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Identifying Risk for Atypical Parenting Behavior Using Prenatal Profiles of Interpersonal
Trauma Experiences and PTSD Symptoms

by

Katherine L. Guyon-Harris, M.S.

Dissertation

Submitted to the Department of Psychology

Eastern Michigan University

in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Clinical Psychology

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December 19, 2016

Ypsilanti, MI

Dedication

To my grandmothers, Mary Ann Guyon, M.D. and Beverly Constance Rigby, who are the
intergenerational transmission of my ambition

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Abstract

Experiences of interpersonal trauma and symptoms of PTSD greatly impact the ability to form and maintain meaningful relationships, which is especially problematic during the perinatal period due to the formation of the mother-child relationship. Interpersonal trauma and symptoms of PTSD present considerable risk for the emergence of a concerning class of “atypical” maternal behaviors (e.g., contradictory communication, sexualized/role reversed behavior, and severe withdrawal) that have serious implications for child social-emotional development. However, past research has focused primarily on how maternal experiences of childhood maltreatment and, to a lesser extent, PTSD symptom severity, predict atypical parenting behaviors. The present study aimed to better understand the association between both child- and adulthood experiences of interpersonal trauma and PTSD symptoms, and atypical parenting behaviors. One hundred twenty women from a longitudinal study that spanned from the third trimester of pregnancy through 3-years postpartum were utilized. Experiences of childhood maltreatment and intimate partner violence (IPV) were assessed during pregnancy. Atypical parenting behaviors were coded from mother-infant interactions 1-year postpartum. Bivariate associations between experiences of interpersonal trauma, prenatal PTSD symptoms, and atypical parenting behavior were few in number. Profiles of interpersonal trauma experiences and prenatal PTSD symptoms were identified using latent profile analysis. Subsequent analyses indicated that experiencing multiple types of childhood maltreatment and prenatal IPV predicted later atypical parenting behavior. Reported PTSD symptoms across clusters, as well as having less education and younger age, presented risk for atypical parenting behavior. Results increase understanding about individual differences in prenatal risk for the development of atypical parenting behavior and have implications for interventions aimed at preventing or reducing parenting problems.

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Identifying Risk for Atypical Parenting Behavior using Prenatal Profiles of Interpersonal Trauma Experiences and PTSD Symptoms

Introduction

Traumatic experiences are events that involve “exposure to actual or threatened death, serious injury, or sexual violence” which produce intense emotional reactions, including shock, horror, anger, and fear (American Psychiatric Association, 2013, p. 271). Traumatic experiences that are interpersonal in nature (i.e., those perpetrated towards human beings by human beings in close proximity) are especially distressing because they threaten fundamental human needs to belong and form protective relationships that offer safety and security (Baumeister & Leary, 1995; Charuvastra & Cloitre, 2008). In the present study, experiences of interpersonal trauma narrowed to include physical, sexual, and psychological abuse and neglect during childhood (collectively, childhood maltreatment) as well as physical, sexual, and psychological male-to-female intimate partner violence (IPV) during adulthood. Interpersonal traumas are among the most common types of traumatic experiences, and the development of posttraumatic stress disorder (PTSD) and related symptoms are more likely to occur and be of greater severity compared to non-interpersonal types of trauma, such as motor vehicle accidents, natural disasters, and terminal medical conditions and emergency medical treatments (Anders et al., 2010; Forbes et al., 2012; Miller et al., 2013). Beyond traditional symptoms of PTSD, experiences of interpersonal trauma across the lifespan also impact the development and maintenance of close relationships because they negatively impact one’s sense of trust and safety in others as well as the ability to form and maintain new relationships. One of the first, and most important, relationships is between a mother and her child. Therefore, the perinatal period (i.e.,

pregnancy through the first year postpartum) is a time of particular concern due to the formation of the mother-child relationship.

There is substantial evidence that experiences of interpersonal trauma and symptoms of PTSD negatively affect general parenting behaviors by impacting a mother's ability to form a healthy attachment with her child and respond effectively and efficiently to her child's needs. For example, numerous research studies have demonstrated that women who report experiencing interpersonal trauma exhibit decreased maternal sensitivity and engagement and increased anger and intrusiveness during interactions with their young children (e.g., Gustafsson et al., 2012; Levendosky et al., 2006; Lyons-Ruth & Block, 1996; Moehler, Biringen, & Poustka, 2007; Muzik et al., 2013; Schechter et al., 2015). A body of research, which developed out of a desire to better understand how and why experiences of interpersonal trauma are so harmful to the developing mother-child relationship, has since identified a class of less common, but more detrimental, parenting behaviors that offer some explanation for the association between a mother's own traumatic experiences and her relationship with her child. This class of behaviors has been referred to and defined in many ways, such as "atypical" or "disrupted" parenting. Such behaviors are more likely to develop in the context of interpersonal trauma, particularly when the trauma is unresolved, and lead to disorganized mother-infant attachment compared to other less-optimal parenting behaviors (Lyons-Ruth, Bronfman, & Parsons, 1999; Madigan et al., 2006, 2007).

The negative implications of atypical parenting behaviors for disorganized mother-child attachment are firmly established; however, less empirical focus has been paid to how women come to exhibit the atypical maternal parenting behaviors that then lead to disorganized infant attachment. The present study seeks to further explore the origins of atypical parenting behavior

by examining how child- and adulthood experiences of interpersonal trauma and PTSD symptoms may be related to the later occurrence of atypical maternal parenting behavior. More specifically, this study seeks to determine whether specific combinations of trauma experiences or PTSD symptom clusters measured during pregnancy present greater risk for the development of atypical parenting behaviors compared to others. This is the first known empirical investigation of predictors of atypical maternal parenting behavior identified during pregnancy. Therefore, the results of this study are expected to yield information that may inform clinical work with high-risk women such as providing ideas for how to screen for atypical parenting risks before the child is born.

Chapter 1: Interpersonal Trauma and PTSD

“The tragedy that is post traumatic stress disorder (PTSD) is brought into stark relief when the origins of the trauma occur in the context of man’s inhumanity to man.”
(Barlow, 2009, p. 65)

Interpersonal traumas are among the most common types of trauma experienced by both men and women in the general population (Miller et al., 2013) and are highly prevalent overall. The impact of interpersonal trauma is further demonstrated by the pervasive impact of such experiences on mental health as well as broader social-emotional functioning. There is particular concern about the impact of past and present experiences of trauma on functioning in the perinatal period; perinatal women are charged with not only their own well-being but the care and well-being of their new baby, leading to vulnerability for the child as well. This chapter focuses on the conceptualization of interpersonal trauma including the reasons that these experiences significantly impact the development and maintenance of interpersonal relationships in general, ending with a focus on the mother-child relationship more specifically.

Theoretical Underpinnings of the Experience of Interpersonal Trauma

Experiences of interpersonal trauma instill a sense of fear and mistrust in others by threatening one’s physical integrity and sense of safety, ultimately contrasting with natural and essential human needs to seek close relationships with others (Charuvastra & Cloitre, 2008; Herman, 1992; Levendosky & Graham-Bermann, 2000b). Interpersonal traumas are unique because they involve the use of force, threats, or coercion by another human being who overpowers and dominates the individual. These elements are absent in non-interpersonal types of trauma, such as natural disasters and motor vehicle accidents, where there is an element of loss of control but without intentional, human inflicted harm. When a human being is dominated by another human being, it greatly limits an individual’s capacity for autonomy and initiative,

and it undermines their close relationships with others (Herman, 2009). For example, the level of domination may prevent reaching out to others, resulting in a loss of support. Furthermore, even once removed from the traumatic situation, the individual may lose trust in other relationships due to having their trust violated in a previous relationship. Subsequently, they may fail to seek out new relationships that might offer safety, security, and, ultimately, the repairing experience the individual needs to begin healing (Herman, 1992). Therefore, interpersonal trauma impacts an individual's ongoing ability to form and maintain healthy relationships by engendering a view of the world and others as dangerous and threatening. Furthermore, interpersonal trauma experiences often lead to overwhelming emotions, feelings of betrayal, pain, emotional numbness, and poor stress tolerance that spur complex emotional difficulties that affect thoughts, feelings, and actions (Ehring & Quack, 2010; Herman 1992; Seng et al., 2014). Both childhood maltreatment and IPV have been associated with a wide range of social and emotional difficulties in adulthood, as well as functional impairments in various interpersonal roles, including parenting and intimate relationships (Cloitre, Miranda, Stovall-McClough, & Han, 2005; Ehring & Quack, 2010; Seng et al., 2014). The theoretical underpinnings specific to the impact of childhood maltreatment and IPV on functioning are detailed next.

Childhood maltreatment is posited to impact ongoing functioning into adulthood through the loss of trust in the adults who are supposed to provide protection and love. Perpetrators of child maltreatment can have any type of relationship to the child, but as many as 80% of perpetrators are primary parents or caregivers (U.S. Department of Health and Human Services, 2010). This is very problematic because children learn how to regulate their emotions and form relationships with others through early interactions with their caregivers. Therefore, when

caregivers are perpetrators of maltreatment, children endure not only the experience of maltreatment, but also the loss of a source of comfort as well as guidance with emotion regulation and cognitive organization (Charuvastra & Cloitre, 2008). However, in cases where parents are not the direct perpetrators of maltreatment, they may be a passive bystander who fails to protect the child, an absence, Herman (2009) argues, which is “felt as palpably as the presence of the perpetrator” (p. xiv). The paradoxical circumstance of the caregiver as a source of simultaneous fear and comfort or a similarly harmful powerless passive bystander damages the child’s sense of safety (Charuvastra & Cloitre, 2008). Not surprisingly, such failures by individuals who children expect to trust and protect them lead to future difficulties with trusting and seeking out support from others.

Experiences of child maltreatment are especially distressing to younger children due to their developing, yet greatly limited, understanding of the world. Although acts of violence and disregard towards humans are confusing and difficult to comprehend for most adults, they are exceedingly more confusing and incomprehensible to children, leading to beliefs that are often faulty and have life-long consequences (Terr, 1990). For example, children may come to the conclusion that acts of maltreatment against them were in some way their fault (Terr, 1990). Children may also feel anger towards the aggressor or themselves, which is difficult to manage and understand, especially without the support and guidance of the caregiver. This anger can be further internalized and contribute to beliefs that one is inherently bad. In this way, survivors of childhood maltreatment develop cognitive distortions about themselves and the world, as well as their interpersonal worth (Pearlman, 2003) that severely impact their views and behaviors with others. Difficulty managing both negative and positive emotions is also common, as important

sources of support (i.e., caregivers) are often unavailable to model and assist with proper emotion regulation skills (Pearlman & Curtois, 2005).

The processes implicated in IPV during adulthood and subsequent functioning are similar to those involved in childhood maltreatment. Although adults have a more sophisticated capacity for making meaning of traumatic experiences compared to children, experiences of adult IPV are still difficult to comprehend. Humans have an innate drive to ascribe meaning to events and, in the case of IPV, this process results in feeling helpless, confused, and unworthy of love and support in close relationships (Charuvastra & Cloitre, 2008). Similar to childhood maltreatment, experiences of IPV carry the loss of a close relationship, in this case, a romantic partner, in addition to the experience of trauma. Therefore, experiences of IPV can be conceptualized as a betrayal by the partner to provide love and support. Betrayal by a partner is theorized to be associated with an overwhelming flood of painful emotions (e.g., rejection) that overpowers the normal capacity to contain emotions (van der Kolk, 1987). Furthermore, individuals who experience interpersonal trauma often develop a sense of hyper-alertness to potential danger, leaving them feeling emotionally and physically exhausted (van der Kolk, 1987). Much like children exposed to maltreatment, adults experiencing IPV develop a sense of mistrust in other human beings to provide love, safety, and support, as well as a consequential conclusion that the self is unworthy of such care.

It is clear that women are vulnerable to developing severe social and emotional difficulties following interpersonal types of trauma from both child- and adulthood. Such difficulties can leave women feeling emotionally numb, unstable, and exhausted, as well as unsure of themselves and their capabilities, and untrusting of those around them. This unique host of difficulties makes the development and maintenance of relationships difficult and tenuous

for those who have experienced the forms of interpersonal traumas highlighted here. In fact, the sequelae of interpersonal trauma experiences are so complex and pervasive, a sophisticated body of literature examining personality changes in those who experience severe ongoing experiences of interpersonal trauma is growing (Cloitre et al., 2005; Herman, 1992, 2009). Such impairments are collectively referred to as complex PTSD and reach beyond the scope of the current study, which focuses on the more narrowly defined construct of PTSD defined by the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5; American Psychiatric Association, 2013). Although the literature on complex PTSD is important, it will not be reviewed here. However, future studies and extensions of this work would benefit greatly from a more broadly defined definition of trauma-related symptoms beyond the typical PTSD symptoms.

Implications for the mother-child relationship. Given the pervasive effects of child- and adulthood experiences of interpersonal trauma on the development and maintenance of close relationships, researchers have begun exploring the impact of interpersonal trauma on parenting and the mother-child relationship (e.g., Levendosky, Huth-Bocks, Shapiro, & Semel, 2003; Lyons-Ruth et al., 1999; Muzik et al., 2013). Parenting requires substantial emotional energy and emotional stability as well as the capacity to form meaningful relationships with others. Interpersonal trauma experiences generally make parenting and the formation of a healthy parent-child relationship more difficult for women due to difficulties reviewed above. However, other trauma-related symptomatology more aligned with narrowly-defined posttraumatic stress symptoms, such as intrusive recollections, avoidance and numbing, and hyperarousal also make it much more difficult for mothers to parent in a sensitive and attuned manner. A greater focus on the impact of interpersonal trauma and PTSD on parenting discussed in subsequent chapters. First, it is important to consider the high prevalence of past and present experiences of

interpersonal trauma as well as the development of PTSD symptoms during the perinatal period to highlight the need to better understand this vulnerable population.

Prevalence Rates of Interpersonal Trauma Among Women in the Perinatal Period

Rates of exposure to interpersonal trauma among women across all ages vary widely depending on both the type of sample as well as the type of interpersonal trauma being studied. For example, rates of reported childhood maltreatment (physical and/or sexual abuse) among adult women in the general population range from 14 to 20.1% (Messman-Moore et al., 2000; Risser et al., 2006), whereas rates range from 31 to 53% among high-risk samples of women, such as those seeking treatment for sexually transmitted infections in low-cost clinics (Senn et al., 2010). Similarly, rates of exposure to IPV among women in the general population range from 1.2 to 20.4% (Caetano et al., 2005; Schafer et al., 1998; Tjaden & Thoennes, 2000), whereas rates among high-risk samples of women (e.g., women in a domestic violence shelter) range from 36.3 to 96.8% (Bo Vatner et al., 2010). In sum, rates of exposure to physical, sexual, and psychological childhood maltreatment and IPV in adulthood among women fall around or below 20% in the general population and above 30% among high-risk samples. There is a great need for understanding and preventing the occurrence of interpersonal trauma and its negative sequelae among high-risk women because they experience higher rates of interpersonal trauma exposure and other adversities that lead to less optimal outcomes compared to low-risk samples of women.

Because experiences of interpersonal trauma have a vast, negative impact on the development and maintenance of close relationships (Cloitre et al., 2005; Herman, 1992; Seng, 2014), considerable attention has been paid to rates of interpersonal trauma exposure in perinatal samples of women, where the mother-child relationship is nascent. New incidences of childhood

maltreatment do not occur in adulthood, which, intuitively, makes the reporting of rates of childhood maltreatment in the perinatal period redundant with reports of rates during any other period. However, it is important to note that retrospective reporting of experiences of childhood maltreatment during the perinatal period have been shown to be higher than rates assessed during other life periods, especially among high-risk samples of women. For example, in a large epidemiological sample of pregnant women, 24.1% of African American women and 19% of non-African American women reported experiencing childhood maltreatment (Seng, Kohn-Wood, McPherson, & Sperlich, 2011). Similarly, in a smaller, low-risk sample of pregnant women, retrospective reports of childhood maltreatment were 25% for emotional abuse, 20.4% for sexual abuse, 18.2% for emotional neglect, and 18.2% for physical neglect (Lang, Gartstein, Rodgers, & Lebeck, 2010).

However, in high-risk samples of women (i.e., mostly minority, economically disadvantaged), retrospective reports of childhood maltreatment during pregnancy are even higher ranging from 47 to 82.1% for physical abuse, 47.7 to 81.2% for emotional abuse, and 28 to 80.3% for sexual abuse (Bert, Guner, & Lanzi, 2009; Huth-Bocks, Krause, Ahlfs-Dunn, Gallagher, & Scott, 2013). Rates of emotional (75%) and physical (49%) neglect are also high (Huth-Bocks et al., 2013). Compared to rates of 14–20.1% (across all types of childhood maltreatment) reported among women in the general population during all periods of life, it is clear that retrospectively reported rates of childhood maltreatment are comparable, and in some cases higher, in pregnant samples of women. When observed, higher rates may be because the salience of childhood maltreatment is amplified during pregnancy as the mother prepares to care for her own child, leading to a greater recollection of maltreatment experiences (Huth-Bocks et al., 2013). Thus, pregnancy is a particularly important time to assess for the occurrence of

childhood maltreatment as well as the impact of such experiences on the woman and her unborn child.

In the general population, rates of IPV exposure in the perinatal period are also comparable to, and in some instances higher than, rates of IPV exposure among women in the general population during all periods of life. In large, nationally representative perinatal samples of women, reported rates of IPV range from 2.9 to 8.1% in the 12 months leading up to pregnancy, 1.1 to 4.7% during pregnancy, and 12.4% in the year after pregnancy (Cha et al., 2014; Scibano et al., 2013). In some high-risk samples of women, rates of IPV during the perinatal period are more comparable to lifetime exposure rates (11.3–15.9%; Bo Vatner et al., 2010; Jackson et al., 2015). In some studies, rates of reported IPV during pregnancy have been much higher compared to rates in the general population. For instance, in a published paper using the same sample as that used in the current study, 24% of women reported experiencing physical and/or sexual IPV during pregnancy, and the percentage increased to 81% when psychological violence was included (Huth-Bocks et al., 2013). In a different perinatal sample of South African women, rates of psychological (16.6%), physical (8.8%), sexual (3.2%), or any (21.4%) IPV during pregnancy were also higher compared to large epidemiological samples in the United States (Groves et al., 2015). In the latter study, reported rates of physical (13.5%), psychological (19.6%), sexual (2.3%), or any (25%) IPV from delivery to 4-months postpartum and physical (10.6%), psychological (14.4%), sexual (2.5%), or any (17.8%) IPV from 4 to 9-months postpartum were also higher compared to epidemiological samples in the United States (Groves et al., 2015). Across studies, several contextual risk variables have also been associated with higher rates of exposure to interpersonal trauma during the perinatal period such as a history

of past interpersonal victimization (e.g., childhood maltreatment or prior experiences of IPV), lower social support, and maternal age (Groves et al., 2015; Jackson et al., 2015).

In sum, women in the perinatal period are not protected from experiences of IPV, especially when they also present with past victimization and lower social support. Furthermore, they may be more prone to remembering or being impacted by past experiences of child maltreatment when re-victimized. As mentioned previously, the known impact of interpersonal trauma on social and emotional functioning makes the perinatal period a time of particular concern and interest due to the budding mother-child relationship.

The Development of PTSD Symptoms in the Perinatal Period

The diagnosis of PTSD. In the recently released fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association [APA], 2013), the symptom structure for PTSD underwent substantial revisions, primarily a shift from a 3-cluster symptom framework to a 4-cluster framework. The intrusive recollections and hyperarousal clusters remained relatively unchanged whereas the avoidance/numbing cluster was split into two clusters: avoidance and negative alterations in cognition and mood. Intrusion symptoms are those involving dissociative reactions, flashbacks, and distressing memories that are recurrent, involuntary, and intrusive. Avoidance symptoms include avoiding internal (e.g., physiological reactions associated with the trauma experience) and external (e.g., sounds or smells associated with the trauma experience) reminders of the traumatic event. The new negative alterations of cognitions and mood cluster contains customary symptoms, including feeling detached or estranged from others or not remembering aspects of the traumatic experience as well as new symptoms pertaining to exaggerated negative beliefs about oneself, others, and the world. This addition is not surprising given literature reviewed earlier that

pointed towards the profound re-conceptualizations of the world and others than can occur following experiences of interpersonal trauma (Charuvastra & Cloitre, 2008; Herman, 1992, 2009; Janoff-Bulman, 1992). The fourth cluster contains symptoms of marked alterations in arousal and reactivity including hypervigilance, sleep disturbances, and angry outbursts. The shift to requiring negative alterations in cognition and mood ultimately led to a reformulation of the diagnosis of PTSD that facilitated its move away from the anxiety disorders section and into a new section of stress and trauma-related disorders due to the tie to an external event(s) that clearly plays a primary role in diagnosis and sets the diagnosis apart from other anxiety disorders (Friedman, Resick, Bryant, Strain, Horowitz, & Spiegel, 2011).

Rates of PTSD during the perinatal period. The national prevalence of a DSM-IV PTSD diagnosis among adults is 6.8% (Kessler et al., 2005); prevalence of DSM-5 PTSD is forthcoming. However, posttraumatic stress symptoms are more likely to develop following exposure to interpersonal compared to non-interpersonal forms of trauma (Anders et al., 2010; Forbes et al., 2012). In a nationally representative sample, women were more likely to develop PTSD (9.7% lifetime) compared to men (3.6% lifetime) following interpersonal types of trauma (Iverson et al., 2013).

Rates of PTSD following exposure to interpersonal forms of trauma vary widely depending on the sample characteristics and the type of trauma exposure being studied. For example, rates of PTSD diagnoses following exposure to IPV among women in a domestic violence shelter are much higher (38.8% point prevalence, 77.6% lifetime; Humphreys et al., 2001) than among women in the general population reporting exposure to childhood sexual abuse (e.g., 10%; Risser et al., 2006) or childhood maltreatment more generally (e.g., 21.3%; Muzik et al., 2013). Typically, PTSD symptoms are known to be associated with age and family

income (e.g., Breslau et al., 1998; Kessler et al., 2005), such that those who are younger and more economically disadvantaged report more PTSD symptoms and have higher rates of PTSD diagnoses. However, such associations have not been supported in some samples of perinatal women (e.g., Seng et al., 2011).

During the perinatal period, many studies report higher rates of PTSD symptoms and diagnoses compared to other samples of women (Seng et al., 2013). It is likely that the experience of pregnancy and raising one's own children makes memories of past childhood maltreatment more salient. For example, as a mother prepares to parent her own child, she likely reflects on her own experiences as a child and how she was parented. Even physical sensations and pain experienced as a part of a typical pregnancy may trigger past or current abuse experiences. Furthermore, symptoms of PTSD can be activated by experiences of being pregnant or caring for young children such as observing and needing to attend to infant distress. Infant distress serves to activate caregivers to take action and attend to the infant's needs, but mothers with symptoms of PTSD such as hyperarousal may be over activated by infant distress and unable to respond effectively. Furthermore, symptoms of avoidance such as emotional numbing, as well as dissociation, may inhibit a response from the mother all together.

Although it is important to understand the prevalence rate and impact of PTSD diagnosis on women and their young children, understanding the unique influences of the different symptom clusters is also beneficial. The diagnosis of PTSD is multifaceted, and one individual who meets diagnostic criteria for PTSD likely has a very different symptom profile compared to another individual with PTSD (e.g., King et al., 1998; Krause et al., 2007; Simms et al., 2002). That is, heterogeneity in meeting diagnostic criteria for PTSD has been repeatedly noted in the literature. However, no known studies to date have examined how differences in presentations

of PTSD symptoms among women who have experienced childhood maltreatment and/or IPV may differentially affect parenting. Therefore, consideration of the symptoms that are most problematic for subsequent parenting, in light of specific types of trauma experiences, may be beneficial.

The heterogeneity of PTSD. PTSD researchers have found evidence for a variety of factor structures underlying PTSD for several decades (see Armour et al., 2016), yet much of the research on PTSD symptoms during the perinatal period has relied solely on symptom totals or severity ratings as well as a formal diagnosis of PTSD based on clinical interview. The diagnosis of PTSD is complex and can be made up of numerous symptom compositions. For instance, the current DSM-5 (APA, 2013) diagnosis of PTSD requires endorsement of one out of five intrusion symptoms, one out of two avoidance symptoms, two out of seven negative alterations in cognition and mood symptoms, and two out of six arousal symptoms. Therefore, to be diagnosed with PTSD, an individual need only present with six out of 20 possible symptoms. In fact, there are thousands of possible symptom presentations that qualify for a diagnosis of PTSD. Beyond the strict diagnosis, individuals can present with even more potential presentations of symptoms that might not meet the formal diagnostic standards, but are debilitating nonetheless. Given the wide range of possible presentations, it is problematic to ignore the complex heterogeneity of symptom profiles following experiences of trauma by simply relying on a dichotomous PTSD versus no-PTSD determination; relying only on symptom severity or total symptom count is also problematic due to meaningful person-to-person differences. Unlike most prior research, the present study employed an innovative, data-driven approach that respects the extensive underlying heterogeneity of PTSD by identifying

symptom presentations or profiles using latent profile analysis, which are detailed later in this chapter.

Applications of Latent Profile Analysis in the Study of Trauma and Related Symptoms

In addition to the heterogeneity of PTSD symptom presentations, meaningful person-to-person differences also exist with respect to types of trauma exposure. For instance, a woman who has experienced sexual abuse as a child likely has different outcomes than a woman who has experienced primarily psychological aggression from a romantic partner. Recent advances in statistical modeling have led to an emphasis on respecting individual differences using a person-centered approach, rather than the more typical variable-centered approach. A person-centered approach allows for the examination of unique and meaningful subgroups within a sample, whereas the variable-centered approach aims to identify global across-sample trends (Bergman & Magnusson, 1997). Latent profile analysis (LPA) is one commonly used person-centered approach that identifies underlying (i.e., latent) relatively homogeneous sub-groups within a heterogeneous set of data (Lazarsfeld & Henry, 1968). When data are heterogeneous, such as the case with PTSD symptoms and trauma experiences, means and variances do not adequately describe the data because such statistics aggregate across subgroups that have different means and variances from one another as well as the grand (overall) mean and distributional properties. Therefore, person-centered analyses are seen as having an advantage over variable-centered analyses when data are heterogeneous.

LPA has recently been widely applied to the study of PTSD symptoms, yet much of the work thus far has focused on symptom presentations for those who experienced military/combat trauma (e.g., Armour, Contractor, Elhai, Stringer, & Lyle, 2015; Frankfurt, Anders, James, Engdahl, & Winskowski, 2015) or natural disasters (e.g., Cao et al., 2015; Lai, Kelley, Harrison,

Thompson, & Self-Brown, 2015). Much work has also focused on identifying and supporting the new dissociative subtype of PTSD using this data analytic approach (e.g., Armour, Karstoft, & Richardson, 2014; Blevins, Weathers, & Witte, 2014; Fewen, Brown, Steuwe, & Lanius, 2015; Mullerova, Hansen, Contractor, Elhai, & Armour, 2016; Wolfe et al., 2012; Wolfe, Lunney, Miller, Resick, & Friedman, 2012; Wolfe, Lunney, & Schnurr, 2016).

More relevant to the present study, some work has focused on profiles of PTSD symptoms among women reporting experiences of interpersonal trauma. One existing study examined latent profiles of PTSD symptoms among 229 women exposed to IPV (Hebenstreit, Maguen, Koo, & DePrince, 2015). Using LPA, these authors identified five PTSD symptom profiles: low symptom (46%), low symptom with high avoidance (17%), intermediate symptom (16%), intermediate symptom with high hypervigilance (11%), and high symptom (10%). Therefore, their results suggest that multiple, meaningful profiles of PTSD symptoms exist among those reporting experiences of IPV. The current study will extend this line of work by utilizing a perinatal sample of women who experienced a broader range of interpersonal trauma experiences (IPV and/or childhood maltreatment).

In a different study of sexual assault survivors ($N = 119$), LPA was utilized to examine profiles of both PTSD and depressive symptoms combined (Au, Dickstein, Comer, Salters-Pedneault, & Litz, 2013). Four profiles were revealed: mild (13.4%), low-moderate (32.8%), high-moderate (42.9%), and severe (10.9%). A third study examined a large sample ($N = 2915$) of African Americans reporting multiple and varied experiences of both adult and childhood interpersonal trauma (Nugent, Koenen, & Bradley, 2012). Results revealed six profiles (resilient [61%], moderate with amnesia [5%], moderate with diminished interest [6.9%], moderate without diminished interest and amnesia [15.4%], severe without amnesia [6.7%], and severe

overall [4.4%]), suggesting again that meaningful differences exist within trauma samples in terms of mental health and general functioning and well-being. Finally, LPA has been utilized in a few studies examining the construct of complex PTSD (e.g., Cloitre, Garvert, Brewin, Bryant, & Maercker, 2013; Knefel, Garvert, Cloitre, & Lueger-Schuster, 2015), but that work is beyond the scope of the present study.

Even fewer studies have used LPA to identify profiles of trauma experiences. Only one known study examined profiles of IPV experiences over time among college students (Armour & Sleath, 2014). Three different profiles were identified: life-course polyvictimization (23.1%), witnessing parental victimization (15%), and psychological victimization only (61.9%). Armour and Sleath reported that individuals in the life-course polyvictimization profile were at a higher risk for later psychosocial problems. Therefore, different, meaningful profiles of interpersonal trauma experiences can be identified and may be related to different outcomes, yet very little work has been done in this area.

In sum, LPA is gaining popularity in the trauma field as a way to identify meaningful sub-groups of individuals within trauma-exposed samples. Although few studies have used the technique with individuals reporting interpersonal trauma, it has been successfully implemented in both large and small samples. No studies have utilized LPA within samples of women in the perinatal period. Therefore, the present study is the first known study to use LPA to identify profiles of interpersonal trauma experiences and profiles of PTSD symptoms in a perinatal sample of women reporting varied experiences of interpersonal trauma during childhood and adulthood.

Conclusion

It is clear that past and present experiences of interpersonal trauma as well as the occurrence of PTSD during the perinatal period present a potential for problems in the formation of the mother-child relationship. Furthermore, women in the perinatal period are not immune to experiences of interpersonal trauma such as IPV or PTSD symptoms and may experience a resurgence of memories of past traumatic experiences and PTSD symptoms as they begin to care for their own child. Variation in PTSD symptom composition from person to person is common, and little is known about the differential impact of clusters of PTSD symptoms on parenting and the parent-child relationship. In the next chapter, the construct of parenting and the impact of interpersonal trauma and symptoms of PTSD on parenting is reviewed more specifically, and the importance of introducing LPA techniques to the field continues to be discussed.

Chapter 2: Parenting in the Context of Interpersonal Trauma and Symptoms of PTSD

Experiences of interpersonal trauma profoundly impact one's ability to form and maintain close, meaningful relationships. Because of this, it is important to understand trauma and the expression of PTSD symptoms during the perinatal period when one of the most important relationships is taking hold: the mother-child relationship. The early parent-child relationship, which begins in pregnancy, is not only important for a parent's overall sense of well-being and life satisfaction, but it also strongly influences the child's early development (Cassidy, 2008). Interpersonal trauma and subsequent mental health difficulties are relevant to the parenting experience due to the negative impact of trauma on the physiological and psychological capacities needed to provide optimal care to infants, who are in need of constant care and attention. Furthermore, the display of caregiving behavior is psychologically and physiologically demanding, which may make it especially difficult for mothers, who are already taxed by experiences of interpersonal trauma to provide optimal care to infants and toddlers. For example, women who have experienced chronic, ongoing interpersonal trauma may have difficulty shifting between being engaged and withdrawn, angry, and warm or loving, as they struggle between times of safety and times of stress (Levendosky & Graham-Bermann, 2000b). However, before the impact of interpersonal trauma and PTSD symptoms on parenting can be reviewed, it is important to first explore the construct of parenting as well as how and why parenting behaviors might be affected by external factors, such as maternal stress and trauma.

The Construct of Parenting

The development of the caregiving system. Decades of research have brought great advancements in understanding the mother-infant relationship, including confirming the existence and importance of infant attachment behaviors as well as identifying negative sequelae

of insecure and disorganized attachment. Infant attachment behaviors are embedded within a larger dyadic parent-child system that also includes a caregiving system, which has received less attention in attachment research. A majority of the theoretical and empirical work on the caregiving behavioral system was pioneered by Carol George and Judith Solomon. In their seminal paper, Solomon and George (1996) defined the caregiving system, following John Bowlby's (1982) initial description, as a *complement* to the child's attachment system that dictates a set of caregiving behaviors designed to respond to infant needs and distress and to protect the child when faced with danger or threats to the child's safety. George and Solomon refer to the act of caregiving, as driven by the caregiving system, as a "complex balancing act" where a mother must remain alert to "real and potential sources of danger and threat" in order to protect her child in the face of competing demands for her own affiliative (e.g., peer and romantic) and other needs (George & Solomon, 2011, p. 134). The caregiving system develops out of the psychological transformation women make during the transition to parenthood from being a receiver of care to being a provider of care (George & Solomon, 2011; Solomon & George, 1996).

Ideally, the caregiving system influences a broad class of protective and nurturing parental behaviors such as sensitivity, responsiveness, and retrieval in response to the child's exploratory behavior as well as signals of distress or need states (e.g., hunger; Bowlby, 1982; Solomon & George, 1996). Thus, the overarching function of both the child's attachment and the parent's caregiving system is survival of the species through protection of the young. The difference is that the attachment system dictates what behaviors the child uses to seek proximity in times of danger and threat, whereas the caregiving system dictates what behaviors the mother uses to maintain proximity with her child in order to protect and nurture her child. Both systems

work in concert to result in the protection and ultimate survival of the child in ideal circumstances; without proximity seeking from the infant or availability of the mother, the system breaks down because the infant is incapable of protecting itself or ensuring its own survival without the presence of a caregiver. Thus, the caregiving system describes the delineation and goal or purpose of parenting behaviors in caregiving contexts, where the objective of the behavior is to provide safety and protection to the child from real or potential danger.

Caregiving behaviors are affected by multiple factors such as the mother's own past experiences of being cared for as well as biological influences to provide care to signaling infants (Hesse, 2008; Pryce, 1995; see review in Bell, 2001), among other things. The caregiving system initially develops throughout childhood and adolescence but further evolves *during* pregnancy as a woman transitions into parenthood; during this time, for example, a woman may reflect more about being a provider of care rather than a receiver of care as she prepares for the task of providing care to her infant (Slade, Cohen, Sadler, & Miller, 2009; Solomon & Geroge, 1996). This transition continues after birth as the mother provides care and readjusts her roles, priorities, and responsibilities. Although existing empirical evidence suggests that, for many women, thoughts and feelings about caregiving generally remain stable from pregnancy to the postnatal period (e.g., Benoit & Parker, 1994), research has not yet examined if, or how, maternal representations of caregiving meaningfully change during pregnancy (e.g., from the first to the last trimester). Furthermore, some evidence suggests that caregiving representations may be less stable from the prenatal to postnatal periods for women experiencing psychosocial adversity (Theran, Levendosky, Bogat, & Huth-Bocks, 2005).

As noted above, the type of care a mother provides to her signaling infant is largely based on the care she received when she was a child, as well as current circumstances (George & Solomon, 2008). For example, women who have had their own history of childhood maltreatment tend to have a greater difficulty making the transition to a nurturing and protective attachment figure (e.g., Jacobvitz, Leon, & Hazen, 2006; Lyons-Ruth & Block, 1996; McCullough et al., 2014). It is believed that many such women do not have an internal working model, or relationship template, of what constitutes a secure parent-child relationship to draw upon when parenting their own child. Furthermore, experiences of intimate partner violence (IPV) during the perinatal period can be detrimental to a woman's sense of safety as well as her physical and psychological resources for parenting. For example, a new mother who must remain vigilant for acts of violence perpetrated by her partner may be less attuned to her child's needs (Levendosky & Graham-Bermann, 2000b); her own self-protective system may interfere with the appropriate functioning of the caregiving system. Current experiences of IPV may also alter women's representations of themselves, themselves as mothers, and others in the world (Herman, 1992; Huth-Bocks, Levendosky, Theran, & Bogat, 2004). Furthermore, experiencing IPV during pregnancy as compared to after giving birth is believed to more strongly impact parenting and child outcomes because it disrupts the mother's psychological transition to becoming the provider of care during this sensitive period (Levendosky, Bogat, & Huth-Bocks, 2011).

Commonly studied parenting behaviors. An important part of the caregiving system is observable parenting, or caregiving, behaviors. Maternal sensitivity is likely the most extensively studied parenting construct, and is consistently associated with numerous beneficial outcomes for children, including secure attachment, greater social-emotional competence, and more optimal

cognitive development (e.g., De Wolff & van IJzendoorn, 1997; Leerkes, Blankson, & O'Brien, 2009; Lemelin, Tarabulsky, & Provost, 2006). Sensitive maternal behaviors include understanding infant cues and initiating prompt and appropriate care that effectively meets the infant's need. Maternal engagement in interactions with infants, which is closely related to sensitivity, reflects the degree to which mothers are involved and responsive in interactions with their infants. Thus, maternal sensitivity and engagement require mothers to not only be alert to infant cues, but also to correctly identify or interpret what the infant is cueing for and respond with warmth, kindness, and understanding. Therefore, decreases in optimal maternal behaviors such as sensitivity and engagement are clearly concerning. Alternatively, increases in less optimal behaviors such as intrusiveness and hostility are also of great concern to parenting researchers. Intrusive behaviors are those that override or ignore the infant's needs rather than responding when cued or appropriate. Similarly, hostility involves conveying negative feelings (e.g., teasing or threatening the infant, name calling, and yelling) and exhibiting negative behaviors (hitting, grabbing, poking) during interactions with the infant.

The maternal behaviors detailed here are typically measured by coding videotaped mother-infant interactions for the intensity, frequency, and/or duration of the behavior. Mother-infant interactions often involve play episodes but can also involve tending to the child's needs (e.g., feeding or changing) during other types of parenting interactions. Research on broad, more common dimensions of parenting, such as sensitivity, engagement, hostility, and intrusiveness, are detailed in this chapter, whereas the less common, more problematic atypical parenting behaviors are the focus of the current study and detailed in the following chapter.

The Impact of Interpersonal Trauma Exposure and PTSD Symptoms on Parenting

Behaviors

As detailed earlier, the mother's ability to choose appropriate parenting behaviors from her available repertoire depends on her ability to (a) correctly perceive and evaluate the child's signals, dictated by the attachment system, and (b) appraise the threat level of the situation (George & Solomon, 2008). In that way, the caregiving behaviors exhibited by the mother are dictated by the situation or environment, which may call for different strategies to maintain the appropriate level of proximity (Solomon & George, 1996). Experiences of interpersonal trauma, which are known to result in increased hypervigilance and/or periods of dissociation, will likely impact a mother's ability in these areas. For example, when faced with danger, behaviors that increase proximity are preferred, but in the absence of danger, such behaviors stifle the infant's developmentally appropriate need to venture away from the caregiver and explore the environment. Alternatively, when caregivers exhibit behaviors that discourage proximity, it can at times be somewhat optimal as it facilitates appropriate exploration in the absence of danger, but in the presence of danger, it puts the infant at great risk.

Additionally, a caregiving system that operates effectively to promote child attachment security must be flexible to changes in the environment. Women who have experienced interpersonal trauma may lack this flexibility, as they are often in a continuing state of fear. Consequently, they may become disconnected with their environment and fail to provide protection in times of actual danger or perceive danger in the environment when there is none. This inflexibility and mismatch of behavior and environment is disorganizing to the infant who is reliant on the caregiver for regulation and support in times of calm as well as times of stress. Threats to the integrity and functioning of the caregiving system such as interpersonal trauma

and PTSD symptoms can also give rise to more severe, less common (i.e., atypical) maternal behaviors that will be detailed in the next chapter.

Childhood maltreatment. A number of studies have found that maternal experiences of childhood maltreatment have been associated with less optimal parenting behavior, such as lower levels of sensitivity and engagement, as well as more frequent non-optimal behaviors, such as hostility and intrusiveness. For instance, in a sample of 291 mothers and their 16-month-old infants, Pereira and colleagues (2012) reported that mothers with histories of various types of childhood maltreatment were observed to be less sensitive in interactions with their infants. This association was further explained by self-reported levels of parenting stress, which mediated the link between trauma exposure and parenting.

Furthermore, in a small ($N = 45$), economically disadvantaged sample of women reporting experiences of childhood maltreatment, Lyons-Ruth and Block (1996) reported associations between childhood sexual abuse histories and decreased maternal involvement during interactions with their 18-month-old infants. In this study, a history of childhood physical abuse was also associated with more hostile and intrusive behavior during mother-infant interactions. Similarly, Moehler and colleagues (2007) compared women with and without histories of childhood maltreatment and found that women who reported childhood physical and/or sexual abuse were observed to be more intrusive in interactions with their 5-month-old infants than women with no history of childhood maltreatment. Although few in number, existing studies suggest that a wide range of childhood maltreatment types have been associated with decreases in optimal parenting behavior, such as sensitivity and engagement, and increases in non-optimal parenting behavior, such as hostility and anger. As mentioned previously, women who have experienced interpersonal trauma typically have difficulty remaining engaged

with their environment, which may lead to decreased maternal sensitivity and engagement. Furthermore, child distress is meant to be physiologically arousing so that the parent is driven to act (i.e., meet the child's needs) and reduce arousal. However, for women who have experienced maltreatment in their childhood, the distress of their own child can serve as a potent reminder of these experiences and lead to hyperarousal that interferes with responsive care of the infant. Alternatively, displays of hostile and intrusive behavior may be influenced by the mother's own representation of how to care for and respond to children, which is based on her own experiences of being maltreated as a child. In sum, experiences of childhood maltreatment impact parenting behavior, and there are numerous mechanisms that can help explain this relationship.

IPV. Less optimal parenting behaviors have also been associated with experiences of recent IPV. For example, in a sample of 203 women and their 12-month-old infants, Levendosky and colleagues (2006) reported that lower levels of maternal sensitivity were associated with various types of current IPV. Current IPV was also associated with increased disengagement, greater maternal hostility, and more anger during mother-infant interactions in this study. The authors posited that current IPV causes stress in the family system that spills over into interactions with the infant (Levendosky et al., 2006). Furthermore, it was the experience of current IPV alone, rather than in conjunction with reported mental health difficulties, that explained the variance in parenting behaviors; sub-optimal parenting was better accounted for by current experiences of IPV than a mental health composite score made up of symptoms of depression, PTSD, and general anxiety. Similarly, in a large ($N = 705$) sample of predominantly low-income mothers and their toddlers (15–36 months), various experiences of IPV were associated with lower levels of maternal sensitivity and higher levels of harsh-intrusive parenting during a mother-child free-play interaction (Gustafsson et al., 2012). Based on these

two existing studies, it seems that experiences of interpersonal trauma may lead to emotional discomfort, dysregulation, and unavailability that make it difficult to consistently respond sensitively to an infant's needs. Additionally, some women experiencing current IPV may interact intrusively with their child as a way to control the child's fussing or other irritating behaviors to protect themselves and their child from the abuser. Clearly, as with childhood maltreatment experiences, research suggests that experiences of IPV can lead to the display of less optimal parenting behaviors, and there are many possible explanations for how and why IPV impacts parenting.

PTSD symptoms. The development of trauma-related symptoms following interpersonal trauma exposure may have an impact on parenting as well. In fact, Schechter and colleagues (2015) reported that greater total severity of PTSD symptoms was associated with lower maternal sensitivity and responsivity, and more controlling maternal behavior during mother-infant interactions with children ages 12–42 months among a sample of 56 women. In a different sample of 150 women and their 6-month-old infants, a total count of PTSD symptoms was associated with bonding impairment in the first 6-months postpartum, and bonding impairment, in turn, was negatively associated with a positive parenting composite consisting of maternal sensitivity, engagement, warmth, and positive affect (Muzik et al., 2013). Unfortunately, the authors in the latter study did not report on the direct relationship between maternal PTSD symptoms and observed parenting.

Both Schechter and colleagues (2015) and Muzik and colleagues (2013) examined PTSD symptom totals and did not offer specific interpretations about the impact of different clusters of PTSD symptoms. However, it is possible that different symptoms of PTSD impact parenting in different ways. For example, intrusive recollections may impact a mother's ability to respond

sensitively to her child's needs by directing her attention away from her child and evoking arousal. Furthermore, avoidance symptoms might impact sensitivity and engagement as well by causing the parent to become unavailable to the infant while they attempt to avoid internal and external reminders of trauma. In regard to hyperarousal and vigilance, although it may facilitate appropriate recognition of threat and mobilization to safety in times of danger, many individuals with PTSD perceive threat and danger when there is none, which can lead to intrusive behavior by the mother who is driven to retrieve her child and prohibit exploration.

Given the lack of empirically-based knowledge about the impact of different PTSD symptom clusters and LPA derived profiles on parenting behaviors, it is important to further understand, more specifically, how and which symptoms of PTSD impact parenting. In fact, Muzik and colleagues (2013) called for future studies to further elucidate the impact of different PTSD symptoms on parenting behavior.

Unresolved trauma and loss. A final set of studies reviewed here has examined parenting in the context of unresolved experiences of childhood trauma using the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1984). Individuals with experiences of maltreatment or traumatic loss in childhood often produce narratives on the AAI that are characterized by unsuccessful use of denial, feeling as though one caused or deserved the abuse, and confusion, which are classified as “unresolved/disorganized with respect to trauma/loss” (Main, Goldwyn, & Hesse, 1984; 2003). A classification of unresolved suggests that experiences of trauma are not yet processed; if a mother has unresolved trauma from her own childhood, raising her own child may bring unwanted reminders of past traumatic experiences. As such, clinicians and researchers have speculated that women with histories of childhood loss or trauma may experience a flooding of uncomfortable and unwanted thoughts, feelings, and

memories of their own experiences of sub-optimal care that interfere with their ability to provide optimal care to their own infants (Lyons-Ruth et al., 1999; Main & Hesse, 1990).

However, nearly all of the studies exploring unresolved states of mind with respect to trauma/loss in adulthood in relation to parenting examine the less common, more severe atypical parenting behaviors alluded to earlier; these studies are detailed in the next chapter.

Utilizing Latent Profile Analysis (LPA) Techniques to Explore the Impact of PTSD

Symptoms and Experiences of Interpersonal Trauma on Parenting Behavior

As mentioned in the previous chapter, few studies have used LPA to examine profiles of PTSD symptoms and interpersonal trauma experiences among survivors of interpersonal trauma, and none have utilized this approach within perinatal samples. Furthermore, no known studies until the present study have examined how different profiles of trauma experiences or PTSD symptoms might impact parenting behaviors. This line of research is important due to the known heterogeneity of trauma experiences, detailed in the previous chapter, and the known impact of PTSD symptoms and trauma on parenting behavior, detailed in this chapter. The present study will identify “risk profiles” with the expectation of providing a more nuanced understanding of how experiences of trauma and PTSD symptoms impact parenting behavior so that interventions can be tailored more to individuals.

Conclusion

Experiences of interpersonal trauma such as childhood maltreatment and IPV can impact a mother’s ability to provide consistent, sensitive, and engaged, as well as non-intrusive, care. A small body of literature has identified associations between IPV, childhood maltreatment, and *total* PTSD symptom severity and decreases in optimal maternal behavior, as well as increases in non-optimal maternal behaviors, among mothers of infants. There exists, however, another class

of severely sub-optimal parenting behaviors that are believed to develop out of experiences of interpersonal trauma and that have far-reaching effects on the child and mother-child relationship, as described earlier. This class of atypical parenting behaviors in relation to maternal experiences of trauma are detailed in the next chapter.

Chapter 3: Atypical Maternal Parenting Behavior in the Context of Interpersonal Trauma and Symptoms of PTSD

In contrast to the more common parenting dimensions (e.g., sensitivity, engagement, intrusiveness) reviewed in the previous chapter, there exists a line of literature focused on less frequent, more severe parenting behaviors that have serious implications for infant attachment and development. These types of behaviors have been defined and referred to in different ways, such as *disorganized/helpless* (George & Solomon, 1996), *frightened/frightening* (Main & Hesse, 1990), and *disrupted/atypical* (Lyons-Ruth, Bronfman, & Parsons, 1999). Despite slightly differing definitions, this class of atypical parenting behaviors has been consistently theorized to result from experiences of interpersonal trauma; all have also been shown to culminate in the same, detrimental outcome---disorganized mother-infant attachment. This area of research has its roots in early theoretical papers by Solomon and George (1996; George & Solomon, 1999), Main and Hesse (1990; Hesse & Main, 1999, 2006), and Lyons-Ruth and colleagues (1999). Each line of research is reviewed separately to highlight the individual contributions that have greatly expanded our understanding about the causes and implications of disorganized, frightened/frightening, and disrupted/atypical parenting behaviors. Then, specific empirical literature on the impact of maternal interpersonal trauma and PTSD symptoms on the development of atypical behavior is reviewed, with a special emphasis on Lyons-Ruth and colleagues' (1999) conceptualization of atypical behavior, as this has been most often used in the empirical literature and is the conceptualization for the present study.

Disorganized and Helplessness Caregiving: George and Solomon

The early work of Carol George and Judith Solomon, detailed in the previous chapter, brought about important advancements in the conceptualization of the caregiving behavioral

system as well as speculations about breakdowns in the optimal functioning of the system. George and Solomon (2011; Solomon & George, 2006) take a broad approach to what they deem to be negative formative experiences in the development and breakdown of the caregiving system, including any experiences that can severely interfere with the mother's orientation to protect the child. Such experiences may include her own exposure to violence, severe psychopathology, substance use, miscarriage, and other possibilities. They have termed such experiences *assaults* to the caregiving system (2011; Solomon & George, 2000). Furthermore, they posit that such experiences can occur throughout the lifespan leading up to the birth of a child. Early experiences of sub-optimal care (child maltreatment, in the worst form), for example, disrupt an individual's early templates about parent-child relationships, as such experiences fail to demonstrate what it means to protect and care for a child. Later experiences such as intimate partner violence (IPV) during adulthood are also theorized to interfere with the capacity to be an effective, protective secure base for one's own child.

