences*, 2(1), 64-68.
- Timko, C., Young, L. B., and Moos, R. H. (2012). Al-anon family groups: Origins, conceptual basis, outcomes, and research opportunities. *Journal of Groups in Addiction & Recovery*, 7, 279-296.
- Tomarken, A. J. and Waller, N. G. (2003). Potential problems with “well fitting” models. *Journal of Abnormal Psychology*, 112(4), 578-598.
- Turner, R. A., Irwin Jr., C. E., and Millstein, S. G. (2014). Family structure, family processes, and experimenting with substances during adolescence. *Risks and Problem Behaviors in Adolescence*, 1(11), 229-247.
- Uusitalo, S. (2015). Addiction, recovery, and moral agency: Philosophical considerations. *International Journal of Alcohol and Drug Research*, 4(1), 85-89.
- Volkow, N. D., Koob, G. F., and McLellan, T. (2016). Neurobiological advances from the brain disease model of addiction. *New England Journal of Medicine*, 374, 363-371.

- Wang, J. and Wang, X. (2012). *Structural Equation Modeling: Applications using mplus*. West Sussex, United Kingdom: Wiley.
- Wegscheider-Cruse, S. (1984a). Co-dependency: An illness, describable and treatable. Rapid City, SD: Nurturing Networks, Inc.
- Wise, R. A. and Koob, G. F. (2014). The development and maintenance of drug addiction. *Neuropsychopharmacology*, 39, 254-262.
- Wolf, E. J., Harrington, K. M., Clark, S. L., and Miller, M. W. (2013). Sample size requirements for structural equation model: An evaluation of power, bias, and solution propriety. *Educational and Psychological Measurement*, 73(6), 913-934.
- Worthington, R. L. and Whittaker, T. A. (2016). Scale development research: A content analysis and recommendations for best practices. *The Counseling Psychologist*, 34(6), 806-838.
- Wright, P. J. (2008). Sexual coaddiction: A new context for inconsistent nurturing as control theory. *Sexual Addiction and Compulsivity*, 15, 1-13.
- Wright, P. H. and Wright, K. D. (1991). Codependency: Addictive love, adjustive relating or both? *Contemporary family Therapy*, 13(5), 435-454.

Appendix A

Co-Addiction Scale

Subgroups

Boundaries

1. I have a hard time setting and enforcing limits.
2. I want to say “no”, but often do not.
3. Others tell me I do too much for my loved one.
4. I do things for my loved one that I should not.
5. Even when I am told “no”, I still try to help.

Fear

6. I spend too much time worrying about my loved one.
7. I am often worried they will die.
8. If I knew they were not using, I could move on with my life.
9. My concern for the consequences causes me to give them what they want.
10. If I do not manage their life, they will likely relapse.

Role

11. It is my job to protect their reputation.
12. The addiction makes it difficult for me to have my own life.
13. I feel empty if I cannot help.
14. Taking care of them helps me feel better about myself.
15. I make better decisions for their life than they do.