When such experiences happen early in life (such as in the case of child maltreatment), individuals are prone to develop what Bowlby (1982) termed *segregated systems*. Bowlby believed individuals were driven to segregate certain experiences as a way to block them from consciousness, thereby protecting individuals from immense emotional and psychological pain. When this happens, people become prone to behavioral disorganization because they are not able to organize and integrate their experiences into their self-concept and fail to process and make meaning of their experiences. As life continues, external triggers of past experiences can activate these unconscious, segregated memories. Activation can then lead the individual to have emotional experiences and to display behaviors that do not match the current situation and are experienced as incoherent to the individual, as well as those around them. Although theory

related to segregated systems has primarily focused on early life experiences, it seems possible that later traumatic and highly distressing experiences could lead to segregated systems as well. The work of George and Solomon helps lay the foundation for the present study, which aims to examine adult experiences of trauma with respect to parenting, along with the more typically addressed childhood maltreatment experiences. In fact, despite the theoretical propositions made by George and Solomon, the present study is the first known investigation of associations between adult experiences of interpersonal violence and atypical caregiving behaviors.

Frightened/Frightening Parenting Behaviors: Main and Hesse

Around the same time that George and Solomon were theorizing and studying caregiving disorganization (helplessness and fright) within the caregiving system, other researchers were pursuing the identification of specific maternal behaviors that could help account for the emergence of disorganized mother-infant attachment (Main & Hesse, 1990). Mary Main and Erik Hesse subsequently suggested that both frightened and frightening (together referred to as FR) parenting behaviors, specifically, were one critical mechanism through which children develop disorganized attachment (Main & Hesse, 1990). This type of parenting includes behaviors that indicate the mother is either frightened by the child and/or is frightening to the child; in both cases, the child is left in a state of fear that they cannot resolve on his/her own or by relying on his/her caregiver, referred to by Hesse and Main as “fright without solution” (1999, p. 484). Although Main and Hesse’s theory behind the way in which FR behaviors impact children is not the focus in the present study, it is important to acknowledge their theoretical framework because it has advanced understanding about atypical parenting behavior and influenced the subsequent development of others’ work in the area.

FR behaviors are believed to be a result of the parent's own history of trauma rather than a feature of the current parent-child relationship (Main & Hesse, 1990; Hesse & Main, 2006). In particular, Main and Hesse (1990) have focused on the effects of parental history of childhood maltreatment as the source of FR behaviors. Drawing also from Bowlby's writings about attachment theory (1982), it is believed that past experiences of trauma can contribute to ongoing fear and remembrance; when these experiences are not properly processed or integrated into the person's sense of self, this "continuing state of fear" can cause an internal struggle within the parent that can lead to inexplicable behaviors that are confusing and disorienting to the infant (Main & Hesse, 1990, p. 163; Hesse & Main, 2006). While some parents respond to internal reminders of trauma with fear and dissociation, others respond with anger and irritability. This variability in response to trauma reminders and unprocessed memories is consistent with the known heterogeneity of posttraumatic stress symptoms. Hesse and Main (1999) further posit that the parent's attempts to contend with reminders of past trauma and loss result in a state of reduced awareness where they are prone to exhibiting FR behaviors. That is, the traumatic events themselves, which are attachment-related, continue to terrorize the parent, leading to periods of dissociation/disorientation (in the case of being frightened of the infant) and/or threatening/hostile behavior (in the case of being frightening toward the infant) during parent-child interactions, especially when the parent is faced with her child's attachment signals. Because these behaviors are believed to be internally triggered, there tends to be an absence of any environmental trigger or explanation for such behavior, resulting in further confusion and disorientation for the child (Main & Hesse, 1990), and ultimately, disorganized attachment.

Following their seminal theoretical paper on FR parenting behaviors (Main & Hesse, 1990), Main and Hesse (1992–2006) developed the first behavioral coding scheme to identify

and quantify FR behaviors in the service of better examining predictors of FR behaviors, as well as sequelae of these parenting behaviors. In brief, their research suggested that unresolved (with respect to trauma/loss) classification on the AAI was associated with higher levels of frightening maternal behaviors during interactions between mothers and their children (Jacobvitz, Leon, & Hazen, 2006; Schuengel et al., 1998). However, it should be noted that FR behaviors according to the Main and Hesse system have not been examined within high-risk samples as of yet.

A third line of work emerged around the time of Main and Hesse's formulation of FR behavior by Karlen Lyons-Ruth and colleagues (1999), who sought to elaborate upon the types of maternal behaviors that may be disorganizing to children. Specifically, in addition to FR behaviors, these researchers began to theorize about and investigate behaviors that included severely inadequate (e.g., delayed or lack of a response) or inappropriate responses to infant cues, as well as disturbances in the ability to repair disrupted interactions. In contrast to research using Main and Hesse's FR coding system, Lyons-Ruth and colleagues began examining their operationalization of non-optimal, atypical parenting behaviors among high-risk samples of women, similar to the sample in the present study.

Atypical Parenting Behavior: Lyons-Ruth and Colleagues

The primary objective of Lyons-Ruth and colleagues was to continue to understand the types of behaviors exhibited by parents in interactions with infants that lead to disorganized infant attachment. Lyons-Ruth and colleagues (1999) utilized the FR behaviors outlined by Main and Hesse (1992–2006), but also speculated that mothers engage in other, at times subtle, behaviors that are equally concerning and have serious implications for the mother-child relationship, especially when coupled with the traditional FR behaviors. In their work, Lyons-Ruth and colleagues adopted Main and Hesse's (1990) hypothesis that the continuing state of

fear experienced by the traumatized mother leads to her display of FR behaviors; however, they introduced two additional hypotheses centered on disrupted and contradictory communication between the mother and her infant as the result of the mother's fear and unprocessed trauma, particularly childhood physical and sexual abuse and severe neglect.

The "failure of repair" hypothesis suggests that infant disorganization can develop when mothers do not display caregiving behaviors that support a reliable and consistent strategy for the infant to have his/her needs met. Similar to the notion regarding a continuing state of fear, Lyons-Ruth and colleagues (1999) suggest that women who have experienced trauma and loss are unable to maintain coherent and clear lines of communication with their children, who are signaling for their needs to be met, as a way to protect themselves from contending with infant distress. As such, behaviors with their infants appear to be disjointed, poorly timed, or withdrawn. For example, in response to the infant's bids for various needs such as proximity at times of separation, caregiver behavior may be excessively delayed, grossly inappropriate, or nonexistent. This "disrupted communication" likely leads children to feel unsafe because they are unable to anticipate how to have their needs met by their caregiver.

The second hypothesis has clearer direct ties to the mother's past experience of trauma. Lyons-Ruth and colleagues (1999) highlight that unresolved experiences of trauma and loss from childhood are interwoven with the mother's own unmet attachment needs and such experiences provide a constant reminder that needs were not met by her caregivers. Therefore, the "competing strategies" hypothesis suggests that the parent re-enacts her own disorganized attachment with her parents when interacting with her infant. Thus, overt, contradictory behaviors will be exhibited by unresolved parents. Examples include caregiving behaviors that

send contradictory messages to the child by heightening the child's need to seek proximity, while simultaneously rejecting an approach.

In tandem with the expansion of the conceptualization of parenting behaviors believed to lead to infant disorganization, Lyons-Ruth and colleagues (2003, 2005) also developed a broader conceptualization of unintegrated states of mind, which, although focused at the representational level, lends further understanding to the need for an expansion beyond the original FR behaviors. Unintegrated states of mind refer to negative evaluations of the self and the caregiver that are not integrated with other aspects of the individual's attachment conceptualizations, resulting in inconsistent and incongruent narratives about the self and the caregiver. The intention of their conceptualization about unintegrated states of mind was to better understand a group of women who have children with disorganized attachment, but who do not evince identifiable experiences of loss or abuse and, thus, cannot be classified as unresolved on the AAI. That is, infant disorganization could not be fully explained by (i.e., predicted) unresolved states of mind. Interest in these women drove the development of the hostile/helpless states of mind classification for the AAI (Lyons-Ruth et al., 2003, 2005), which helped explain the additional cases of observed disorganized child attachment whose mothers were not classified as unresolved with respect to trauma/loss. Although trauma or loss per se did not come up in these women's AAIs, Lyons-Ruth and colleagues observed that many noted other troubling childhood experiences with their own caregivers such as significant conflictual or contradictory behaviors and general unavailability.

In fact, more subtle parental behaviors, such as early experiences of maternal unavailability, have been shown to more strongly predict later psychopathology than other overt types of atypical behavior such as sexualized/role reversed behavior or hostility (Pechtel,

Woodman, & Lyons-Ruth et al., 2012). Furthermore, hostile/helpless states of mind predict more problematic infant attachment classifications such as disorganized-insecure as opposed to disorganized-secure groups (Lyons-Ruth et al., 2005). Therefore, the hostile/helpless states of mind classification on the AAI represents another type of disorganization at the representational level in mothers that may lead to disorganization in their own children. This work also further solidifies the need for the integration of more subtle parental behaviors such as severe caregiver unavailability and incongruence between affect and behavior, in addition to the traditional FR behaviors outlined by Main and Hesse, into what may be considered atypical parenting behavior.

The AMBIANCE system. As a result of all of the work surrounding disorganized states of mind and atypical caregiving, Lyons-Ruth and colleagues (1999) developed the Atypical Maternal Behavior Instrument for Assessment and Classification (AMBIANCE) system to assess the broad array of maternal behaviors expected to lead to infant disorganization. The AMBIANCE system includes the same frightened and frightening behaviors detailed by Main and Hesse (1992–2006) but adds a variety of other caregiver behaviors believed to capture the disrupted and contradictory communication detailed above. As such, the original FR behaviors are seen as embedded within a broader conceptualization of what Lyons-Ruth and colleagues call “disrupted communication” or “atypical parenting behavior.” In this paper, all following references to the behaviors assessed by the AMBIANCE are referred to as “atypical parenting behavior” whereas references to the Main and Hesse system will be referred to as “FR.”

The AMBIANCE system consists of five related, but distinct, dimensions of atypical parenting behavior that capture a wide range of behaviors from unavailability to the child to overt hostility and intrusiveness: affective communication errors, role/boundary confusion, dissociative/disoriented, negative/intrusive, and withdrawal. The role/boundary confusion,

dissociative/disoriented, and negative/intrusive dimensions are heavily based on Main and Hesse's (1992–2006) conceptualization of FR behaviors and contain all of the original behaviors dictated in the FR system as well as additional items that were added over time as the system underwent empirical investigation and continued refinement. The affective communication errors and withdrawal dimensions are not included in the FR system, but are seen as additions that, together with the previously established FR behaviors, capture the larger atypical parenting behaviors construct based on the hypotheses noted above.

AMBIANCE dimensions. Dimension one, *affective communication errors*, contains behaviors such as contradictory signaling to the infant (e.g., smiling while using a stern voice, directing the infant to do something and then not to do it), failure to initiate responsive behavior to infant cues (e.g., not attempting to soothe a distressed infant, failing to provide limits around safety), and inappropriate or delayed responses to infant cues (e.g., laughing while infant is crying, overriding the infant's negative affect with positive affect). Affective communication errors capture the quality of the communication between the caregiver and the infant and are especially important to observe in times of stress because it is during stressful times that the infant relies on the caregiver for comfort, support, and reassurance. Although these types of behaviors may commonly be observed in a mother who is insensitive but not disrupted, a mother can be considered disrupted when she exhibits a high frequency of affective communication errors in tandem with the other classes of behavior within the AMBIANCE system. Furthermore, frequent communication errors may lead an infant to feel confused about his/her own internal states and experiences of the world, which are consistently felt as incoherent with a disrupted mother's actions and responses.

Dimension two, *role/boundary confusion*, contains behaviors that suggest clear difficulty in the caregiver's ability to prioritize the infant's needs over hers, such as eliciting reassurance from the infant, asking the infant for permission, and demanding a show of affection from the infant (e.g., repeatedly asking the infant to give a hug). Dimension two also contains sexualized behaviors that suggest the caregiver is treating the infant as an intimate or sexual partner. These behaviors include speaking in hushed, intimate tones, touching inappropriate parts of the infant's body, and kissing the infant in a sexualized or over-intimate manner. Role/boundary confusion is problematic because it suggests that the parent is not capable of providing needed care due to her own needs; if the caregiver goes to the infant for help, reassurance, and comfort in times of stress, the baby is left to care for him/herself and the caregiver, which the baby is not developmentally capable of doing (Bronfman, Madigan, & Lyons-Ruth, 2014).

Dimension three, *fearful/disoriented*, contains fearful behaviors (e.g., frightened expressions, recoiling, and backing away from the infant), dissociative or disorganized behavior (e.g., trance-like postures or freezing, deadened affect, or aimless wandering), and fearful or disoriented voices (e.g., haunted or ghost-like whispering, a sudden rise in intonation).

Dimension three behaviors are coded when they occur in the presence of the infant, suggesting that the infant is experienced as a source of fear by the parent, making it difficult for infants to approach and seek comfort from their caregiver. As with affective communication errors, this type of behavior is disorienting to infants who are not behaving in a scary way or in any way intentionally provoking fear, yet their caregiver is responding to them with fear and alarm.

Dimension four, *intrusiveness/negativity*, contains physical (e.g., pulling infant by the wrist, restraining the infant, forcing the infant into a sitting position) and verbal (e.g., mocking or teasing the infant, using loud or sharp voice tones, making negative comments about the infant)

communications, as well as negative attributions about the intentions or motivations of the infant (e.g., “he/she hates me” following an innocuous behavior or action by the infant). This dimension also includes exerting excessive control using objects (e.g., removing or withholding a toy despite the infant’s show of joy or engagement). Like dimension three, dimension four behaviors disrupt the infant’s ability to seek comfort and security from the parent; however, in this case, it is because the caregiver’s behaviors evoke fear in the infant rather than the infant evoking a sense of fear in the parent. Also, like dimension one, although these behaviors are commonly observed in generally hostile or intrusive parents who are not disrupted, it is the frequency and intensity of the behaviors in this domain as well as the co-occurrence with behaviors in other dimensions that culminates in a “disrupted” classification.

Finally, dimension five, *withdrawal*, contains behaviors that create physical distance (e.g., holding the infant away from the body with stiff arms, directing an approaching infant away), otherwise maintain distance using verbal communication (e.g., not speaking to the infant during interactions, dismissing the infant’s need for contact, saying “you don’t need me”), and direct the infant away from the self using toys (e.g., offering objects over an unusual distance, presenting toys without regard for the infants interest as a substitute for closer contact and not as a means of shared play). These behaviors are not uncommon among mothers who are generally less engaged with their infants but again, like with previous dimensions, it is the culmination of the intensity and frequency of behaviors within and across the five dimensions that is problematic.

The AMBIANCE system has been empirically tested and regarded as a useful tool for identifying and classifying atypical parenting behavior in both low- and high-risk samples. As such, it has been used in many research studies to aid in the empirical investigation of FR and

other forms of atypical parenting behavior. In fact, it has been used much more extensively than Main and Hesse's (1992–2006) FR coding system in the empirical literature. In prior studies, atypical parenting behavior using the AMBIANCE system is commonly operationalized as a dimensional score (1–7) that captures the overall disrupted quality of the mother-child interaction or a dichotomous “disrupted/not disrupted” classification.

Predictors of Atypical Parenting Behavior

The impact of atypical parenting behaviors on child attachment and later development is well documented (Lyons-Ruth, Bronfman, & Parsons, 1999; Madigan et al., 2007; Shi, Bureau, Easterbrooks, Zhao, & Lyons-Ruth, 2012) and not the focus here. Instead, the focus of the current study is to investigate predictors of atypical parenting behaviors, in particular, maternal interpersonal trauma and PTSD symptoms in a more comprehensive way than has been done previously in the literature. Due to the known negative sequelae of atypical parenting behaviors, investigations into predictors of atypical parenting behavior in the earliest years of the child's life are important. Although atypical parenting behaviors are theoretically believed to stem from experiences of interpersonal trauma, especially past maltreatment by one's caregiver during childhood, surprisingly little work has been done to investigate this link empirically as much of the work has focused on using atypical parenting behaviors to predict infant attachment disturbances. Therefore, there is a need in the field for empirical investigations of the impact of different types of interpersonal trauma, as well as PTSD symptoms, on the development of atypical parenting behavior. Existing studies in this sparse literature are detailed next.

Interpersonal trauma, PTSD symptoms, and atypical parenting behavior. A seminal study by Lyons-Ruth and colleagues (1999) examined the link between various indices of psychosocial risk and atypical parenting behavior among 65 low-income mothers and their 18-

month-old infants. Psychosocial risk was defined as a maternal history of physical or sexual childhood maltreatment and/or inpatient psychiatric care. Results from this study revealed that mothers with one or both of these experiences were more likely to be classified as disrupted than mothers who did not have psychosocial risk. Although much of the work on predictors of atypical parenting behaviors focuses on unresolved status on the AAI, these early results suggest that self-reported experiences of trauma may be another viable predictor of atypical parenting.

In a study of 41 clinic-referred mothers reporting exposure to interpersonal trauma (in childhood and/or adulthood) and their 8–50-month-old children, Schechter and colleagues (2004) examined associations between salivary cortisol, PTSD symptoms, and the presence of atypical parenting behavior. Atypical parenting behaviors were measured in a separate visit 2-weeks after the initial intake into the study. Direct links between PTSD and atypical parenting behavior were not provided; however, the authors reported that severity of interpersonal trauma experiences (in childhood and/or adulthood) was correlated with dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis, which in turn, predicted the severity level of atypical parenting behavior. Direct associations between PTSD symptoms and atypical parenting behavior were examined in the same clinic-referred sample in a later paper (Schechter et al., 2008). The researchers reported that, although the overall severity of PTSD symptoms (i.e., number of symptoms reported) was not related to overall atypical parenting behavior, PTSD symptom severity was correlated with the number (i.e., frequency count) of maternal withdrawal behaviors. No other dimensions of atypical parenting behavior were associated with PTSD symptoms. The results of this study point to the utility of examining separate dimensions of maternal atypical behavior, in addition to an overall (or combined) rating of disrupted maternal behavior or overall disrupted/not disrupted classification. Furthermore, the authors did not find

any associations between diagnoses of PTSD and the presence of atypical parenting behavior, pointing to the importance of examining PTSD symptom levels or severity. Based on the findings, the authors hypothesized that women with severe PTSD symptoms may be more apt to engage in withdrawal behaviors as a way to distance and protect themselves from their child's needs and distress, which may be dysregulating to them. This interpretation of findings is consistent Lyons-Ruth and colleagues' (1999) "failure to repair" hypothesis, which suggests women who have experienced trauma are unable to maintain adequate lines of communication with their children, who are signaling for their needs to be met, as a way to protect themselves from contending with infant distress.

One additional study by Schechter and colleagues (2010) examined associations between PTSD symptoms and atypical parenting behavior in a community sample of 74 mothers and their 12–48 month old children. The authors reported a modest, trend-level ($p < .10$) association between concurrent assessments of interpersonal violence-related PTSD symptom severity and atypical parenting behavior (Schechter et al., 2010). Given that the development of atypical parenting behavior is hypothesized to be especially impacted by childhood experiences of interpersonal trauma, it is possible that the lack of a statistically significant association was due to the fact that varied experiences of interpersonal trauma exposure were considered together rather than analyzed separately in this particular study. Furthermore, this study was cross-sectional (with two visits within 2 weeks), indicating the need for longitudinal studies that examine predictors of atypical parenting behavior over time. It is also important to note that maternal level of education was negatively associated with atypical parenting behavior, such that more years of education were associated with less atypical parenting behavior. Schechter and colleagues (2010) chose not to include education as a covariate in analyses because it was

unrelated to all other study variables but did note the importance of examining this association further in future studies.

In sum, few studies have examined direct associations between maternal experiences of interpersonal trauma, PTSD symptoms, and atypical parenting behavior among mothers of young children. This is surprising given the extensive theoretical and conceptual writings regarding these associations. Furthermore, the few empirical studies that exist define interpersonal trauma and PTSD broadly, rather, multiple types of trauma are lumped together and experiences are not examined separately or specifically. Beyond these few studies, an additional line of research has focused on the link between unresolved states of mind with respect to trauma/loss (on the AAI) and the development of atypical parenting behavior. As previously mentioned in Chapter 2, the unresolved classification implies a history of unresolved trauma and/or loss and thus is one way of capturing maternal experiences of trauma, specifically, a history of unresolved childhood trauma. However, the AAI relies on a person's spontaneous disclosure of such trauma, and the specific type of childhood trauma or loss is often unknown, which makes the present study valuable.

AAI unresolved status and atypical parenting behavior. As originally proposed by Main and Hesse (1990) several decades ago, many studies have sought to investigate the link between unresolved states of mind with respect to trauma/loss and atypical parenting behavior. For example, a few studies by Madigan and colleagues (Madigan, Moran, & Pederson, 2006; Madigan, Moran, Schuengel, Pederson, & Otten, 2007) examined associations between unresolved status and atypical parenting behavior in a sample of adolescent mothers and their 12-month-old infants. In the first study (Madigan et al., 2006), the five dimensions of atypical parenting behavior were examined separately, and found to be predicted by unresolved status,

suggesting an important link between maternal unresolved trauma experiences and atypical caregiving.

In the second study (Madigan et al., 2007) on the same sample of adolescent mothers, the primary objective was to examine associations between AAI classification, atypical parenting behavior, infant attachment, and later toddler behavior problems. In this study, unresolved status, measured at 6 months postpartum, was found to be predictive of the overall rating of atypical parenting behavior across the five dimensions at 12 months postpartum, within a larger path model; the model also demonstrated that atypical parenting behavior predicted disorganized mother-infant attachment which, in turn, predicted infant externalizing problems. Unlike prior studies, the studies by Madigan and colleagues utilized longitudinal data, which allowed for the examination of factors associated with the development and sequelae of atypical parenting behaviors over time.

The association between maternal unresolved status and atypical parenting behavior has also been documented in a sample of foster mothers caring for 11–41-month-old children. Ballen and colleagues (2010) reported that a history of maltreatment in the foster mother's childhood, measured separately from the AAI, as well as unresolved status on the AAI, were both significant predictors of the fearful/disoriented dimension of atypical parenting behavior. Although both variables accounted for significant portions of the variance, self-reported maltreatment history accounted for 12%, whereas unresolved status only accounted for 2.8% of the variance in fearful/disoriented maternal behavior. Unexpectedly, when atypical parenting behavior was measured dichotomously using the disrupted/not disrupted classification, no significant association between unresolved status and disrupted status was found. This unexpected finding again demonstrates the utility of examining the five dimensions of maternal

behavior, as well as the classification and overall severity rating of the measure. Importantly, in this sample of foster mothers and children, child age was associated with atypical parenting behavior such that foster mothers caring for younger infants were more likely to be classified as disrupted than those caring for older infants (within the range of 11–41 months). This may be because caring for younger children is more physically and psychologically taxing on the caregiver, for many mothers. For instance, the higher frequency of infant signaling may lead to more activation of the mother's own history of childhood maltreatment or unmet attachment needs, thus activating displays of atypical parenting behaviors.

In one more study, Goldberg, Benoit, Blokland, and Madigan (2003) found similar associations between unresolved status and the overall dimensional rating of atypical parenting behavior in a low-risk community sample of 197 mothers and their 12-month-old infants. However, they did not find as strong of a link between unresolved status and atypical parenting behaviors compared to other studies, though their reported association was statistically significant. The authors posited that this was due to their sample, which was a low-risk community sample, and participants exhibited a low frequency of atypical behaviors overall. The authors further concluded that it is important to continue investigating this link in different types of samples to provide more generalizable results to the larger population.

In sum, much of the research on predictors of atypical parenting behavior has utilized unresolved states of mind on the AAI, and this literature provides some evidence for the theoretical assertion that atypical parenting behaviors derive from maternal experiences of trauma, in particular, unresolved childhood maltreatment. However, although these states of mind assessed through the AAI provide a proxy for unresolved trauma, they do not provide specific information about the types of trauma that have been experienced and, as noted by

Lyons-Ruth et al. (1999), may not fully capture the wide range of experiences that might impact parenting behavior. Therefore, the present study utilizes self-reported experiences of both child- and adulthood experiences of interpersonal trauma; although this approach is less commonly used as compared to reliance on unresolved status according to the AAI, it seems possible that self-reported experiences of trauma and symptoms of PTSD may predict atypical parenting behavior. This research stands to complement and extend the consistently-reported findings on associations between unresolved states of mind with respect to attachment and atypical parenting behavior.

Conclusion

It is clear that atypical parenting behaviors present serious risk for child development and, in fact, much of the research in this area has focused on the impact of atypical parenting behaviors on the social-emotional health and development of young children. Atypical parenting behaviors are theorized to stem from experiences of trauma and loss during childhood, and presumably, from other experiences that render mothers severely incapacitated in their caregiving role (such as adult experiences of IPV). However, broad categories and conceptualizations of experiences of interpersonal trauma experiences during childhood have been the primary focus, with less attention paid to PTSD symptoms and even less to adult experiences of interpersonal trauma. Although adult experiences of violence, such as IPV, have been theorized to have disorganizing effects on caregiving behaviors, this association has yet to be tested empirically. Furthermore, the present study will extend current knowledge on predictors of atypical parenting behavior by examining latent profiles of trauma experiences and PTSD symptoms. As mentioned in earlier chapters, the present study will be the first known study to use LPA to identify profiles of PTSD symptoms and interpersonal trauma experiences

among perinatal women. It will also be the first study to examine associations between latent profiles of symptoms and experiences and AMBIANCE dimensions of atypical parenting behavior 1-year following the birth of a child. The identification of risk profiles that can be assessed during pregnancy will help inform interventions and address atypical parenting behaviors before children are born and negatively impacted.

Chapter 4: The Present study

For several decades, the presence of mothers' interpersonal trauma has been proposed to predict atypical parenting behaviors largely evidenced (but not exclusively) by maternal unresolved states of mind on the adult attachment interview (AAI), which is a known, powerful predictor of atypical parenting behavior. However, past work by Lyons-Ruth and colleagues (2003, 2005) observed that other troubling childhood experiences beyond trauma experiences can contribute to parenting difficulties. Furthermore, the type of trauma experienced (e.g., sexual v. physical v. neglect) is often not reported, and AAI unresolved status also does not take into account adult experiences of interpersonal trauma, such as IPV or trauma-related symptoms. Solomon and George (2000) have theorized that experiences of violence in adulthood can disrupt optimal development of the caregiving system as the woman transitions to parenthood and may, therefore, lead to the display of disorganized parenting behaviors. However, the impact of adult experiences of interpersonal trauma such as IPV on the development of atypical parenting behavior has yet to be investigated.

A smaller body of research has examined the link between symptoms of PTSD and atypical parenting behavior. However, symptoms of PTSD widely vary from person to person and, while some may not meet diagnostic criteria, they may present with problematic PTSD symptom levels or symptom profiles that have meaningful implications for parenting behaviors. As Schechter and colleagues (2008) demonstrated, it was the severity or number of symptoms of PTSD that predicted atypical parenting behavior rather than the presence of a diagnosis. Therefore, it is possible that meaningfully different combinations or types of interpersonal trauma or symptoms of PTSD have different implications for the development of atypical parenting behavior.

Contrary to past work, the present study examined relations between self-reported experiences of trauma and symptoms of PTSD and later disrupted parenting without specifically identifying the trauma as being unresolved, stepping outside the theoretical framework within which the construct of disrupted parenting was developed. However, the present study may make meaningful contributions to this work by extending the known predictors of disrupted parenting to a wider net of risk factors. The present study also examined different combinations of PTSD symptoms as an additional, possible risk for the exhibition of disrupted parenting. In this way, the present study aims to complement and extend the well-established link between unresolved trauma and disrupted parenting behavior by empirically examining whether self-reported experiences of trauma and symptoms of PTSD might yield similar risk for later parenting difficulties. Furthermore, the presence of PTSD symptoms may very well represent an indicator that the trauma has not been resolved, as it is still causing psychological disruption, which provides justification for examining how PTSD symptoms relate to disrupted caregiving. Although unresolved traumatic experiences are a potent predictor of disrupted caregiving, the identification of quicker, more feasible methods for identifying risk is worthwhile, particularly in situations where assessing for unresolved trauma through lengthy clinical interviews may not be indicated or possible. Such situations might include medical or under-resourced settings where time and/or monetary resources may be limited. In sum, the present study does not intend to replace or equate self-reported experiences with unresolved status with respect to trauma/loss, but rather, aims to support and extend past work by examining other possible predictors of disrupted caregiving.

The present study had two primary aims. The first was to demonstrate an association between maternal experiences of childhood maltreatment and PTSD symptoms, assessed

prenatally, and later atypical maternal parenting behaviors. The following two hypotheses were examined:

1a) Greater severity of childhood maltreatment experiences will be associated with greater severity of atypical maternal parenting behavior 1-year postpartum.

1b) Greater severity of PTSD symptoms will be associated with greater severity of atypical maternal parenting behavior 1-year postpartum.

The second aim was exploratory and had two parts. The first was to explore the impact of adult experiences of IPV during pregnancy on the development of atypical parenting behaviors 1-year postpartum. This association has yet to be examined empirically, though some have theorized that, broadly speaking, adult experiences of violence may increase the likelihood of disorganized or atypical maternal caregiving (e.g., Solomon & George, 2000). The following exploratory hypothesis was examined:

2a) Greater severity of IPV experiences during pregnancy will be associated with greater severity of atypical maternal parenting behavior 1-year postpartum.

The second part was to explore combinations of different types (e.g., sexual vs. physical vs. psychological) and timing (e.g., childhood vs. adult) of interpersonal trauma and PTSD symptoms that may place women at a greater risk for exhibiting atypical parenting behaviors using LPA. As mentioned in earlier chapters, the present study is the first known study to use LPA to identify profiles of PTSD symptoms and interpersonal trauma experiences among perinatal women. It is also the first study to examine associations between latent profiles of symptoms and experiences, and AMBIANCE dimensions of atypical parenting behavior 1-year following the birth of a child. To further elucidate these relationships, unique profiles of

interpersonal trauma experiences, as well as possible profiles of prenatal PTSD symptoms, were therefore examined along with the following exploratory hypotheses:

2b) Different profiles of interpersonal trauma experiences assessed prenatally will have differential relationships with atypical parenting behaviors 1-year postpartum.

2c) Different profiles of prenatal PTSD symptoms will have differential relationships with later atypical parenting behavior 1-year postpartum.

Chapter 5: Method

Participants

Participants for the present study included a community sample of 120 pregnant women, who participated in a larger 5-panel longitudinal study beginning in pregnancy and extending through the child's third birthday. The larger study aimed to examine various psychosocial risk factors in relation to the mother-infant relationship and infant development. The first panel (T1) was completed when the women were in their third trimester of pregnancy, the second (T2) panel was completed when their infants were 3-months old, the third (T3) panel was completed at 1-year postpartum, the fourth (T4) panel was completed at 2 years postpartum, and the fifth panel (T5) was completed at 3 years postpartum. Data from the T1 and T3 panels were used in the current study. Although the larger study allows for the examination of relevant constructs beyond age 1, the focus will remain on the T1 and T3 waves at this time due to the labor-intensive nature of coding atypical parenting behaviors using the AMBIANCE system.

Participants ranged in age from 18 to 42 years ($M = 26.2$, $SD = 5.7$). Forty-seven percent of participants are African American, 36% are Caucasian, 13% are Biracial, and 4% belong to other racial groups. Twenty percent of the sample reported having a high school diploma/GED or less, 44% reported some college or trade school, and 36% reported having a college degree. Furthermore, 63% described themselves as single (never married), 28% married, 5% divorced, and 4% separated at study entry. Thirty percent of participants were pregnant for the first time, and those who had given birth before had an average of 1.42 children (range = 1–5), not including the current pregnancy.

Participants were economically disadvantaged overall and several reported receiving governmental and other assistance services. At the first assessment, the median family monthly

income of participants was \$1,500 (range = \$0–\$10,416). Seventy-three percent of participants reported receiving services from Women, Infants, and Children (WIC), 52% were receiving food stamps, 75% were receiving Medicaid, MI-Child, or Medicare, and 17% were receiving public supplemental income. Forty-five percent were employed at the time of the first interview. This was a non-treatment seeking, community sample; only 11.7% reported having sought mental health services in the past year.

Procedures

Participants were recruited through the posting of flyers (see Appendix A) in public locations, as well as local community organizations and agencies serving low-income families in Washtenaw and Wayne counties. More specifically, 23% were recruited through community-based health clinics serving low-income and/or uninsured individuals, 18% through the WIC social service program, 16% through student areas at one community college and one regional-level university, 11% through a “community baby shower” sponsored by local service programs, 11% heard about the study through word of mouth (via a friend, relative, another research study, or church), 7% through Head Start and local daycare programs, 7% through subsidized housing and/or temporary housing facilities, 5% through second-hand donation centers for pregnant women and their children, and 2% through a parenting class. The strategic distribution of fliers allowed for the recruitment of economically disadvantaged pregnant women, which was a specific focus of the overall larger, longitudinal study. The fliers posted advertised for pregnant women who were interested in participating in a research study (called the EMU Parenting Project) about women’s health and their experiences during and after pregnancy.

Interested women called the research office, and upon doing so, were read a scripted description of the study by a research assistant (see Appendix B). The description included

information on the intended purpose of the study, as well as other logistics including the amount of time the interviews would take, confidentiality, compensation, and the types of questions they would be asked. The description also indicated that the researchers were interested in remaining in contact until their infants turned 1 year old (at that time, the study was only intended to go through the first year postpartum). Lastly, the script included a description of the rights of research participants. If the women were still interested in participating, they were asked to give their verbal consent to continue gathering basic information, which would help to determine study eligibility.

Eligibility requirements included (a) being pregnant, (b) being at least 18 years of age, and (c) having the ability to speak fluent English, as bilingual translators were not available. Once deemed eligible, research assistants collected basic demographic and contact information including: (a) the potential participant's name, (b) date of birth, (c) anticipated due date, (d) phone number/s, (e) email, (f) mailing address, (g) ethnicity, (h) education level, and (i) where they had heard about the study. Those women in their third trimester of pregnancy at the time of the initial contact were scheduled for the pregnancy interview, preferably at their home, or, alternatively, at a research office on campus. The contact information of those women not in their third trimester at the time of the initial contact was placed in a binder of potential participants. As these women entered their third trimester, they were contacted to set up the pregnancy interview.

Prior to attending participant interviews, all research assistants were thoroughly trained by the principal investigator of the longitudinal study on study procedures and protocol related to home visits (e.g., safety, ethical issues, appropriate conduct, etc.), as well as the proper administration of all measures. All research assistants were required to attend mandatory

training sessions before they were allowed to lead interviews. Research assistants consisted of both graduate and undergraduate students at Eastern Michigan University.

Training of the research assistants (both graduate and undergraduate) involved covering each measure in detail, as well as the details of study procedures and protocol as a team on a weekly basis until every study procedure and protocol had been taught and learned by all team members. Then, advanced research assistants (i.e., graduate students) led interviews while less advanced research assistants observed. It was required that less advanced research assistants go through the training and then observe two interviews before they could start to lead in the company of more advanced research assistants. Meetings were held on a weekly basis with the primary investigator for ongoing training and to discuss the questions and concerns that had arisen during the course of each interview. This process allowed the principal investigator to carefully monitor whether or not all research assistants were correctly administering measures and adhering to study protocol. This process was also helpful in evaluating the readiness and competency of new research assistants as they began to lead interviews.

The pregnancy interview began with the reading and signing of an informed consent form (see Appendix C). The consent form was read aloud by the leading research assistant and signed by both parties. Two copies were signed in order for the participant and the researcher to each have a signed copy. The interview began with a brief demographic section and was followed by a battery of questionnaires. Also included was a 1-hour semi-structured interview asking participants about their ideas and feelings about their unborn child. This interview was audio-recorded for later transcription and coding. The questionnaires were administered in the same predetermined order for each participant, which was strategically determined by the principal investigator to build rapport with the participants before asking more sensitive and personal

questions. The reasoning was that such rapport would likely increase the participants' comfort and, therefore, their likelihood to report honest answers. This was especially important due to the method of administration; research assistants read the questions aloud and circled the response of the participant. Participants were given a copy of the questionnaire packet to follow along. The reading aloud of questions by the research assistant was strategically chosen as the method of administration in order to minimize random responding and protect against possible literacy difficulties. Approximately 78% of the participants chose to have the pregnancy interviews conducted in their home, and 22% of the interviews were conducted at a research office on campus. Interviews were conducted by teams of two research assistants; one interviewer would lead the interview, while the second would either provide childcare to the participants' other children or observe the interview.

Each pregnancy interview lasted approximately 2 ½ to 3 hours. At the conclusion of the interview, the women were asked by the research assistants for their permission to stay in contact (via tracking calls every 3 months) in order to continue with the ongoing longitudinal study. Participants were also asked to provide contact information for themselves as well as the names and contact information of up to three "recontact people" who could provide information on the location of the study participant in the event that she could not be reached directly at a given tracking interval. Upon completion, participants were then thanked for their time, given a referral list of area community resources, and compensated with a \$25.00 gift card to Target.

As a prelude to the second interview, each participant was contacted by a research assistant approximately 2 weeks after the expected due date of her baby. The purpose of this phone call was to confirm the baby's date of birth, sex, and name, as well as update the

participant's contact information. Data from the T2 interview will not be used in this study, therefore, the procedures of the interview will not be detailed here.

The women were then contacted approximately 2 weeks before the child's first birthday with the intent to schedule the third wave (T3) interview around the time the child turned 1-year old. Many of the interviews were completed in the women's homes (93%), although 7% were completed at Eastern Michigan University. The interview began with the reading aloud of the informed consent by the research assistant (Appendix D). The interview took approximately 3 to 3½ hours and contained questionnaires, in a predetermined order for reasons noted above. In addition to the battery of questionnaires, the women were asked to engage in a 10-minute free-play and 2-minute clean up interaction task with their child. This interaction was videotaped for later coding by trained research assistants.

As in previous interviews, the research assistants read all questionnaires aloud to the participant. At the end of the interview, the woman was asked for her permission to remain in contact with her and her baby because the study had been extended at that time; recontact information was also updated at this time. Lastly, the participants were thanked and given a referral list of community resources. Participants were compensated with \$50 cash and a baby gift for their participation. One hundred and fourteen women participated in the T3 interview (retention: 95%).

During the course of the study, women were tracked every 3 months between each wave by research assistants to obtain updated contact information and to stay in contact with the women until the next scheduled interview. These "tracking assignments" were completed by trained research assistants and progress was monitored at weekly lab meetings. Data from the T4 and T5 interviews will not be used in this study and, therefore, will not be detailed here.

Approval from the institutional review board (IRB) at Eastern Michigan University was maintained throughout the entire study.

Measures

Childhood trauma. The Childhood Trauma Questionnaire – Short Form (CTQ-SF) was administered in the third trimester of pregnancy to measure mothers' experiences of maltreatment during childhood (i.e., birth to age 18; Bernstein & Fink, 1998; Bernstein et al., 2003). The CTQ-SF is a 28-item self-report questionnaire appropriate for use in clinical and community samples. There are five subscales of the CTQ-SF, each with 5 items: emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect. Items are rated from 1-5, with "1" for "*never true*," "2" for "*rarely true*," "3" for "*sometimes true*," "4" for "*often true*," and "5" for "*very often true*." Items were rescaled in the present study to a 0 to 4 scale such that scores of zero indicated an absence of experiences of childhood maltreatment. Three additional validity items capture possible minimization and denial of maltreatment experiences but were not used in the present study. Some items are reverse scored so that higher values on all items indicate greater endorsement of symptoms. Higher scores on all calculated subscales indicate greater experiences of each type of maltreatment. All subscales were used in the present study, as well as a total maltreatment score.

The psychometric properties of the CTQ-SF were reported by Bernstein and colleagues (2003) across a wide range of different samples (i.e., substance abusers, inpatient psychosis patients, and a community sample) and revealed good criterion-related validity (compared to therapist ratings of abuse and neglect) and construct validity. Furthermore, internal consistency reliability of the CTQ-SF in the current study is excellent for all subscales: emotional abuse $\alpha =$

.91, physical abuse $\alpha = .90$, sexual abuse $\alpha = .96$, emotional neglect $\alpha = .92$, and physical neglect $\alpha = .84$. The alpha for the total score in the present study is .96.

Intimate partner violence. Experiences of intimate partner violence (IPV) during pregnancy were assessed in the third trimester using the Revised Conflict Tactics Scale (CTS-2; Straus, Hamby & Warren, 2003). The CTS-2 is a self-report measure that assesses the extent to which partners in a dating, cohabitating, or marital relationship engage in psychological and physical attacks on one another, as well as the nature in which each partner negotiates when dealing with conflict (Straus, Hamby, Boney-McCoy & Sugarman, 1996). The 33 items that specifically measure violence reported by the victim (in this case, male to female violence) were administered in the present study. Responses for each item indicate the amount of times that each event occurred, and include “0” for *never*, “1” for *once*, “2” for *twice*, “3” for *3 to 5 times*, “4” for *6 to 10 times*, “5” for *11 to 20 times*, “6” for *more than 20 times*, and “7” to indicate that it has not happened during the time period of question, but that it has occurred in the past. The 33 items are divided into four subscales: psychological aggression (8 items), physical violence (12 items), injury resulting from partner violence (6 items), and sexual violence (7 items). Higher scores on all subscales reflect greater frequency of IPV. Items can also be summed into a total score. This measure can be scored using a weighted or un-weighted system. In the weighted system (Straus et al., 2003), frequency values are recoded (0=0, 1=1, 2=2, 3=4, 4=8, 5=15, 6=25) and then totaled, yielding total scores that can range from 0 to 825. In the un-weighted system (e.g., Shorey et al., 2012), item responses are recoded (0=0 and 1-6=1) to result in a total score ranging from 0-33. The present study utilized the un-weighted system; other researchers have noted that this method reduces the occurrence of unacceptable skew values (Shorey et al., 2012), a common problem with data on IPV experiences. In the present study, the

total score as well as the subscales from the T1 pregnancy assessment were used in analyses. Additionally, the CTS total score at T3 (age 1) was used as a control variable in some analyses.

This measure has demonstrated good internal consistency for all subscales as well as good convergent validity with other, similar measures (Straus et al., 1996). The factor structure of the CT2-2 has also been empirically validated (Straus et al., 2003). At T1, internal consistency reliability of the total score ($\alpha = .93$) as well as the subscales in the present sample is acceptable to excellent: psychological aggression $\alpha = .69$, physical violence $\alpha = .91$, injury $\alpha = .76$, and sexual violence $\alpha = .87$. Reliability of the total score at T3 is excellent ($\alpha = .95$).

Posttraumatic stress disorder symptoms. Prenatal symptoms of posttraumatic stress disorder (PTSD) were assessed in the third trimester of pregnancy using the Posttraumatic Stress Disorder Checklist-Civilian version (PCL; Weathers et al., 1993). A specific traumatic event is not identified on this version of the PCL; rather, respondents are asked to report on symptoms resulting from “very stressful life events.” Seventeen items measure how much one has been bothered by trauma-related symptoms in the past month on a Likert-type scale from “0” = *not at all* to “4” = *extremely*. All items can be summed into a total score or into their respective subscales: intrusion (5 items), hyperarousal (2 items), avoidance (2 items), and dysphoria/numbing (8 items). No items are reverse scored; higher scores on all indices indicate greater severity of PTSD symptoms. The PCL total score from the T3 interview was included as a covariate in some analyses to control for concurrent (with observed parenting) PTSD symptoms.

The PCL has demonstrated good reliability and validity (Blanchard et al., 1996). Good internal consistency was demonstrated in this study for the total score at T1 ($\alpha = .87$) and T3 ($\alpha =$

.91). Reliability for the four subscales at T1 is also acceptable: intrusion $\alpha = .83$, hyperarousal $\alpha = .63$, avoidance $\alpha = .61$, and dysphoria/numbing $\alpha = .76$.

Although the version of the PCL used in the present study was designed to assess symptoms of PTSD as defined by DSM-IV (APA, 2000), the allocation of items into four subscales mirrors the new diagnostic criteria for DSM-5 PTSD (APA, 2013) where the dysphoria/numbing and avoidance clusters are split into two separate entities. The DSM-5 conceptualization is consistent with empirical support for the 4-factor model of the PCL (Asmundson et al., 2000). However, as noted earlier in the paper, prior empirical research has shown evidence for different latent structures underlying the PCL-C (e.g., Armour et al., 2016). Therefore, common factor structures that have been validated in other samples were explored in the present study to make a data-driven decision about which factor structure was most appropriate for this sample. Table 1 displays information on symptom allocation for each model, as well as fit statistics from confirmatory factor analyses testing two 2-factor, one 3-factor, two 4-factor, and one 5-factor models. Given the results presented in Table 1, the 5-factor dysphoric arousal model (see Elhai et al., 2001) was chosen and used in the present study. Therefore, PCL items were summed into five subscales (re-experiencing, avoidance, numbing, dysphoric arousal, and anxious arousal), to be used in the latent profile analysis of PTSD symptoms.

Atypical maternal parenting behavior. Atypical parenting behavior was coded using the Atypical Maternal Behavior Instrument for Assessment and Classification (AMBIANCE; Lyons-Ruth, Bronfman, & Parsons, 1999). The most recent coding manual (Bronfman, Madigan, & Lyons-Ruth, 2014) is an unpublished manuscript available from the authors to those who complete training on the AMBIANCE. The manual details the behaviors commonly observed in each dimension as well as the conceptual foundation for each dimension. The AMBIANCE

consists of five related, but distinct, dimensions of atypical parenting behavior, as detailed earlier in the paper: affective communication errors, role/boundary confusion, dissociative/disoriented, negative/intrusive, and withdrawal. As mentioned in chapter 3, the role/boundary confusion, dissociative/disoriented, and negative/intrusive dimensions are largely based on Main and Hesse's (1992–2006) conceptualization of FR behaviors and contain all of the original items dictated in the FR system plus several new items that have been added throughout the development of the AMBIANCE system. The affective communication errors and withdrawal dimensions are not included in the FR system but are seen as an extension of FR behaviors into the larger atypical parenting behaviors construct. Behaviors in each domain have been observed in mother-child interactions across a variety of contexts, but are more likely to be observable in interactions that contain a stressful situation because stressful contexts are likely to yield a higher frequency of atypical parenting behaviors (Madigan et al., 2006). This is because stressful situations place more demands on the mother and may provoke a collapse in her abilities to uphold a supportive environment (Madigan et al., 2006). Empirical investigations of the factor structure of the AMBIANCE revealed that each dimension is a unique factor underlying the larger atypical parenting behavior construct (Lyons-Ruth, 1999). Furthermore, the stability of atypical parenting behaviors over time has been established from age 1 to age 7 (Madigan, Voci, & Benoit, 2011).

Dimension one, *affective communication errors*, contains behaviors such as contradictory signaling to the infant (e.g., smiling while using a stern voice, directing the infant to do something and then not to do it), failure to initiate responsive behavior to infant cues (e.g., not attempting to soothe a distressed infant, failing to provide limits around safety), and inappropriate or delayed responses to infant cues (e.g., laughing while infant is crying,

overriding the infant's negative affect with positive affect). Dimension two, *role/boundary confusion*, contains behaviors that suggest clear difficulty in the caregiver's ability to prioritize the infant's needs over hers such as eliciting reassurance from the infant, asking the infant for permission, and demanding a show of affection from the infant (e.g., repeatedly asking the infant to give a hug). Dimension two also contains sexualized behaviors that suggest the caregiver is treating the infant as an intimate or sexual partner. These behaviors include speaking in hushed, intimate tones, touching inappropriate parts of the infant's body, and kissing the infant in a sexualized or over-intimate manner. Dimension three, *fearful/disoriented*, contains fearful behaviors (e.g., frightened expressions, recoiling, and backing away from the infant), dissociative or disorganized behavior (e.g., trance-like postures or freezing, deadened affect, or aimless wandering), and fearful or disoriented voices (e.g., haunted or ghost-like whispering, a sudden rise in intonation). Dimension four, *intrusiveness/negativity*, contains physical (e.g., pulling infant by the wrist, restraining the infant, forcing the infant into a sitting position) and verbal (e.g., mocking or teasing the infant, using loud or sharp voice tones, making negative comments about the infant) communications, as well as negative attributions about the intentions or motivations of the infant (e.g., "he/she hates me" following an innocuous behavior or action by the infant). This dimension also includes exerting control using objects (e.g., removing or withholding a toy despite the infant's show of joy or engagement). Finally, dimension five, *withdrawal*, contains behaviors that create physical distance (e.g., holding the infant away from the body with stiff arms, directing an approaching infant away), otherwise maintain distance using verbal communication (e.g., not speaking to the infant during interactions, dismissing the infant's need for contact, saying "you don't need me"), and direct the infant away from the self

using toys (e.g., offering objects over an unusual distance, presenting toys without regard for the infants interest/as a substitute for closer contact and not as a means of shared play).

Upon viewing each interaction to be coded, a transcript is created that details the interactions between the mother and child. Using the transcripts, indications of atypical parenting behaviors throughout the interaction are tallied, yielding a frequency count of behaviors in each domain. Once all of the behaviors across the dimensions have been identified, they can be analyzed in a number of ways. In the early days of the coding system, the tallied frequency counts of behaviors in each domain were often used in analyses to examine the effects of behaviors in each dimension separately. However, the frequency count was noted to be susceptible to poor inter-rater reliability (Madigan et al., 2006). To improve the utility of the five domains, Madigan and colleagues (2006) designed 7-point rating scales for each dimension that substantially improved inter-rater reliability for the five dimensions. For example, reported intra-class correlation coefficients (ICC) for the frequency count in the study by Lyons-Ruth and colleagues (1999) ranged from .31 to .93, with most falling around .75, whereas the ICCs for the newly designed rating scales reported in Madigan and colleagues (2006) ranged from .54 to .96 for one type of mother-child interaction (presence of toys to facilitate interactions) and from .78 to .90 in another type of mother-child interaction (absence of toys to create a more demanding interaction context). The authors noted that the .54 value, which was for dimension two (Role/boundary confusion), was low due to a low base rate of these behaviors in the 'toys' condition.

Currently, the rating scale for each dimension is based on, not only the frequency count of behaviors in each domain but also the *severity* of behaviors observed. For example, certain italicized behaviors, those that have been shown to be highly correlated with the development of

disorganized infant attachment, are given more weight than other, non-italicized behaviors. Therefore, the rating of 1 to 7 for each dimension is based on the frequency and severity of behaviors observed within each dimension, with higher values indicating more atypical behaviors of each type. Based on the five dimensional ratings and number of observed italicized behaviors, a 1 to 7 *total* score is also assigned that captures the overall quality of the interaction. Using the total score, caregivers are classified as not disrupted (a score of 1 to 4) or disrupted (a score of 5 to 7). This binary, categorical rating is also commonly used in analyses. In the present study, the disrupted/not disrupted classification was used only to provide basic descriptive information about the number of women in the sample classified in each group. In all other analyses, the total overall rating, as well as the individual dimensional ratings, were used as continuous variables.

In this study, atypical parenting behaviors were coded from a 12-minute video-taped mother-infant interaction task that included a 10-minute free play followed by a 2-minute clean-up. Following consultation with Dr. Sheri Madigan and Dr. Elisa Bronfman, two AMBIANCE trainers and gold-standard coders, it was decided that the second half of the free play and the entire clean-up would be coded, resulting in a code-able 7-minute interaction. A standard set of developmentally appropriate toys that were novel to each family was brought to the interview and used for the interaction task. Participants were informed in advance of the video-taped interaction prior to scheduling the interview. The same standardized instructions for the interaction were read aloud to mothers right before the task began:

Now we'd like to videotape you and your baby playing together with some of the toys that we brought along. Please feel free to play and interact with your child as you normally would. Go ahead and have a seat behind the toys and facing us. If possible,

please try to keep your child around this area and these toys for the next 12 minutes.

After about 10 minutes, we'll let you know that there's about 2 more minutes left and then you and your baby can clean up the toys by putting them back in the bucket. One of us will make sure the camera is working, and the other will just be sitting aside organizing paperwork. Ready to begin?

After data were collected, this investigator attended two separate 3-day trainings with Drs. Madigan and Bronfman). The trainings involved a theoretical background of disorganized caregiving behaviors, a detailed overview of the AMBIANCE system, and supervised practice coding. Following training, attendees were given practice tapes to continue training on the system before attempting inter-rater reliability.

Inter-rater reliability (IRR) was established with Dr. Elisa Bronfman on 35 interactions in the present sample (33% of 106 interactions). IRR was evaluated using intra-class correlation coefficients (ICC; single, absolute) for the dimensional and overall 1 to 7 ratings, and Kappa for the overall dichotomous rating (Disrupted/Not Disrupted). IRR was acceptable to excellent for all ratings: overall dichotomous rating ($k = .94$), affective communication errors ($r = .84$), role/boundary confusion ($r = .78$), fearful/disoriented ($r = .70$), intrusive/negative ($r = .91$), and withdrawal ($r = .75$). This investigator consulted with Dr. Bronfman on additional, particularly difficult cases ($n = 6$) throughout the coding process after IRR was established, which prevented drift and allowed for continued coding fidelity.

Chapter 6: Data Analytic Plan and Results

Review of Study Hypotheses

Hypothesis 1 states that greater severity of childhood maltreatment experiences will be associated with greater severity of atypical maternal parenting behavior 1-year postpartum. This hypothesis was examined using scatter plots and bi-variate correlations. Childhood maltreatment severity was operationalized as the total severity score on the CTQ and atypical maternal parenting behavior as the total AMBIANCE score. Additional correlations that are more exploratory in nature were conducted to examine associations between total childhood maltreatment experiences, the different types of child maltreatment (emotional, physical, sexual abuse and emotional and physical neglect), and different types of atypical parenting behavior (affective communication errors, boundary confusion/role reversal, disorientation/dissociation, intrusive negativity, and withdrawal).

Hypothesis 2 states that greater severity of PTSD symptoms will be associated with greater severity of atypical maternal parenting behavior 1-year postpartum. This hypothesis was also examined using scatter plots and bi-variate correlations. PTSD symptom severity was operationalized as the total symptom severity score on the PCL and atypical maternal parenting behavior was measured with the total AMBIANCE score. Additional exploratory correlations between different clusters of PTSD symptoms and dimensions of atypical maternal parenting behavior (outlined above) were also examined.

Hypothesis 3 states that greater severity of IPV experiences during pregnancy will be associated with greater severity of atypical maternal parenting behavior 1-year postpartum. IPV severity was operationalized as the CTS-2 total severity score and atypical maternal parenting behavior as the total AMBIANCE score. Hypothesis 3 was examined with scatter plots and bi-

variate correlations. Additional correlations between different types of IPV (sexual violence, violence resulting in injury, physical violence, and psychological aggression) and dimensions of atypical maternal parenting behavior were also examined.

Hypothesis 4 states that different prenatal profiles of interpersonal trauma experiences will have differential relationships with later atypical parenting behaviors. Similarly, Hypothesis 5 states that different prenatal profiles of PTSD symptoms will exist and have differential relationships with later atypical parenting behavior 1-year postpartum. Profiles of interpersonal trauma experiences, as well as profiles of PTSD symptoms, were explored using latent profile analysis (LPA). Nine variables were used to determine profiles of interpersonal trauma experiences: five childhood variables (physical abuse, sexual abuse, emotional abuse, physical neglect, and emotional neglect) and four adult variables (sexual violence, violence sustained injury, physical violence, and psychological aggression). The empirically-derived five PTSD symptom clusters (re-experiencing, avoidance, numbing, dysphoric arousal, and anxious arousal) were used to determine profiles of PTSD symptoms. Unconditional models (i.e., without covariates and AMBIANCE variables) were examined first to ensure heterogeneity of the data; it is important to first ensure that meaningful profiles exist before examining outcome variables. For the conditional models, maternal age and education level were included as covariates due to significant correlations with PTSD symptoms and maternal trauma history. The significance or size of the difference between groups on the AMBIANCE dimensions was also depicted using effect sizes (Cohen's *d*) for all analyses. When using multiple imputation in Mplus with auxiliary variables, only descriptive information is provided for the groups (e.g., *m* and *se*); no *p*-values are provided. Therefore, the *se* was converted to *sd* which was used to calculate Cohen's *d* values.

Latent profile analysis. LPA is a person-centered approach that identifies underlying (i.e., latent) homogeneous sub-groups within a heterogeneous set of data (Lazarsfeld & Henry, 1968). Therefore, one primary assumption of LPA is that latent profiles exist within the data. When data are homogenous, the identification of latent profiles is not necessary as the data are well described by basic variable-centered descriptive statistics, such as means and variances. When data are heterogeneous, means and variances do not adequately describe the data because such statistics aggregate across subgroups that have different means and variances from one another as well as the grand (overall) mean and distributional properties. Therefore, person-centered analyses are seen as having an advantage over variable centered analyses when data are heterogeneous.

Another assumption of LPA is that the variables being used in the profiles are continuous. A similar method, latent class analysis (LCA), is used with binary or other types of categorical data. A final set of assumptions is that the variables are independent and normally distributed. Normality of variables was examined and addressed using the procedures outlined above. Independence of variables means that a score on one variable is not dependent on or co-linear with another variable. The assumption of independence may be violated when identifying profiles of interpersonal trauma experiences because, as detailed in the literature review, childhood experiences are known to be associated with adult experiences of trauma. Due to dependence in the present study, childhood and adult experiences were examined separately after they were considered together. The relationships between identified profile and atypical parenting behavior, as outlined below, were examined separately.

LPA is a data-driven approach, meaning that the number of profiles within the data is not predetermined, but rather, guided by fit indices, which identify the optimal number of profiles

that exist within the data (i.e., the number of profiles that best represent the data). There are many different indices to choose from, and it is important to consider more than one index of fit. Although there are no firm guidelines for choosing which fit indices to examine, the Bayesian Information Criterion (BIC) as well as the Lo-Mendell-Rubin-adjusted likelihood ratio test (LMR-A) and bootstrap likelihood ratio test (BLRT) have been shown to be consistent indicators of the adequate number of profiles (Nylund, Asparouhov, & Muthen, 2007). Therefore, these three indices were used in the present study to evaluate model fit, along with considerations of theoretical applicability. Although fit statistics are important, theoretical interpretability of the profiles is also meaningful in choosing the most appropriate model.

Fit using BIC values is typically determined by comparing the values across models starting with a 2-profile model. If BIC values decrease across models, fit is improving with the addition of more profiles. Once BIC values begin to rise, further model testing is not advised as the addition of profiles is not expected to result in improved model fit. Therefore, using the BIC, the best fitting model is the model with the lowest BIC value. The LMR-A and BLRT indices compare the present k -profile model with a $k-1$ profile model to determine whether the current model is superior to a model with one fewer profiles; that is, it determines whether the k -profile model improves upon the $k-1$ profile model. The likelihood value is evaluated against a critical value and a statistically significant value; at the p -value $< .05$ level, it suggests that the k -profile model is superior to the $k-1$ profile model.

Data Preparation and Handling of Missing Data

Missing data were minimal. All 120 participants provided information on childhood trauma experiences and symptoms of PTSD during pregnancy (T1). One participant refused to provide information on adult experience of IPV at the T1 wave; IPV data for this participant

were estimated using a maximum likelihood estimation procedure that produces standard errors that are robust to non-normality, known in Mplus as MLR. MLR estimates missing data through identifying likelihood functions for observed data and integrating over those with missing data. This procedure results in maximally likely values for missing cases given information obtained from observations with complete data. Multiple imputation was used for the final conditional LPA models, with AMBIANCE entered as auxiliary outcome variables, to account for missingness on the AMBIANCE scales; MLR cannot address missingness on auxiliary variables in Mplus. Twelve percent ($n = 14$) of women were missing AMBIANCE scores for various reasons: three were unable to be located at the time of the 1-year interview, two withdrew from the study, one moved out of the country, one did not have consistent contact with her child at the time of the interview, two did not have custody of their children at the time of the interview, four interviews were completed over the phone, and one video was unable to be coded due to various interruptions and distractions during the free play and clean-up. Using MLR and multiple imputation allowed for all analyses (except for descriptive statistics) to be based on the full sample size of $N = 120$.

Descriptive Statistics

Descriptive information (raw data) for study variables is presented in tables 2 to 4. Women in the present study reported a wide range of experiences of childhood maltreatment (see Table 2). Sixty-four percent of women reported at least one experience of childhood maltreatment. Fifty percent reported emotional abuse, 32.5% physical abuse, 29.2% sexual abuse, 42.5% emotional neglect, and 29.2% physical neglect.

Similarly, a wide range of experiences of IPV during pregnancy were reported by the women in the present study (see Table 2). Seventy-eight percent reported at least one experience

of IPV during pregnancy. A majority reported experiencing psychological aggression (76.7%), 12.5% reported physical IPV, 6.7% reported sustaining an injury from IPV, and 13.3% reported sexual IPV during their pregnancy with the target child.

In addition to experiences of child- and adulthood trauma, women in the present study reported a wide range of symptoms of PTSD (see Table 3). Taking into consideration the total score on the PCL, 10 women (8.3%) fell above the cut-off for probable PTSD (score of 44 or greater). Furthermore, 73% reported at least one re-experiencing symptom, 60% at least one avoidance symptom, 64.2% at least one numbing symptom, 84.2% at least one dysphoric arousal symptom, and 54.2% at least one anxious arousal symptom.

The overall level of atypical parenting was moderately high, with a mean of 4.25. That is, across all five AMBIANCE dimensions, women in the present study demonstrated non-optimal parenting behaviors with their 1-year-old infants on average (see Table 4). In regards to the dichotomous disrupted versus not disrupted classification, nearly half of the women (49%) in the present study were classified as disrupted.

Raw data (i.e., prior to estimation procedures) were also examined for dispersion issues. Many of the trauma exposure variables demonstrated moderate to high levels of positive skew, indicating that many women did not endorse such experiences (See Table 2). This type and level of skew is to be expected for a community sample of women and is not concerning. Furthermore, the data estimation procedure utilized in the present study (reviewed above), is robust to non-normality. Dispersion for the PTSD symptom domains was acceptable (see Table 3). All five AMBIANCE dimensions and the overall level also demonstrated acceptable dispersion in terms of skew and kurtosis (see Table 4). Therefore, no data transformations were made.

Analysis of Potential Covariates

Past literature has noted maternal age and education are related to experiences of interpersonal trauma and reported PTSD symptoms. Therefore, associations between maternal age and education and trauma and PTSD symptom variables were examined as potential covariates (see Table 5). Bi-variate correlations revealed significant associations between maternal age and PTSD symptoms ($r = -.247, p < .01$) as well as IPV during pregnancy ($r = -.214, p < .05$), indicating that younger maternal age was associated with higher PTSD symptom severity and higher endorsement of experiences of IPV during pregnancy. The association between maternal age and childhood maltreatment experiences was not statistically significant, nor was the association between age and AMBIANCE total. Education was related to all major study variables such that lower education level was associated with higher PTSD symptom severity ($r = -.245, p < .01$), higher severity of childhood maltreatment ($r = -.248, p < .01$), higher endorsement of experiences of IPV during pregnancy ($r = -.237, p < .01$), and higher level of atypical parenting behavior ($r = -.434, p < .001$). Therefore, maternal age was included as a covariate in analyses that included PTSD symptoms and/or IPV during pregnancy, and education was included in all analyses. Additionally, experiences of IPV across the first year postpartum and reported PTSD symptoms at 1-year postpartum were entered as covariates into some analyses to control for the impact of experiences concurrent with parenting behavior.

Associations between Childhood Maltreatment and Atypical Parenting Behavior

Hypothesis 1 states that greater severity of childhood maltreatment experiences will be associated with greater severity of atypical maternal parenting behavior 1-year postpartum. A scatter plot between childhood maltreatment severity (CTQ total) and the overall total AMBIANCE score revealed a very weak relationship (see Appendix F.1). Therefore, there were

several women who displayed high levels of atypical parenting behavior yet reported little to no history of childhood maltreatment, further indicating no systematic relationship between the variables. In fact, the bi-variate correlation between CTQ total and overall AMBIANCE score was not statistically significant ($r = .100$, ns ; see Table 6). Therefore, hypothesis 1 was not supported.

Additional, exploratory associations were conducted to examine relationships between the severity of different types of child maltreatment (emotional, physical, sexual abuse and emotional and physical neglect) and different types of atypical parenting behavior (affective communication errors, boundary confusion/role reversal, disorientation/dissociation, intrusive negativity, and withdrawal). A preliminary view of the scatterplots did not reveal issues with heteroscedasticity (see Appendices F.2 to F.26). Scatterplots depicted very few systematic relationships between childhood maltreatment types and dimensions of atypical parenting behavior.

Given the large number of associations being explored, it was necessary to consider the chance of conducting a Type-I error (i.e., a false stating of significance), as examining multiple associations simultaneously increases the chances of finding significant associations due to chance. In the present study, there were five childhood maltreatment variables and five AMBIANCE dimensions, resulting in 25 associations being investigated. Therefore, a Bonferroni adjustment was made such that the significance value was set at $p < .002$ level. Using this correction, none of the bi-variate associations between types of childhood maltreatment and dimensions of atypical parenting behavior were statistically significant (see Table 6). However, without the correction, it is noteworthy that a history of childhood sexual abuse was positively associated with affective communication errors ($r = .205$, $p < .05$), and

childhood physical neglect was positively associated with role/boundary confusion ($r = .210, p < .05$).

Associations between PTSD Symptoms during Pregnancy and Atypical Parenting Behavior

Hypothesis 2 states that greater severity of PTSD symptoms will be associated with greater severity of atypical maternal parenting behavior 1-year postpartum. A scatterplot depicting the relationship between total symptom severity score on the PCL and the overall AMBIANCE score revealed little systematic relation (see Appendix F.27). The bi-variate correlation coefficient confirmed the lack of a significant relationship ($r = .096 ns$; see Table 7). Therefore, there was little support for the hypothesis that greater severity of PTSD symptoms during pregnancy would be related to atypical parenting behavior 1-year postpartum.

Additional exploratory correlations between different clusters of PTSD symptoms (re-experiencing, avoidance, numbing, dysphoric arousal, and anxious arousal) and dimensions of atypical maternal parenting behavior (outlined above) were also examined (see Appendices F.28 to F.52). No issues with heteroscedasticity were noted in scatterplots. Furthermore, very few systematic associations between PTSD symptom clusters and dimensions of atypical parenting behavior were found.

A Bonferroni correction ($p < .002$) was again applied to protect against Type-I error. Subsequently, there were no statistically significant associations between PTSD symptom clusters and AMBIANCE dimensions (see Table 7). However, using a traditional p -value of .05, results revealed that higher levels of anxious arousal during pregnancy were related to higher levels of affective communication errors ($r = .203, p < .05$) and intrusiveness/negativity ($r = .253, p < .05$) 1-year postpartum. Dysphoric arousal was related to role/boundary confusion; however, it was in the unexpected direction with higher dysphoric arousal being associated with

lower instances of role/boundary confusion ($r = -.213, p < .05$). In sum, little to no evidence for systematic relationships between PTSD symptom clusters and later atypical parenting behavior was found.

Associations between IPV Exposure during Pregnancy and Atypical parenting behavior

Hypothesis 3 is exploratory and states that greater severity of IPV experiences during pregnancy will be associated with greater severity of atypical maternal parenting behavior 1-year postpartum. A view of the scatterplot between IPV during pregnancy and overall AMBIANCE level suggests that many women reported low levels of IPV during pregnancy and that there was little systematic relation between pregnancy IPV and later atypical parenting behavior (see Appendix F.53). Heteroscedasticity did not appear to be a problem, though there was a higher concentration of women near lower levels of total IPV. The bi-variate correlation between IPV and overall AMBIANCE level supported the observation of no systematic relationship ($r = .017, ns$; see Table 8). Hypothesis 3 was not supported.

Additional correlations between different types of IPV (sexual violence, violence sustained injury, physical violence, and psychological aggression) and dimensions of atypical maternal parenting behavior were also examined (see Appendices F.54 to 73). With a Bonferroni correction of .003, no significant associations between types of IPV during pregnancy and dimensions of AMBIANCE were revealed (see Table 8). Without a correction, sexual IPV was positively associated with maternal withdrawal ($r = .242, p < .05$), and injury sustained from IPV was associated with fearful/disoriented maternal behavior, although not in the expected direction ($r = -.213, p < .05$).

Latent Profiles of Trauma Experiences as Predictors of Later Atypical parenting behavior

Hypothesis 4 states that different prenatal profiles of interpersonal trauma experiences will have differential relationships with later atypical parenting behaviors. Nine variables were used to determine profiles of interpersonal trauma experiences using latent profile analysis (LPA): five childhood variables (physical abuse, sexual abuse, emotional abuse, physical neglect, and emotional neglect) and four adult variables (sexual violence, injury sustained from IPV, physical violence, and psychological aggression).

Unconditional models (i.e., without covariates and dependent variables) were examined first to determine the presence of latent profiles; missing data were handled using MLR. Fit statistics for models with two to six profiles are presented in Table 9. The presence of latent profiles was supported by the 2-profile model as the LMR-A and BLRT statistics were significant, which indicated the 2-profile model better represented the data than a 1-profile model. As the number of classes increased, the models became increasingly unstable, with very small class memberships (i.e., profiles with only 1 to 3 participants).

Conditional models were examined next, which included maternal age and education as covariates as well as postnatal experiences of IPV (i.e., over the first year following birth). Missing data were estimated using MLR. Conditional models continued to provide support for the presence of two latent profiles of trauma experiences, and also showed model instability with increasing numbers of classes (See Table 10). Therefore, the 2-profile model was chosen. This solution revealed one profile, labeled chronic ($n = 31$), characterized by the presence of both child- and adulthood experiences of trauma and one labeled psychological aggression only ($n = 89$), characterized by moderate levels of psychological aggression perpetrated by an intimate partner in adulthood only (see Figure 1).

To explore differences in AMBIANCE scores between profiles, a conditional, 2-profile model was examined with all five AMBIANCE dimensions entered as auxiliary variables. Due to missing data on the AMBIANCE scales, multiple imputation was used, which can account for missing data in auxiliary variables, unlike MLR.

In regards to differences in atypical parenting behavior between profiles, moderate to large effect size differences were observed between women in the chronic profile and women in the psychological aggression only profile for all domains of atypical behavior except withdrawal (see Table 11). The effect size was small to moderate for the difference in affective communication errors and role boundary confusion, with women in the chronic profile demonstrating more atypical behaviors compared to women in the psychological aggression only profile (Cohen's $d = .33$ and $.37$, respectively). Although women in the psychological aggression only profile demonstrated a higher mean level of withdrawal behaviors compared to women in the chronic profile, the difference was very small (Cohen's $d = .10$).

Profiles of childhood maltreatment experiences and later atypical parenting behavior. Due to poor model stability for the trauma model, latent profile models for childhood and adulthood experiences were explored separately to further examine potential profiles of trauma experiences. For childhood maltreatment experiences (emotional abuse, physical abuse, sexual abuse, physical neglect, and emotional neglect), a 2-profile solution demonstrated improved fit compared to a single profile, indicating the presence of latent profiles (see Table 12). In the conditional models, controlling for maternal education, BIC values continued to decrease for each additional profile added and bottomed out at the 5-profile model, which demonstrated good fit based on the BIC and BLRT statistics (see Table 13). However, the model had specification issues and, therefore, was not a suitable model. Therefore, the 4-profile model

was chosen as the best fitting model; it was superior to the 3-profile model in terms of BIC and the BLRT statistics and produced four theoretically interesting profiles (see Figure 2). The 4-profile model consisted of a low exposure group with little to no reports of childhood maltreatment ($n = 78$), a high exposure group with higher reported rates of childhood maltreatment across all five types ($n = 15$), another relatively low maltreatment group except for high rates of sexual abuse, labeled high sexual ($n = 12$), and another relatively high exposure group except for low rates of sexual abuse, labeled high physical and emotional ($n = 15$).

At 1-year postpartum, women in the high exposure profile demonstrated the highest rates of all types of atypical parenting behavior except withdrawal (see Table 14). Moderate to large effect sizes were observed for the difference in affective communication errors between the high exposure profile and all other profiles (Cohen's d ranged from .456 to .677). For role/boundary confusion, only the difference between the high exposure and low exposure profiles was notable, with the high exposure profile demonstrating more role/boundary confusion ($d = .486$). Meaningful differences between profiles were not observed for fearful/disoriented, intrusive/negativity, or withdrawal. Effect sizes for differences in AMBIANCE dimensions between profiles are presented in Tables 15 to 19.

Profiles of experiences of IPV in adulthood and later atypical parenting behavior.

When examining latent profiles for adulthood experiences of IPV, difficulties similar to the overall trauma experiences model emerged. The presence of latent profiles was somewhat supported by the unconditional 2-profile model as the BLRT statistic was significant, which indicates that the 2-profile model better represented the data than a 1-profile model; however, the LMR-A was not significant (see Table 20). Furthermore, increasing the number of profiles led to greater model instability. The addition of covariates (maternal age, education, and concurrent

partner violence) did not add much stability to the models, and a 2-profile model was chosen due to adequate fit statistics (see Table 21). One profile, mild psychological aggression ($n = 114$), was characterized by mild levels of psychological aggression only. Another profile, moderate to high ($n = 6$), was characterized by moderate to high levels of all types of IPV but with little to no sexual abuse (see Figure 3).

Women in the moderate to high abuse profile demonstrated higher average levels of affective communication errors, role/boundary confusion, intrusive/negativity, and withdrawal compared to the mild psychological aggression only profile (d 's ranged from .28 to .40; see Table 22). In contrast, women in the mild psychological aggression profile displayed higher average levels of fearful/disoriented behavior compared to women in the low sexual abuse profile ($d = .49$).

Latent Profiles of PTSD Symptoms as Predictors of Later Atypical parenting behavior

Hypothesis 5 states that different prenatal profiles of PTSD symptoms will exist that have differential relationships with later atypical parenting behavior 1-year postpartum. The empirically-derived five PTSD symptom clusters (re-experiencing, avoidance, numbing, dysphoric arousal, and anxious arousal) were used to determine profiles of PTSD symptoms.

Unconditional models were examined first. Fit statistics for models with 2 to 6 profiles are presented in Table 23. The presence of latent profiles was supported by the 2-profile model as the LMR-A and BLRT statistics were significant, indicating a 2-profile model better represented the data than a 1-profile model. The LMR-A statistic for all subsequent models was not significant, suggesting that the 2-profile model may be the best fit for the data; however, the BLRT statistic indicated that all models were sufficient, and provided a better fit for the data than the previous ($k - 1$) model. Furthermore, the BIC statistic continued to decrease for each

subsequent unconditional model, indicating that adding more profiles may provide a better fit for the data.

Conditional models with age, education, and PTSD symptoms (total score) at 1 year postpartum entered as covariates were run for 2 to 6 profile models. Fit statistics are presented in Table 24. The LMR-A was only significant for the 2-profile model; however, the BLRT was significant for all models. Furthermore, the BIC continued to decrease until the 4-profile conditional model and then began to rise again, indicating that the 4-profile model may be the most optimal model.

A conditional 4-profile model with AMBIANCE dimensions entered as auxiliary variables (using multiple imputation for missing data) was run as the final model. Two of the profiles were characterized by moderate to high levels of symptoms (see Figure 4); one was characterized by high levels of symptoms across all symptom clusters (high, $n = 8$) and another was characterized by high to moderate levels across all clusters except numbing and anxious arousal (moderate, $n = 22$). The other two profiles were characterized by relatively low symptoms across all clusters, with moderate elevations in arousal. However, the women in one of the profiles were significantly older and more well-educated than women in all other profiles, and the women in the other low symptom profile had a slightly lower average age and education, similar to descriptive statistics for the entire sample of 120. Therefore, the profiles were labeled low, well-educated ($n = 21$) and low, demographic risk ($n = 69$).

The women in the low, well-educated profile demonstrated the lowest average level of atypical parenting behaviors across all AMBIANCE dimensions (see Table 25). As expected, women in the high profile, demonstrated some of the highest average levels of atypical parenting behavior. Women in the high profile demonstrated more affective communication errors than

women in all other profiles (d 's ranged from .47-1.00) as well as higher role/boundary confusion ($d = 1.03$), fearful/disoriented behavior ($d = .97$), intrusive/negative behavior ($d = 1.26$), and withdrawal behavior ($d = .60$) compared to women in the low, well educated profile. Women in the high profile also demonstrated higher intrusive/negative behavior compared to the demographic risk group ($d = .39$). There were small to moderate effects for the differences between the high and moderate profiles on role/boundary confusion ($d = .20$), intrusive/negativity ($d = .25$), and withdrawal ($d = .29$), all with women in the high profile demonstrating more atypical parenting behaviors. Women in the moderate profile demonstrated higher levels of affective communication errors ($d = .40$), role/boundary confusion ($d = .79$), fearful/disoriented ($d = .97$), and intrusive/negative ($d = .97$) behaviors compared to women in the low, well-educated group. Interestingly, women in the demographic risk profile, who had similar PTSD symptom levels to the other low profile, demonstrated small to moderately higher levels of role/boundary confusion ($d = .24$), fearful/disoriented behavior ($d = .25$), and withdrawal ($d = .27$) compared to the moderate group, as well as moderate to large elevations for all five dimensions compared to the low, well-educated group (d 's range from .51 to 1.28). There was also a small effect for the difference in fearful/disoriented behaviors between the demographic risk and high groups, with women in the demographic risk group demonstrating slightly higher levels of this form of atypical parenting behavior ($d = .24$). Effect sizes for differences in AMBIANCE dimensions between PTSD symptom profiles are presented in Tables 26 to 30.

Chapter 7: Discussion

The purpose of the present study was to examine associations between experiences of child- and adulthood interpersonal trauma and later atypical maternal parenting behavior 1-year postpartum, as well as associations between prenatal posttraumatic stress disorder (PTSD) symptoms and later atypical maternal parenting behaviors. The present study aimed to replicate past work by demonstrating an association between maternal experiences of childhood maltreatment and PTSD symptoms and atypical maternal parenting behaviors (e.g., Lyons-Ruth et al., 1999; Schechter et al., 2008, 2010). Additionally, associations between adult experiences of IPV during pregnancy and atypical parenting behavior 1-year postpartum were explored. Finally, different types (e.g., sexual vs. physical vs. psychological) and timing (e.g., childhood vs. adult) of interpersonal trauma, along with PTSD symptom clusters (re-experiencing, avoidance, numbing, dysphoric arousal, and anxious arousal), were investigated in relation to atypical parenting behaviors. The intended implications of the present study were to identify ways in which women, during pregnancy, are at risk for displaying atypical parenting behaviors 1-year postpartum which are known to be very damaging to infants' social-emotional development (Lyons-Ruth et al., 1999; Madigan et al., 2007; Shi et al., 2012).

Associations between Childhood Maltreatment and Atypical Parenting Behavior

Statistically significant associations between experiences of childhood maltreatment and atypical parenting behavior were not found. In fact, some women in the present study who reported few to no experiences of childhood maltreatment were still found to display a wide range of atypical parenting behaviors from optimal to severely disrupted levels. There was also considerable variability in AMBIANCE scores among those who reported numerous experiences of childhood maltreatment. These results are inconsistent with past findings. For instance,

previous work by Lyons-Ruth and colleagues (1999) demonstrated a link between psychosocial risk (i.e., history of physical or sexual childhood maltreatment and/or inpatient psychiatric care) and atypical parenting behavior; however, their entire sample reported one or more operationally-defined risk experiences. In contrast, the women in the present study made up a non-treatment seeking, community sample who reported a wider range of maltreatment experiences including 36% of women who did not report any experiences of childhood maltreatment. It is possible, therefore, that the association between childhood trauma and atypical parenting was weaker in the present study due to the presence of women without experiences of childhood maltreatment in the sample.

Schechter and colleagues (2004) also previously reported indirect associations (via dysregulation of the hypothalamic-pituitary-adrenal [HPA] axis) between severity of experiences of interpersonal trauma (child- or adulthood) and atypical parenting behavior; however, child and adult experiences were combined in their study. In contrast, associations between child- and adulthood experiences and atypical parenting behaviors were examined separately in the present study, making it hard to compare results.

The unexpected lack of associations between mothers' reports of their own experiences of childhood maltreatment and observed atypical parenting behavior in the present study may also indicate there are other important factors to consider in understanding the link between experiences of childhood maltreatment and atypical parenting behavior. For instance, as past research has suggested (e.g., Ballen et al., 2010; Goldberg et al., 2007; Madigan et al., 2006, 2007), classification of childhood trauma experiences as 'unresolved' may be a critical condition to establish an association between childhood maltreatment experiences and atypical parenting behavior. As explained earlier, the classification of trauma as unresolved indicates that the

traumatic experience has not yet been psychologically processed (i.e., not yet been made conscious and/or coherent), which can lead to ongoing impairments in many domains of functioning including parenting (Lyons-Ruth et al., 1999; Main & Hesse, 1990; Main et al., 1984). Unresolved trauma has been measured using researcher-coded markers and classifications from the AAI, an extensive, semi-structured interview, with a focus on *how* a person discusses his/her trauma experiences. As such, past research examining the impact of childhood maltreatment on atypical parenting behavior has focused almost exclusively on the link between the AAI Unresolved classification and AMBIANCE scores. Because the AAI was not administered in the present study, the degree to which participants' childhood trauma was (un)resolved could not be determined. Instead, participants self-reported childhood maltreatment on a questionnaire, and these responses were used to predict atypical parenting behavior. Therefore, the lack of bi-variate associations in the present study may be an indication that unresolved trauma status, or some other indication that the trauma is still having an impact on functioning, is a necessary condition for risk for atypical parenting behavior.

Even so, the present study contributes to the field's understanding of how experiences of trauma may (or may not) impact atypical parenting behavior. Having an experience of trauma in childhood may not, by itself, indicate risk for extreme parenting difficulties; furthermore, unresolved traumatic experiences might not be the only source of risk for atypical parenting. For example, LPA results in the present study suggest that experiencing multiple types of trauma puts women at a greater risk of displaying atypical parenting behaviors. These results will be further discussed below.

Associations between PTSD Symptoms during Pregnancy and Atypical Parenting Behavior

Results from the present study revealed little support for the hypothesis that greater severity of PTSD symptoms during pregnancy would be related to atypical parenting behavior 1-year postpartum. This is surprising given past work by Schechter and colleagues (2008) demonstrating associations between concurrent PTSD symptom severity and severe maternal withdrawal according to the AMBIANCE system. Additionally, Schechter and colleagues (2010) demonstrated a trend-level association between interpersonal violence-related PTSD symptom severity and the total amount of atypical parenting behavior. However, all women in the Schechter studies had a history of interpersonal trauma, which was specifically tied to their report of PTSD symptoms. Not all women in the present study had histories of interpersonal trauma, and additionally, they provided information on PTSD symptoms in general (in response to a wide range of stressors) rather than symptoms tied to a specific instance of interpersonal trauma. Therefore, associations between PTSD symptoms and atypical parenting behavior may be stronger when the symptoms are specifically tied to an instance of interpersonal trauma. Furthermore, only 8.3% of the women in the present study reported current PTSD symptoms above the measure's clinical cut-off, compared to 44% (using a structured clinical interview) in Schechter and colleagues' 2008 study and 23% in their 2010 study. Thus, the frequency and severity of PTSD symptoms among participants in the present study may have been too low to yield significant bivariate associations between PTSD symptoms and atypical parenting behavior. Therefore, as other results from the current study suggest, it may be beneficial to look at individual differences in the presentation of PTSD symptoms as different types and combinations of PTSD symptom clusters may allow for a more nuanced identification of risk than when using a PTSD symptom total; this possibility is further discussed below.

Associations between IPV Exposure during Pregnancy and Atypical parenting behavior

In addition to examining self-reported childhood maltreatment experiences and prenatal trauma symptoms in relation to parenting behavior, this was the first known study to investigate the link between experiences of interpersonal violence in adulthood and atypical parenting behaviors. Theoretical work by Solomon and George (2000) supports the hypothesis that experiences of violence in close relationships across the lifespan can contribute to a disabled caregiving system, thus negatively impacting parenting behavior. Although associations between IPV and atypical behavior specifically had not yet been examined prior to this study, a small amount of prior research indicates that IPV can, indeed, lead to concerning parenting behaviors such as hostility, harsh intrusiveness, and disengagement (Gustafsson et al., 2012; Levendosky et al., 2006). Therefore, although exploratory in nature, the lack of bivariate associations between IPV during pregnancy and atypical parenting behavior was surprising. One possible reason for these findings may be that, although the majority (76.7%) of the women in the present study reported experiences of psychological aggression from a partner during pregnancy, other types of partner violence were less frequently endorsed such as physical (12.5%) and sexual (13.3%) violence. It could also be that having more than one type of experience (e.g., physical IPV and psychological aggression) impacts the caregiving system in different ways, leading to varied risks for parenting. For example, experiencing psychological aggression *and* physical IPV compared to only physical IPV or only psychological aggression may have a greater impact on parenting behaviors. Therefore, examining associations between IPV and atypical parenting behavior without consideration of types of IPV experiences in combination may fail to elucidate potentially important individual variability in experiences and associations with atypical parenting constructs. More research is needed to further explore the

potential impact of combinations of different types of experiences of IPV in adulthood on atypical parenting behavior including how associations might be moderated by other factors, such as the presence of current PTSD symptoms.

In sum, across the first three hypotheses in the present study, there was a surprising lack of statistically significant associations between experiences of interpersonal trauma and symptoms of PTSD and later atypical parenting behavior, which contrasts with past empirical and theoretical work. In addition to the possible reasons described above for the different results in the present study as compared to past studies, the analyses utilized to test initial hypotheses in the current study were variable-centered and thus focused on detecting associations across the entire sample as a whole rather than examining possibly meaningful differences at the individual level.

Due to advancements in statistical techniques in recent years, the present study also aimed to advance the literature on predictors of atypical parenting behavior by utilizing person-centered techniques to identify meaningful predictors of parenting risk on an individual level. In fact, results from later hypotheses, discussed next, suggest that identifying profiles of trauma exposure and symptoms among sub-groups of sample participants may be helpful in better understanding and predicting risk for atypical parenting behavior.

Latent Profiles of Trauma Experiences as Predictors of Later Atypical parenting behavior

The LPA combining both child and adult experiences of interpersonal trauma was not statistically sound; it demonstrated convergence issues and produced untrustworthy standard errors and variances. Because experiences of maltreatment in childhood are often associated with later experiences of interpersonal trauma in adulthood (Classen, Paresh, & Aggarwal, 2005; Messman-Moore et al., 2000), dependence of variables may have contributed to the problematic

nature of the combined trauma LPA. Alternatively, model instability may have been due to other issues such as low base rates of some trauma experiences or the large number of scales being included with a relatively small sample size. It is also possible that only two profiles of trauma experiences exist for these data therefore, the two-profile solution (chronic and psychological aggression) was further examined.

The chronic profile consisted of only 7 women and was characterized by high levels of childhood maltreatment and adult IPV. The psychological aggression only profile contained the rest of the sample ($n = 113$) and was characterized by moderate levels of psychological aggression perpetrated by an intimate partner in adulthood only, with little to no experiences of childhood maltreatment. As expected, women in the chronic profile demonstrated higher levels of affective communication errors, role/boundary confusion, fearful/disoriented, and intrusive/negativity compared to women in the psychological aggression only profile. Therefore, accumulating numerous *types* of interpersonal trauma experiences before and during pregnancy puts women at risk for displaying atypical parenting behaviors toward their infants at 1-year postpartum. This is not surprising given past research demonstrating the impact of unresolved childhood trauma on atypical parenting behavior (e.g., Lyons-Ruth et al., 1999), but also adds merit to the notion that experiences of IPV in adulthood may be an additional risk factor, particularly in combination with earlier experiences of child maltreatment. Therefore, it appears that the accumulation of experiences of trauma across the lifespan presents particular risk for atypical parenting behavior. However, results should be interpreted with caution given the model identification issues for the overall trauma experiences model.

Profiles of childhood maltreatment experiences and later atypical parenting behavior. Due to the unique contributions of LPA in this field, additional analyses were

conducted with childhood maltreatment and adult IPV separately. In the childhood maltreatment models, the 4-profile solution demonstrated the best fit. The model consisted of a low exposure profile made up of women reporting little to no experiences of childhood maltreatment ($n = 78$), a high exposure profile made up of women reporting high levels of all types of childhood maltreatment ($n = 15$), a high physical and emotional maltreatment profile ($n = 15$), and a high sexual abuse ($n = 12$) profile. Results revealed that women in the group characterized by high exposure to all maltreatment types displayed more severe affective communication errors with their infants compared to women in all other profiles. Affective communication errors include behaviors such as contradictory signaling (e.g., frowning while speaking in a sweet voice), failure to initiate proper responses to infant cues, and inappropriate responses to infant cues. Experiencing interpersonal trauma, particularly multiple types of interpersonal trauma, is known to negatively impact interactions with others due to high levels of distrust in others, a strong desire to avoid social interaction, and alterations in how women view themselves (Cloitre et al., 2005; Herman, 1992). Therefore, mothers who have experienced severe childhood maltreatment (i.e., multiple types of maltreatment) may be very uncomfortable with intimacy and closeness with their infant due to reminders of past abuse. This type of maltreatment history may also lead a defensive denial of children's own needs for closeness and connection. As a result, women with multiple experiences of childhood maltreatment may be more prone to miss or respond inappropriately to their infant's cues for closeness and exploration. For example, a mother may experience an infant's cries and cue for closeness as suffocating or, alternatively, as intimidating and aggressive and respond inappropriately by minimizing the infant's affective experience (e.g., "you don't need me," "stop that right now") or distorting it (e.g., laughing while stating "you are just trying to get under my skin").

For role/boundary confusion, women in the high exposure to all types profile again demonstrated the highest average level of role/boundary problems with their infants, with meaningfully higher levels ($d = .486$) compared to the low exposure and high sexual profiles. Furthermore, women in the high physical and emotional profile demonstrated higher levels of role/boundary confusion compared to women in the high sexual group, perhaps indicating that experiencing physical and emotional childhood maltreatment may put women at a greater risk for such behaviors with their children compared to women who only experience sexual abuse. Role/boundary confusion includes behaviors that suggest clear difficulty in the caregiver's ability to prioritize the infant's needs over her own such as repeatedly asking for affection, asking the child for permission, and in severe cases, treating the infant like a spouse or romantic partner. This finding provides further support to the notion that having experienced multiple, different types of childhood maltreatment is a risk factor for displaying certain forms of atypical parenting behaviors, in this case, perhaps by reducing the parent's sense of agency and effectiveness in relationships. For instance, the pervasive experience of multiple types of maltreatment may result in a sense of no control in relationships, an internalized sense of helplessness, and excessive dependency on others for care and support (including one's own children).

Interestingly, meaningful differences between childhood maltreatment profiles were not observed for the fearful/disoriented, intrusive/negativity, or withdrawal domains. Women across all childhood maltreatment profiles demonstrated similar levels of fearful/disoriented behavior, which approached the non-optimal range. A score of 4 indicates non-optimal (though not disrupted) levels of fearful/disoriented behavior, and women across all profiles averaged 3.29 to 3.60 on this scale. Similarly, women across all profiles demonstrated, on average, non-optimal

levels of intrusive/negativity behaviors (means ranged 4.05 to 4.66). Therefore, rates of fearful/disoriented and intrusive/negativity behaviors were near or in the non-optimal range across all maltreatment profiles in the present study. Levels of withdrawal were also similar across profiles, though not particularly elevated (2.59 to 2.79). A lack of findings for the withdrawal dimension, in particular, could be due to the fact that severe withdrawal was not observed much in the present study therefore, there was not enough range of maternal withdrawal behaviors to detect differences between profiles.

In sum, LPA results suggest that different types of experiences of childhood maltreatment have implications for the display of maternal affective communication errors and role/boundary confusion during mother-infant interactions at 1-year postpartum. In particular, experiencing multiple, different types of childhood maltreatment appears to impact a mother's ability to effectively communicate with her child, read and understand her child's social cues, and form appropriate roles within the parent-child relationship. A large body of past research suggests that exposure to atypical parenting behavior (more generally) contributes to the development of child disorganized attachment (e.g., Lyons-Ruth et al., 1999; Madigan et al., 2007; Shi et al., 2012); thus, it will be important for future research to further elucidate how different dimensions of atypical parenting behavior, resulting from extensive maternal childhood trauma, impact the parent-child relationship and child social-emotional development.

Importantly, this is the first known study to examine latent profiles of maternal trauma experiences as they relate to different dimensions of atypical parenting behavior. The use of LPA to identify latent profiles of trauma experiences is an innovative approach to examining predictors of parenting behavior and highlights the importance of examining individuals' unique combination of experiences, rather than relying on trends within an entire sample. The divergent

sets of findings in the present study resulting from variable-centered and person-centered approaches highlight this particularly well. Furthermore, this is one of few studies to examine predictors of the different dimensions of atypical parenting behavior coded with the AMBIANCE system; most of the past research on atypical parenting behavior has only utilized the total score and/or the disrupted versus not-disrupted classification.

Profiles of experiences of IPV in adulthood and later atypical parenting behavior.

When experiences of IPV in adulthood were examined separately from childhood experiences, similar model issues that occurred with the overall trauma experiences model were observed. Ultimately, a 2-profile model was chosen, which consisted of a mild psychological aggression profile ($n = 114$) and a moderate to high violence profile ($n = 6$). The mild psychological aggression profile was made up of women who reported little to no experiences of IPV during pregnancy except for mild levels of psychological aggression. Most of the women in the sample were in this profile (95%). The remaining 5% were in the moderate to high profile, which consisted of women reporting moderate to high levels of all types of IPV during pregnancy (i.e., physical, injury, sexual, and psychological aggression). Women in the moderate to high profile demonstrated higher average levels of all types of atypical parenting behavior compared to women in the mild psychological aggression profile, except fearful/disoriented behavior. Therefore, women who experience moderate to high levels of IPV during pregnancy, albeit much fewer in number in the current sample, seem to be at risk for displaying numerous types of atypical parenting behavior when interacting with their infants at 1-year postpartum compared to women who report mild levels of psychological aggression with little to no experience of other types of IPV.

Interestingly, women who report only mild levels of psychological aggression during pregnancy actually display more fearful/disoriented behaviors when interacting with their 1-year-old infants compared to women who report all types of IPV. This finding is difficult to interpret as it was expected that more severe IPV would be related to higher levels of all types of atypical parenting behavior. The finding is also difficult to interpret given that few, if any, past studies have examined specific dimensions of atypical parenting behavior in favor of totals and/or overall classification of women, as noted above. However, similar to the combined trauma model, findings using the LPA for IPV during pregnancy should be interpreted cautiously as the groups are quite uneven, and the model demonstrated considerable convergence issues.

In sum, unique profiles of child- and adulthood experiences of interpersonal trauma can be identified using LPA and suggest that certain profiles present risk for later atypical parenting behavior. In contrast to the lack of associations using variable-centered analyses in the present study, findings highlight that examining latent profiles of trauma experiences is an innovative approach to studying predictors of parenting more broadly, and atypical parenting behavior more specifically. It is clear that meaningful individual differences in trauma experiences exist, and applying an understanding of individual differences to the prevention of parenting risk represents an important future direction for the field.

Latent Profiles of PTSD Symptoms as Predictors of Later Atypical parenting behavior

Heterogeneity of prenatal PTSD symptoms was also demonstrated in the present study, echoing past work that has demonstrated the presence of several profiles of PTSD symptoms over a single, homogenous profile (Au et al., 2013; Hebenstreit et al., 2015; Nugent et al., 2012). However, it is important to note that this is the only known study to use the five clusters of the dysphoric arousal model of PTSD (re-experiencing, avoidance, numbing, anxious arousal, and

dysphoric arousal) as the basis for examination of latent profiles. Results from the present study suggested that a 4-profile model was the best fitting model based on PTSD symptom clusters. The high profile ($n = 21$) consisted of women reporting high severity of symptoms across all five clusters. The moderate profile ($n = 9$) was characterized by women reporting moderate symptom severity across all clusters. The two remaining profiles appear identical in terms of PTSD symptom presentation, yet differ on education and age, which were entered as covariates. Women in the low, well-educated ($n = 21$) profile were significantly older and more well-educated than women in all other profiles. Conversely, women in the demographic risk ($n = 69$) profile, which contained the largest number of women, had an average age and education level similar to women in the other profiles, who reported moderate to high levels of PTSD symptoms.

Not surprisingly, women with high levels of PTSD symptoms are at the greatest risk for displaying atypical parenting behavior at 1-year postpartum, particularly affective communication errors, negativity, and withdrawal. Thus, women with high symptoms were more likely to show inappropriate or inadequate responses to infant cues, hostility and intrusiveness, and a tendency to distance themselves physically and verbally when interacting with their infants. Women in the moderate profile reported higher levels of all types of atypical behavior except withdrawal compared to women in the low, well-educated group. PTSD symptoms may lead to inadequate response to child cues because symptoms of re-experiencing, hyperarousal, dysphoria, and avoidance likely make it difficult to be attuned to a child's cues and needs. Symptoms of PTSD may also lead to irritability or negative perceptions of the child, which could influence negative and intrusive interactions with the child. In regard to withdrawal, severe symptoms of PTSD across all clusters may lead to internal preoccupation and a desire for solitude that motivate creating distance from the child. Of note, Schechter and

colleagues (2008) also reported links between PTSD symptom severity and maternal withdrawal. Elevations in both intrusiveness/negativity and withdrawal seem counterintuitive since women who are intrusive are typically not also withdrawn. However, it may be that some women with high levels of PTSD symptoms tend towards intrusiveness/negativity, while others are more prone to withdrawal. It will be important for future research to further examine how symptoms of PTSD might influence or predict different parenting dimensions.

Surprisingly, despite having the same level of reported PTSD symptoms, women in the demographic risk group demonstrated more atypical parenting behavior than women in the low PTSD symptoms, well-educated profile, with moderate to large effect sizes. Therefore, in the relative absence of PTSD symptoms, having older age and more education appears to be a protective factor against the display of atypical parenting behavior. Perhaps women who are older and well-educated have more experience with children and are more well-adjusted leading to less stress and strain on the parent and parent-child relationship (e.g., Belsky, 1984). Thus, given that younger age and less education appear to be associated with atypical parenting behavior in the present study, unresolved trauma status may not be the only pathway to atypical parenting behavior. Future research is needed to further explore associations between demographic risk and the development of atypical parenting behavior, including mechanisms that may help explain this association.

Taken together with the lack of bivariate associations between PTSD symptom total and atypical parenting behavior, results suggest that having high, or even moderate, severity of symptoms across *all* PTSD symptom clusters poses a unique risk to parenting. For example, two women with identical PCL total scores of 46 both fall above the cut-off for probable PTSD (score of 44), yet their risk for atypical parenting behavior may be different. In particular, if the

score of the first woman is made up of only very high levels of re-experiencing symptoms with little to no elevation across other clusters, she may be at lower risk compared to a woman whose score is made up of moderate to high severity of symptoms across all clusters. Thus, the heterogeneity observed in PTSD symptom presentations is important to consider when identifying women at risk for displaying atypical parenting behavior; women who present in pregnancy with even moderate levels of PTSD symptoms across all clusters may be at a unique risk for displaying later atypical parenting behavior towards her infant.