Identity

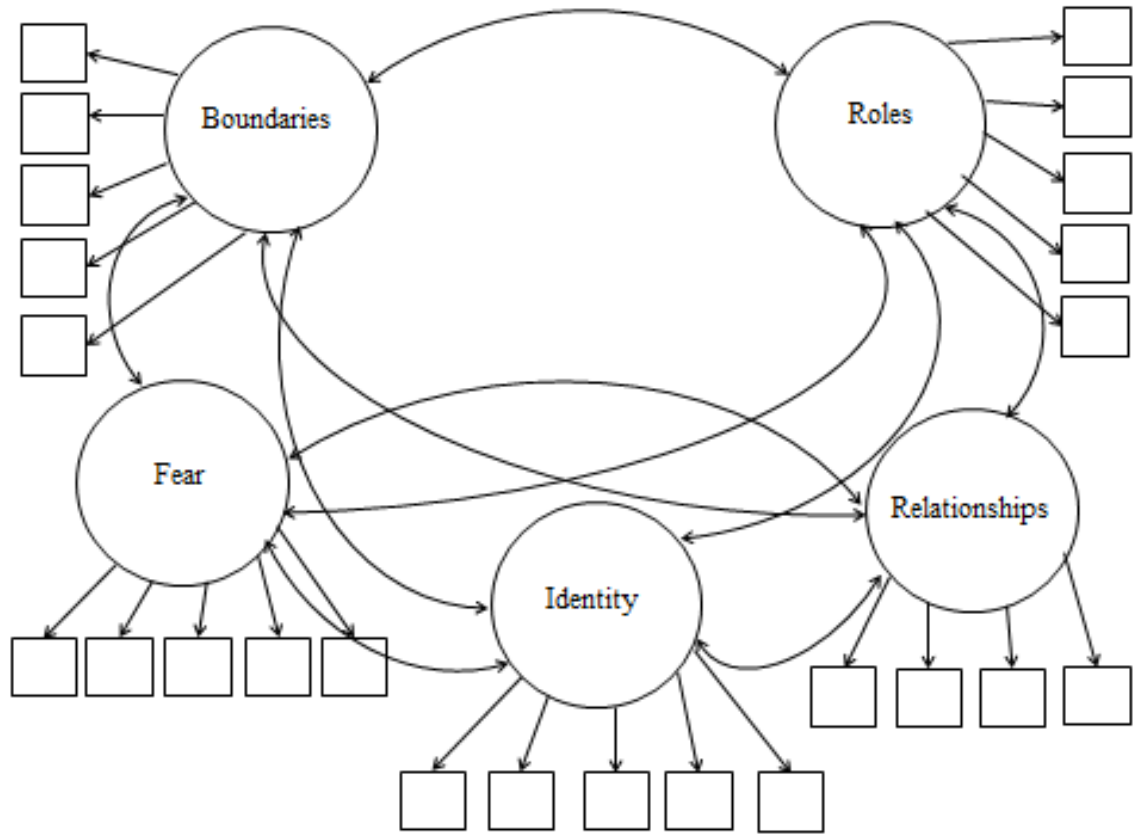
16. I struggle with how I feel about myself.
17. I have forgotten who I am and things I enjoy doing.
18. I am more concerned about their feelings than my own.
19. I sacrifice my own needs to keep them from using.
20. I care for my loved one even when they do not care for me.

Relationships

21. My other relationships are suffering.
 22. I isolate myself to keep others from knowing about the addiction.
 23. The relationship with my loved one would be better if it was not for the addiction.
 24. I do not have time to invest in other relationships.
-