Strengths

The use of both variable- and person-centered analyses in the present study was a significant strength. Variable-centered techniques, such as correlation, rely on sample-level totals and draw general conclusions about the entire sample; such techniques assume homogeneity within a sample. In contrast, person-centered techniques utilize underlying heterogeneity and individual differences within a sample to make conclusions about meaningful, homogenous groups within a heterogeneous sample. In the present study, few if any meaningful findings were revealed when using traditional, variable-centered analyses (i.e., bivariate correlations). However, the use of LPA provided a wealth of meaningful information that adds to our understanding about the impact of maternal trauma and PTSD symptoms on atypical parenting behavior. This is the first known study to examine individual differences and profiles of risk for atypical parenting behaviors using LPA. The lack of findings in the present study when using variable-centered statistics compared to the significant findings using person-centered statistics, many of which demonstrated moderate to large effects, underscores the importance of utilizing techniques like LPA.

Another important strength of the present study is the longitudinal design that allowed for the prospective assessment of PTSD symptoms and experiences of IPV across the birth of a child, as well as the examination of maternal risks for atypical parenting behavior before the child was born. Ongoing assessment allowed for concurrent PTSD symptoms and IPV to be controlled for in analyses. Past work identifying risk for atypical parenting behaviors has been largely cross-sectional (e.g., Lyons-Ruth et al., 1999; Schechter et al., 2004, 2010) with few longitudinal studies (e.g., Madigan et al., 2007). Furthermore, the diverse, economically disadvantaged sample provides much needed information about families with high levels of demographic risk who are non-treatment seeking, but nevertheless, may need intervention.

Additionally, the use of the AMBIANCE system to measure atypical parenting behavior and strong inter-rater reliability across all AMBIANCE dimensions is another significant strength of the current study. Most of the research thus far on atypical parenting behaviors has focused on the disrupted versus not disrupted classification or the overall AMBIANCE score. The use of the five atypical parenting behavior dimensions in the present study allowed for a more in-depth and nuanced examination of how maternal trauma and mental health may adversely impact specific types of parenting behavior. Knowing what *types* of behaviors might emerge among women with different experiences of interpersonal trauma and symptoms of PTSD allows for more focused intervention aimed at reducing or preventing specific problematic behaviors (e.g., affective communication errors or role/boundary confusion). Furthermore, the AMBIANCE measure was successfully utilized in a free play interaction with a mildly stressful clean-up episode, whereas past research has used AMBIANCE in more stressful situations. The successful use of the coding system under relatively less stressful interaction contexts in the

present study underscores the strong reliability and validity of the coding system within high-risk samples.

Limitations

Despite the strengths of this study and the unique contributions of knowledge generated from LPA findings, it is important to note several limitations. One limitation of the present study is the relatively small sample size, which may have negatively impacted the ability to detect statistically significant differences between trauma and PTSD symptom profiles and later atypical parenting behavior. Furthermore, although past research has employed LPA with similar sample sizes in other areas of trauma research (e.g., Au et al., 2013, $n = 119$), the ability to detect meaningful profiles can also be impacted by sample size. For example, in the present study, the LPAs with combined child- and adulthood experiences of trauma were unstable and produced small group sizes, yet the profiles were still meaningful and differences between profiles were detected. Still, future research with larger samples is needed to replicate and expand upon the findings in the present study. Another limitation may be the relatively low levels of PTSD symptoms and trauma experiences overall, despite the reasonable range for a non-treatment seeking, community sample. Furthermore, even among those women who reported interpersonal trauma, not all women reported PTSD symptoms in this community sample. However, rates of trauma and symptoms of PTSD are still higher in the present sample compared to middle-class, predominantly Caucasian samples. Additionally, PTSD symptoms were measured with regard to very stressful life events, rather than pertaining to a specific event, the latter of which is more consistent with a diagnostic approach and past research in this area. Therefore, it is impossible to tell whether the PTSD symptoms reported by women in the present study are related to experiences of interpersonal trauma.

One final limitation is that unresolved status with respect to maternal experiences of trauma according to the AAI was not measured in the present study, which has been the standard in past research on maternal predictors of atypical parenting behavior. Instead, latent profiles of self-reported experiences of trauma and PTSD symptoms were explored as new, alternative predictors of atypical parenting behavior. However, the utility of latent profiles cannot be fully understood without a comparison to measures of unresolved status with respect to trauma. For example, future studies should explore whether latent profiles of self-reported accounts of trauma experiences and symptoms of PTSD provide incremental predictive validity above unresolved status when predicting atypical parenting behavior.

Conclusion

Collecting information on experiences of interpersonal trauma and trauma-related symptoms during pregnancy can help predict who may or may not display atypical parenting behavior after the birth of a child, which is known to severely damage the security of the parent-infant relationship. Furthermore, knowing the specific types of trauma and PTSD symptoms pregnant women experience matters. In particular, women who report experiencing multiple, different types of past and current trauma may display higher levels of certain forms of atypical parenting behavior compared to women who experience one type of trauma. Experiencing moderate to high levels of PTSD symptoms across symptom clusters also seems to place women at risk for atypical parenting. Being younger and less well-educated may also be risk factors for atypical parenting behavior even in the absence of PTSD symptoms. Therefore, early prevention of atypical parenting behaviors requires an individualized approach that takes into account how many types of trauma (and when) women have experienced, as well as the severity of PTSD

symptoms across clusters, as well as other factors such as age, education, and other indicators of demographic risk.

The results of the present study clearly show that indicators of risk for atypical parenting can be identified during the prenatal period. Yet, many of our current parent-infant interventions focus on the postpartum period, after the baby is born, and after the mother has begun to display atypical parenting behaviors while interacting with her infant. There is a need to develop more focused prenatal interventions that address *how* experiences of trauma and symptoms of PTSD might impact specific forms of parenting. Therefore, it may be beneficial for interventions aiming to prevent risk for atypical parenting behavior to include psychoeducation and to foster appropriate developmental expectations for children, as well as guidance about the meaning of and appropriate responses to infant cues. Additionally, interventions with mothers who have certain profiles of trauma experiences may target decreasing certain forms of disorganized parenting.

Given also that unresolved trauma is known, based on past research, to be associated with atypical parenting, interventions should include techniques designed to help mothers process and meaningfully make sense of their traumatic experiences; this may prove more challenging and time-consuming for those who have disavowed or repressed such experiences. Furthermore, given that younger, less well-educated women appear to be more at risk for displaying atypical parenting behavior compared to older, more well-educated women, it may be beneficial for more general parenting programs for families in poverty (e.g., in Head Start or other low-income programs) to include a focus on parenting that is part of atypical parenting as conceptualized by researchers and clinicians using the AMBIANCE system. Last, it will be important for researchers to continue exploring protective factors that might shield women from the

development of atypical parenting behaviors. Age and education were identified in the present study as potential protective factors; however, it is important to continue to identify risk and protective factors that are feasible intervention targets as opposed to unchangeable factors such as age, race, and trauma history.

In sum, experiences of childhood maltreatment, adult IPV, and symptoms of PTSD during pregnancy are not as rare as once thought and present significant risk for atypical parenting behavior, which is widely known to negatively impact parent-child attachment. In particular, experiencing multiple, different types of interpersonal trauma and experiencing moderate to high levels of different symptoms of PTSD may confer unique risks to the mother-infant relationship. Given that these experiences can be identified during pregnancy, before the child is born, the development of preventative interventions, guided by both attachment and trauma theories, during the prenatal period is imperative. Future research is needed to continue identifying profiles of prenatal risks, as well as possible protective factors, for atypical parenting that can be integrated into the ongoing development of such interventions.

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Tables and Figures

Table 1

Confirmatory Factor Analyses Results for Six Potential PCL-C Factor Structures

Item/Symptom	2A	2B	DSM-IV (3-factor)	Emotional numbing (4-factor)	Dysphoria (4-factor)	Dysphoric arousal (5-factor)
B1: recurrent thoughts of trauma	R/AV	R/AV	R	R	R	R
B2: recurrent dreams of trauma	R/AV	R/AV	R	R	R	R
B3: flashbacks	R/AV	R/AV	R	R	R	R
B4: psychological cue reactivity	R/AV	R/AV	R	R	R	R
B5: physiological cue reactivity	R/AV	R/AV	R	R	R	R
C1: avoidance of thoughts of trauma	R/AV	R/AV	AV	AV	AV	AV
C2: avoidance of reminders of trauma	R/AV	R/AV	AV	AV	AV	AV
C3: memory impairment	N/H	R/AV	AV	N	D	N
C4: diminished interest in activities	N/H	N/H	AV	N	D	N
C5: feelings of detachment from others	N/H	N/H	AV	N	D	N
C6: restricted range of affect	N/H	N/H	AV	N	D	N
C7: sense of foreshortened future	N/H	N/H	AV	N	D	N
D1: sleeping difficulties	N/H	N/H	H	H	D	DA
D2: irritability or anger	N/H	N/H	H	H	D	DA
D3: difficulty concentrating	N/H	N/H	H	H	D	DA
D4: hypervigilance	N/H	N/H	H	H	H	AA
D5: exaggerated startle response	N/H	N/H	H	H	H	AA
Chi-square	238.943	243.084	241.099	192.622	211.124	175.412
<i>df</i>	118	118	116	113	113	109
<i>p</i> -value	< .0001	< .0001	< .0001	< .0001	< .0001	0.0001
RMSEA	0.092	0.094	0.095	0.077	0.085	0.071
CFI	0.821	0.815	0.815	0.882	0.855	0.902
TLI	0.793	0.786	0.783	0.858	0.825	0.877
SRMR	0.077	0.079	0.079	0.067	0.071	0.064

Note. R = Re-experiencing, AV = Avoidance, N = Numbing, H = Hyperarousal, D = Dysphoria, DA = Dysphoric arousal, AA = Anxious arousal.

Table 2

Descriptive Information for Trauma Variables

	Minimum	Maximum	<i>M</i>	<i>SD</i>	Skew	Kurtosis
Childhood trauma						
Emotional abuse	0.000	3.000	0.992	1.199	0.790	-0.987
Physical abuse	0.000	3.000	0.742	1.170	1.159	-0.393
Sexual abuse	0.000	3.000	0.613	1.059	1.397	0.345
Emotional neglect	0.000	3.000	0.767	1.051	1.101	-0.164
Physical neglect	0.000	3.000	0.592	1.033	1.494	0.706
Total childhood abuse	0.000	15.000	3.700	4.524	1.064	-0.222
Adult trauma: IPV during pregnancy						
Psychological aggression	0.000	8.000	2.270	1.840	0.467	-0.404
Physical	0.000	5.000	0.230	0.807	4.676	23.478
Injury	0.000	2.000	0.090	0.390	4.335	18.040
Sexual	0.000	2.000	0.150	0.425	2.919	8.256
Total IPV	0.000	15.000	2.740	2.647	1.675	4.501

Table 3

Descriptive Information for PTSD Symptoms

	Minimum	Maximum	<i>M</i>	<i>SD</i>	Skew	Kurtosis
Re-experiencing	1.000	4.000	1.692	0.805	1.281	0.579
Avoidance	1.000	4.500	1.783	0.895	1.229	1.059
Numbing	1.000	3.800	1.493	0.621	1.740	3.187
Dysphoric arousal	1.000	5.000	2.239	0.937	0.584	-0.174
Anxious arousal	1.000	5.000	1.775	0.965	1.244	0.881
Total PTSD symptoms	1.000	5.000	1.775	0.965	1.244	0.881

Table 4

Descriptive Information for AMBIANCE Scales

	Minimum	Maximum	<i>M</i>	<i>SD</i>	Skew	Kurtosis
Affective communication errors	1.000	7.000	3.363	1.711	0.081	-0.976
Role/boundary confusion	1.000	6.000	2.736	1.396	0.415	-0.851
Fearful/disoriented	1.000	6.000	3.321	1.470	0.077	-1.029
Intrusive/negativity	1.000	7.000	4.170	1.657	-0.209	-0.761
Withdrawal	1.000	6.000	2.726	1.336	0.461	-0.584
Overall level	1.000	7.000	4.245	1.465	-0.213	-0.780

Table 5

Correlations Between Major Study Variables and Covariates

	Age	Education
PTSD symptom severity during pregnancy	-0.247**	-0.245**
Total childhood maltreatment	-0.006	-0.248**
Total IPV during pregnancy	-0.214*	-0.237**
Overall AMBIANCE score	-0.114	-0.434***

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 6

Correlations Between AMBIANCE Scores and Experiences of Childhood Maltreatment

	Emotional abuse	Physical abuse	Sexual abuse	Emotional neglect	Physical neglect	Total maltreatment
Affective communication errors	0.061	0.136	0.206	0.124	0.128	0.195
Role/boundary confusion	0.009	0.069	0.085	0.027	0.210	0.119
Fearful/disoriented	0.038	0.053	0.155	0.048	-0.010	0.059
Intrusive/negativity	-0.024	0.079	0.042	0.024	0.117	0.080
Withdrawal	-0.037	-0.045	0.024	-0.031	-0.170	-0.054
Overall level	0.040	0.137	0.131	0.044	0.064	0.100

Table 7

Correlations Between AMBIANCE Scores and Clusters of PTSD Symptoms

	Re-experiencing	Avoidance	Numbing	Dysphoric arousal	Anxious arousal	Total PTSD Symptoms
Affective communication errors	0.008	0.084	0.029	-0.085	0.203	0.078
Role/boundary confusion	-0.011	0.061	0.008	-0.213	0.125	-0.024
Fearful/disoriented	-0.028	0.003	-0.045	-0.012	0.035	-0.039
Intrusive/negativity	0.139	0.173	0.111	0.006	0.253	0.166
Withdrawal	-0.019	0.046	0.073	0.151	-0.048	0.034
Overall level	0.049	0.171	0.066	-0.023	0.18	0.096

Table 8

Correlations Between AMBIANCE Scores and Experiences of IPV during Pregnancy

	Psychological aggression	Physical	Injury	Sexual	Total IPV
Affective communication errors	0.045	-0.047	0.052	0.053	-0.035
Role/boundary confusion	0.145	-0.050	0.021	0.026	0.132
Fearful/disoriented	-0.065	-0.141	-0.213	0.017	-0.051
Intrusive/negativity	0.109	-0.023	0.079	0.061	-0.001
Withdrawal	0.020	-0.010	-0.050	0.242	-0.041
Overall level	0.098	-0.077	-0.020	0.053	0.017

Table 9

Unconditional Latent Profile Models for Trauma Experiences

	BIC	LMR-A	<i>p</i> -value	BLRT	<i>p</i> -value
2-profile	2499.380	447.914	< .0001	-1411.300	< .0001
3-profile	2276.546	265.170	0.622	-1182.665	< .0001
4-profile	2252.484	70.465	0.764	-1047.311	< .0001
5-profile	2183.440	48.384	0.638	-977.463	< .0001
6-profile	2113.002	25.591	< .0001	-906.665	< .0001

Note. Models for 3 to 6 profiles are not viable models due to small profile sizes (e.g., *n*'s less than 5).

Table 10

Conditional Latent Profile Models for Trauma Experiences

	BIC	LMR-A	<i>p</i> -value	BLRT	<i>p</i> -value
2-profile	4337.736	458.755	0.001	-2313.362	< .0001
3-profile	4108.839	286.531	0.634	-2080.300	< .0001
4-profile	4038.696	130.288	0.358	-1934.732	< .0001
5-profile	3948.074	143.576	0.754	-1864.838	< .0001
6-profile	4030.120	*****	*****	*****	*****

Note. Models for 3 to 6 profiles are not viable models due to small profile sizes (e.g., *n*'s less than 5). The 6-profile model had convergence issues and could not be properly run.

Table 11

Trauma Profile Differences on AMBIANCE Dimensions

	Profile 1		Profile 2		Cohen's <i>d</i>
	Psychological aggression only		Chronic		
	<i>m</i>	<i>sd</i>	<i>m</i>	<i>sd</i>	
Affective communication errors	3.24	1.70	3.84	1.89	0.33
Role/boundary confusion	2.60	1.42	3.16	1.61	0.37
Fearful/disoriented	3.30	1.51	3.51	1.56	0.14
Intrusive/negativity	4.15	1.70	4.42	1.89	0.15
Withdrawal	2.78	1.42	2.63	1.56	0.10
Age	26.21	5.76	26.20	5.50	-
Education	3.70	1.47	3.00	1.27	-

Note. Mplus only provides two decimal places for means and standard deviations of distal outcomes.

Table 12

Unconditional Latent Profile Models for Childhood Trauma Experiences

	BIC	LMR-A	<i>p</i> -value	BLRT	<i>p</i> -value
2-profile	1445.940	425.264	< .0001	-904.705	< .0001
3-profile	1384.365	87.262	0.289	-684.670	< .0001
4-profile	1340.052	70.581	0.376	73.038	< .0001
5-profile	1308.535	58.216	0.200	-603.001	< .0001
6-profile	1282.962	53.274	0.496	-573.295	< .0001

Table 13

Conditional Latent Profile Models for Childhood Trauma Experiences

	BIC	LMR-A	<i>p</i> -value	BLRT	<i>p</i> -value
2-profile	1884.465	432.561	< .0001	-1119.486	< .0001
3-profile	1827.654	87.707	0.296	-896.752	< .0001
4-profile	1785.552	73.423	0.343	-851.590	< .0001
5-profile	1759.460	57.878	0.233	-813.782	< .0001
6-profile	1770.027	27.207	0.331	-786.517	< .0001

Table 14

Childhood Trauma Profile Differences on AMBIANCE Dimensions

	Profile 1 Low exposure		Profile 2 High sexual		Profile 3 High physical and emotional		Profile 4 High exposure	
	<i>m</i>	<i>sd</i>	<i>m</i>	<i>sd</i>	<i>m</i>	<i>sd</i>	<i>m</i>	<i>sd</i>
Affective communication errors	3.21	1.68	3.57	1.70	3.30	2.05	4.33	1.63
Role/boundary confusion	2.63	1.41	2.45	1.39	2.96	1.63	3.33	1.47
Fearful/disoriented	3.29	1.50	3.44	1.49	3.36	1.63	3.60	1.51
Intrusive/negativity	4.18	1.68	4.05	1.70	4.12	2.17	4.66	1.63
Withdrawal	2.79	1.41	2.59	1.32	2.71	1.67	2.68	1.43
Education	3.77	1.50	3.19	1.14	3.26	1.32	2.74	1.20

Note. Mplus only provides two decimal places for means and standard deviations of distal outcomes. Effect sizes for differences in AMBIANCE dimensions between profiles are presented in tables 15 to 19.

Table 15

Effect Sizes of the Difference in Affective Communication Errors Between Childhood Trauma Profiles

	Low exposure	High sexual	High physical and emotional	High exposure
Low exposure	-			
High sexual	0.213	-		
High physical and emotional	0.048	0.143	-	
High exposure	0.677	0.456	0.556	-

Note. Effect sizes are in absolute value.

Table 16

Effect Sizes of the Difference in Role/Boundary Confusion Between Childhood Trauma Profiles

	Low exposure	High sexual	High physical and emotional	High exposure
Low exposure	-			
High sexual	0.129	-		
High physical and emotional	0.217	0.337	-	
High exposure	0.486	0.615	0.238	-

Note. Effect sizes are in absolute value.

Table 17

Effect Sizes of the Difference in Fearful/Disoriented Between Childhood Trauma Profiles

	Low exposure	High sexual	High physical and emotional	High exposure
Low exposure	-			
High sexual	0.100	-		
High physical and emotional	0.045	0.051	-	
High exposure	0.206	0.107	0.153	-

Note. Effect sizes are in absolute value.

Table 18

Effect Sizes of the Difference in Intrusive/Negativity Between Childhood Trauma Profiles

	Low exposure	High sexual	High physical and emotional	High exposure
Low exposure	-			
High sexual	0.077	-		
High physical and emotional	0.031	0.036	-	
High exposure	0.290	0.366	0.281	-

Note. Effect sizes are in absolute value.

Table 19

Effect Sizes of the Difference in Withdrawal Between Childhood Trauma Profiles

	Low exposure	High sexual	High physical and emotional	High exposure
Low exposure	-			
High sexual	0.146	-		
High physical and emotional	0.052	0.08	-	
High exposure	0.077	0.065	0.019	-

Note. Effect sizes are in absolute value.

Table 20

Unconditional Latent Profile Models for IPV during Pregnancy

	BIC	LMR-A	<i>p</i> -value	BLRT	<i>p</i> -value
2-profile	746.086	316.009	0.376	-506.596	< .0001
3-profile	652.421	112.839	0.535	-341.979	< .0001
4-profile	548.695	124.186	0.782	-284.080	< .0001
5-profile	448.662	133.104	0.723	-225.522	< .0001
6-profile	400.535	29.095	0.005	-136.264	< .0001

Note. Models for 3 to 6 profiles are not viable models due to small profile sizes (e.g., *n*'s less than 5) and model instability.

Table 21

Conditional Latent Profile Models for IPV during Pregnancy

	BIC	LMR-A	<i>p</i> -value	BLRT	<i>p</i> -value
2-profile	2575.108	338.689	0.391	-1408.658	< .0001
3-profile	2490.190	120.083	0.627	-1234.892	< .0001
4-profile	2397.490	127.667	0.789	-1173.282	< .0001
5-profile	2308.982	115.521	0.705	-1103.480	< .0001
6-profile	2190.262	115.902	0.544	-1024.751	< .0001

Note. Models for 3 to 6 profiles are not viable models due to small profile sizes (e.g., *n*'s less than 5) and model instability.

Table 22

Pregnancy IPV Profile Differences on AMBIANCE Dimensions

	Profile 1		Profile 2		<i>d</i>
	Mild psychological aggression		Moderate to high		
	<i>m</i>	<i>sd</i>	<i>m</i>	<i>sd</i>	
Affective communication errors	3.37	1.76	3.90	2.04	0.28
Role/boundary confusion	2.72	1.45	3.33	1.61	0.40
Fearful/disoriented	3.39	1.48	2.66	1.53	0.49
Intrusive/negativity	4.19	1.72	4.81	1.74	0.36
Withdrawal	2.72	1.39	3.23	1.48	0.36
Age	26.33	5.64	23.83	5.93	-
Education	3.56	1.46	2.67	0.94	-
T3 IPV	3.17	3.32	9.16	4.98	-

Note. Mplus only provides two decimal places for means and standard deviations of distal outcomes.

Table 23

Unconditional Models for PTSD Symptom

	BIC	LMR-A	<i>p</i> -value	BLRT	<i>p</i> -value
2-profile	1385.408	165.837	0.013	-740.209	< .0001
3-profile	1349.737	62.230	0.120	-654.404	< .0001
4-profile	1345.656	31.702	0.355	-662.206	< .0001
5-profile	1339.426	33.779	0.285	-605.803	< .0001
6-profile	1338.397	28.753	0.494	-588.326	< .0001

Table 24

Conditional Models for PTSD Symptom

	BIC	LMR-A	<i>p</i> -value	BLRT	<i>p</i> -value
2-profile	3421.764	218.216	0.001	-1762.678	< .0001
3-profile	3401.868	61.555	0.240	-1651.038	< .0001
4-profile	3392.872	50.902	0.826	-1619.547	< .0001
5-profile	3397.633	37.458	0.243	-1593.505	< .0001
6-profile	3406.305	32.190	0.515	-1573.603	< .0001

Table 25

PTSD Profile Group Differences on AMBIANCE Dimensions

	Profile 1 Demographic risk		Profile 2 High		Profile 3 Moderate		Profile 4 Low, well educated	
	<i>m</i>	<i>sd</i>	<i>m</i>	<i>sd</i>	<i>m</i>	<i>sd</i>	<i>m</i>	<i>sd</i>
Affective communication errors	3.52	1.74	4.32	1.65	3.35	1.81	2.66	1.66
Role/boundary confusion	3.07	1.49	3.01	1.43	2.72	1.45	1.73	1.01
Fearful/disoriented	3.73	1.42	3.38	1.52	3.37	1.50	2.06	1.17
Intrusive/negativity	4.37	1.67	4.99	1.51	4.60	1.62	3.04	1.59
Withdrawal	2.94	1.40	3.00	1.56	2.56	1.43	2.14	1.30
Age	25.16	6.18	22.30	23.98	25.03	13.69	32.36	7.47
Education	3.03	1.35	2.59	5.10	3.12	3.02	5.86	1.39
1-year PTSD	25.82	9.03	42.75	16.54	36.87	28.33	22.85	7.44

Note. Mplus only provides two decimal places for means and standard deviations of distal outcomes. Effect sizes for differences in AMBIANCE dimensions between profiles are presented in tables 26 to 30.

Table 26

Effect Sizes of the Difference in Affective Communication Errors Between PTSD Symptom Profiles

	Demographic risk	High	Moderate	Low, well educated
Demographic risk	-			
High	0.472	-		
Moderate	0.096	0.56	-	
Low, well educated	0.506	1.003	0.397	-

Table 27

Effect Sizes of the Difference in Role/Boundary Confusion Between PTSD Symptom Profiles

	Demographic risk	High	Moderate	Low, well educated
Demographic risk	-			
High	0.041	-		
Moderate	0.238	0.201	-	
Low, well educated	1.053	1.034	0.792	-

Table 28

Effect Sizes of the Difference in Fearful/Disoriented Between PTSD Symptom Profiles

	Demographic risk	High	Moderate	Low, well educated
Demographic risk	-			
High	0.238	-		
Moderate	0.246	0.006	-	
Low, well educated	1.284	0.973	0.974	-

Table 29

Effect Sizes of the Difference in Intrusive/Negativity Between PTSD Symptom Profiles

	Demographic risk	High	Moderate	Low, well educated
Demographic risk	-			
High	0.389	-		
Moderate	0.14	0.249	-	
Low, well educated	0.816	1.258	0.972	-

Table 30

Effect Sizes of the Difference in Withdrawal Between PTSD Symptom Profiles

	Demographic risk	High	Moderate	Low, well educated
Demographic risk	-			
High	0.04	-		
Moderate	0.269	0.294	-	
Low, well educated	0.592	0.599	0.307	-

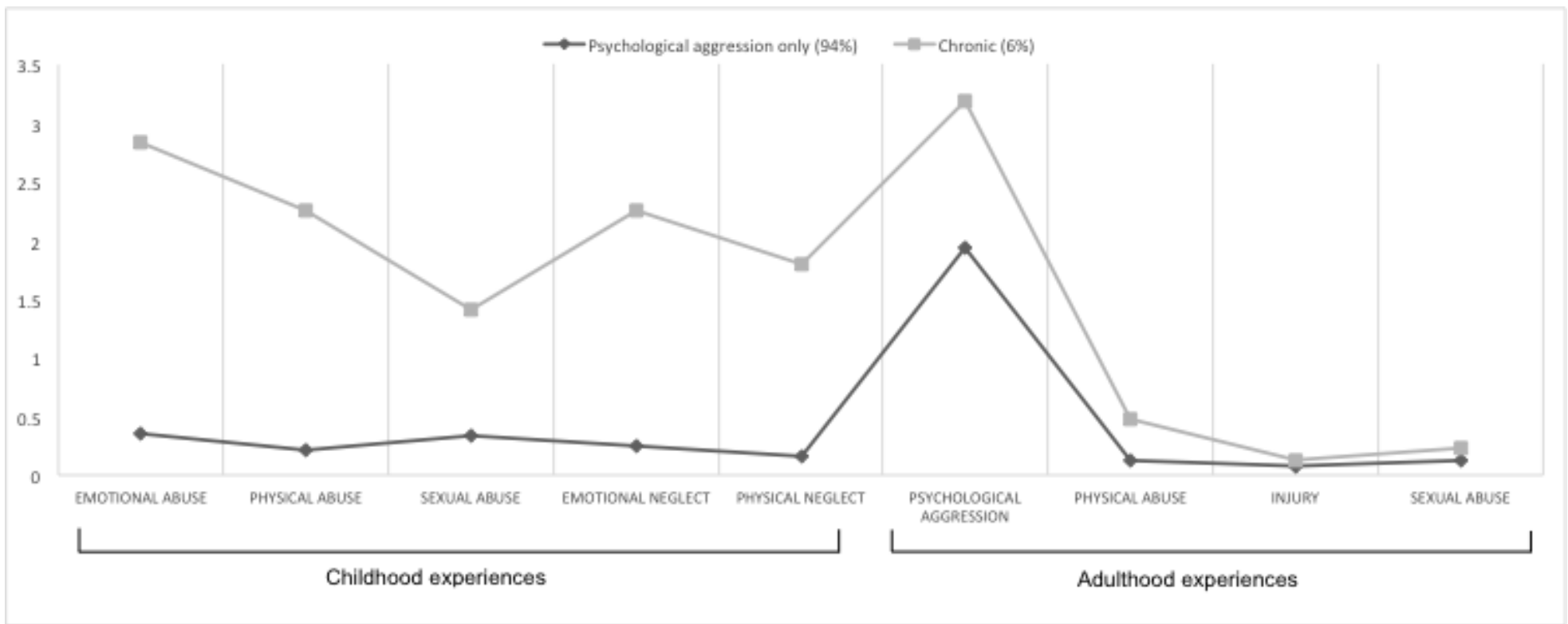


Figure 1. Latent profiles of child- and adulthood trauma experiences

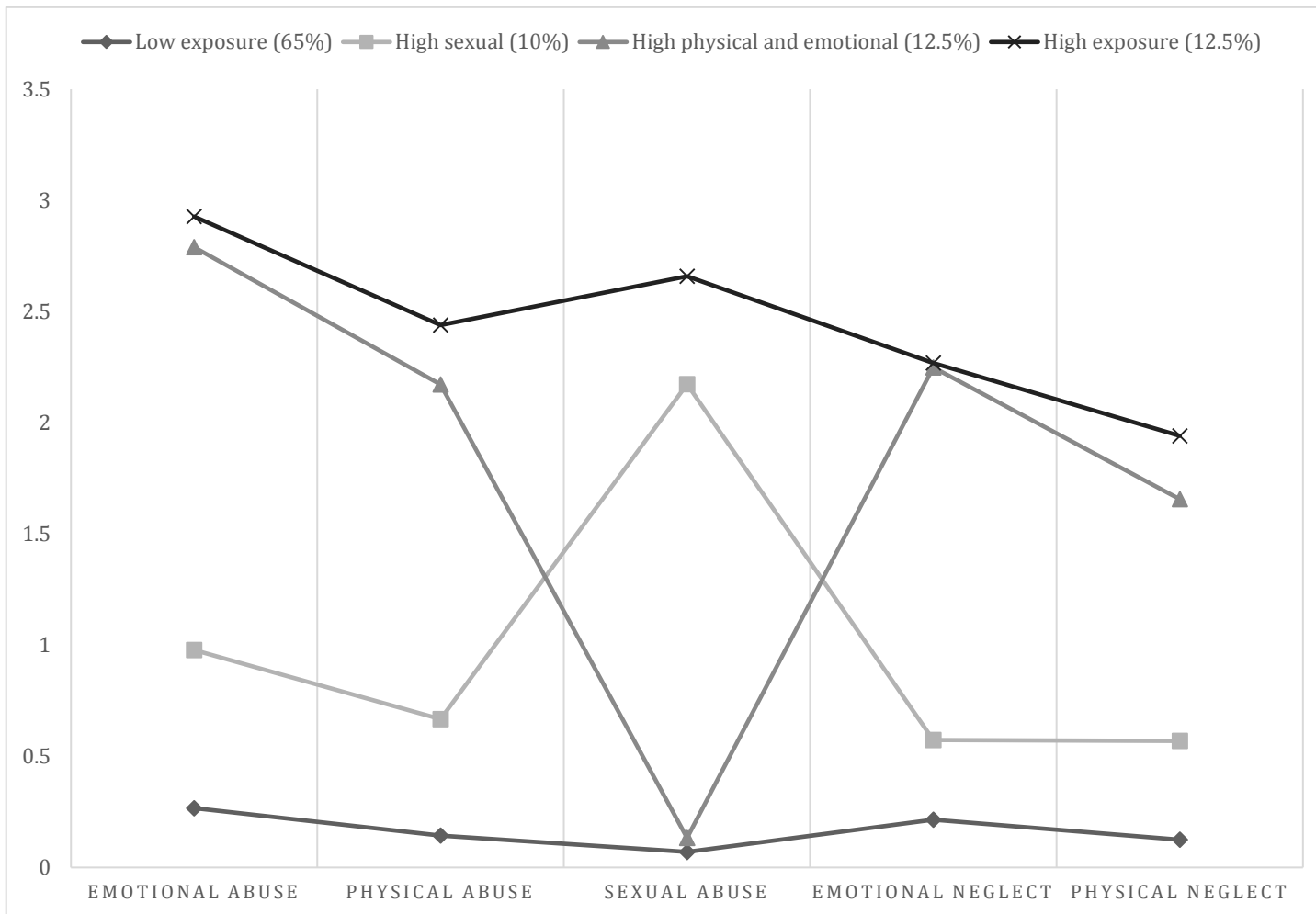


Figure 2. Latent profiles of childhood trauma experiences

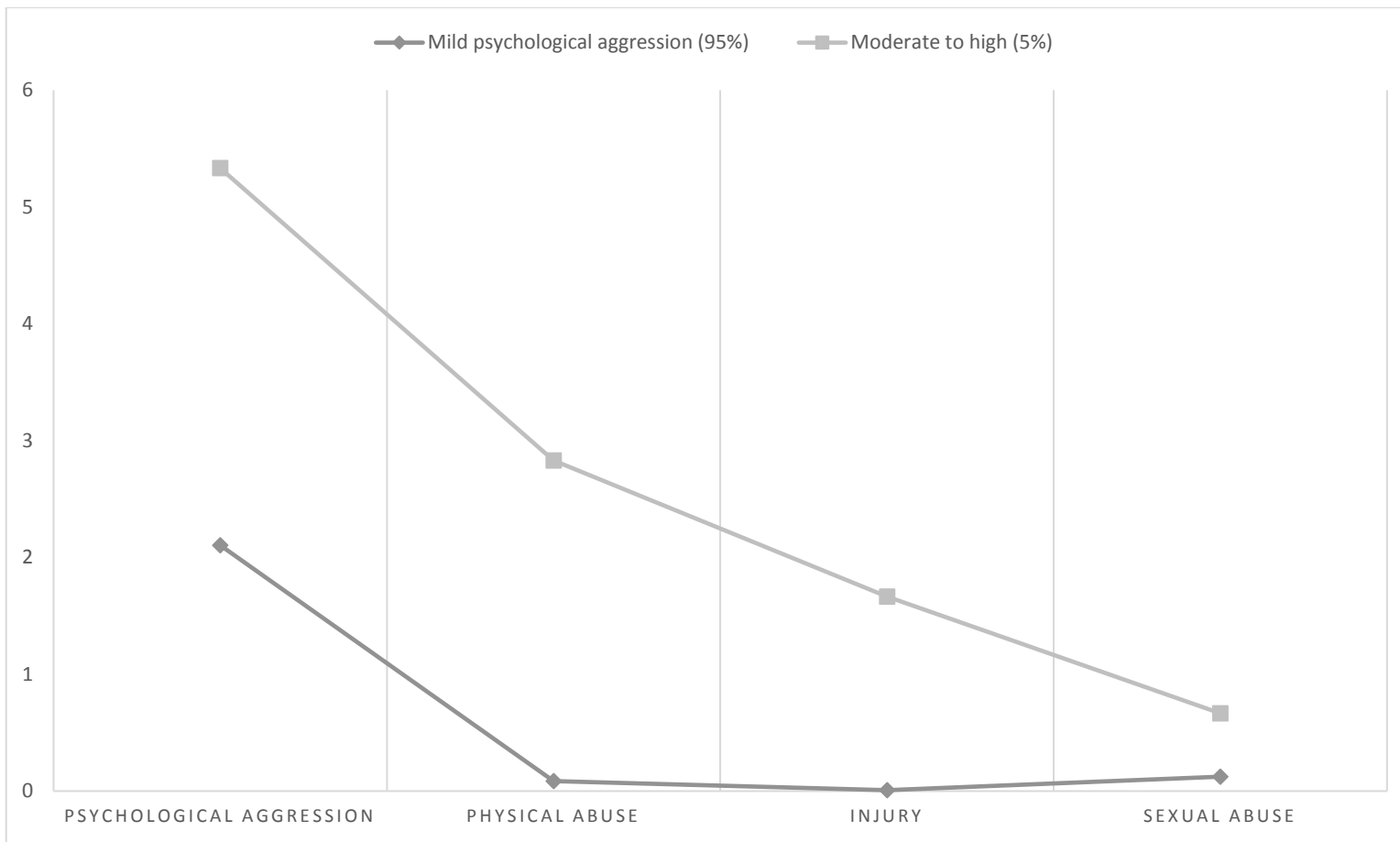


Figure 3. Latent profiles of IPV during pregnancy

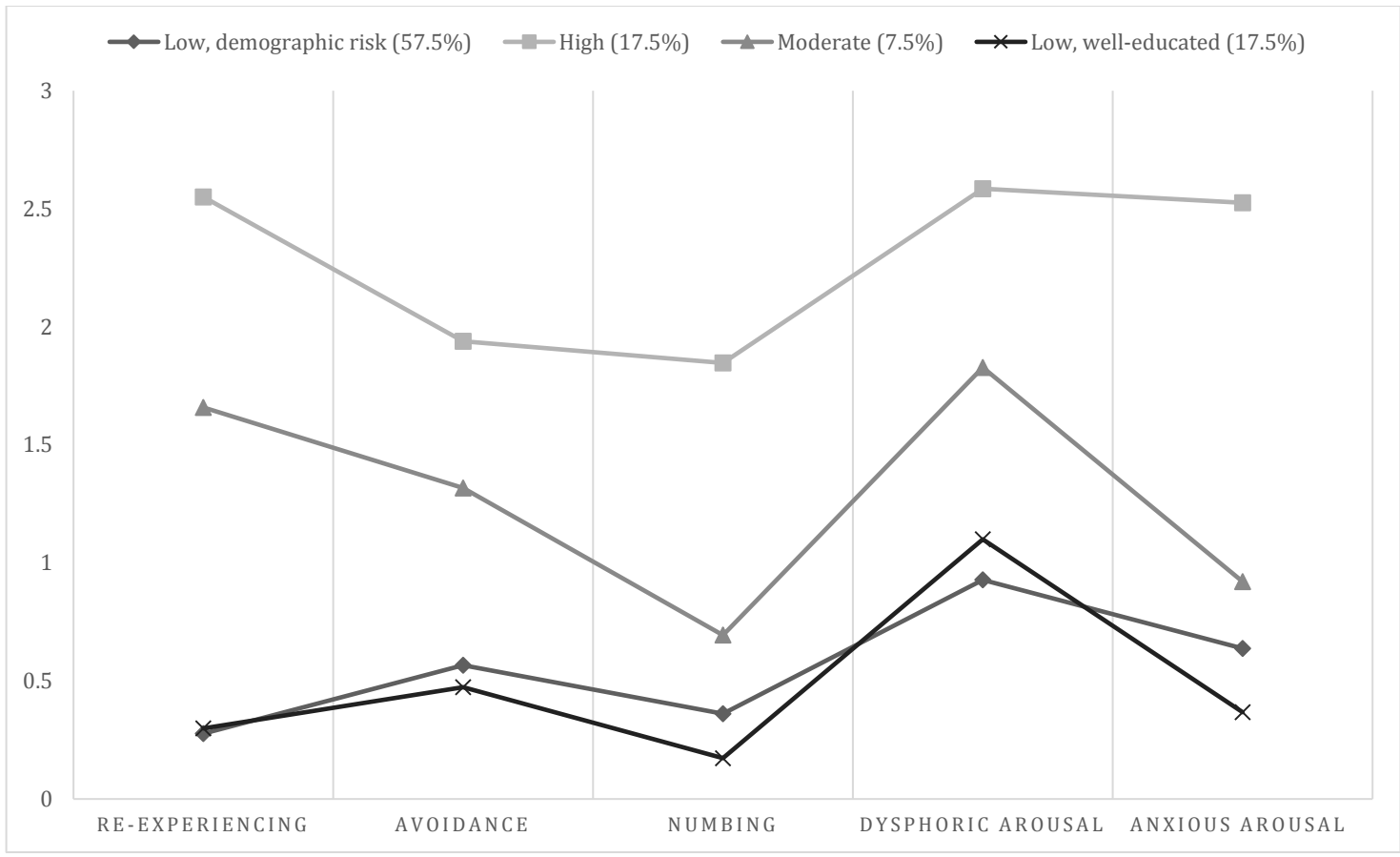


Figure 4. Latent profiles of PTSD symptoms

Appendices

Eastern Michigan University's
PARENTING
PROJECT



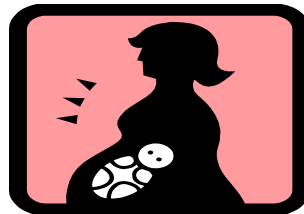
Looking for PREGNANT WOMEN to participate in a research study about:

- ❖ Experiences during pregnancy
- ❖ Other life experiences
- ❖ Women's health

Participants will be given GIFT CARD and/or CASH after completion of interview

INTERESTED? CONTACT

734-487-2238



PHONE SCRIPT FOR INTAKE FORM

Thank you for your interest in the Parenting Project. You are being asked to participate in a research study about women's experiences during and after pregnancy, as well as how these experiences influence mothers and babies after birth. This research will help psychologists and other health service workers better understand mothers' and babies' well-being during the transition to parenthood.

As part of this study, you will be asked to fill out a number of questionnaires during your last trimester of pregnancy; these questionnaires will ask you about a variety of experiences including your experiences during pregnancy, other important life events, and your overall health. In order to protect your confidentiality, you will be assigned an identification number, which will be used instead of your name, on all of your questionnaires and interviews.

The entire procedure will last approximately 2 ½ to 3 hours. At the end of this interview, we will ask your permission to stay in contact with you so that we may see how you and your baby are doing around 3 months and 1 year after birth. These follow-up interviews will take approximately 30-45 minutes at 3 months and 2 ½ to 3 hours at 1 year.

Your participation in this study is completely voluntary. You may refuse to answer any questions and may choose to withdraw from the study at any time with no penalty or negative consequences.

In order to complete the interview, you may choose to come to Eastern Michigan University's campus, or a research assistant on the project would be willing to come to your home. In return for your participation in the pregnancy interview, you will be given a \$25 Target gift card, and a gift card, baby gift, or cash will be given for any follow-up interviews.

Do I have your verbal consent to continue and gather some basic information about you to determine your eligibility in this study?

If "yes," complete the intake form.

If "no," thank individual for calling and for their interest in the study.

Appendix C: Written Informed Consent Agreement – Pregnancy Interview

The EMU Parenting Project

Investigator: Alissa Huth-Bocks, Ph.D.

WRITTEN INFORMED CONSENT AGREEMENT (Pregnancy Interview)

Description of the Research Study:

You are being asked to participate in a research study about women's experiences during and after pregnancy, as well as how these experiences influence mothers and babies after birth. This research will help psychologists and other health service workers better understand mothers' and babies' well-being during the transition to parenthood.

As part of this study, you will be asked to fill out a number of questionnaires during your last trimester of pregnancy; these questionnaires will ask you about a variety of experiences including childhood experiences, current relationships, your mental health, important life events, and social support. You will also be interviewed about your feelings about your pregnancy, motherhood, and your infant; this interview will be audio-recorded so that research assistants may better understand your responses at a later date. The entire procedure will last approximately 2 ½ to 3 hours. At the end of this interview, we will ask your permission to stay in contact with you so that we may see how you and your baby are doing around 3 months and 1 year after birth. These follow-up interviews will take approximately 30-45 minutes at 3 months and 2 ½ to 3 hours at 1 year.

Participation is Voluntary:

Your participation in this study is completely voluntary. You may refuse to answer any questions and may choose to withdraw from the study at any time with no penalty or negative consequences. You will be informed if significant new findings develop during the course of this research that may impact your willingness to continue in the study.

Confidentiality:

You will be assigned an identification number, which will be used instead of your name, on all of your questionnaires and interviews to protect your confidentiality. Your name or other identifying information will never be placed on any of your materials so that your responses will be kept completely private. All responses will be stored in a locked research office which is located in a locked hallway of our building. Similarly, audio- and video-tapes will be placed in a locked cabinet in the same locked office immediately after the interview is completed to ensure confidentiality of these data. A log of names and identification numbers will be locked in a separate cabinet in a separate office; only the principal investigator and project managers will have access to this log. Results from the study will only be reported or published about *groups* of participants at professional conferences or through publications in scientific journals; individual responses will never be reported. Individual audio- or video-tapes will never be disseminated.

If, during the course of the interview, project staff learns that your safety is in jeopardy, we may be required to seek outside help in order to keep you safe. If we learn that your infant's safety is in danger, we are required to make a report to Child Protective Services. These are the only exceptions to complete confidentiality.

Risks and Benefits to Participation:

There are no known or anticipated risks from participating in this study. However, some participants may find answering certain questions uncomfortable or distressing. If you experience any distress, project staff will help direct you to appropriate referrals in the community. All women will be given a comprehensive list of referrals that are designed for mothers and young children at the end of the interview.

Your participation in this study will help researchers better understand the unique experiences that women and babies go through during and after pregnancy. Some participants will find discussing these important life events with project staff relieving and enjoyable. You will be given a \$25.00 Target gift card at the end of this interview, and if you choose to participate in future interviews, you will be compensated with gifts, gift cards, or cash.

Future Questions:

If, at any time, you have questions or concerns about study procedures or your participation in the study, please contact the principal investigator, Dr. Alissa Huth-Bocks, at (734) 487-0112 or ahuthboc@emich.edu.

Human Subjects Review:

This research protocol and informed consent document has been reviewed and approved by the Eastern Michigan University Human Subjects Review Committee for use from 9/26/08 to 9/26/09. If you have questions about the approval process, please contact Dr. Deb de Laski-Smith (734.487.0042, Interim Dean of the Graduate School and Administrative Co-chair of UHSRC, human.subjects@emich.edu)."

CONSENT TO PARTICIPATE: I understand my rights as a research participant and I voluntarily consent to participate in this study. I understand the purpose and procedures of the study. I will receive a copy of this consent form for my future reference.

Participant Signature

Date

Participant Name

Witness Signature

Date

Appendix D: Written Informed Consent Agreement – 1-year Interview

The EMU Parenting Project
Investigator: Alissa Huth-Bocks, Ph.D.

WRITTEN INFORMED CONSENT AGREEMENT
(1 year Interview)

Description of the Research Study:

Thank you for participating in the first parts of our study. As you know, you are being asked to continue participating in this research study about women's experiences during and after pregnancy, as well as how these experiences influence mothers and babies after birth. This research will help psychologists and other health service workers better understand mothers' and babies' well-being during the transition to parenthood.

During this interview today, we will ask you and your baby to play together for about 12 minutes with some toys that we have brought. This part of the interview will be video-taped so that only research staff can view it at a later time. Then, you will be given a number of questionnaires about your experiences since the last interview and about your baby; many of these questionnaires will be the same ones you filled out earlier, but some of them will be new to you. This interview will take approximately 2 ½ to 3 hours. While this is the last interview we have planned for the study at this time, it is possible that we may continue the study at some point in the future. At the end of the interview, we will ask if you are willing to have us contact you in the future if the study does continue at some point.

Participation is Voluntary:

Your and your baby's participation in this study is completely voluntary. You may refuse to complete any part of the interview and may choose to withdraw from the study at any time with no penalty or negative consequences. You will be informed if significant new findings develop during the course of this research that may impact your willingness to continue in the study.

Confidentiality:

As a reminder, your name or other identifying information will never be placed on any of your questionnaires so that your responses will be kept completely private. All responses will be stored in a locked research office which is located in a locked hallway of our building. Similarly, audio- and video-tapes will be placed in a locked cabinet in the same locked office immediately after the interview is completed to ensure confidentiality of these data. A log of names and identification numbers will be locked in a separate cabinet in a separate office; only the principal investigator and project managers will have access to this log. Results from the study will only be reported or published about *groups* of participants at professional conferences or through publications in scientific journals; individual responses will never be reported. Individual audio- or video-tapes will never be disseminated.

If, during the course of the interview, project staff learns that you may seriously harm yourself, we may be required to seek outside help in order to keep you safe. If we learn that your current children's safety is in danger, we are required to make a report to Child Protective Services. These are the only exceptions to complete confidentiality. We do not report domestic abuse.

Risks and Benefits to Participation:

There are no known or anticipated risks from participating in this study. However, some participants may find answering certain questions uncomfortable or distressing. If you experience any distress, project staff will help direct you to appropriate referrals in the community. All women will be given a comprehensive list of referrals that are designed for mothers and young children at the end of the interview.

Your participation in this study will help researchers better understand the unique experiences that women and babies go through during and after pregnancy. Some participants will find discussing these important life events with project staff relieving and enjoyable. You will be given a baby gift and \$50.00 at the end of this interview.

Future Questions:

If, at any time, you have questions or concerns about study procedures or your participation in the study, please contact the principal investigator, Dr. Alissa Huth-Bocks, at (734) 487-2238 or ahuthboc@emich.edu.

Human Subjects Review:

This research protocol and informed consent document has been reviewed and approved by the Eastern Michigan University Human Subjects Review Committee for use from 9/26/09 to 9/26/10. If you have questions about the approval process, please contact Dr. Deb de Laski-Smith (734.487.0042, Interim Dean of the Graduate School and Administrative Co-chair of UHSRC, human.subjects@emich.edu)."

CONSENT TO PARTICIPATE: I understand my rights and my baby's rights as a research participant and I voluntarily consent for both my baby and I to participate in this study. I understand the purpose and procedures of the study. I will receive a copy of this consent form for my future reference.

Participant Signature

Date

Participant Name

Witness Signature

Date

RESEARCH @ EMU

UHSRC Determination: EXPEDITED INITIAL APPROVAL

DATE: November 15, 2016

TO: Katherine Guyon-Harris, M.S. Eastern Michigan University

Re: UHSRC: # 989054-1 Category: Expedited category 5

Approval Date: November 15, 2016 Expiration Date: November 14, 2017

Title: Identifying risk for atypical parenting behavior using prenatal profiles of interpersonal trauma experiences and PTSD symptoms

Your research project, entitled Identifying risk for atypical parenting behavior using prenatal profiles of interpersonal trauma experiences and PTSD symptoms, has been approved in accordance with all applicable federal regulations.

This approval included the following: 1. Research involving materials (data, documents, records, or specimens) that have been collected.

Renewals: This approval is valid for one year and expires on November 14, 2017. If you plan to continue your study beyond November 14, 2017, you must submit a Continuing Review Form by October 15, 2017 to ensure the approval does not lapse.

Modifications: All changes must be approved prior to implementation. If you plan to make any minor changes, you must submit a Minor Modification Form. For any changes that alter study design or any study instruments, you must submit a Human Subjects Approval Request Form. These forms are available through IRBNet on the UHSRC website.

Problems: All major deviations from the reviewed protocol, unanticipated problems, adverse events, subject complaints, or other problems that may increase the risk to human subjects or change the category of review must be reported to the UHSRC via an Event Report form, available through IRBNet on the UHSRC website

Follow-up: If your Expedited research project is not completed and closed after three years, the UHSRC office requires a new Human Subjects Approval Request Form prior to approving a continuation beyond three years.

Please use the UHSRC number listed above on any forms submitted that relate to this project, or on any correspondence with the UHSRC office.

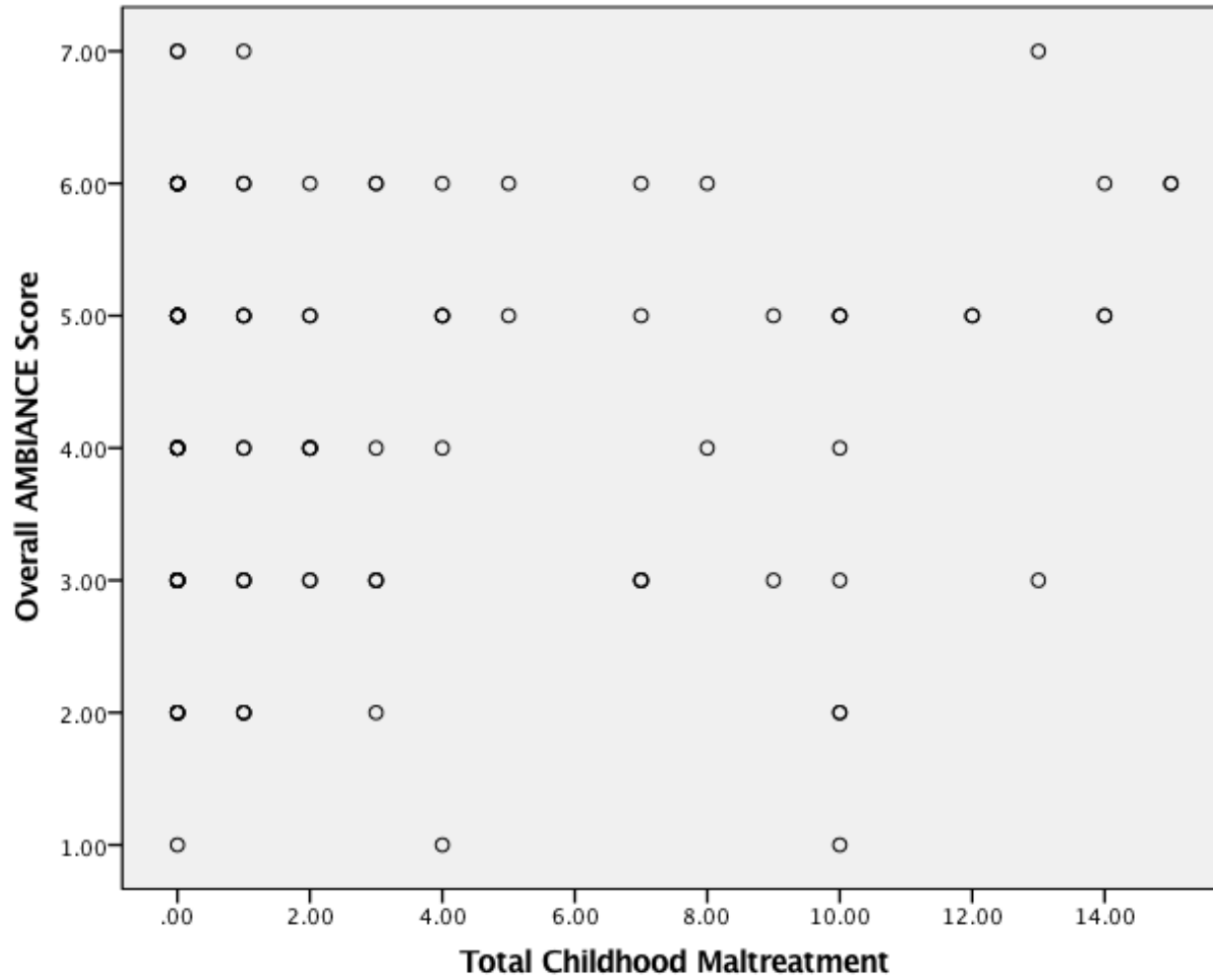
Good luck in your research. If we can be of further assistance, please contact us at 734-487-

3090 or via e-mail at human.subjects@emich.edu. Thank you for your cooperation.

Sincerely, Jennifer Kellman Fritz, PhD

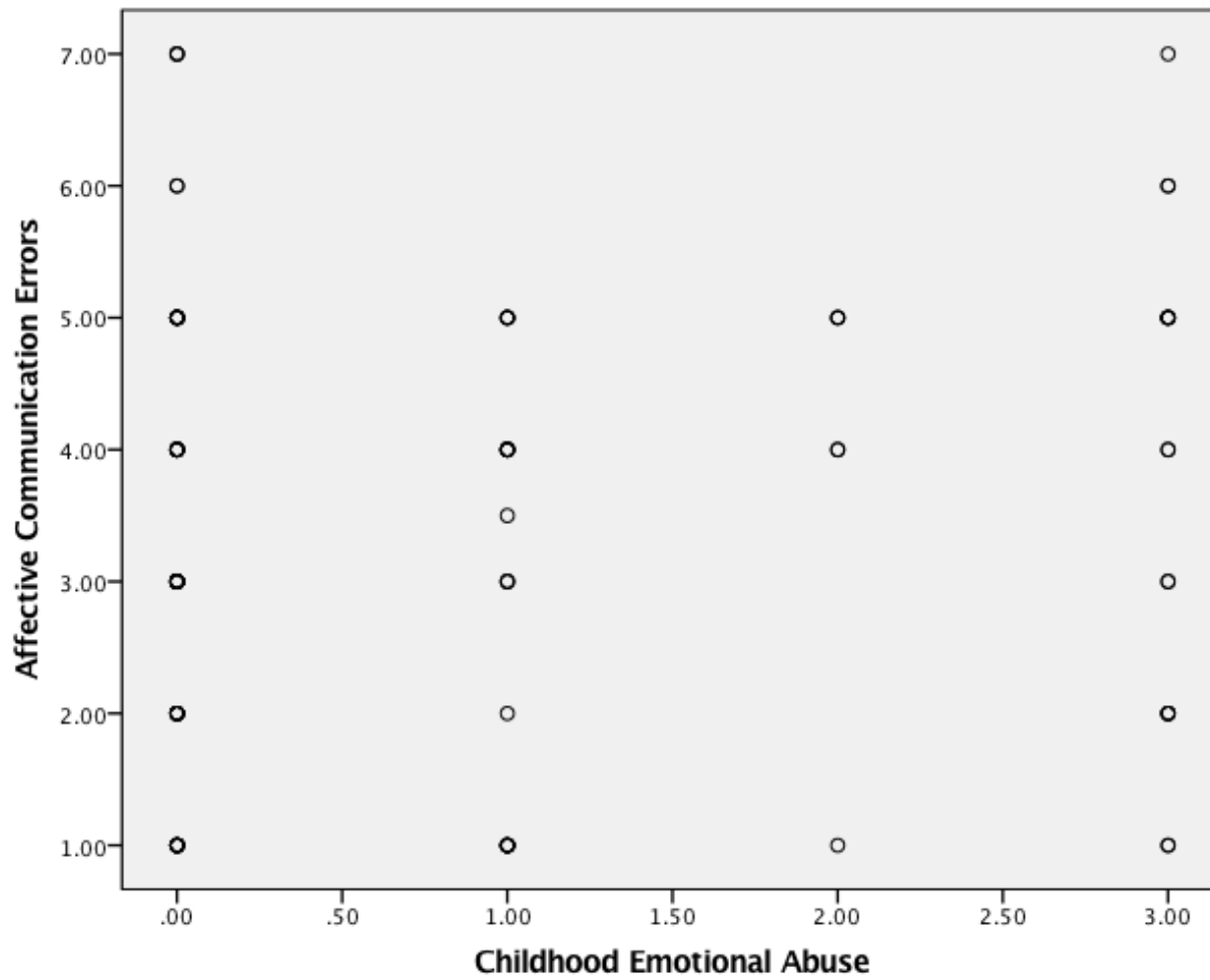
Chair University Human Subjects Review Committee

Appendix F: Scatter Plots



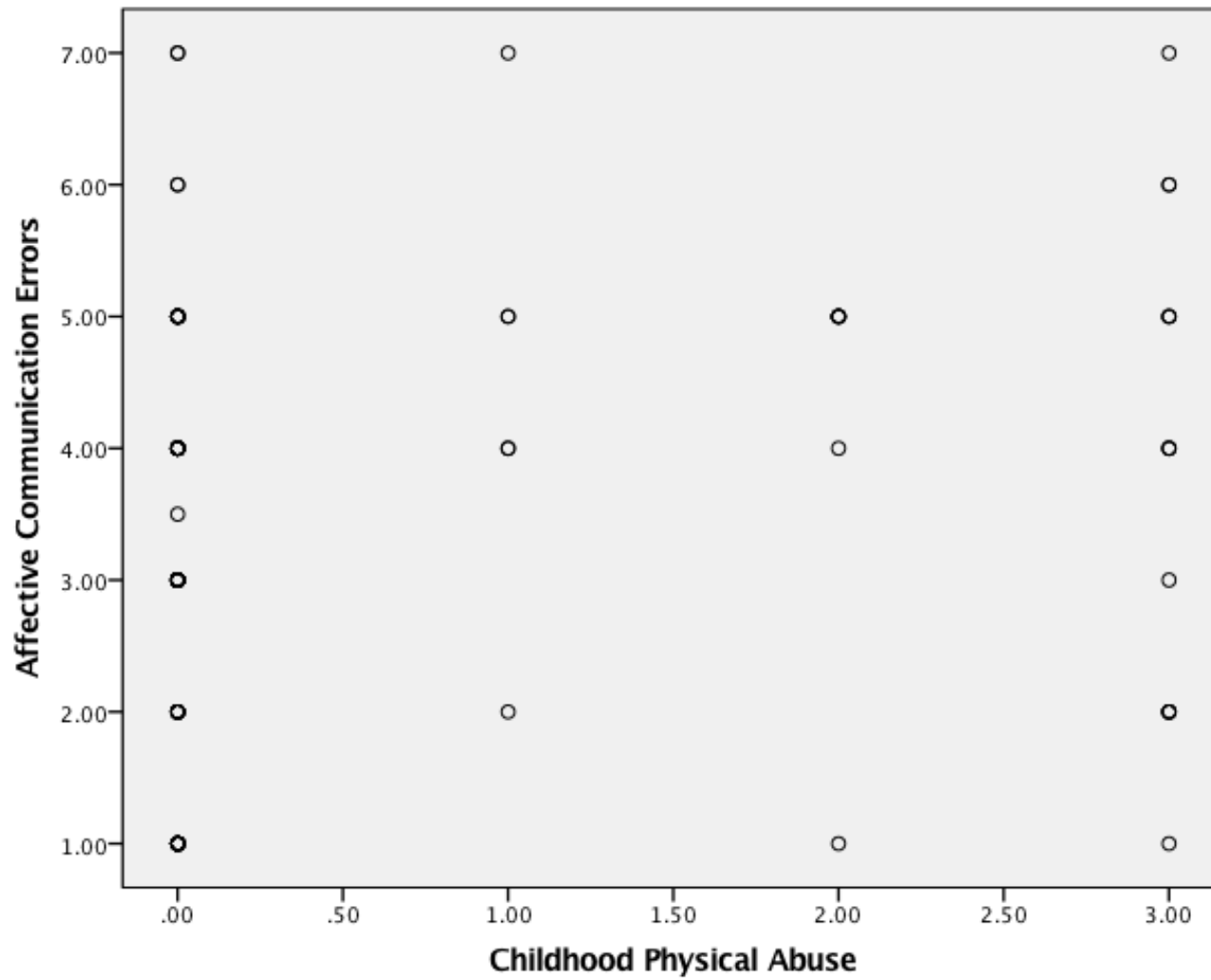
Appendix E.1

Association between overall AMBIANCE score and total childhood maltreatment



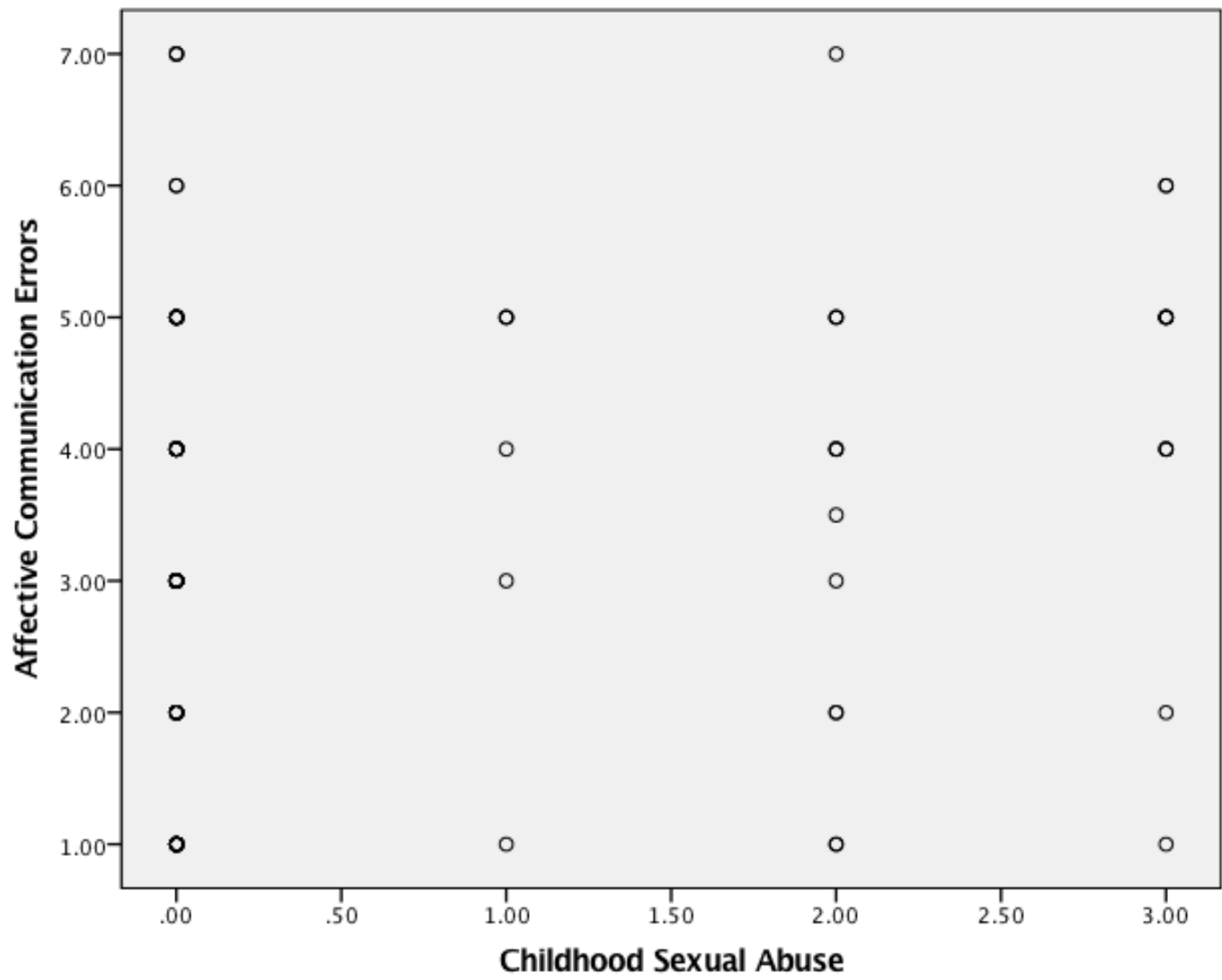
Appendix e.2

Association between affective communication errors and childhood emotional abuse



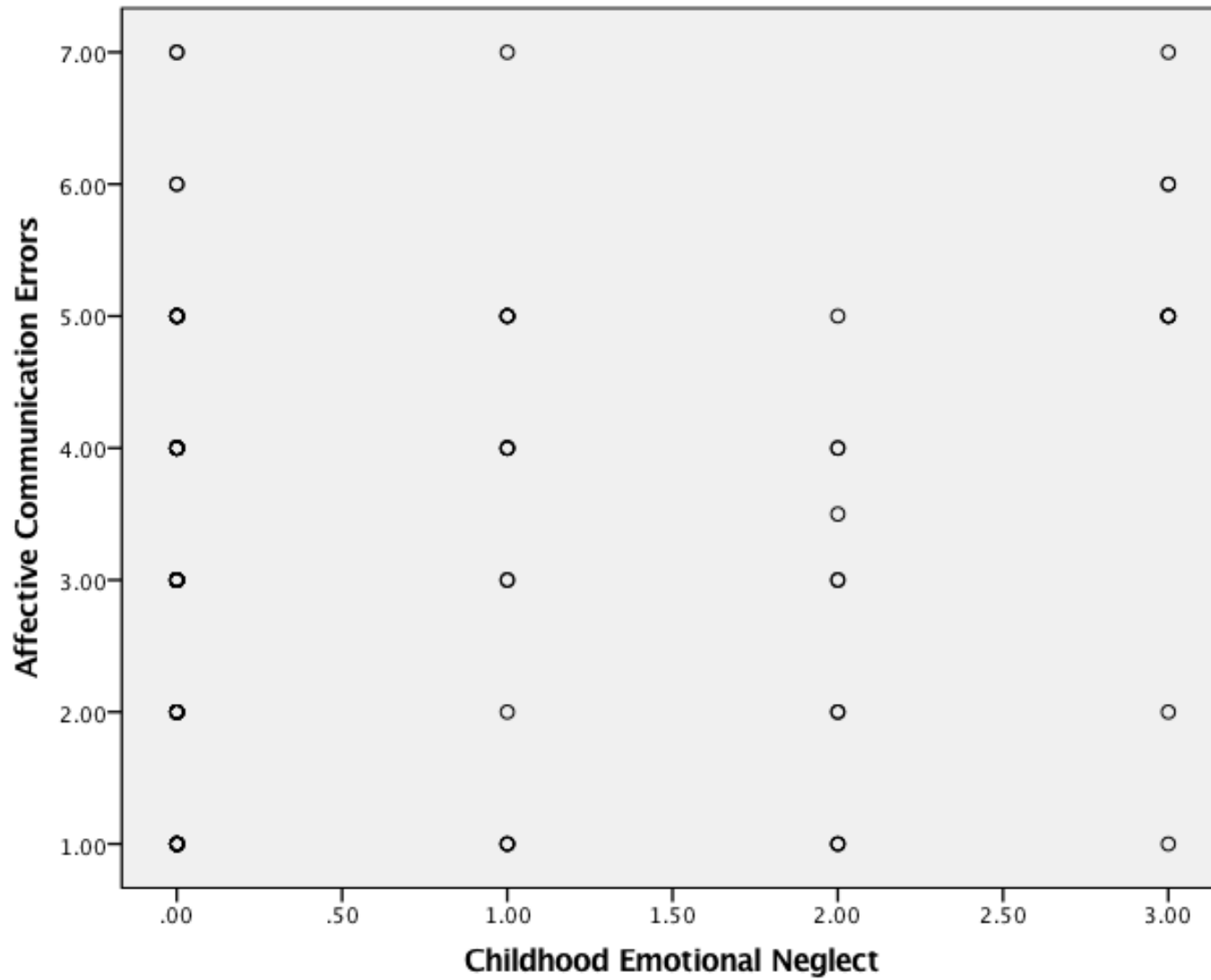
Appendix e.3

Association between affective communication errors and childhood physical abuse



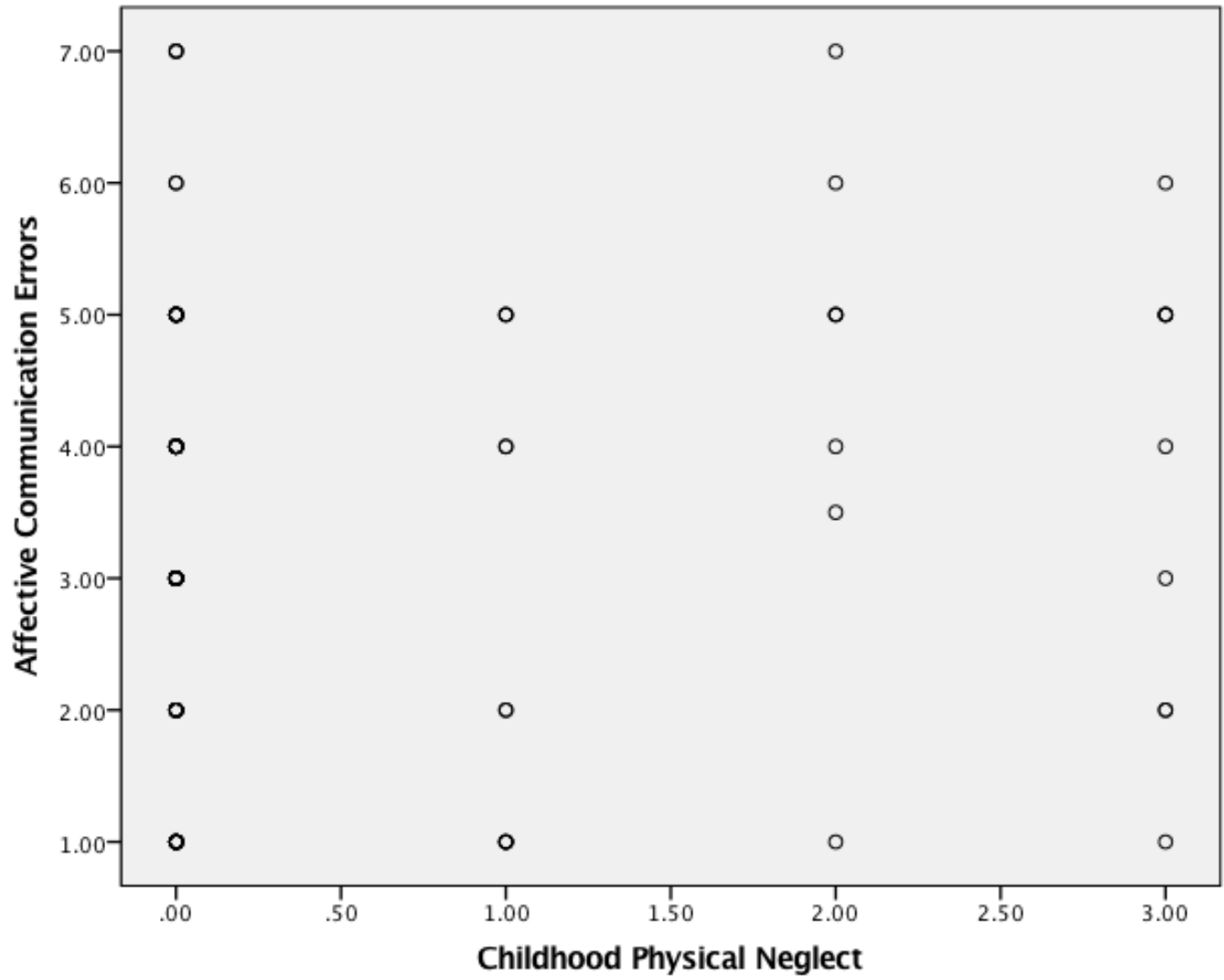
Appendix e.4

Association between affective communication errors and childhood sexual abuse



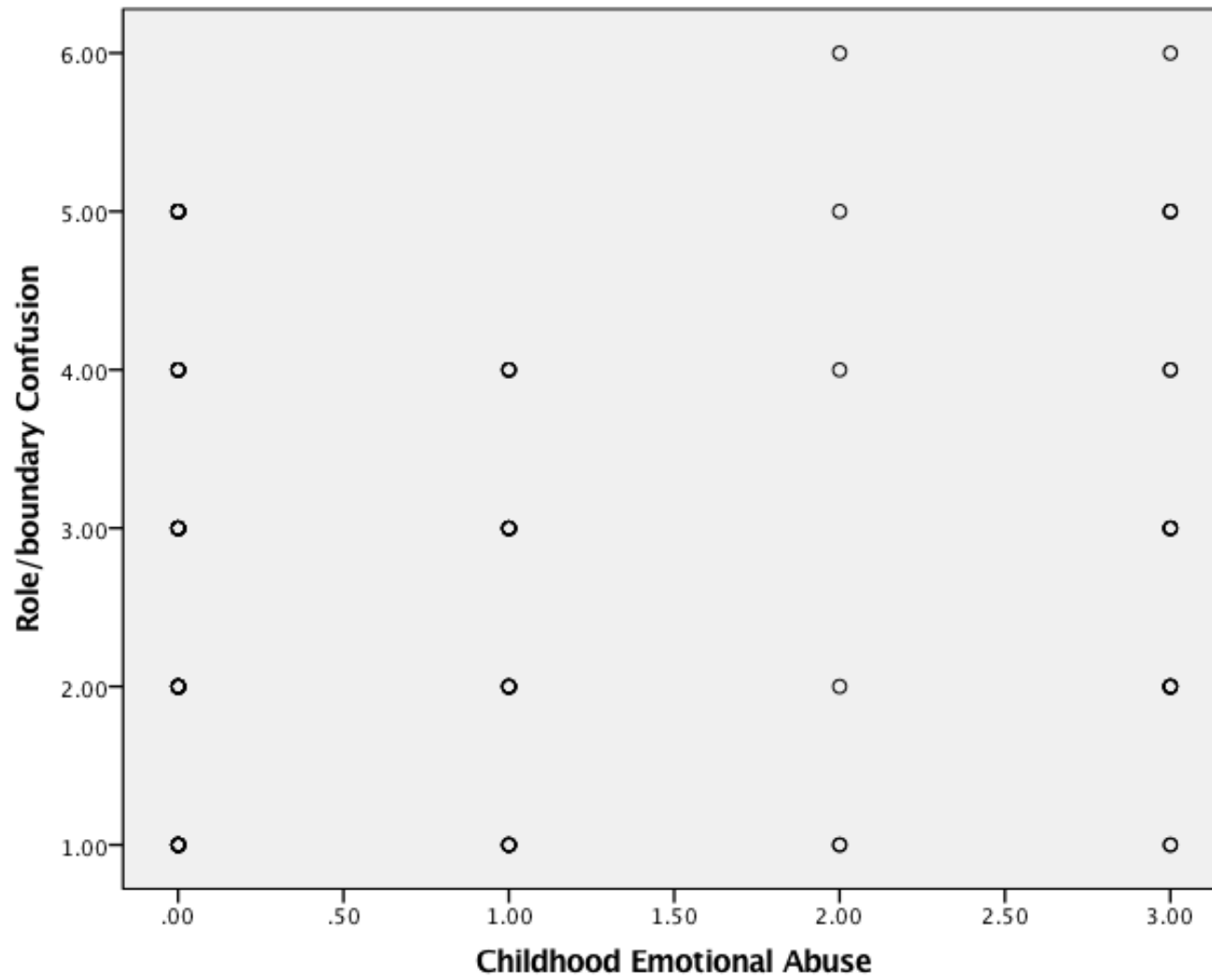
Appendix e.5

Association between affective communication errors and childhood emotional neglect



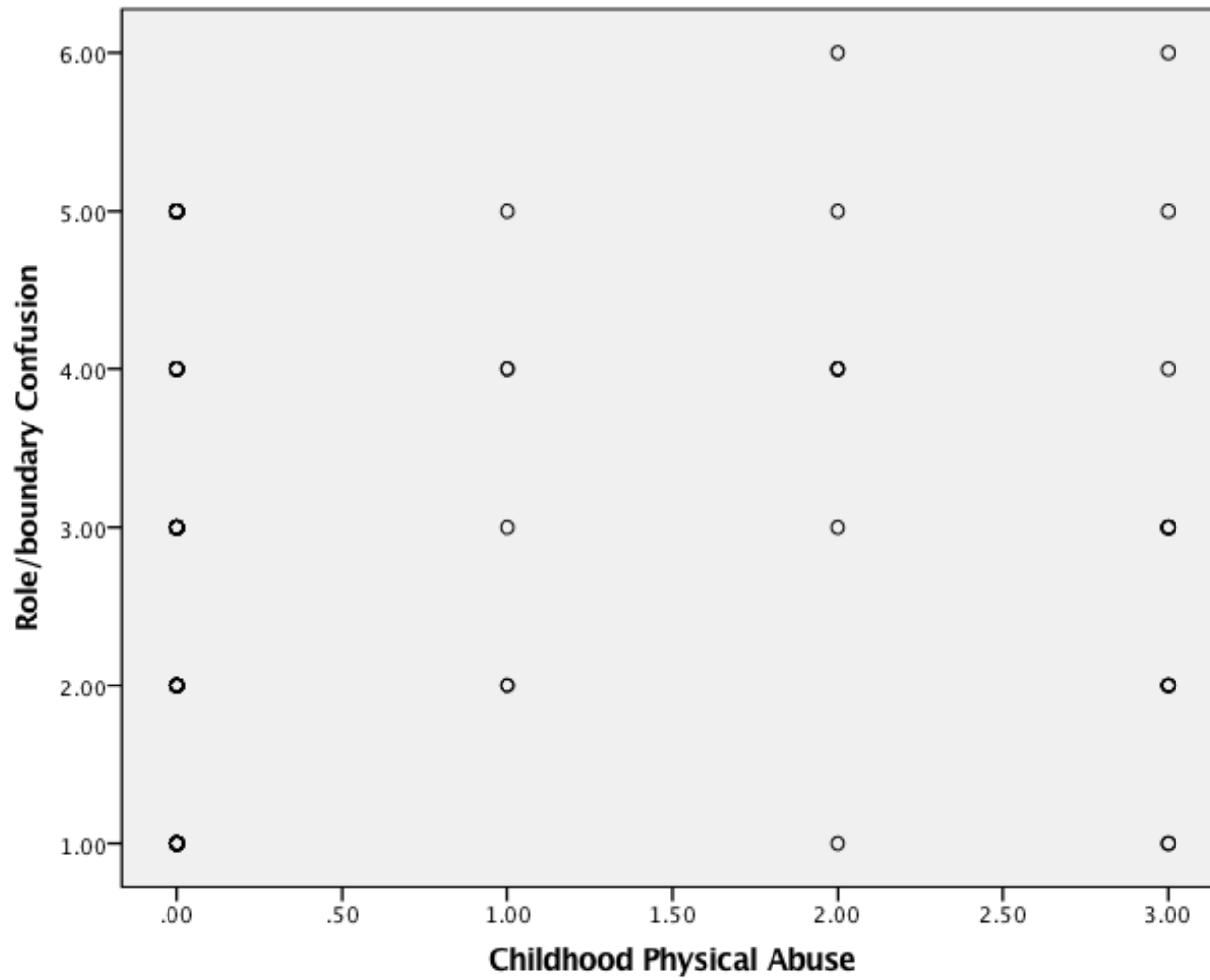
Appendix e.6

Association between affective communication errors and childhood physical neglect