Appendix B

Figure 1
Hypothesized Co-Addiction Scale Model



Appendix C

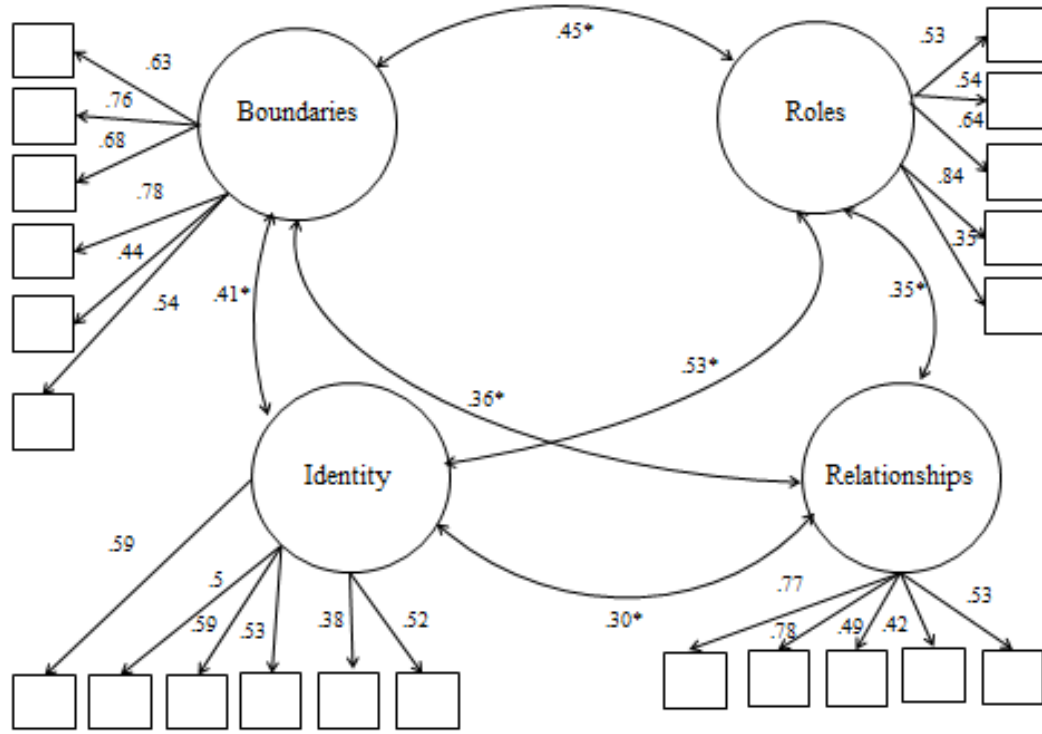
Table 10

<i>Rotated Loadings for Categorical EFA 5-Factor Model</i>					
Items	F1	F2	F3	F4	F5
I have a hard time setting and enforcing limits.	0.64	-0.05	0.08	-0.03	0.33
I want to say “no”, but often do not.	0.77	-0.22	-0.04	-0.02	0.4
Others tell me I do too much for my loved one.	0.7	0.03	0.03	0.13	0.02
I do things for my loved one that I should not.	0.79	0.16	0.01	-0.01	0
I spend too much time worrying about my loved one.	0.46	0.08	0.08	0.37	-0.08
I am often worried they will die.	0.39	0.37	0.37	0.02	-0.06
If I knew they were not using, I could move on with my life.	0.34	0.02	0.87	-0.01	0.01
My concern for the consequences causes me to give them what they want.	0.55	0.18	-0.06	0.09	0.1
If I do not manage their life, they will likely relapse.	0.09	0.53	-0.05	0.43	-0.06
It is my job to protect their reputation.	0.02	0.52	-0.11	0.45	0.02
The addiction makes it difficult for me to have my own life.	-0.02	0.65	0.15	0.15	0.2
I feel empty if I cannot help.	-0.03	0.03	0.31	0.61	0.13
Taking care of them helps me feel better about myself.	-0.03	-0.12	0.19	0.8	0.02
I struggle with how I feel about myself.	0.03	0.67	-0.03	0.17	-0.24
I have forgotten who I am and things I enjoy doing.	-0.01	0.03	0.07	0.17	0.77
I am more concerned about their feelings than my own.	0.04	0.3	-0.06	0.04	0.71
I sacrifice my own needs to keep them from using.	0.13	0.05	-0.06	0.45	0.48
I care for my loved one even when they do not care for me.	0.15	0.38	0.06	0.28	0.23

My other relationships are suffering.	0.05	0.68	0.01	-0.2	0.26
I isolate myself to keep others from knowing about the addiction.	0	0.42	0.1	0.07	0.3
The relationship with my loved one would be better if it was not for the addiction.	-0.09	0.57	0.06	-0.14	0.06
<u>I do not have time to invest in other relationships.</u>	<u>-0.14</u>	<u>0.64</u>	<u>0.02</u>	<u>-0.06</u>	<u>0.38</u>

Appendix D

Figure 2
Categorical EFA Four Factor Solution



Note. * $p < .01$.

Appendix E

Figure 3
ESEM Four-Factor Solution with Predictors