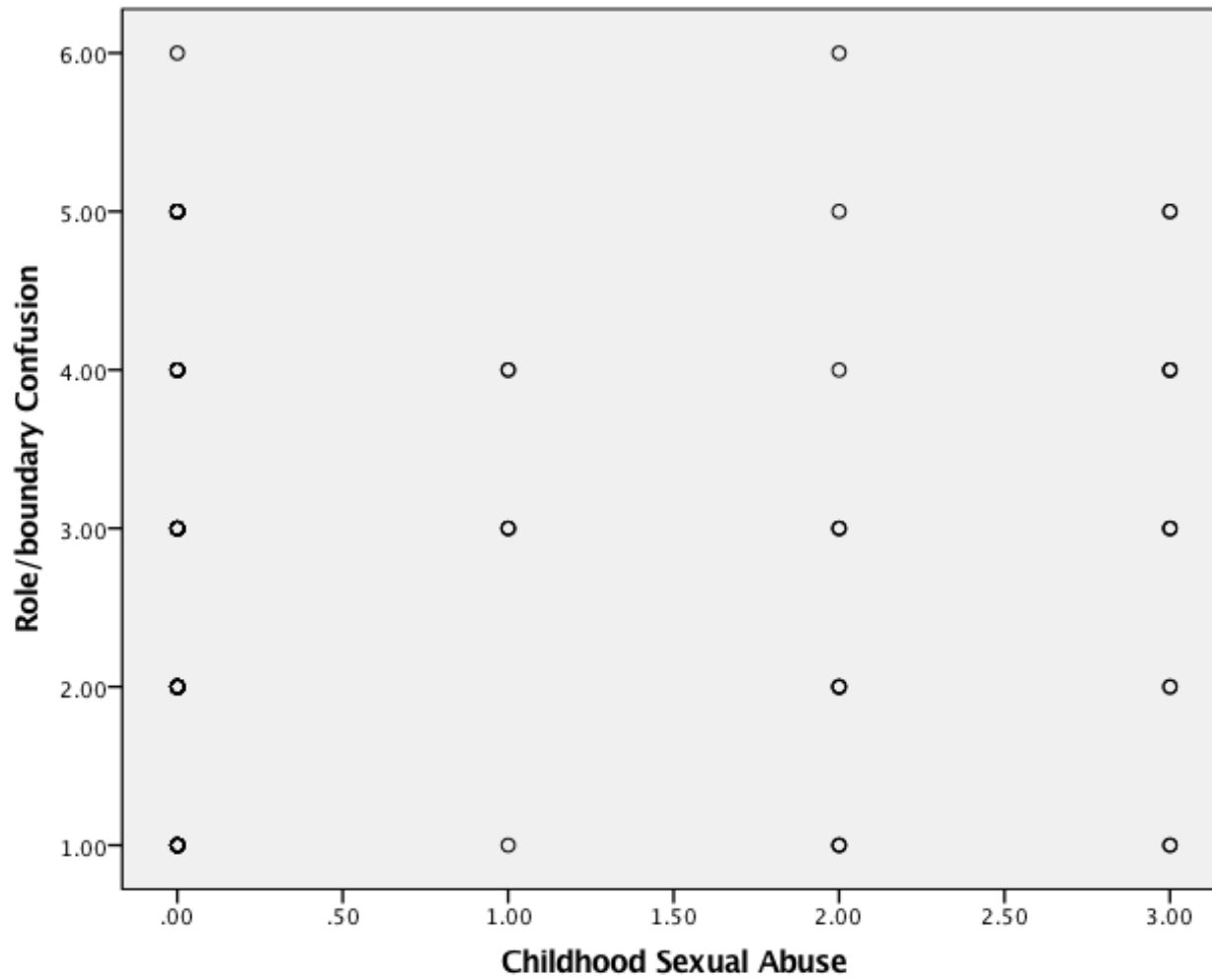
Appendix e.7

Association between role/boundary confusion and childhood emotional abuse



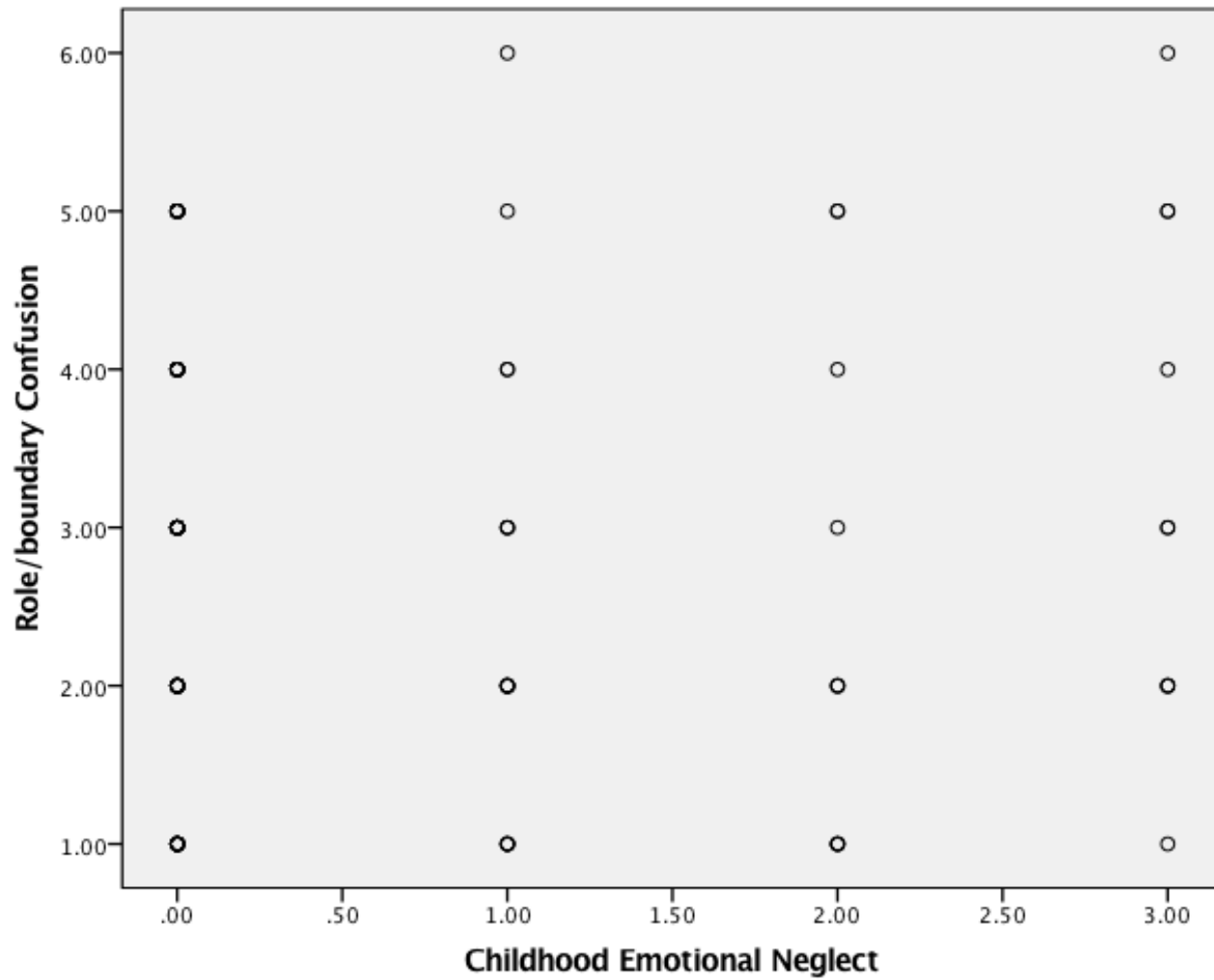
Appendix e.8

Association between role/boundary confusion and childhood physical abuse



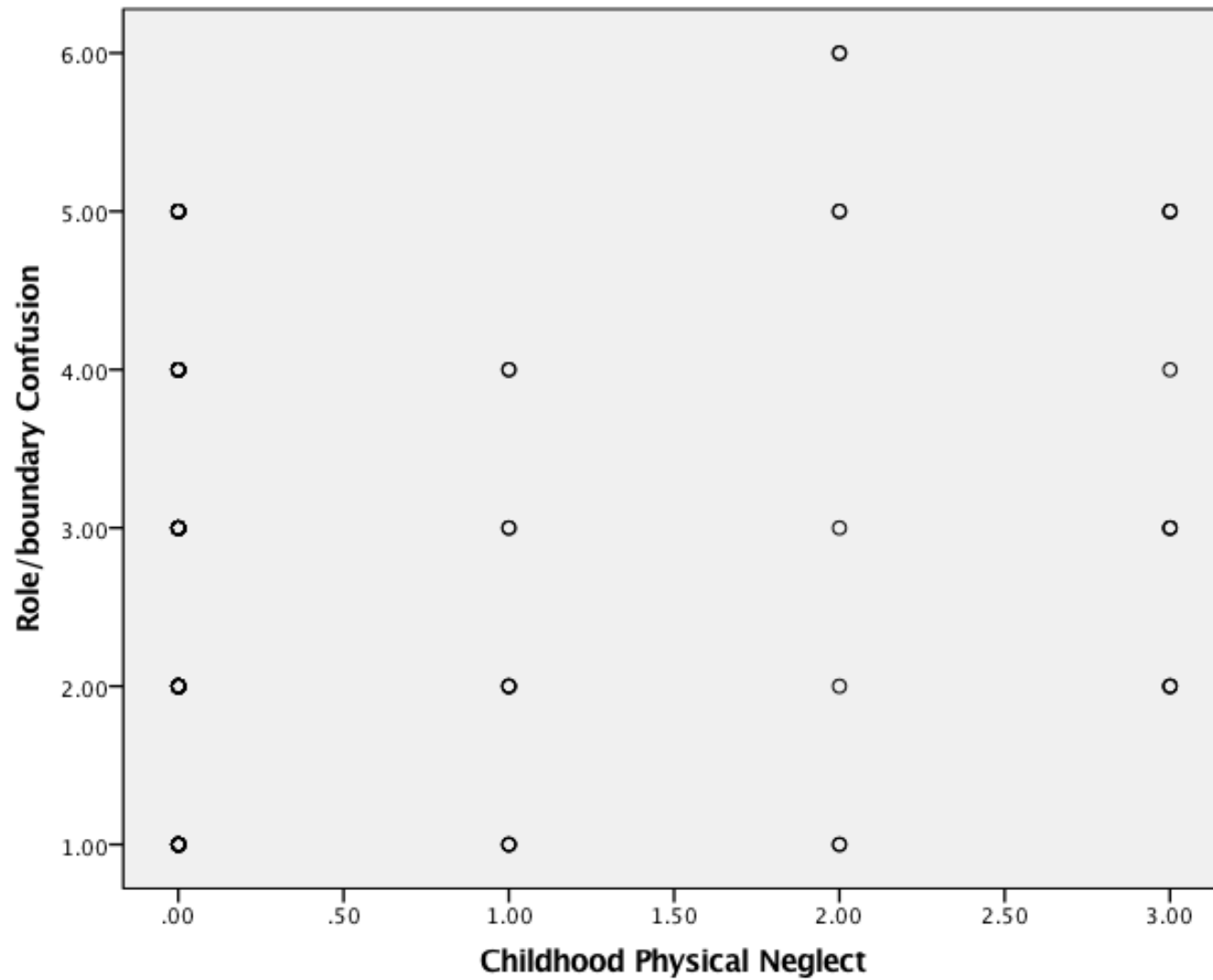
Appendix e.9

Association between role/boundary confusion and childhood sexual abuse



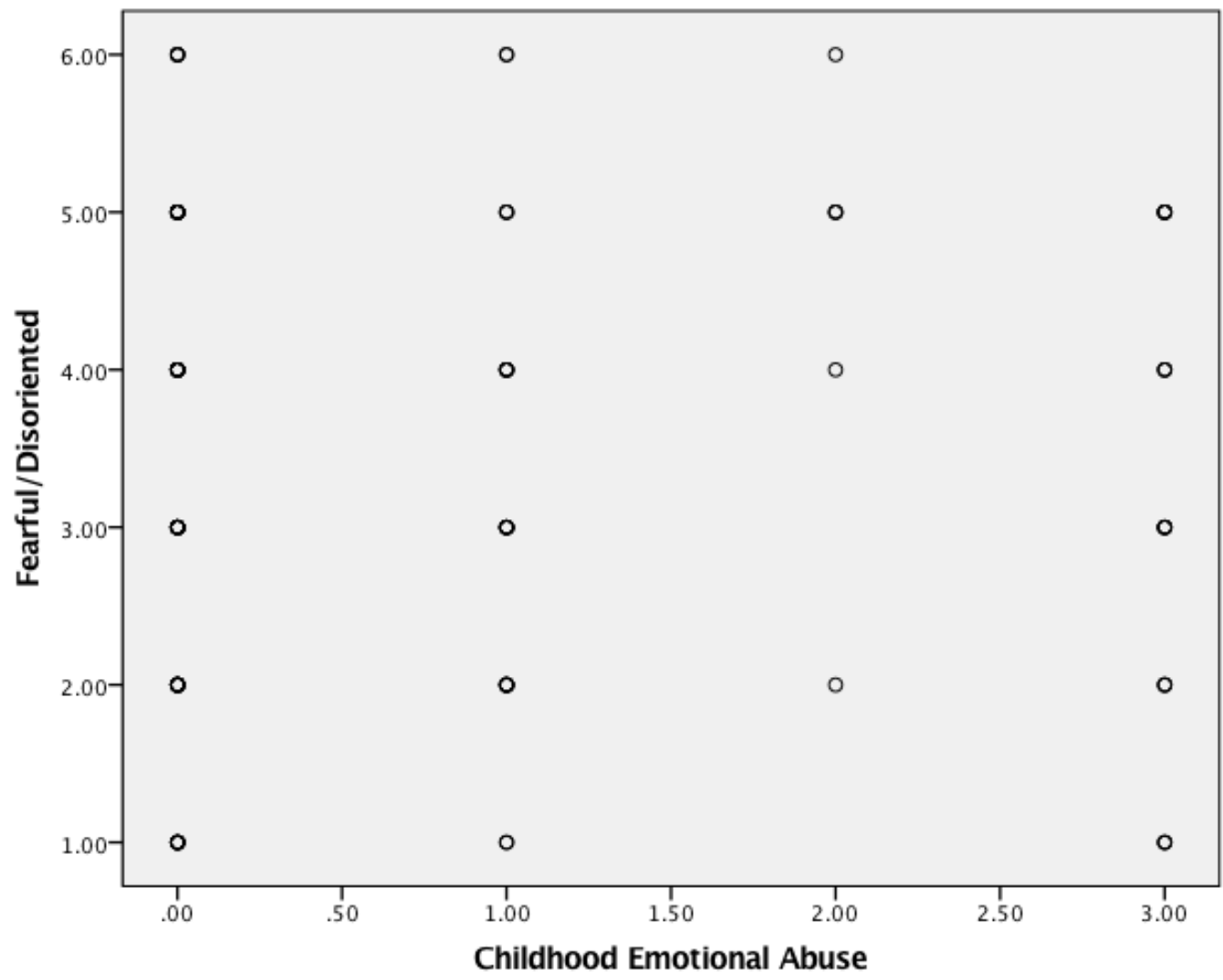
Appendix e.10

Association between role/boundary confusion and childhood emotional neglect



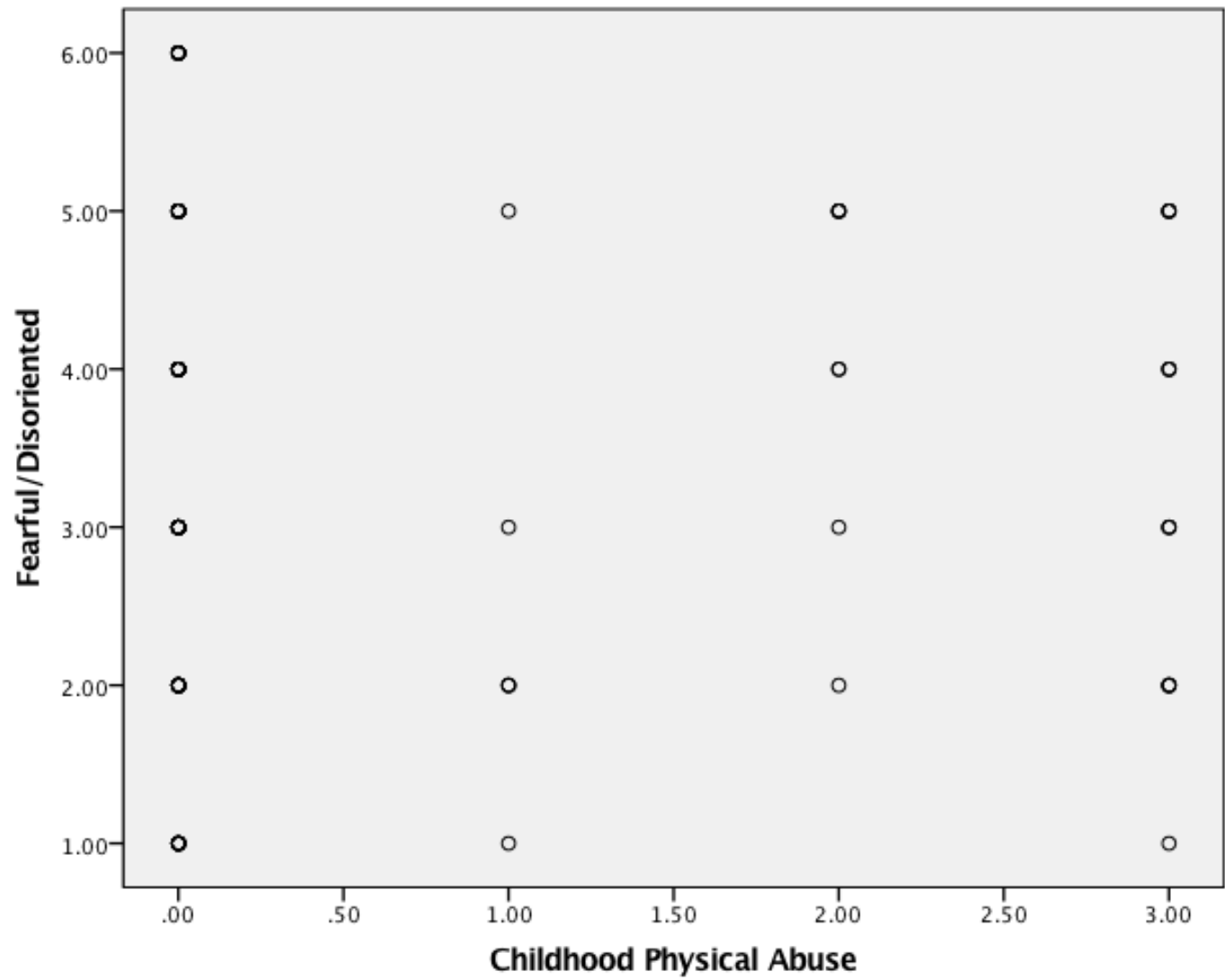
Appendix e.11

Association between role/boundary confusion and childhood physical neglect



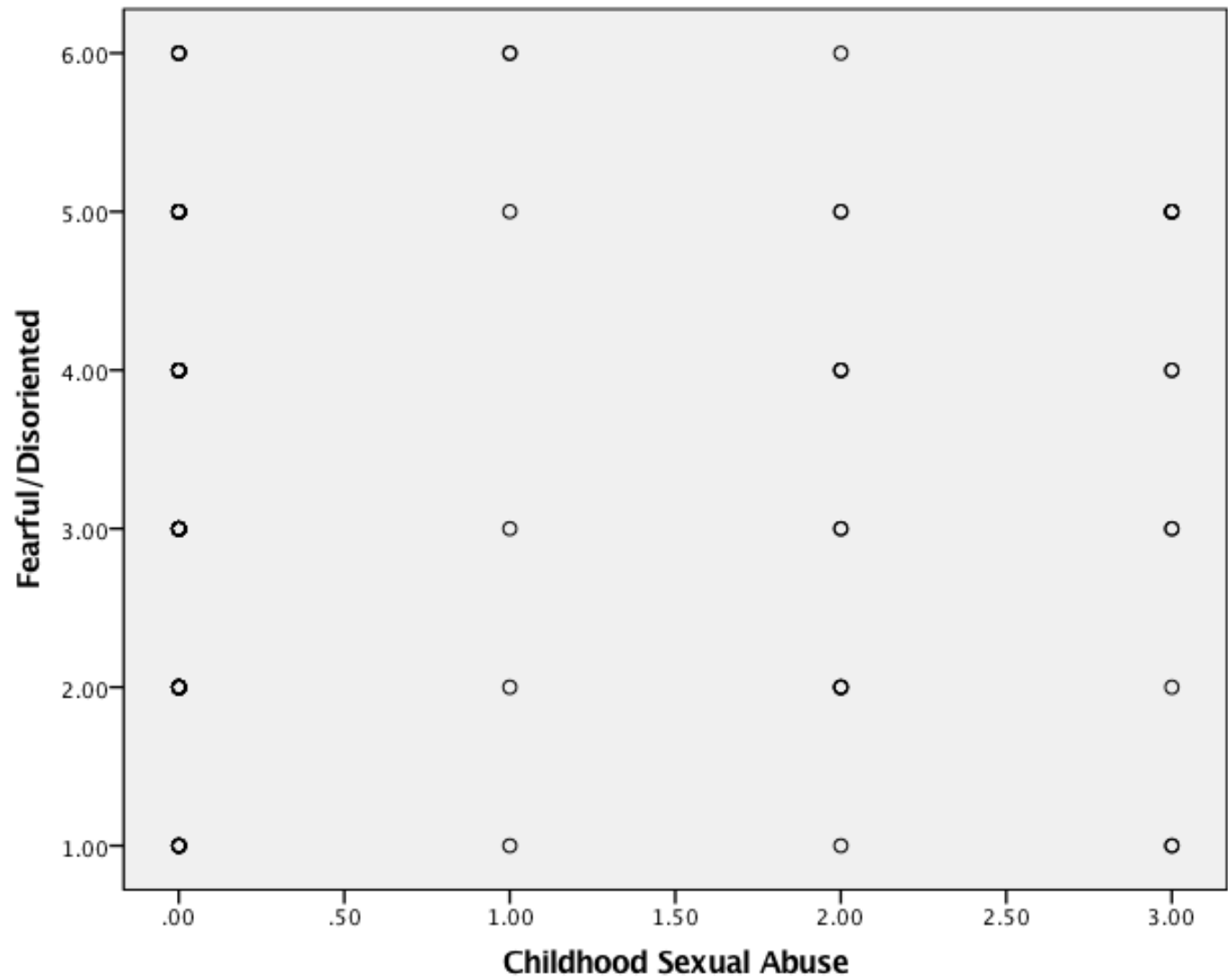
Appendix e.12

Association between fearful/disoriented and childhood emotional abuse



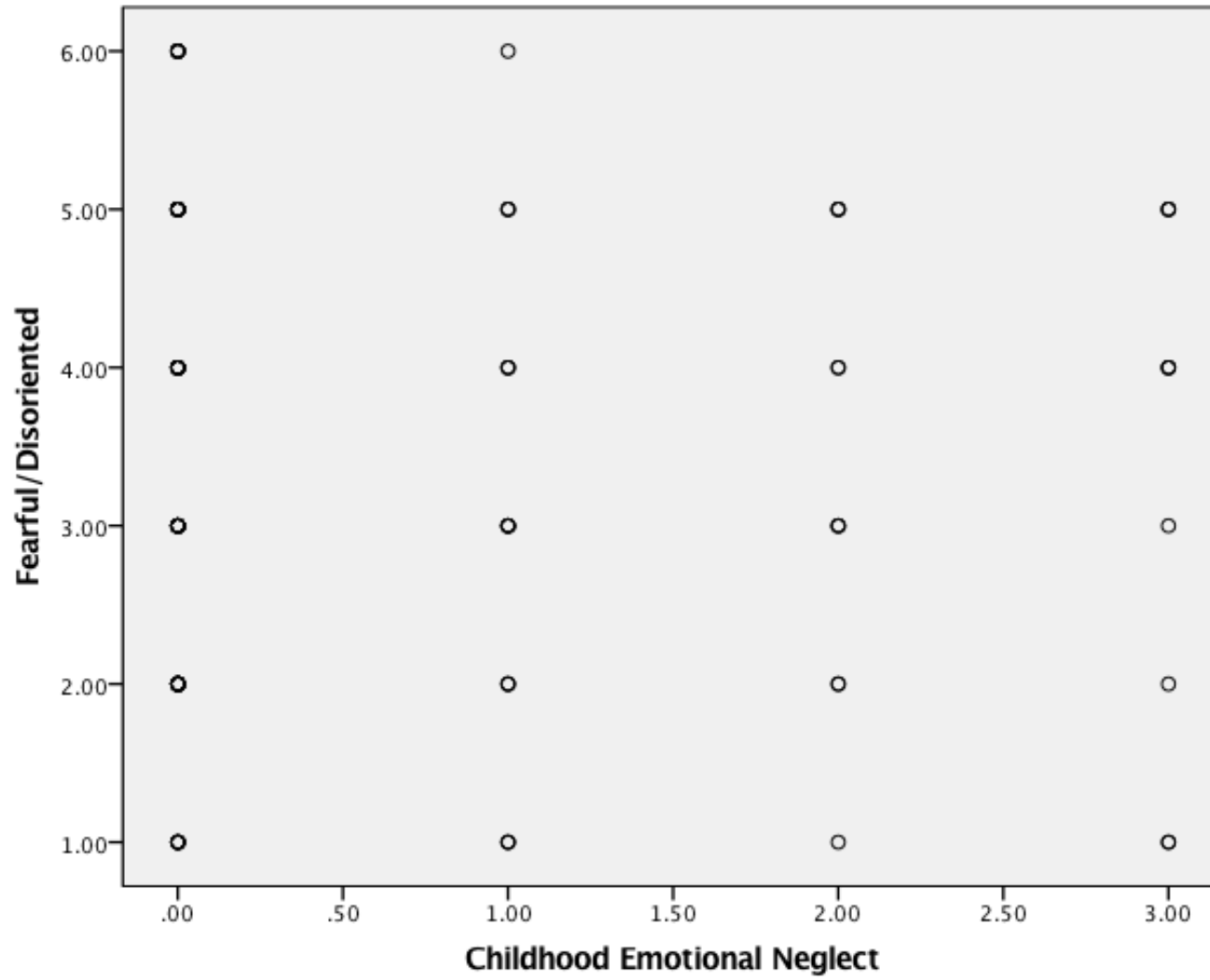
Appendix e.13

Association between fearful/disoriented and childhood physical abuse



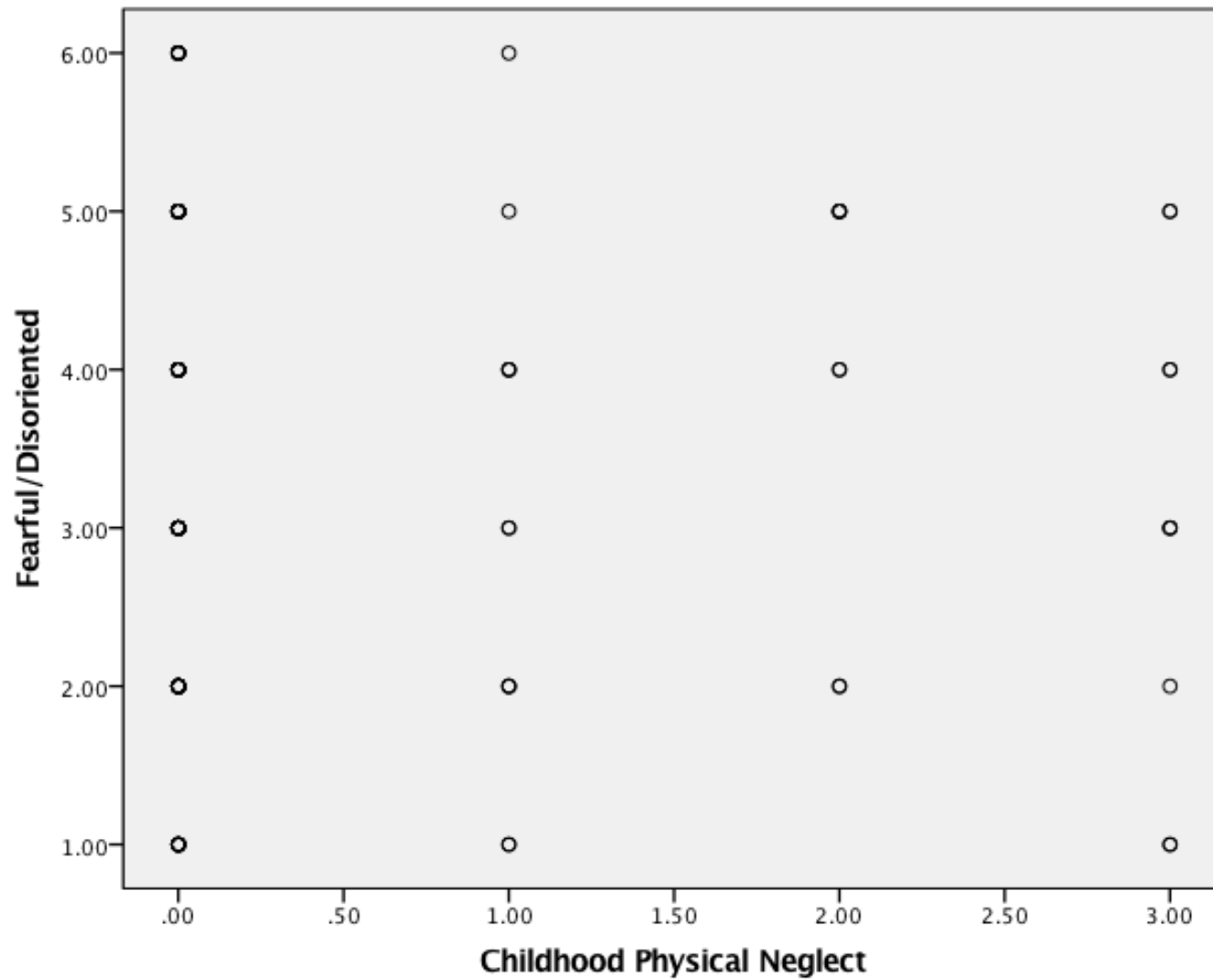
Appendix e.14

Association between fearful/disoriented and childhood sexual abuse



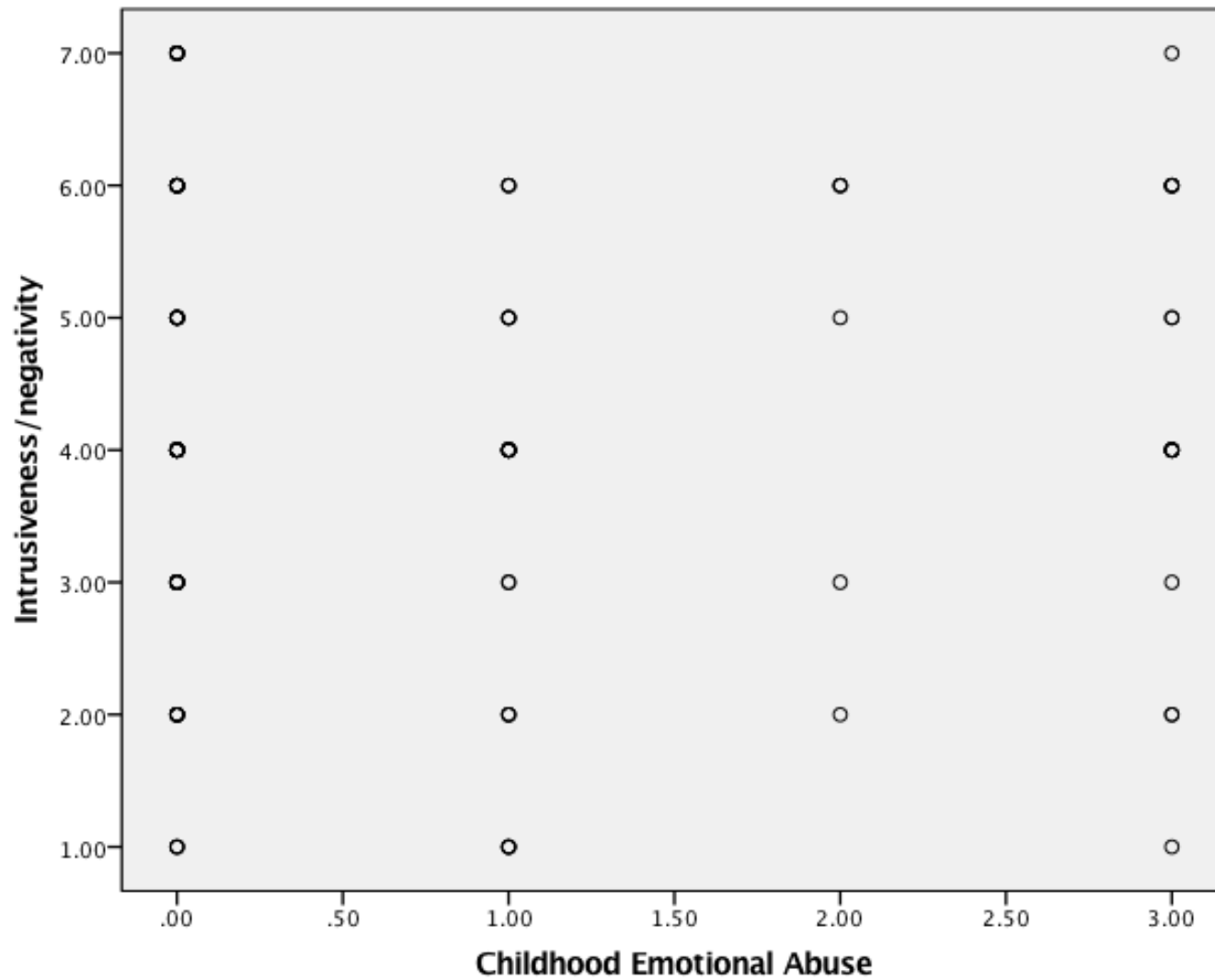
Appendix e.15

Association between fearful/disoriented and childhood emotional neglect



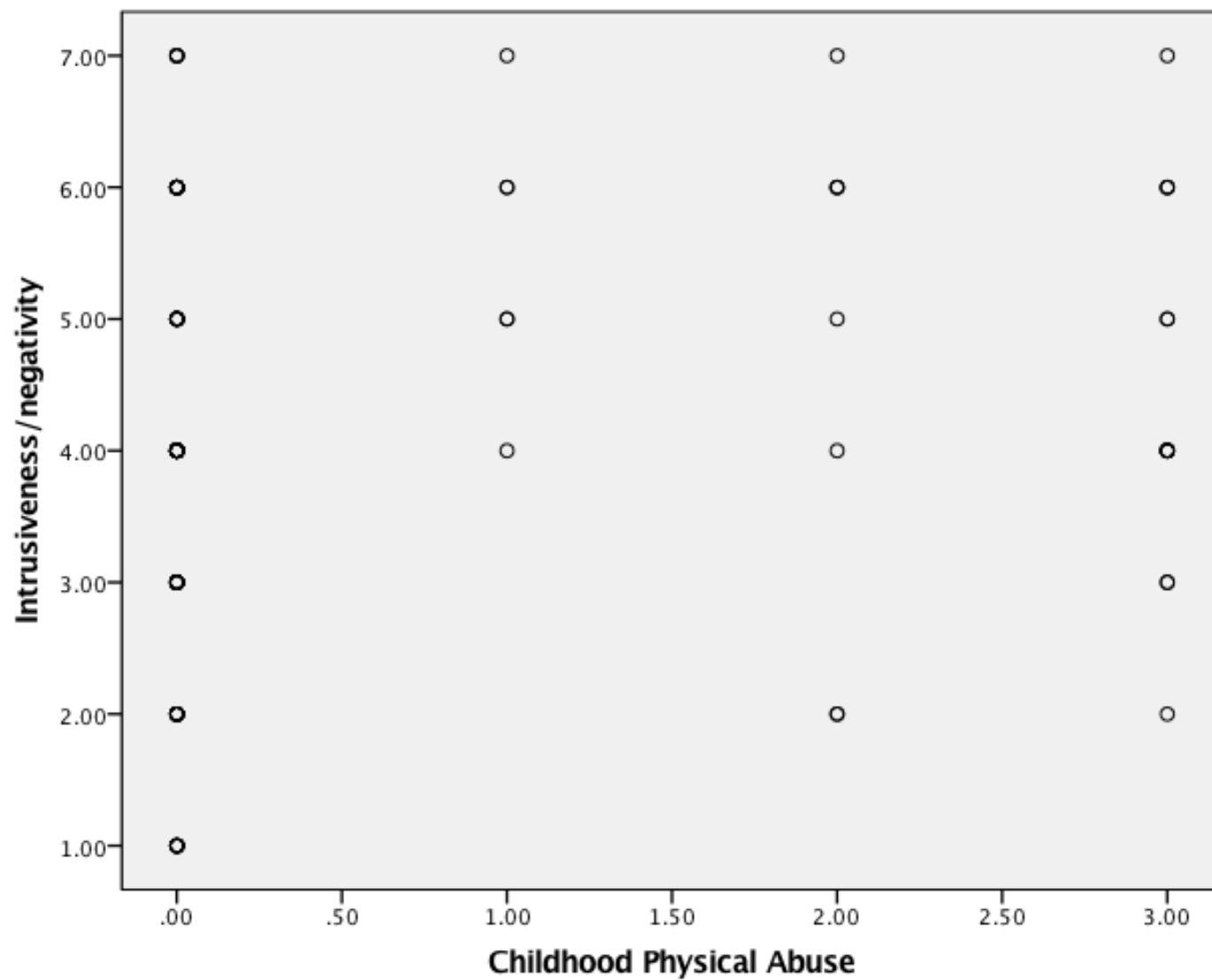
Appendix e.16

Association between fearful/disoriented and childhood physical neglect



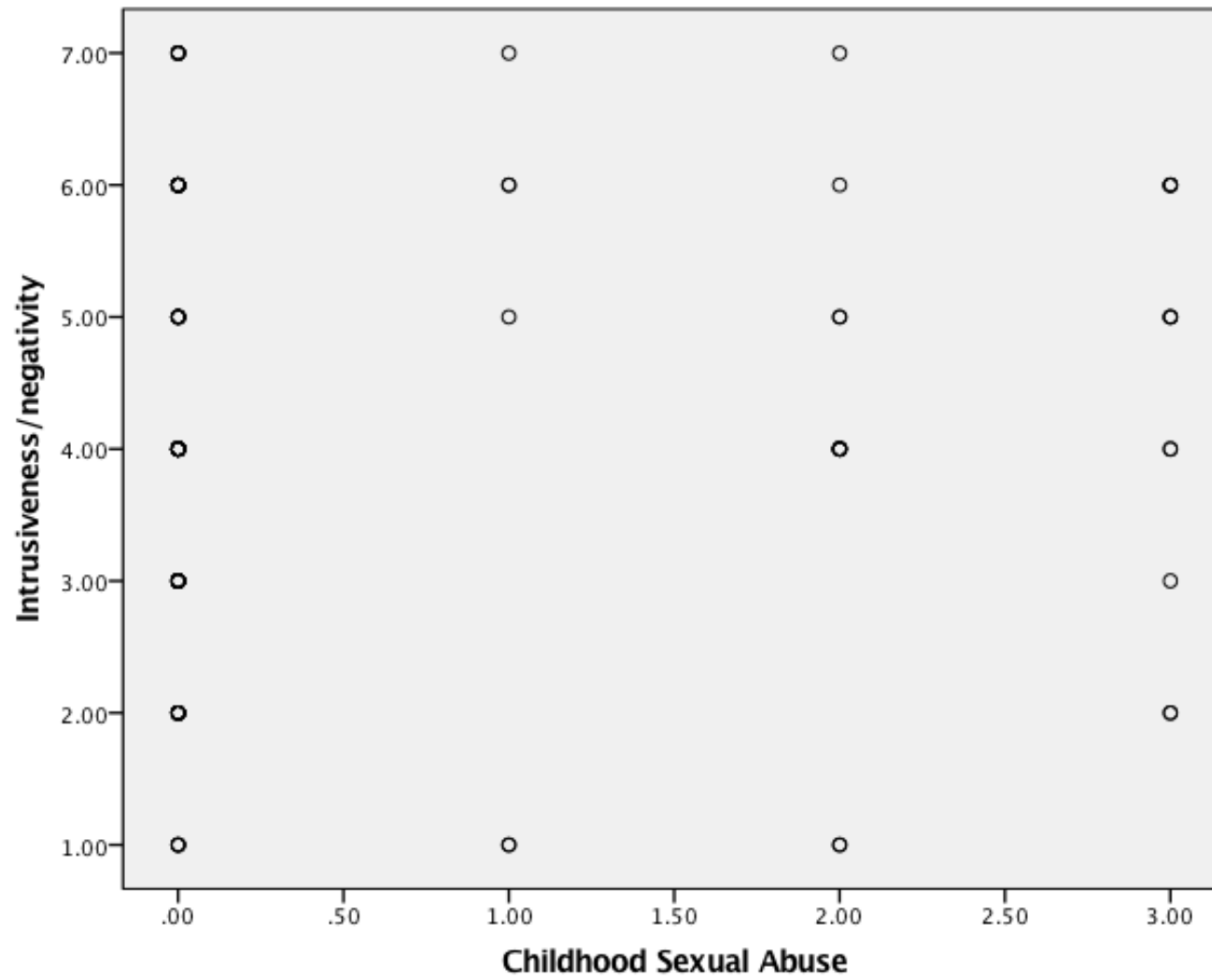
Appendix e.17

Association between intrusiveness/negativity and childhood emotional abuse



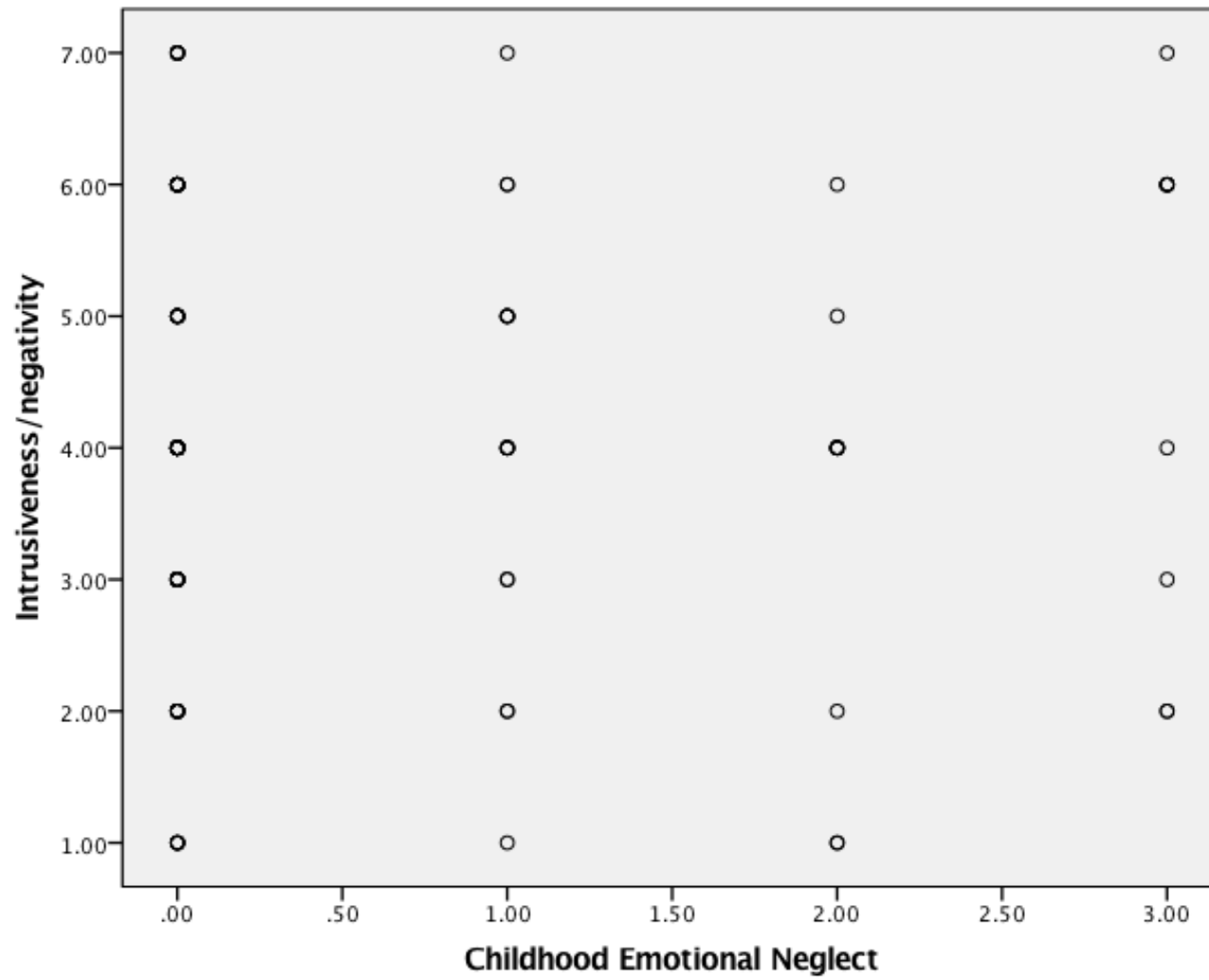
Appendix e.18

Association between intrusiveness/negativity and childhood physical abuse



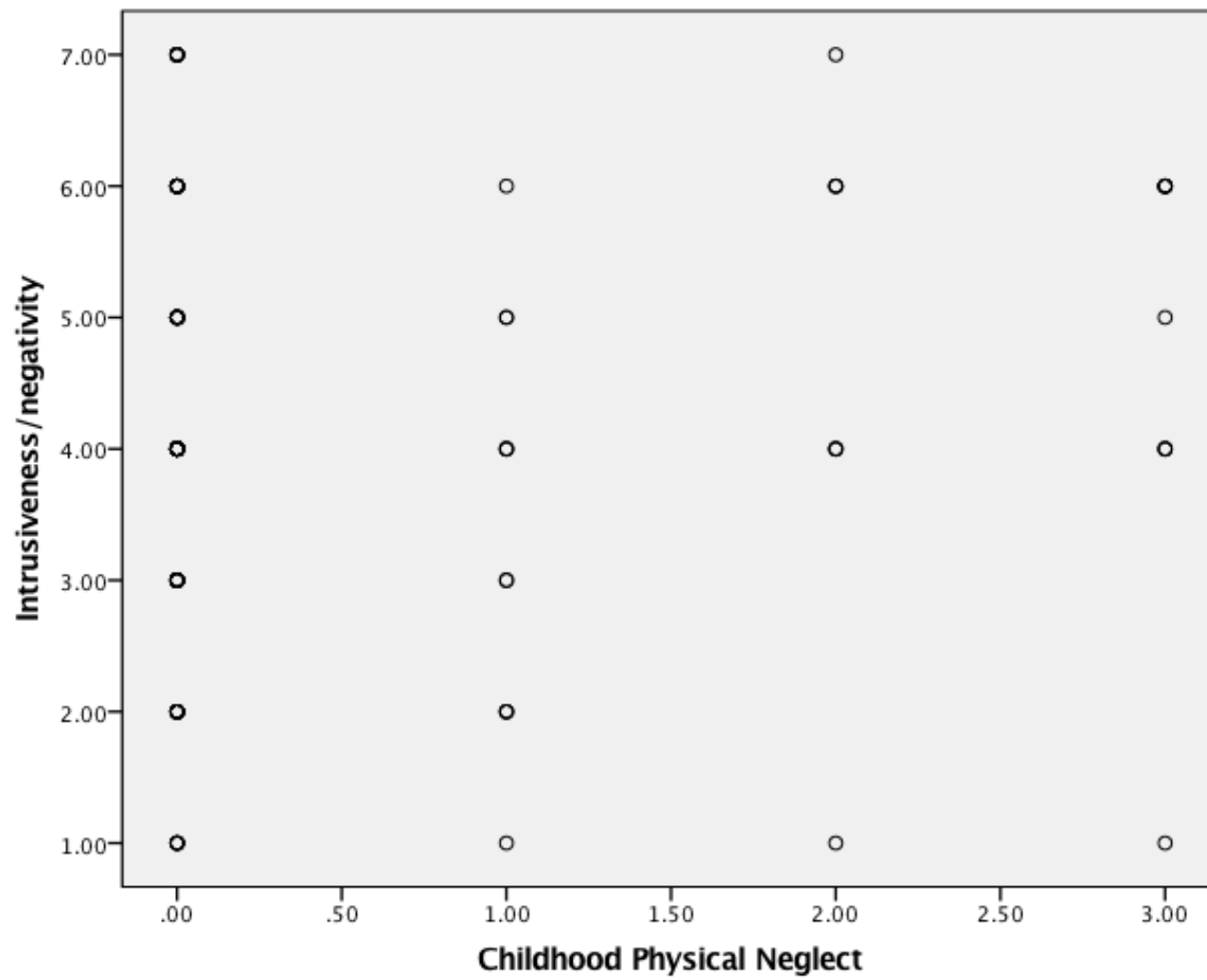
Appendix e.19

Association between intrusiveness/negativity and childhood sexual abuse



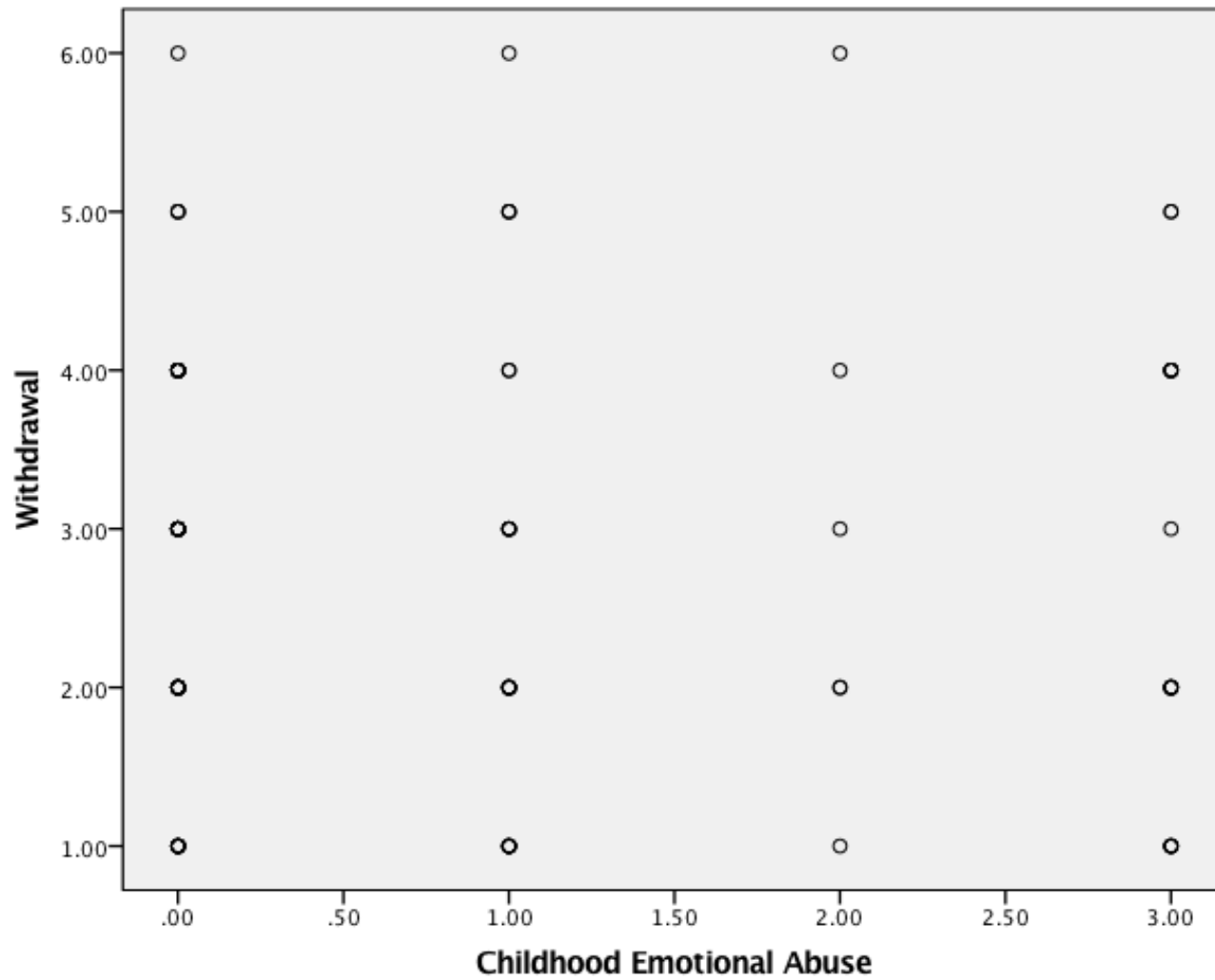
Appendix e.20

Association between intrusiveness/negativity and childhood emotional neglect



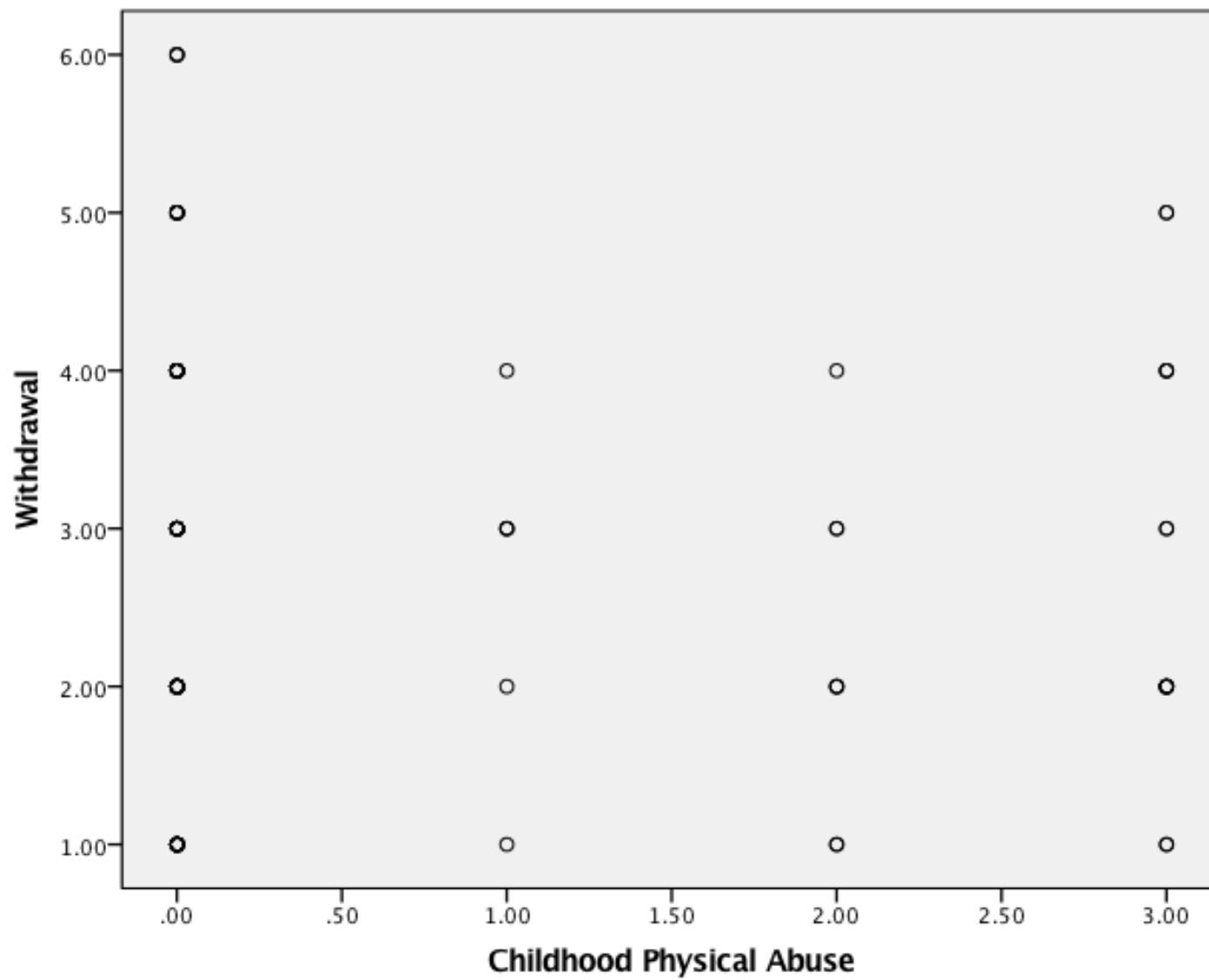
Appendix e.21

Association between intrusiveness/negativity and childhood physical neglect



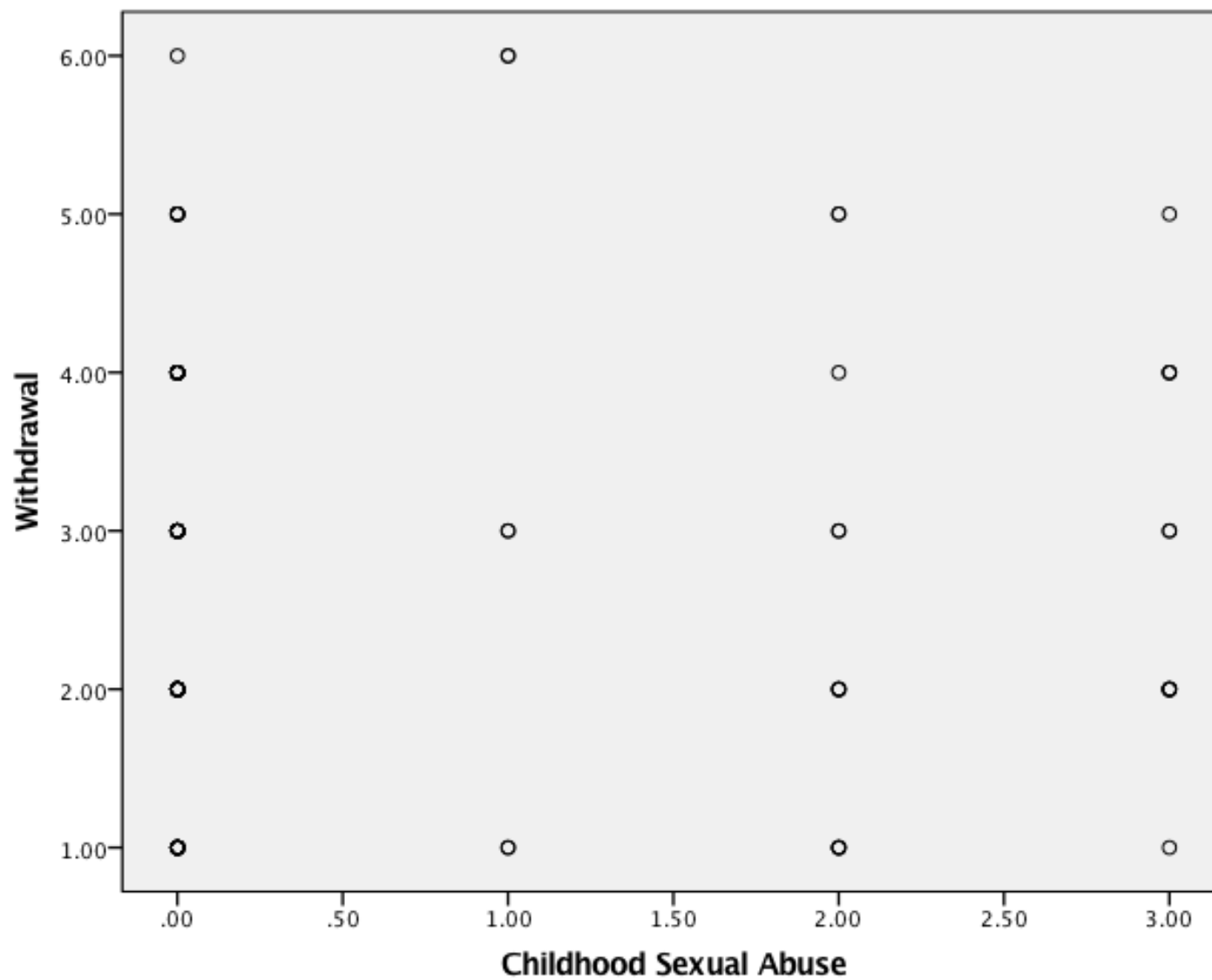
Appendix e.22

Association between withdrawal and childhood emotional abuse



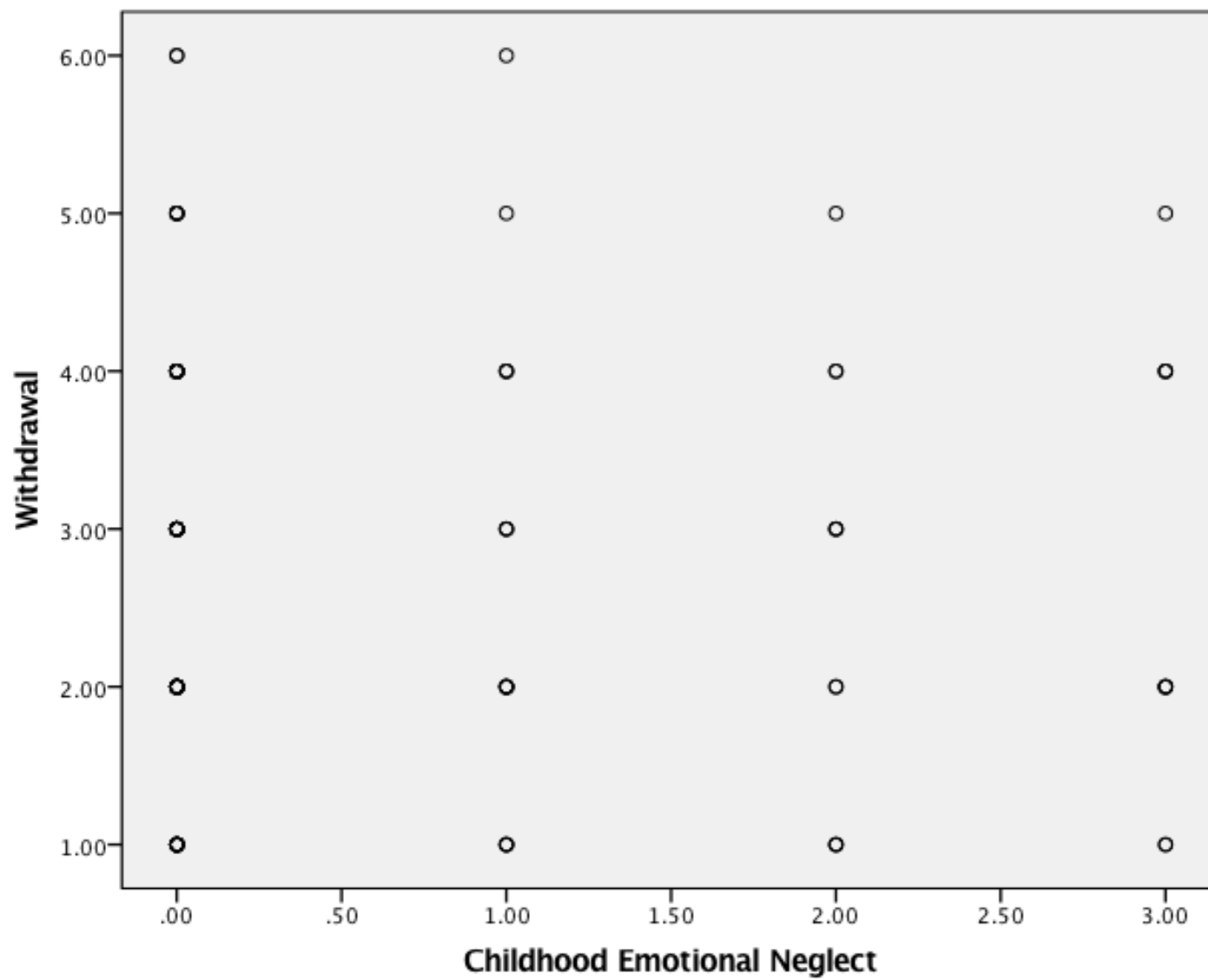
Appendix e.23

Association between withdrawal and childhood physical abuse



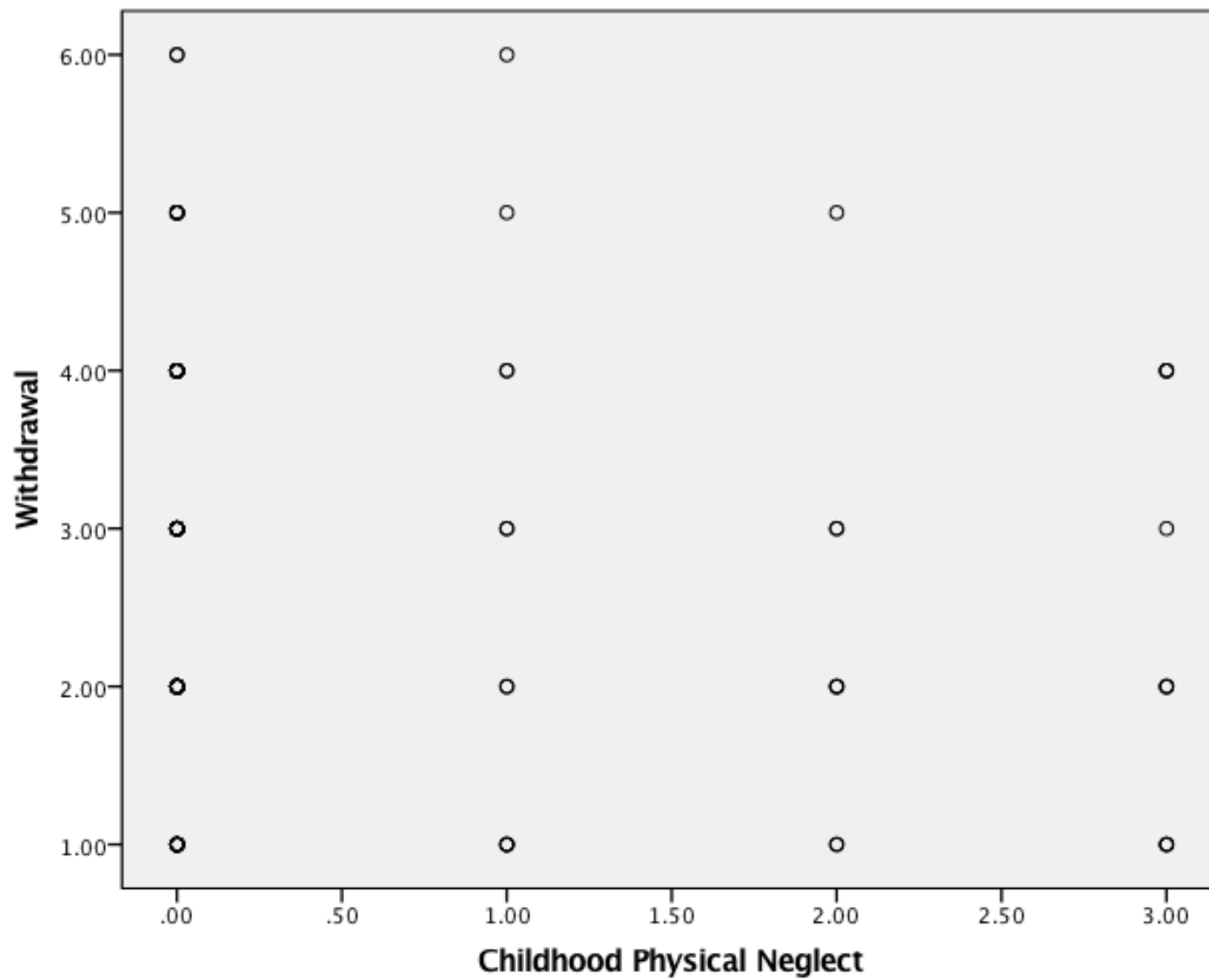
Appendix e.24

Association between withdrawal and childhood sexual abuse



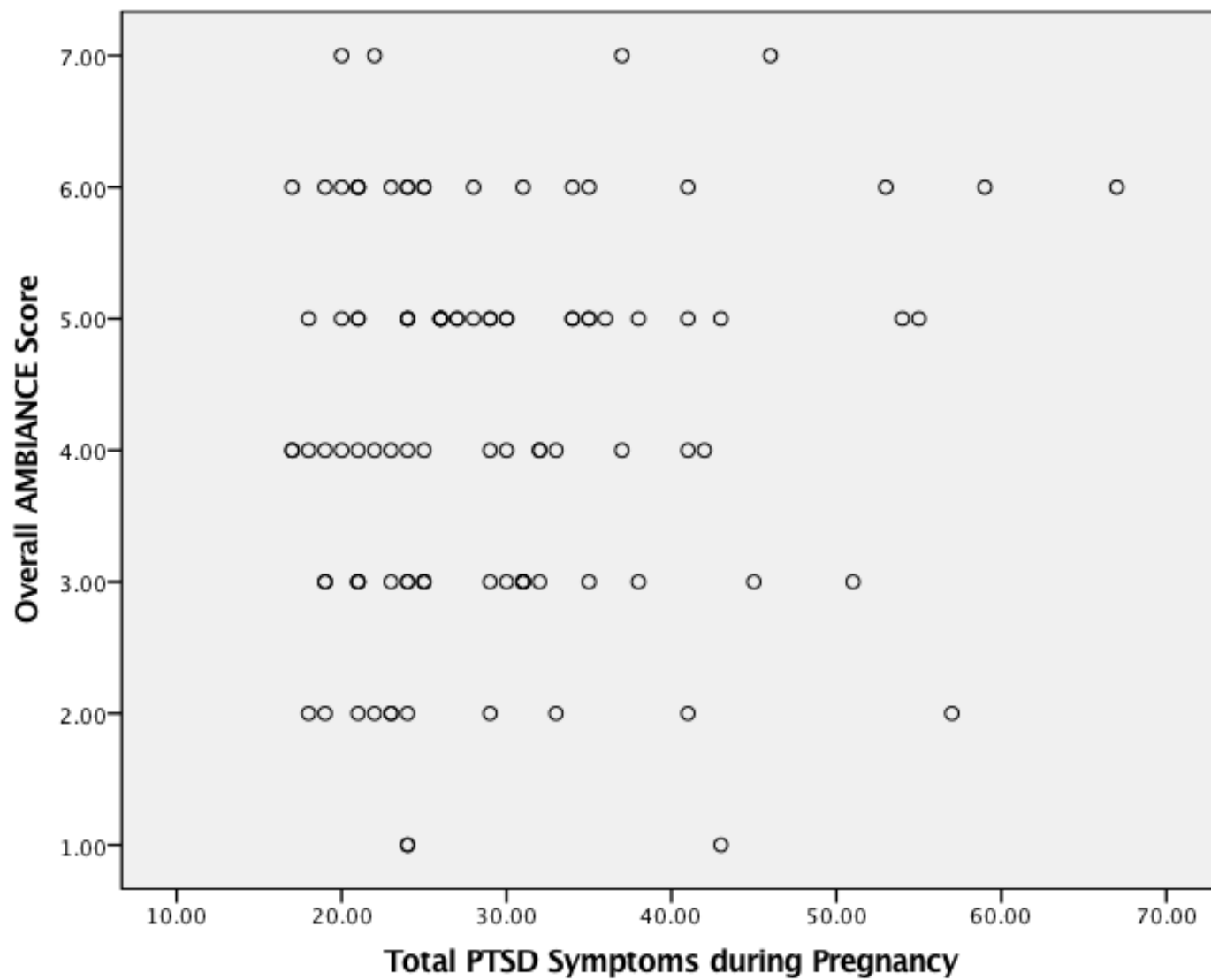
Appendix e.25

Association between withdrawal and childhood emotional neglect



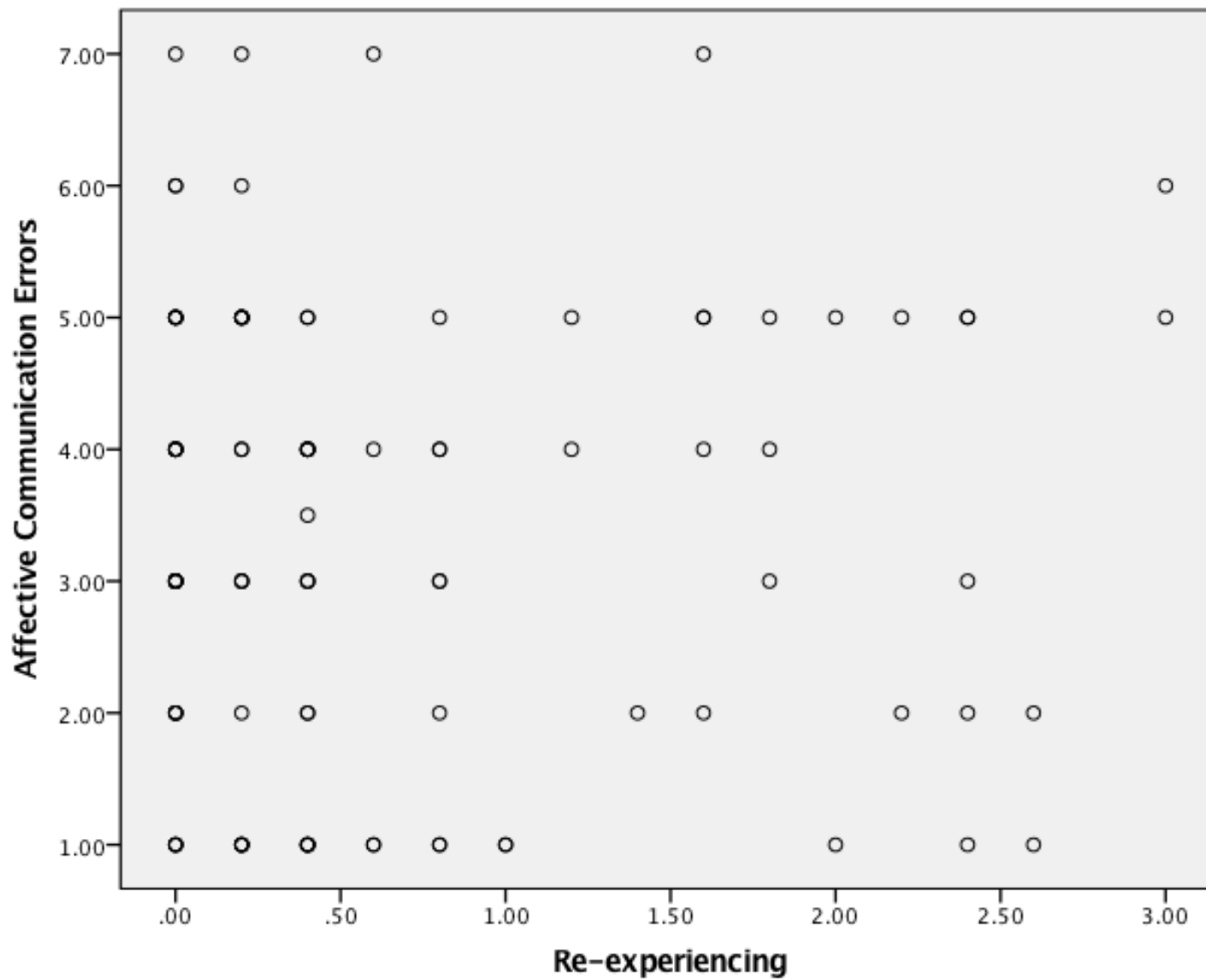
Appendix e.26

Association between withdrawal and childhood physical neglect



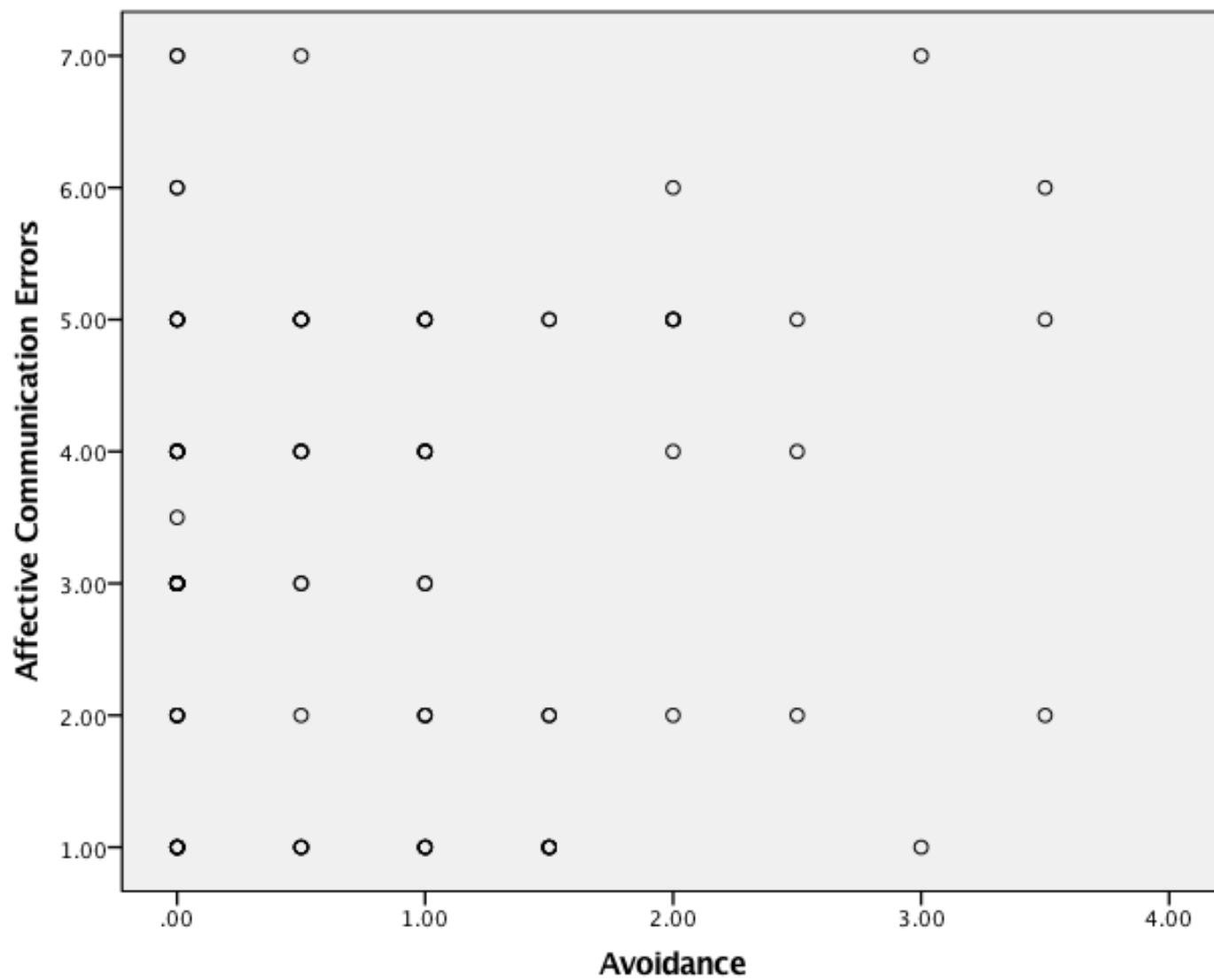
Appendix e.27

Association between overall AMBIANCE score and total PTSD symptoms during pregnancy



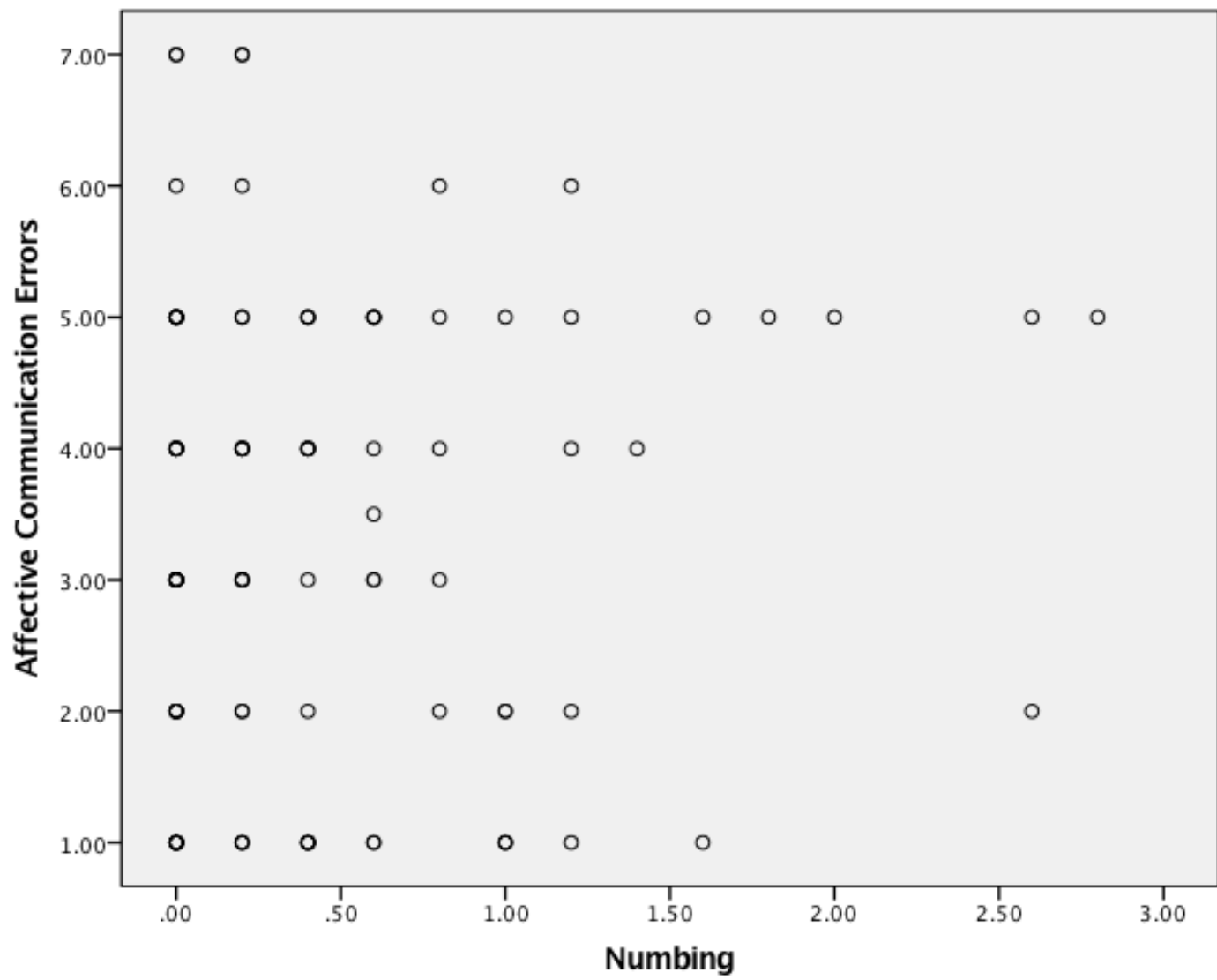
Appendix e.28

Association between affective communication errors and re-experiencing symptoms during pregnancy



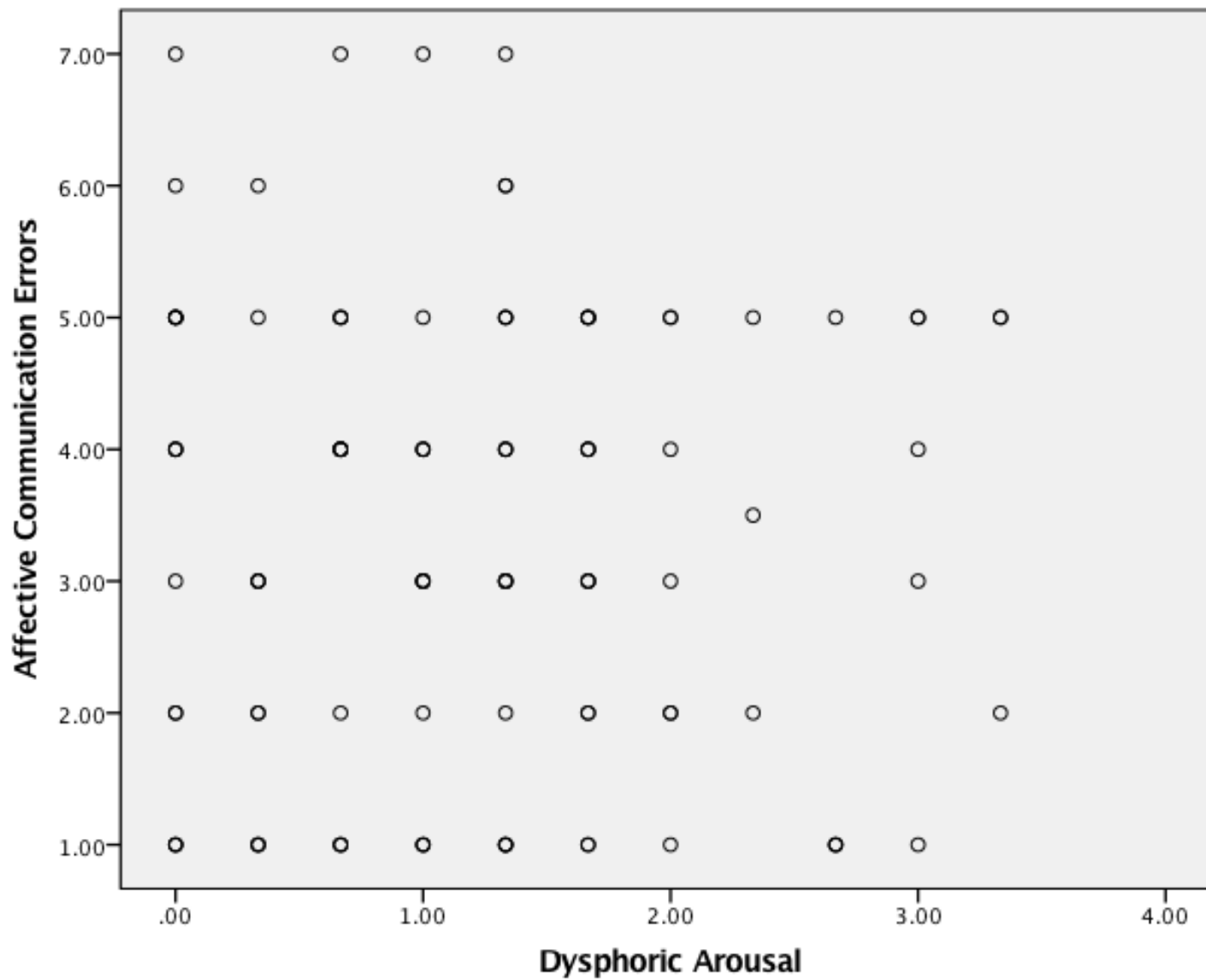
Appendix e.29

Association between affective communication errors and avoidance symptoms during pregnancy



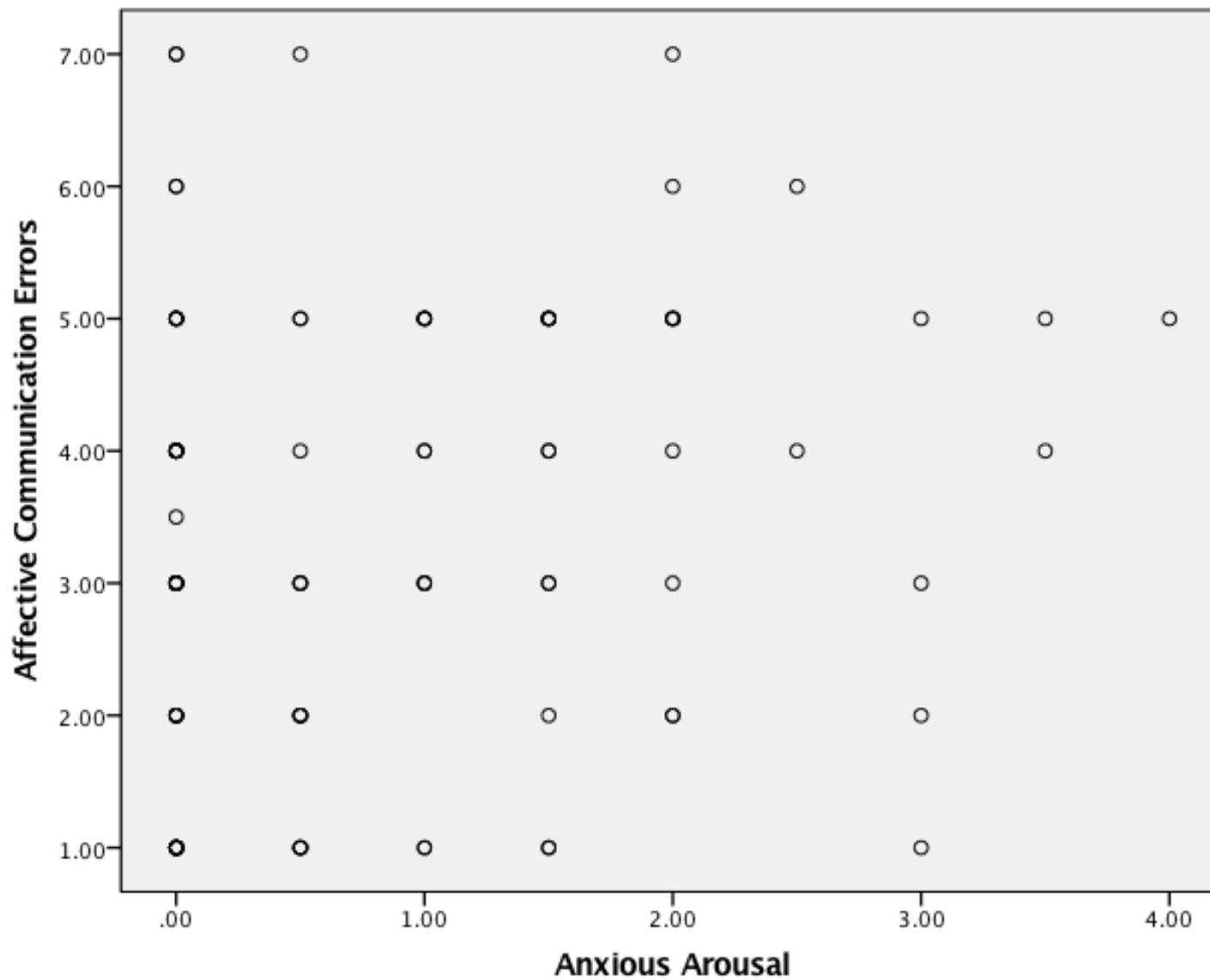
Appendix e.30

Association between affective communication errors and numbing symptoms during pregnancy



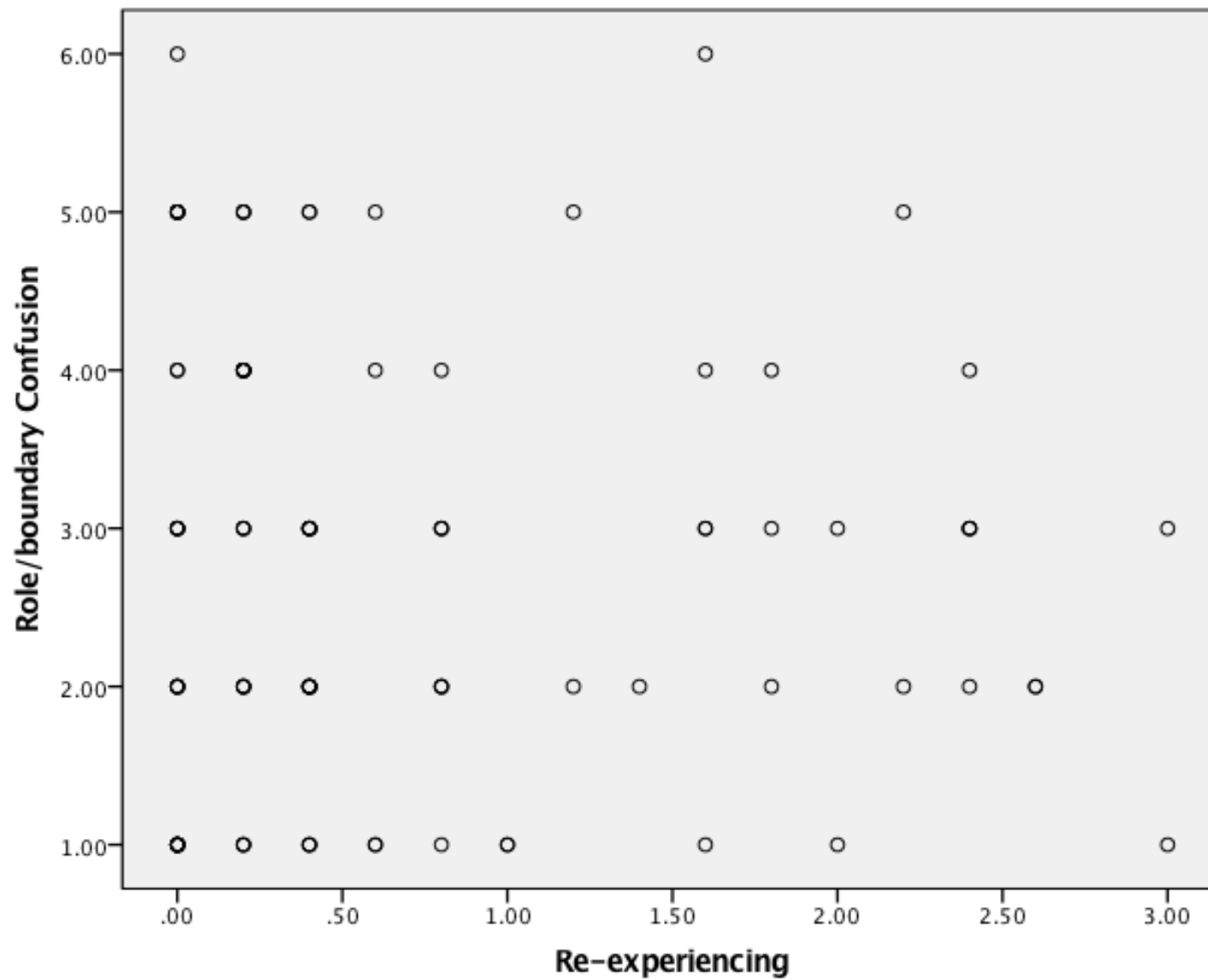
Appendix e.31

Association between affective communication errors and dysphoric arousal symptoms during pregnancy



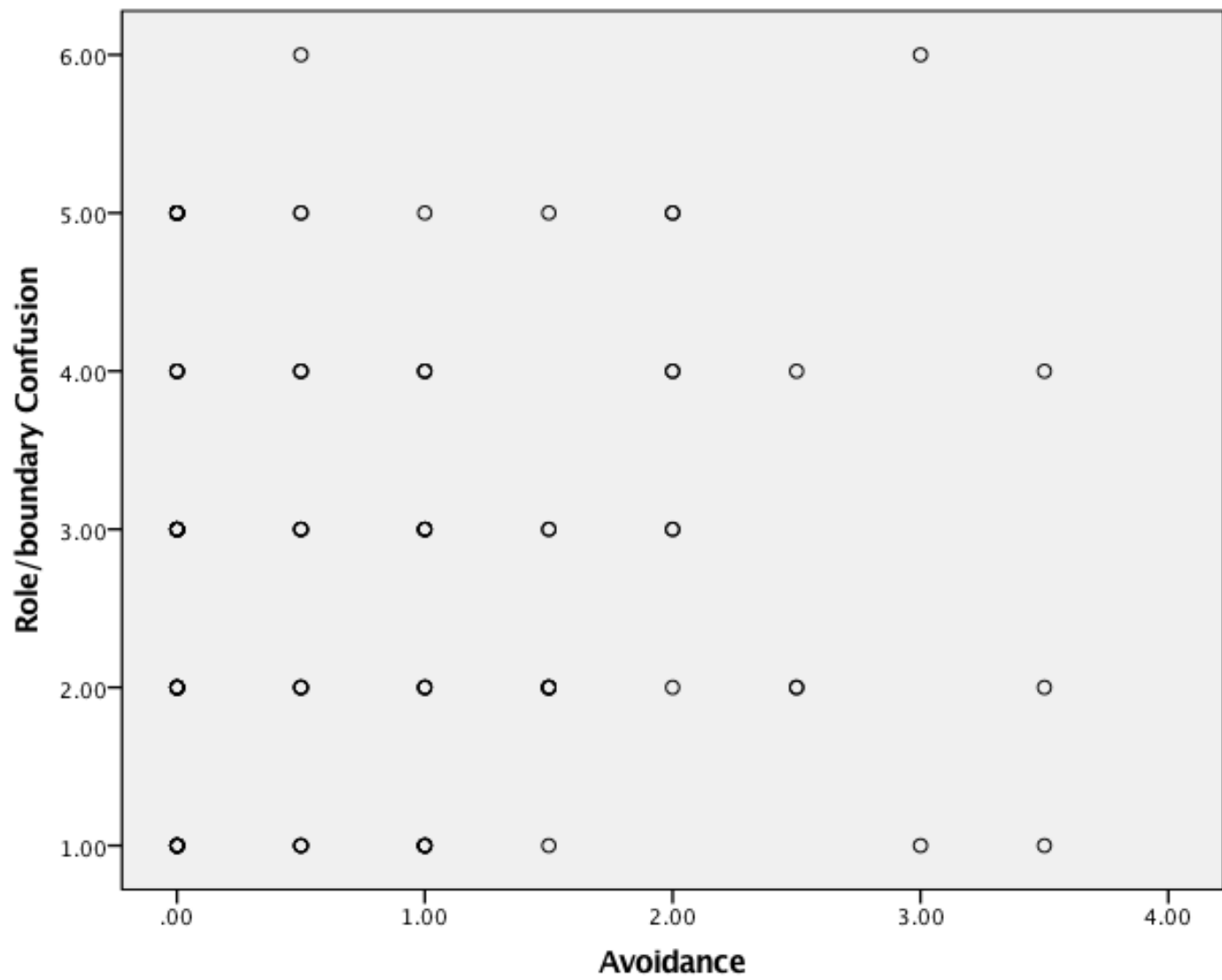
Appendix e.32

Association between affective communication errors and anxious arousal symptoms during pregnancy



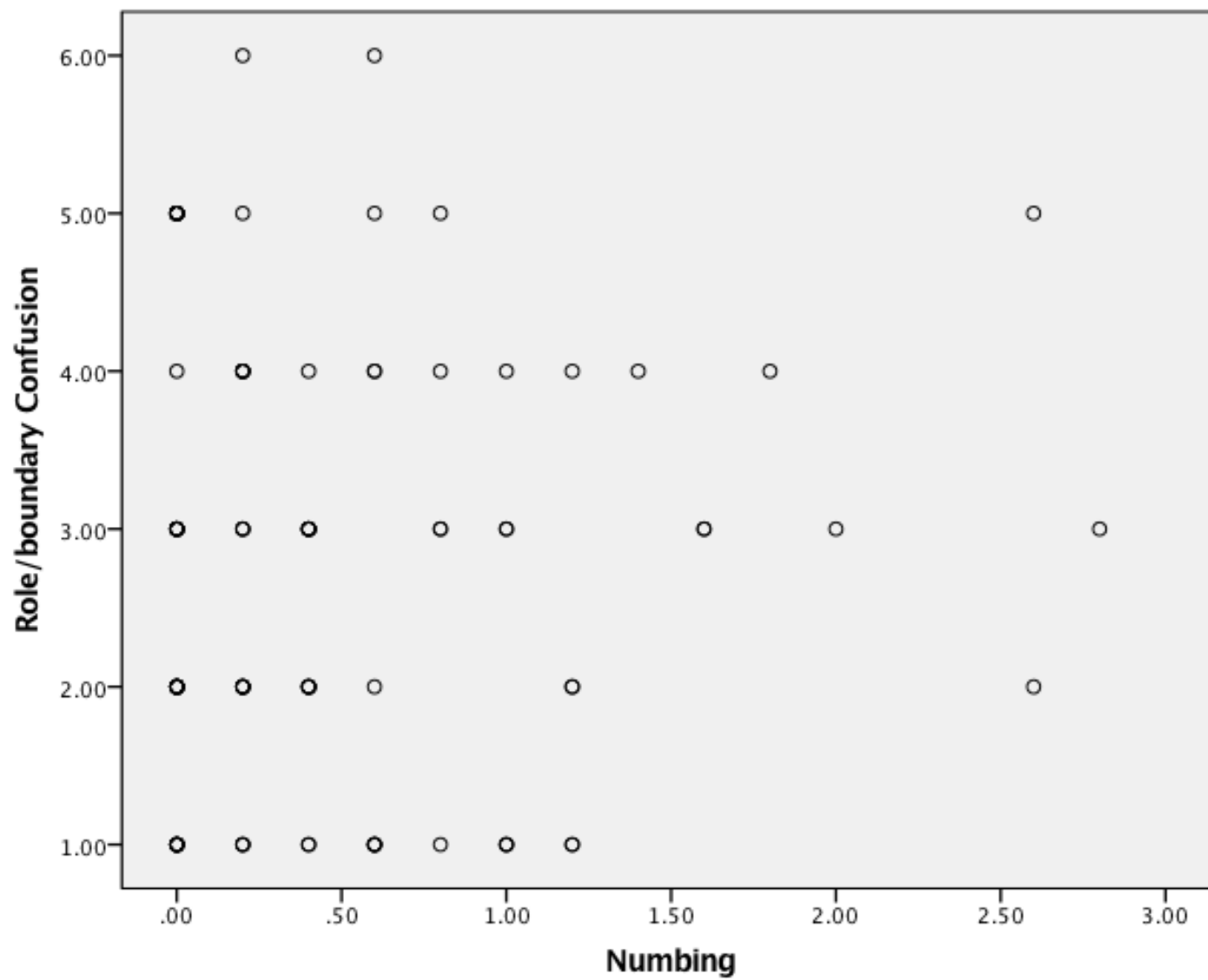
Appendix e.33

Association between role/boundary confusion and re-experiencing symptoms during pregnancy



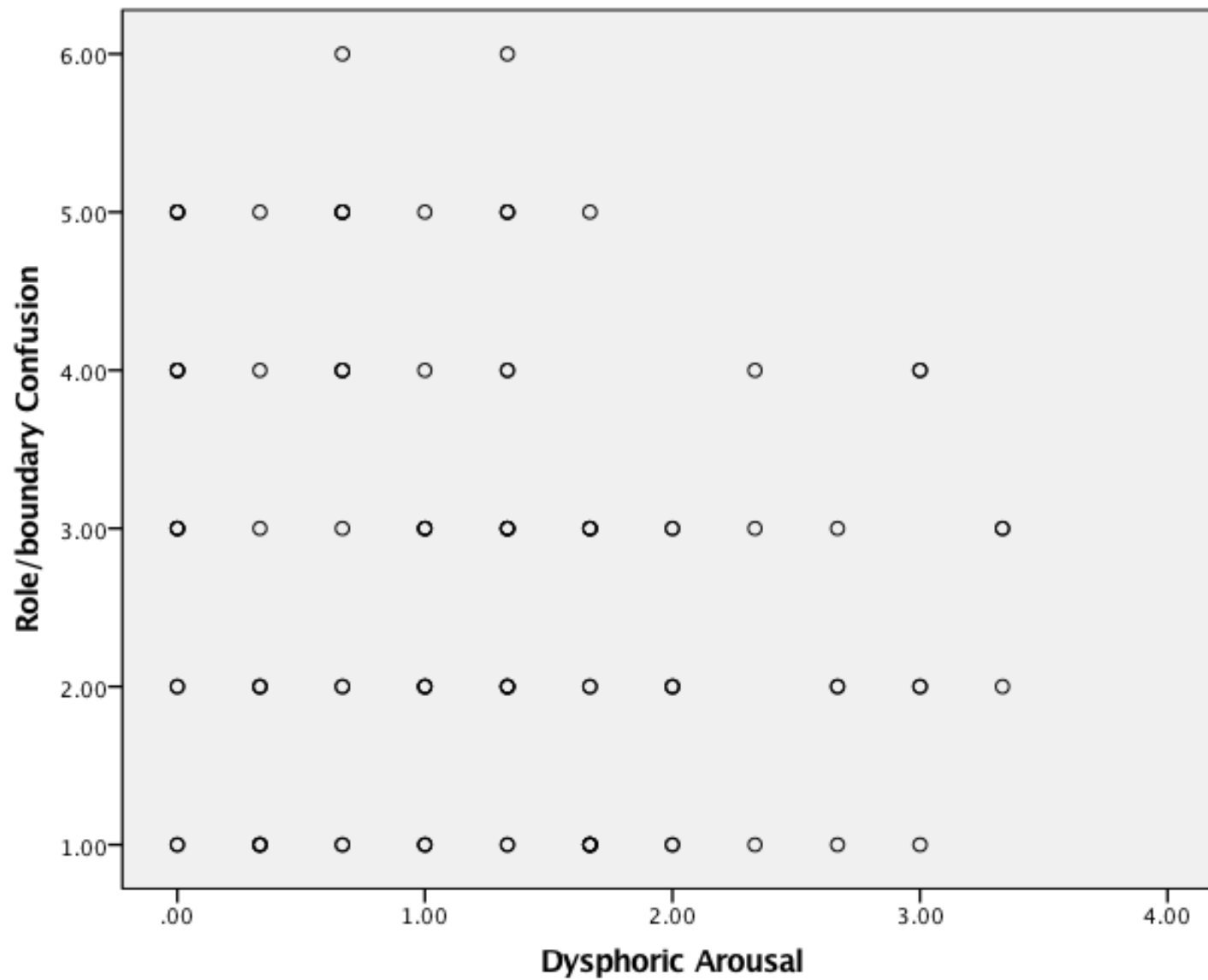
Appendix e.34

Association between role/boundary confusion and avoidance symptoms during pregnancy



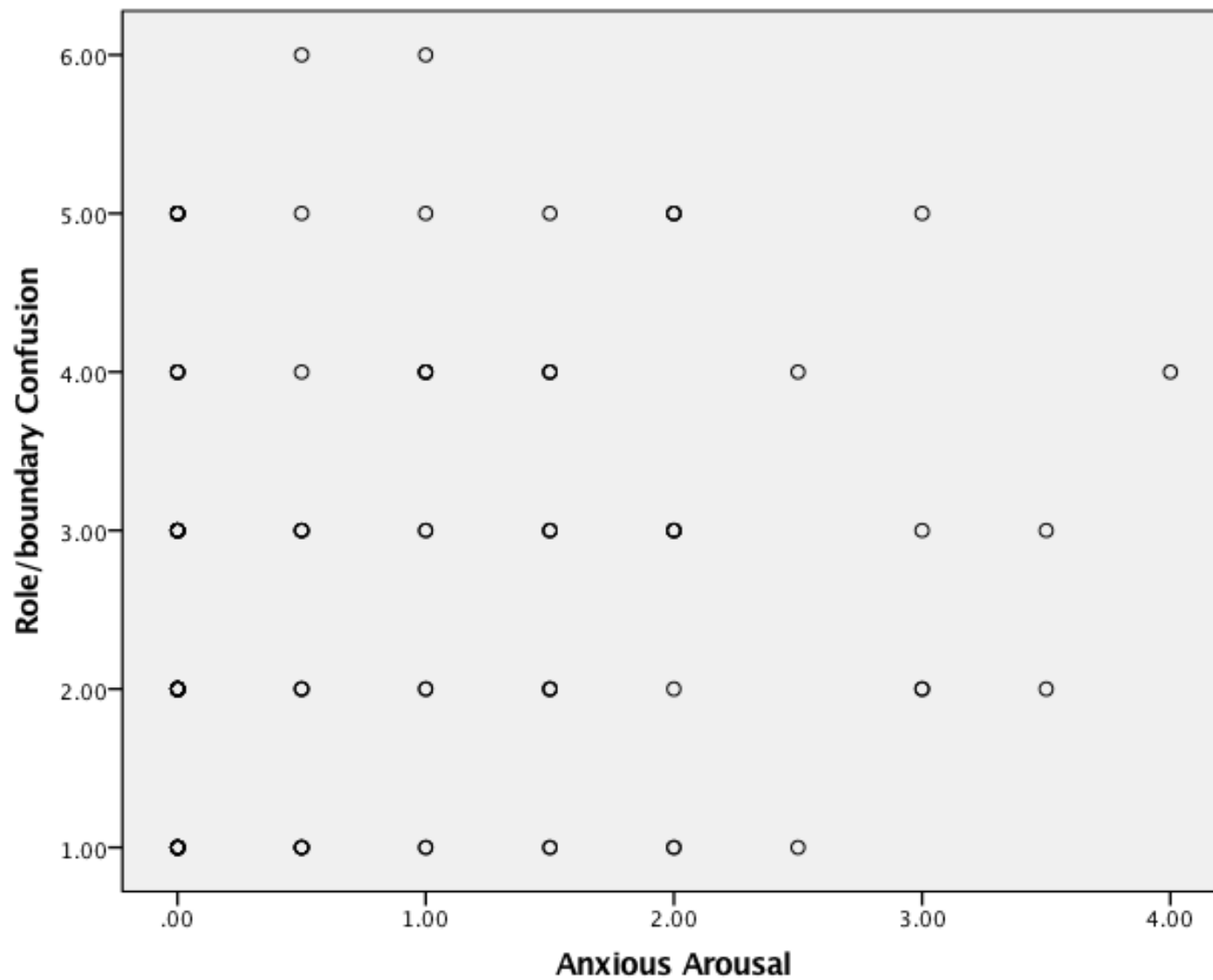
Appendix e.35

Association between role/boundary confusion and numbing symptoms during pregnancy



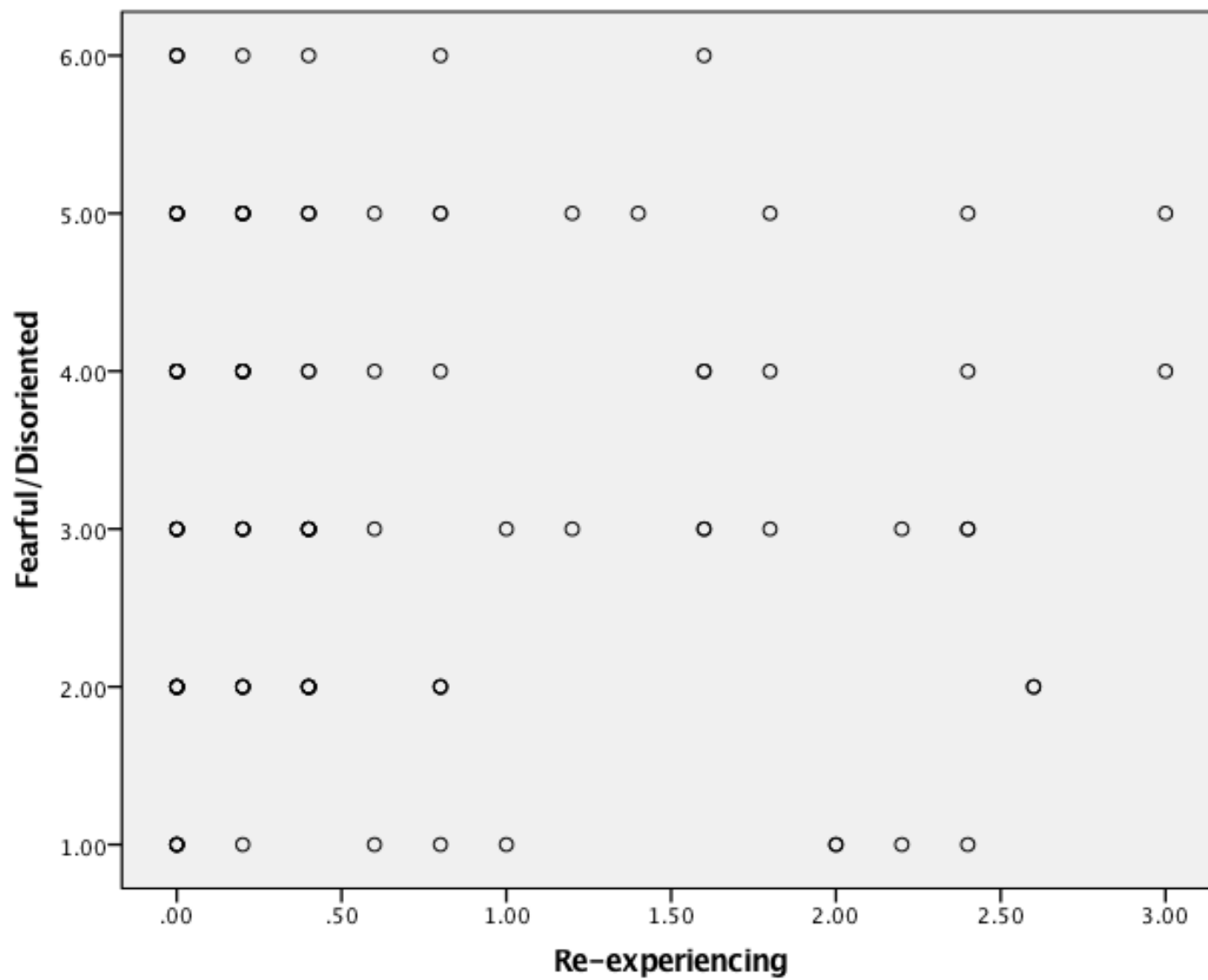
Appendix e.36

Association between role/boundary confusion and dysphoric arousal symptoms during pregnancy



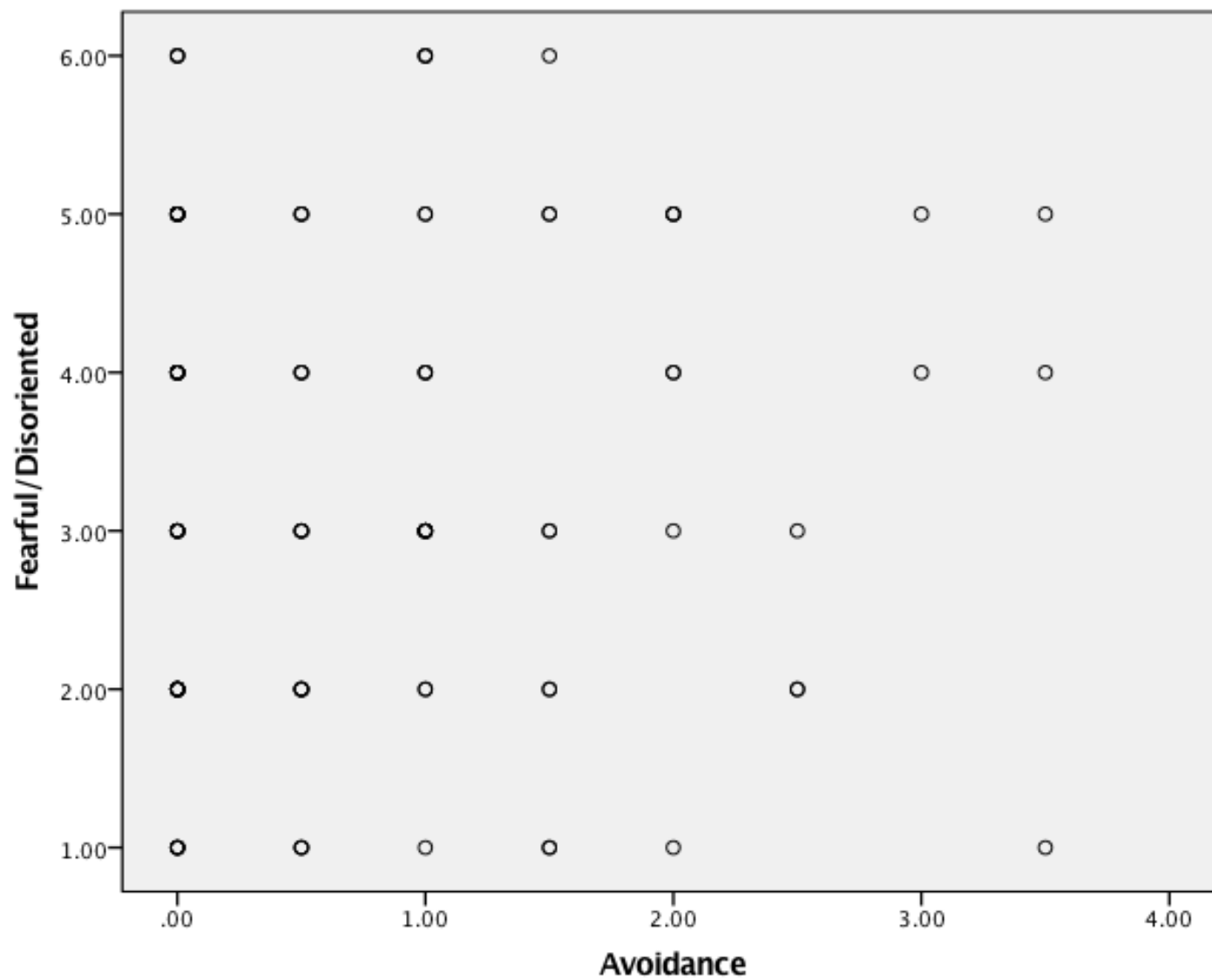
Appendix e.37

Association between role/boundary confusion and anxious arousal symptoms during pregnancy



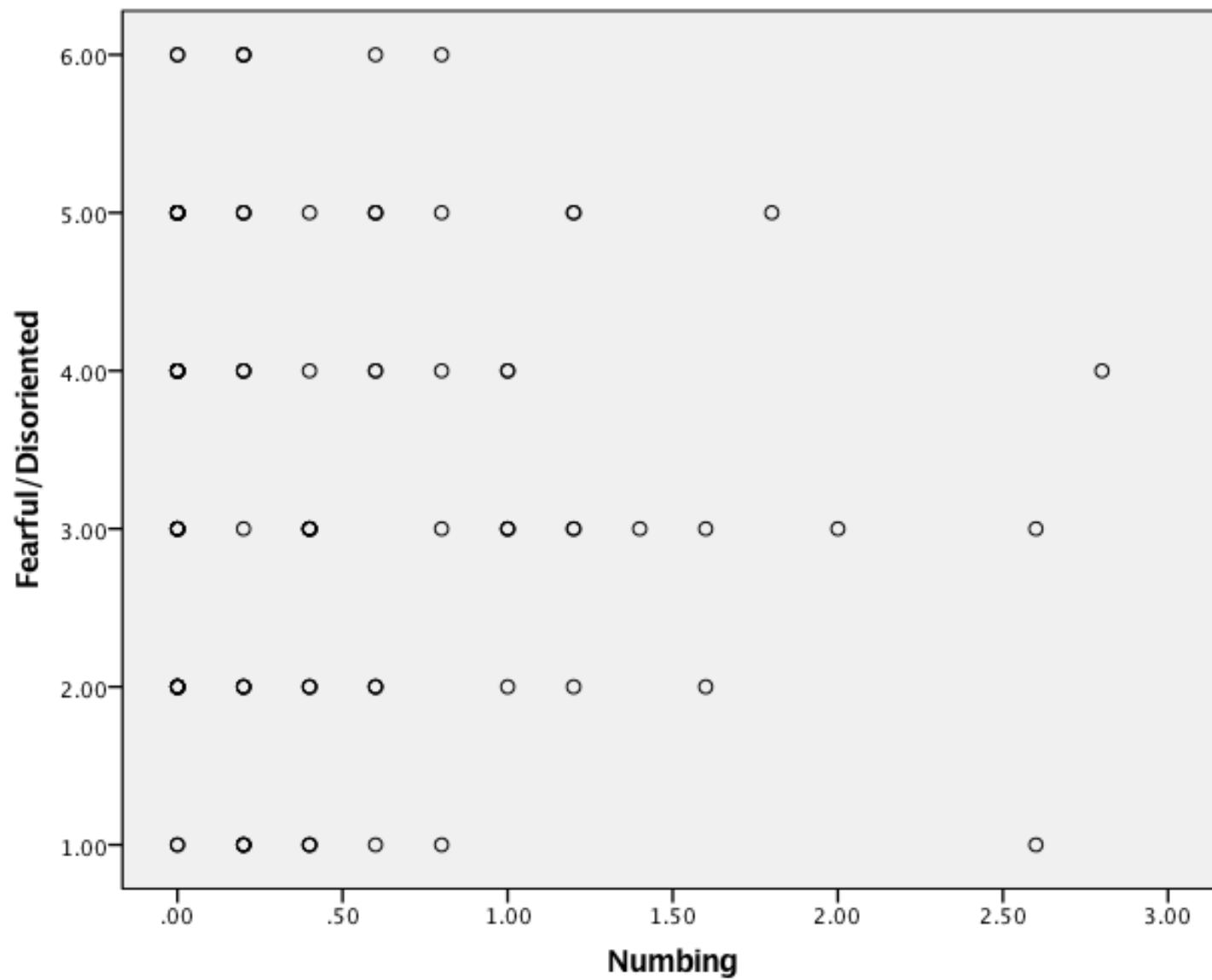
Appendix e.38

Association between fearful/disoriented and re-experiencing symptoms during pregnancy



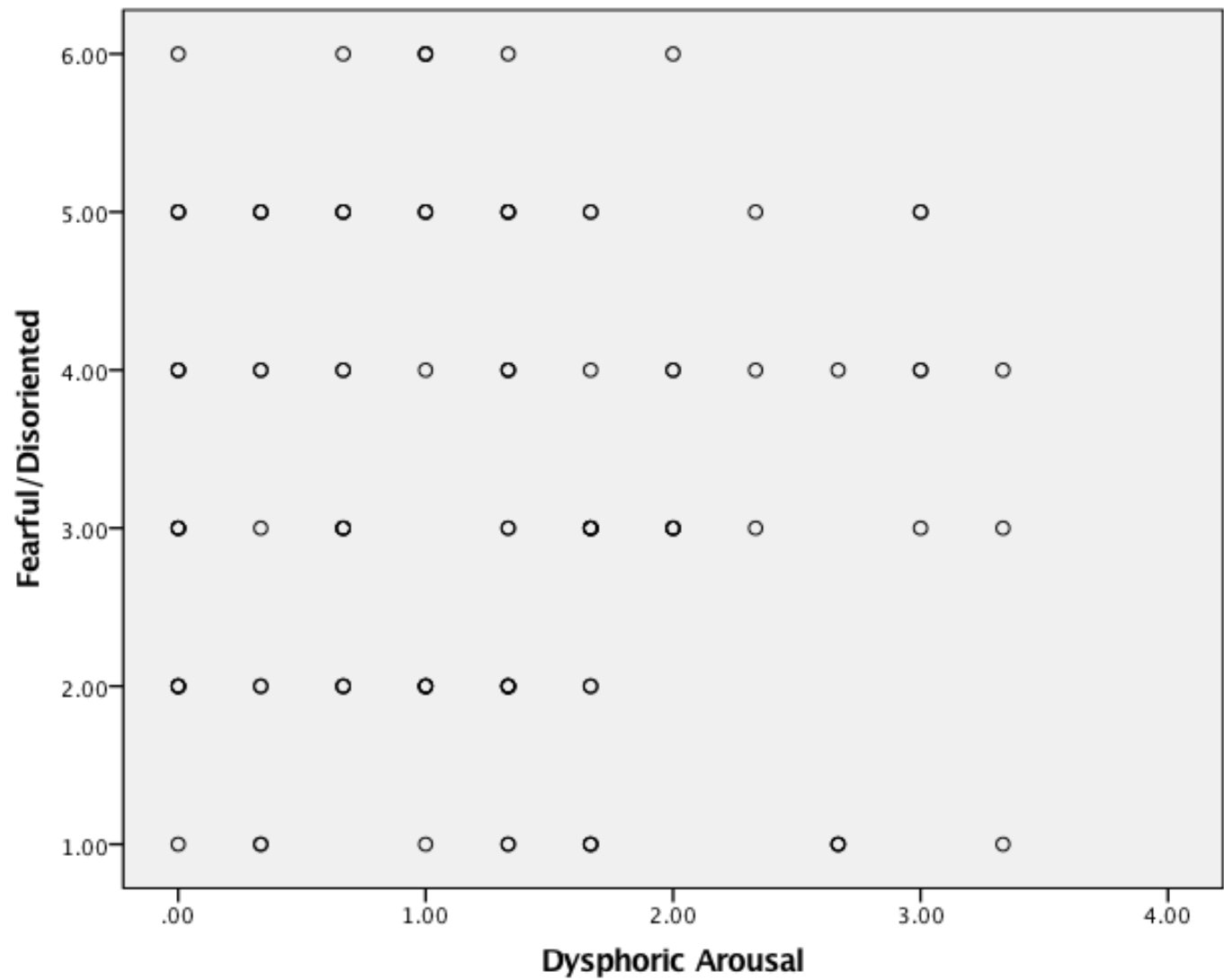
Appendix e.39

Association between fearful/disoriented and avoidance symptoms during pregnancy



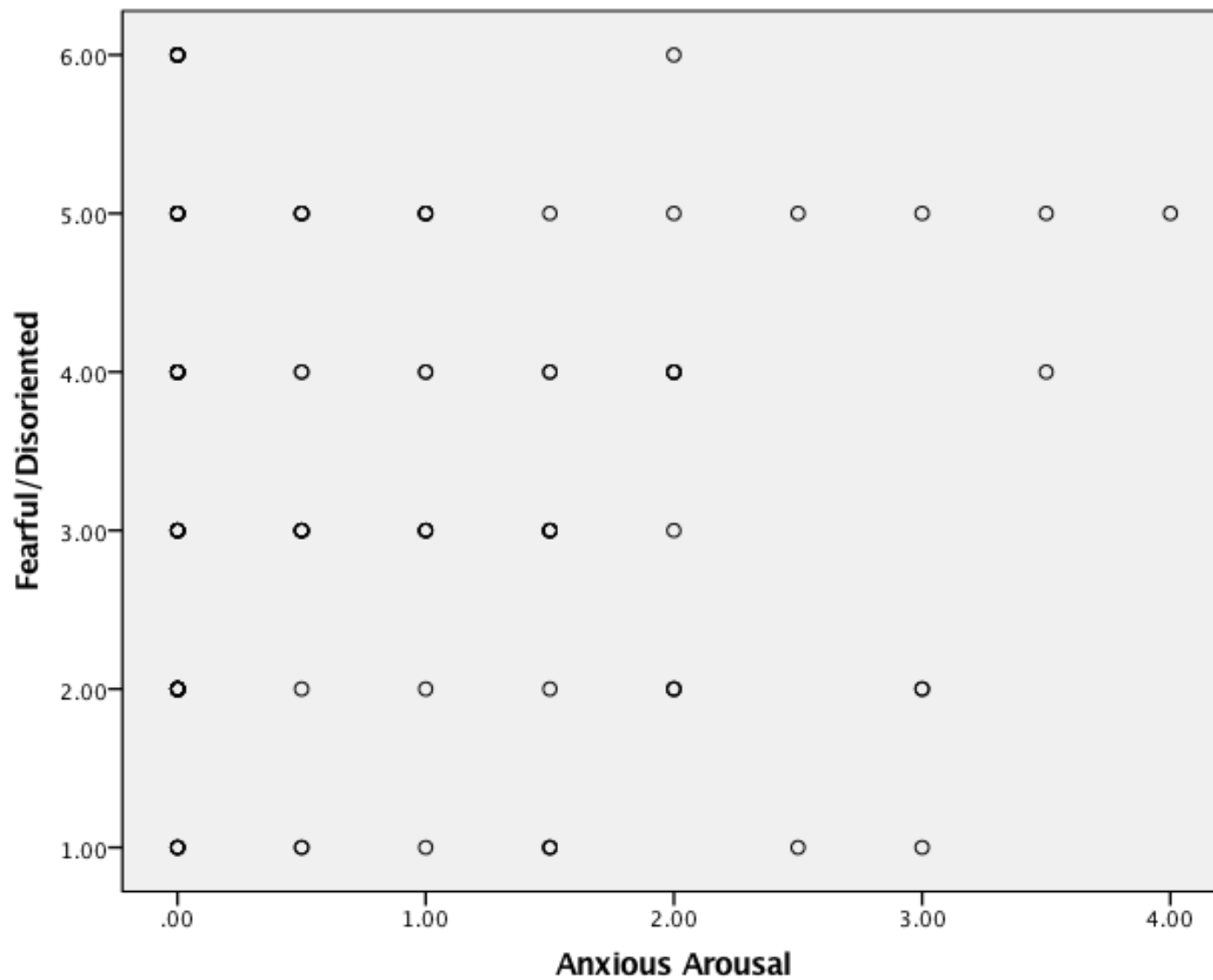
Appendix e.40

Association between fearful/disoriented and numbing symptoms during pregnancy



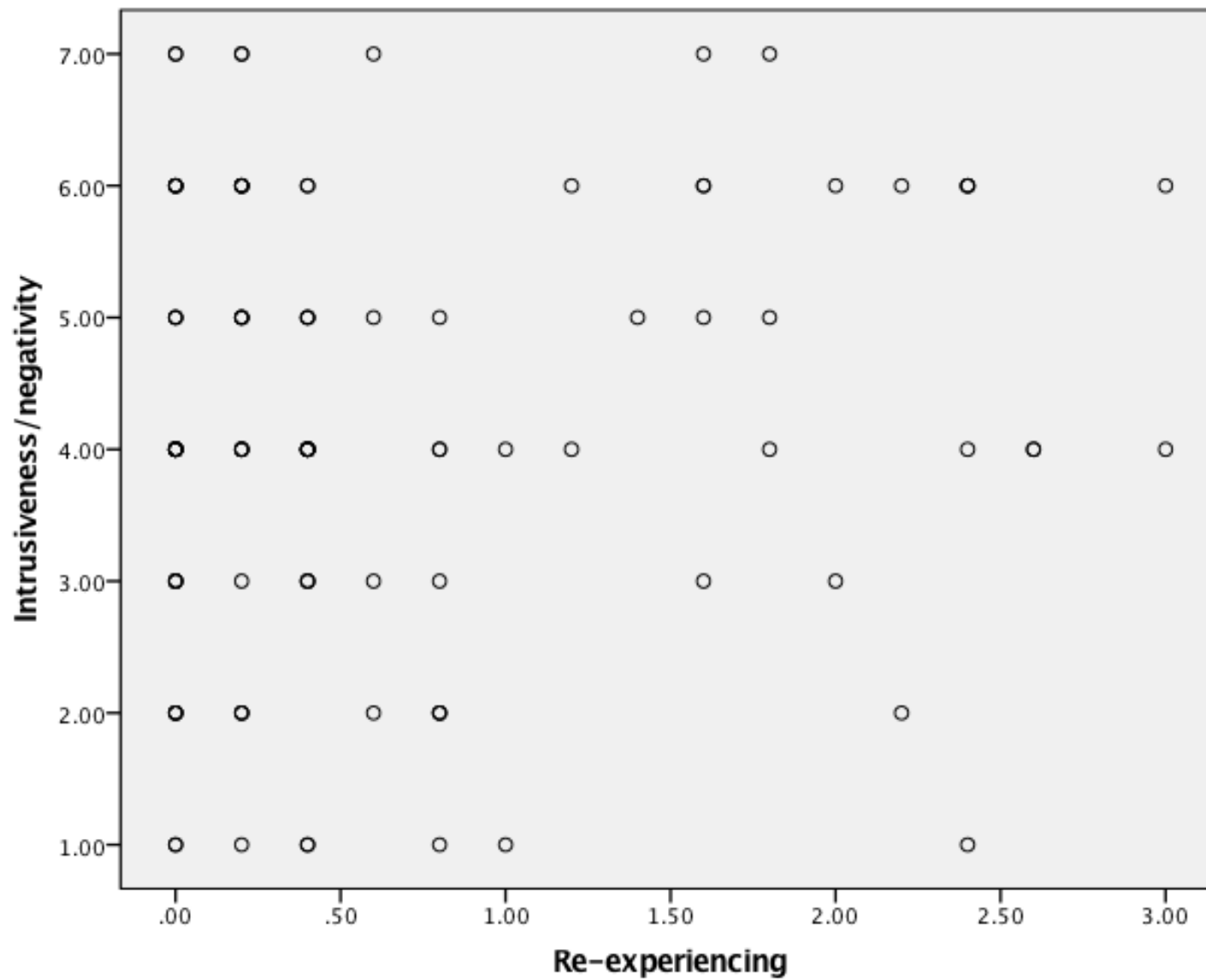
Appendix e.41

Association between fearful/disoriented and dysphoric arousal symptoms during pregnancy



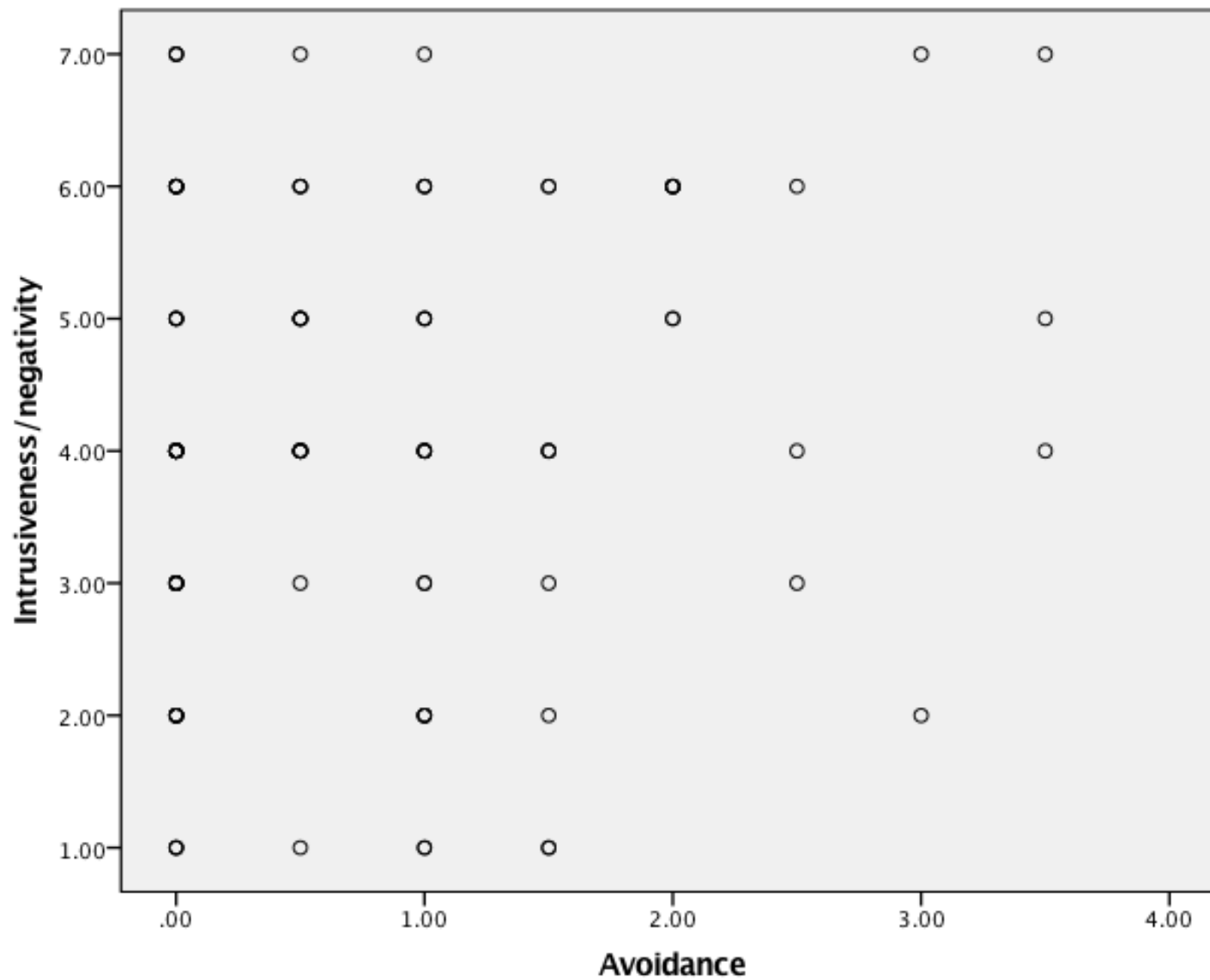
Appendix e.42

Association between fearful/disoriented and anxious arousal symptoms during pregnancy



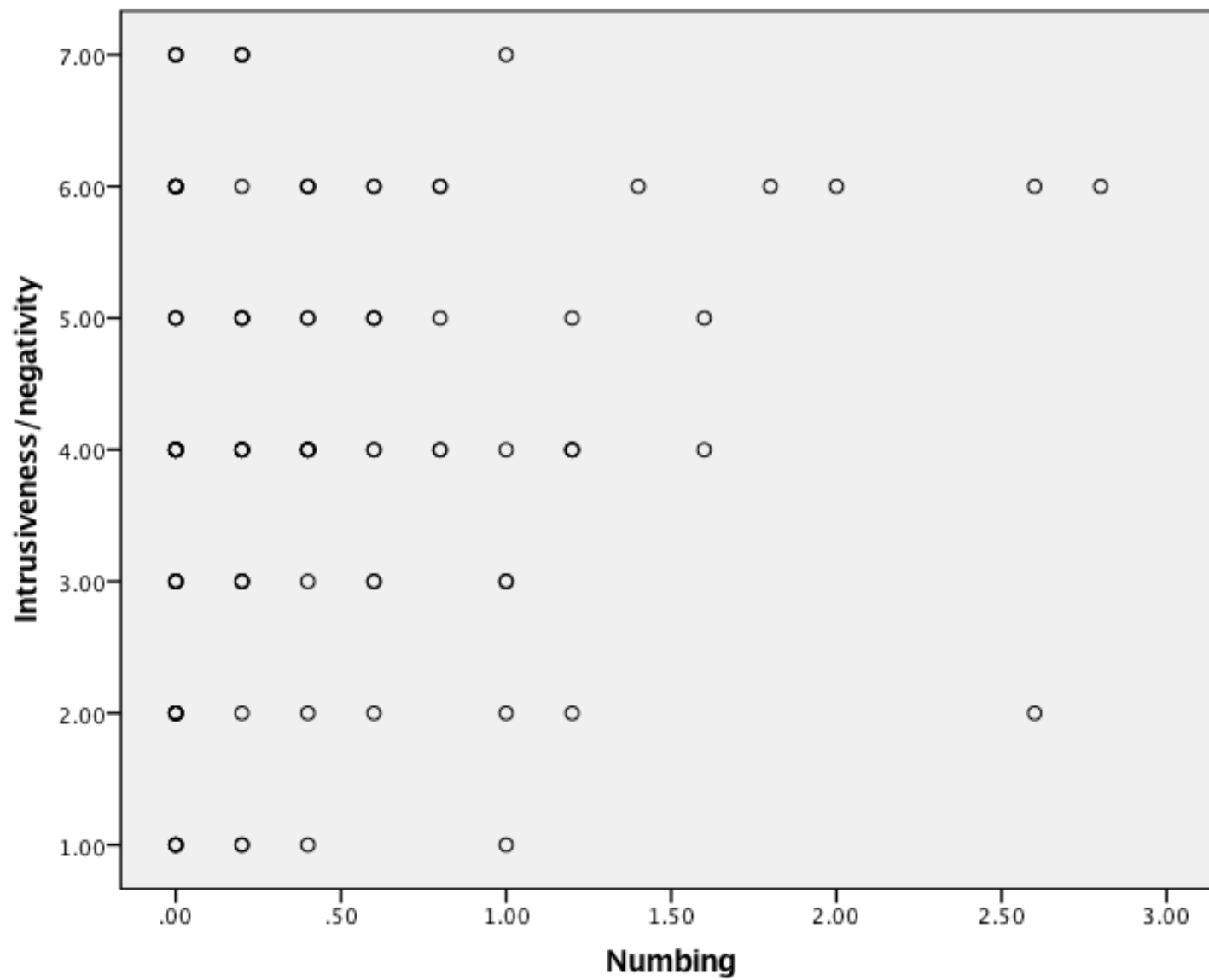
Appendix e.43

Association between intrusiveness/negativity and re-experiencing symptoms during pregnancy



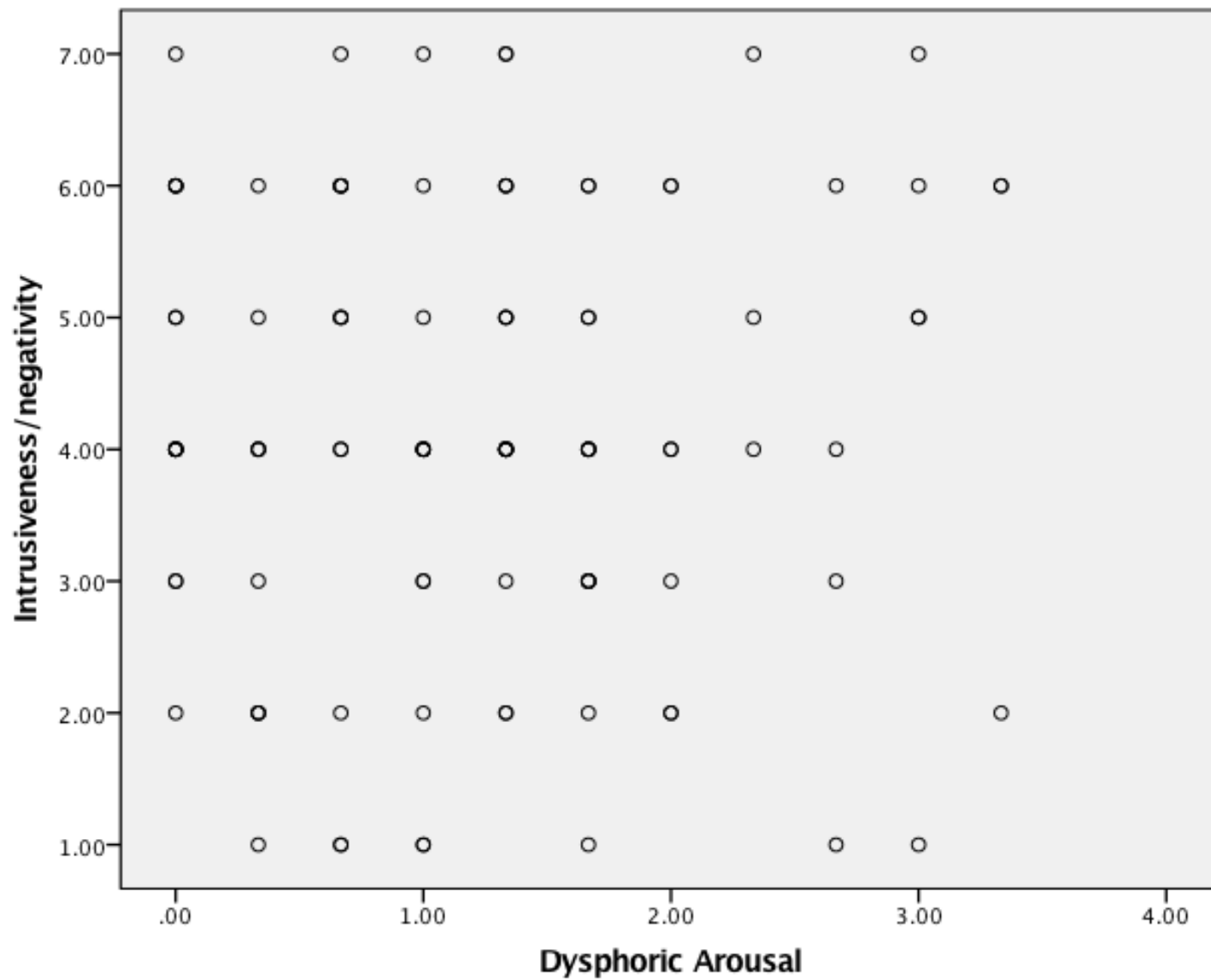
Appendix e.44

Association between intrusiveness/negativity and avoidance symptoms during pregnancy



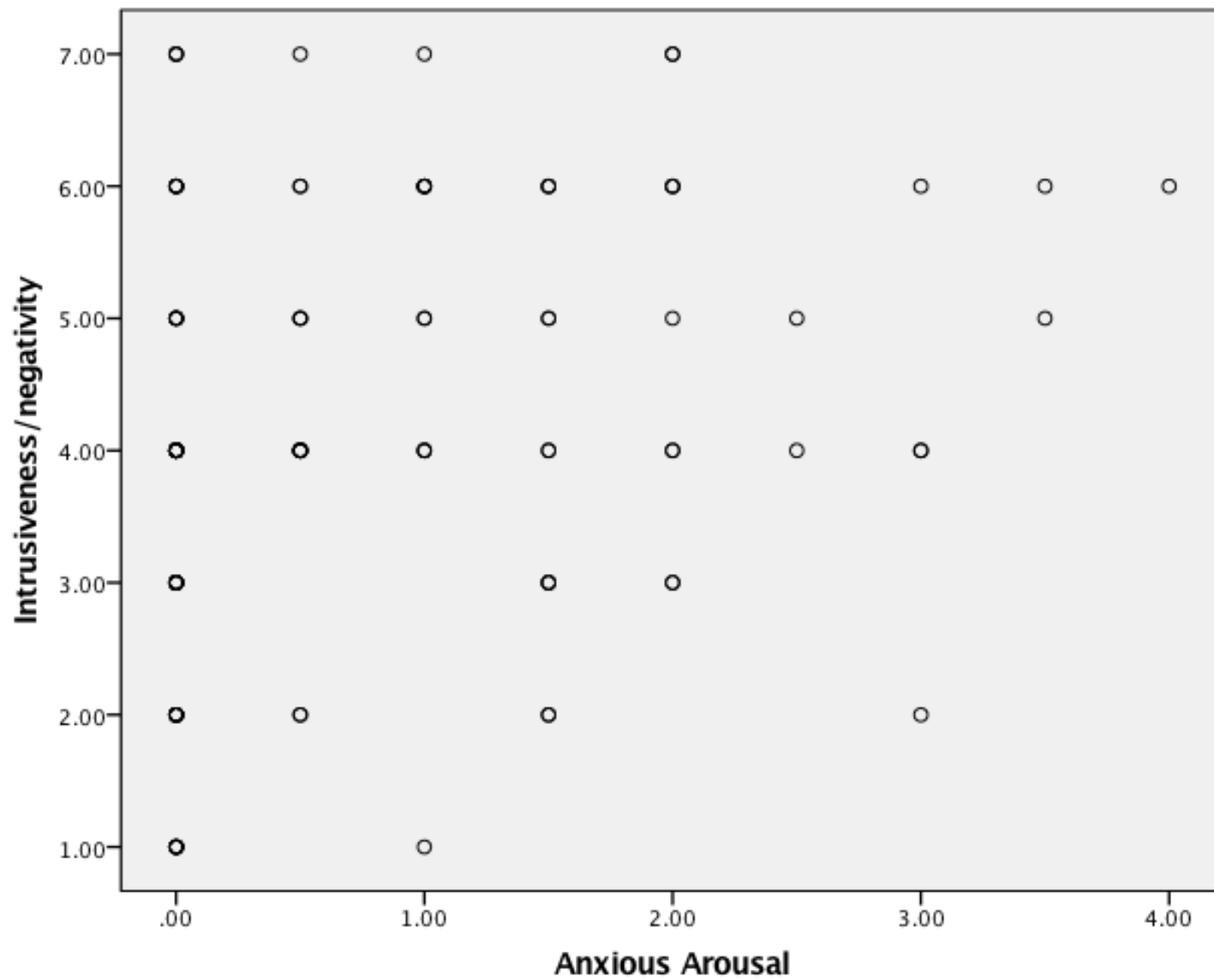
Appendix e.45

Association between intrusiveness/negativity and numbing symptoms during pregnancy



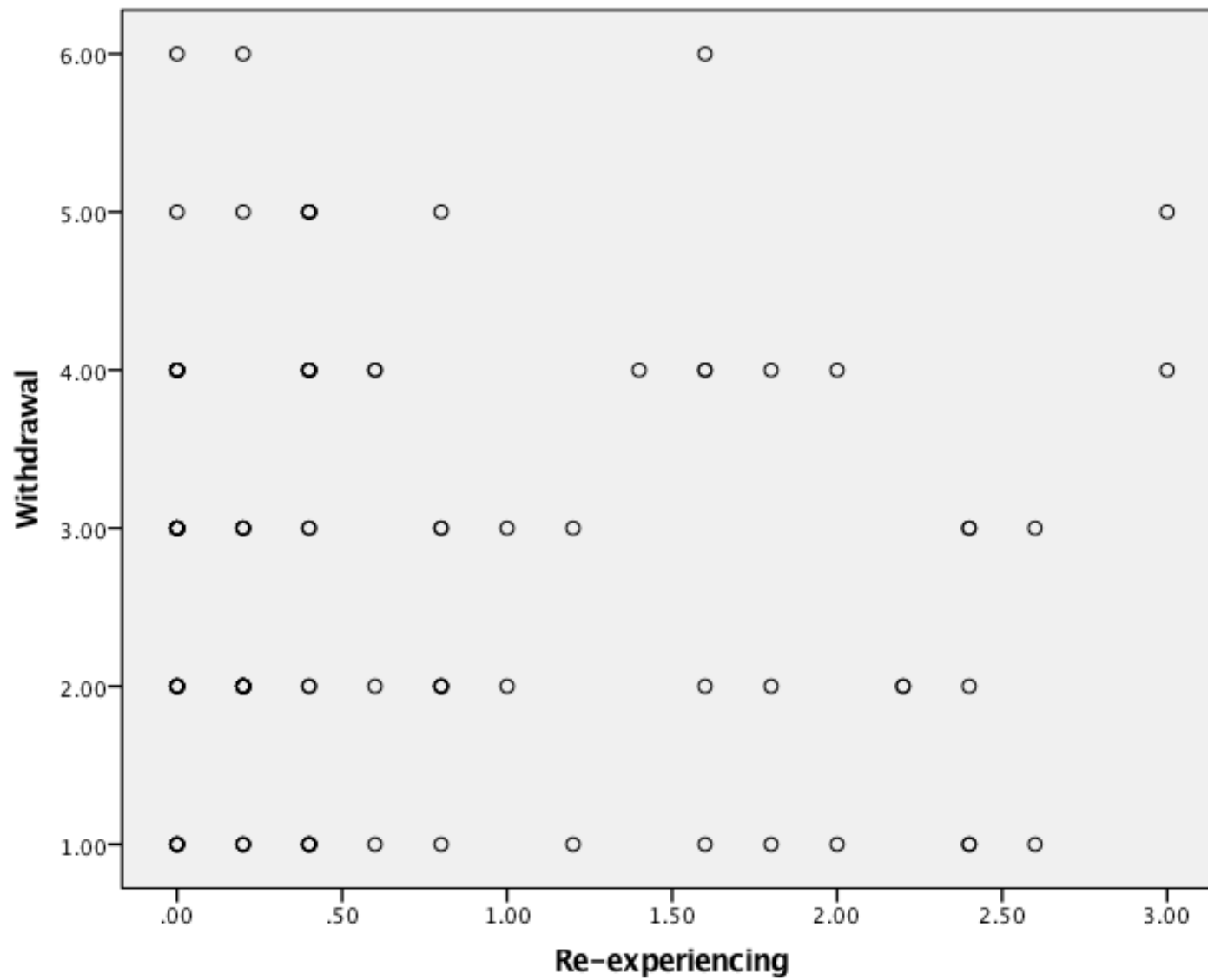
Appendix e.46

Association between intrusiveness/negativity and dysphoric symptoms during pregnancy



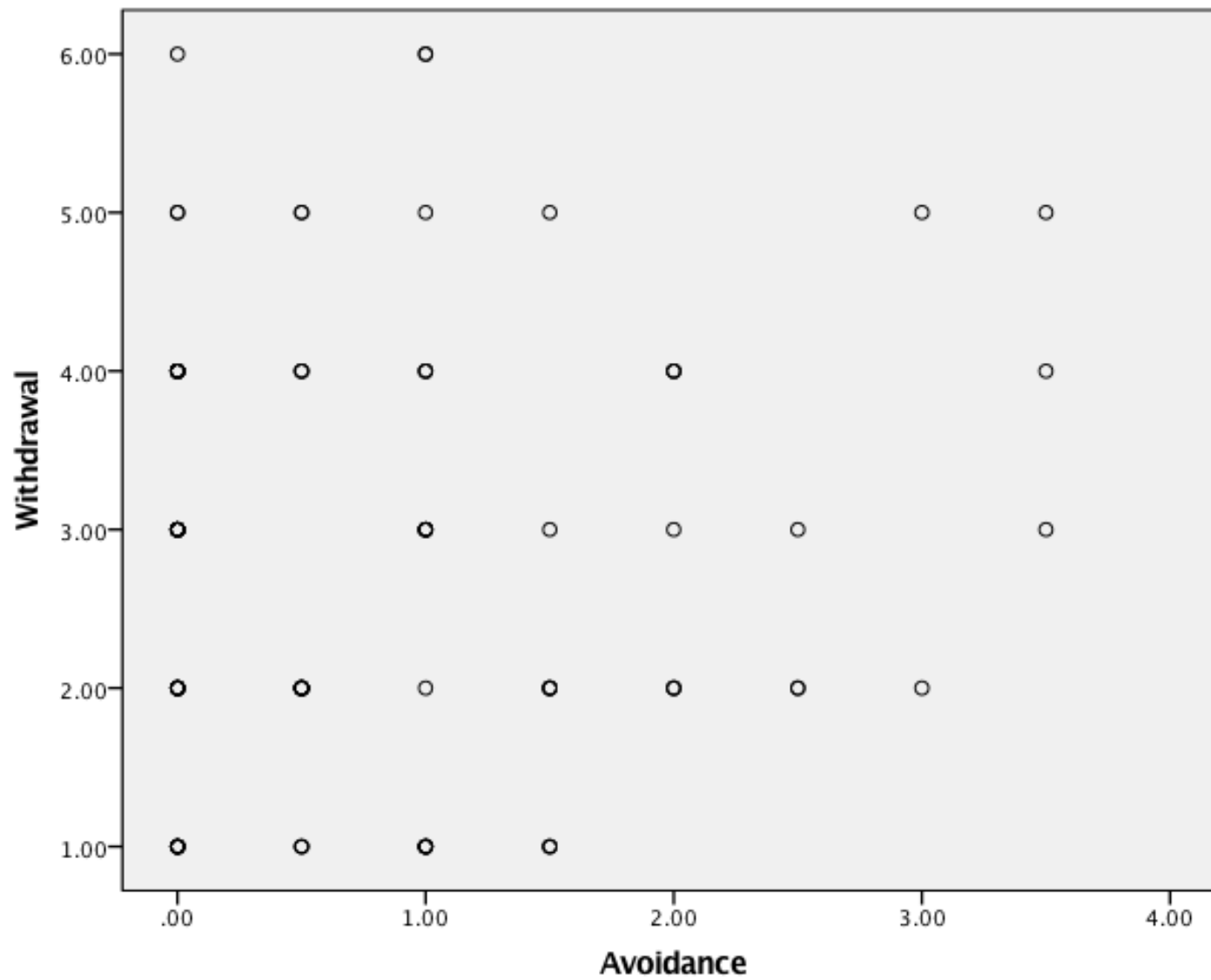
Appendix e.47

Association between intrusiveness/negativity and anxious arousal symptoms during pregnancy



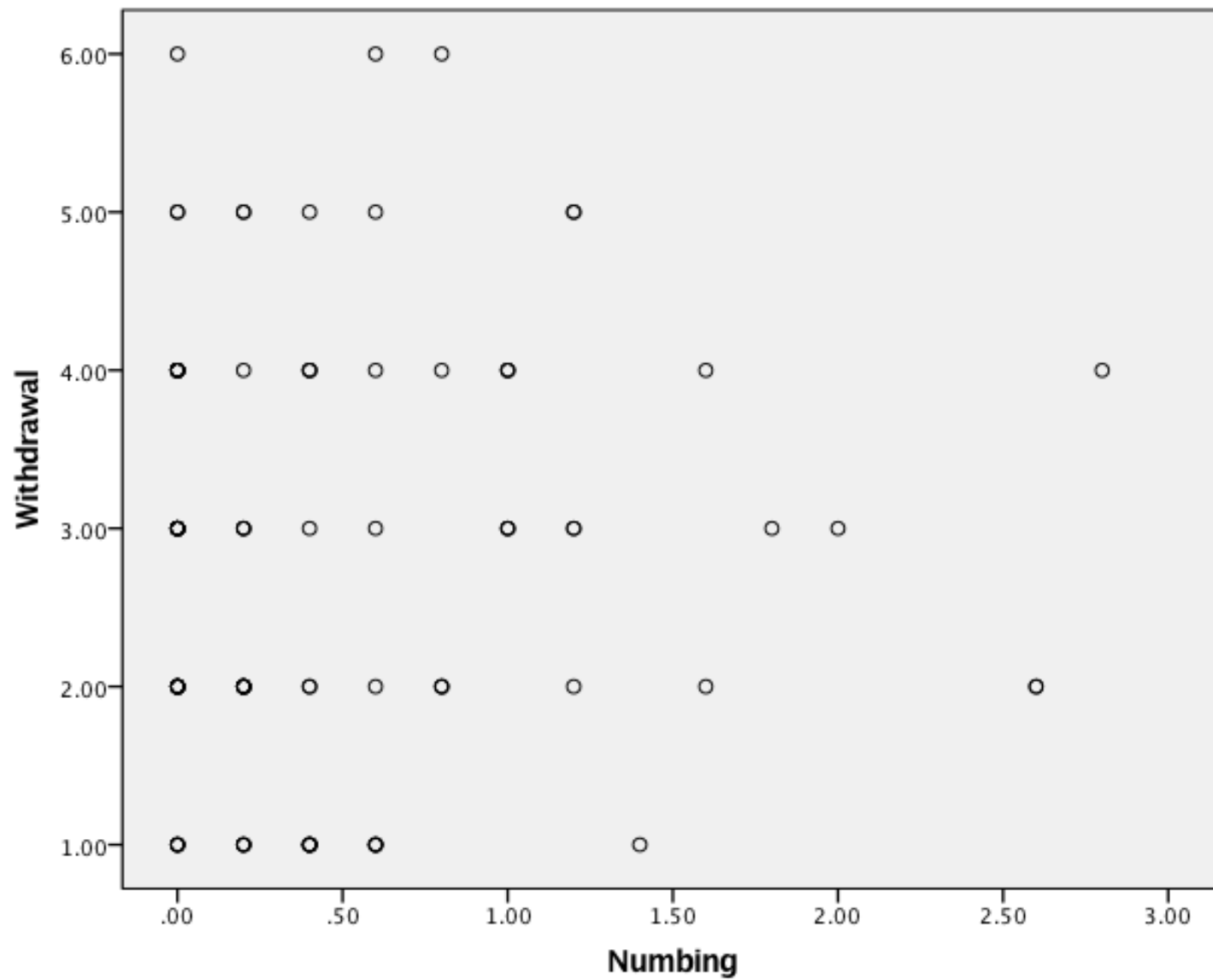
Appendix e.48

Association between withdrawal and re-experiencing symptoms during pregnancy



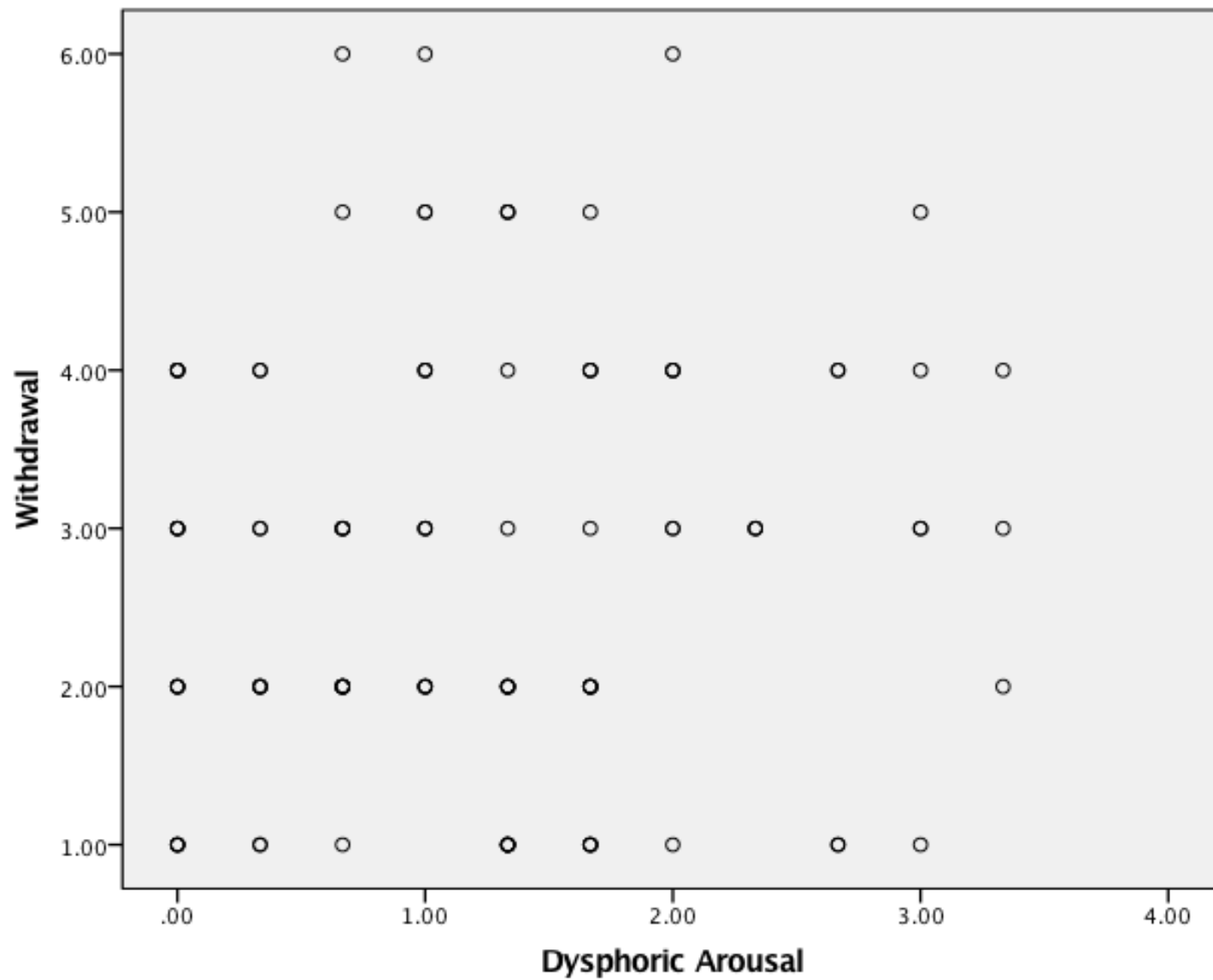
Appendix e.49

Association between withdrawal and avoidance symptoms during pregnancy



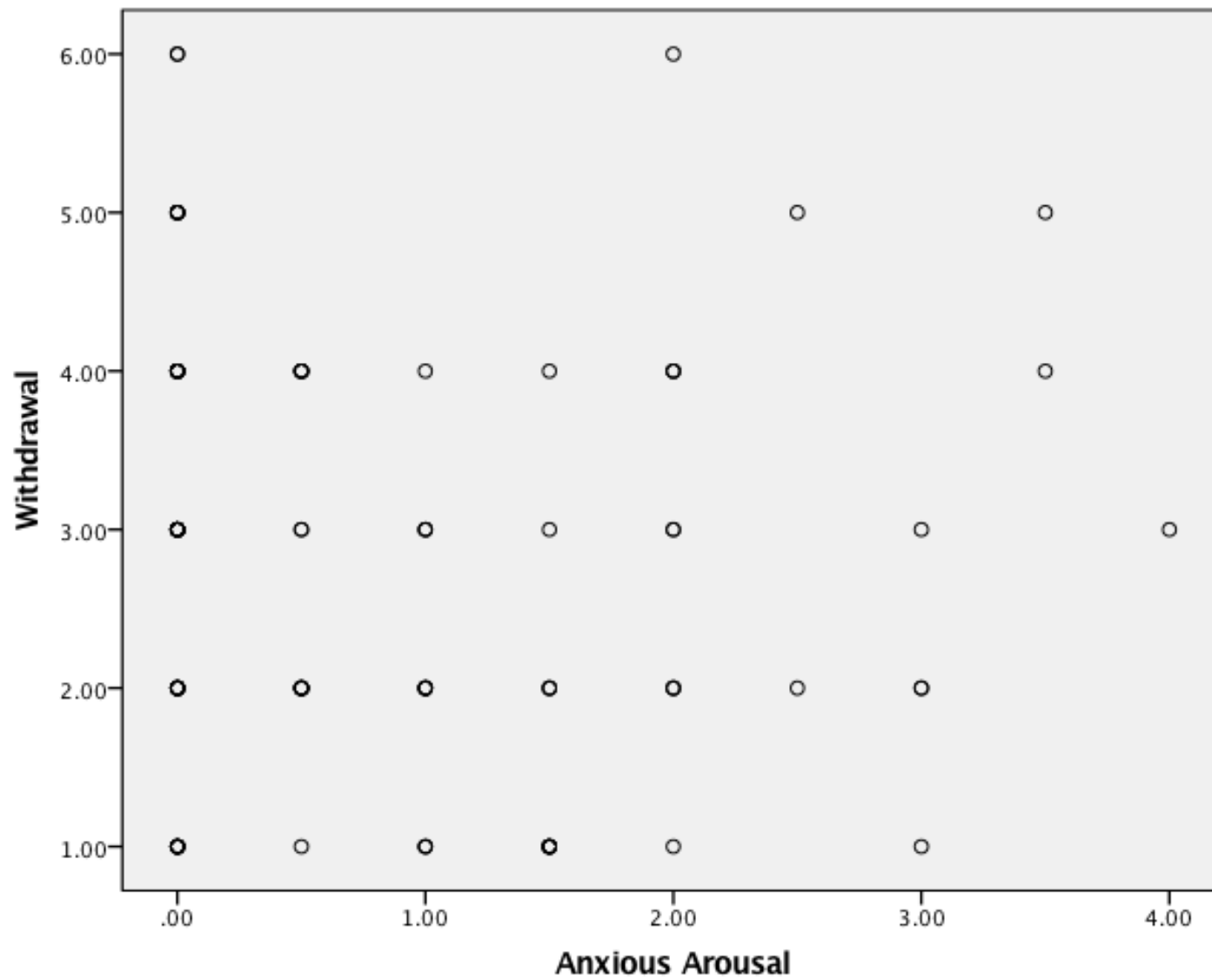
Appendix e.50

Association between withdrawal and numbing symptoms during pregnancy



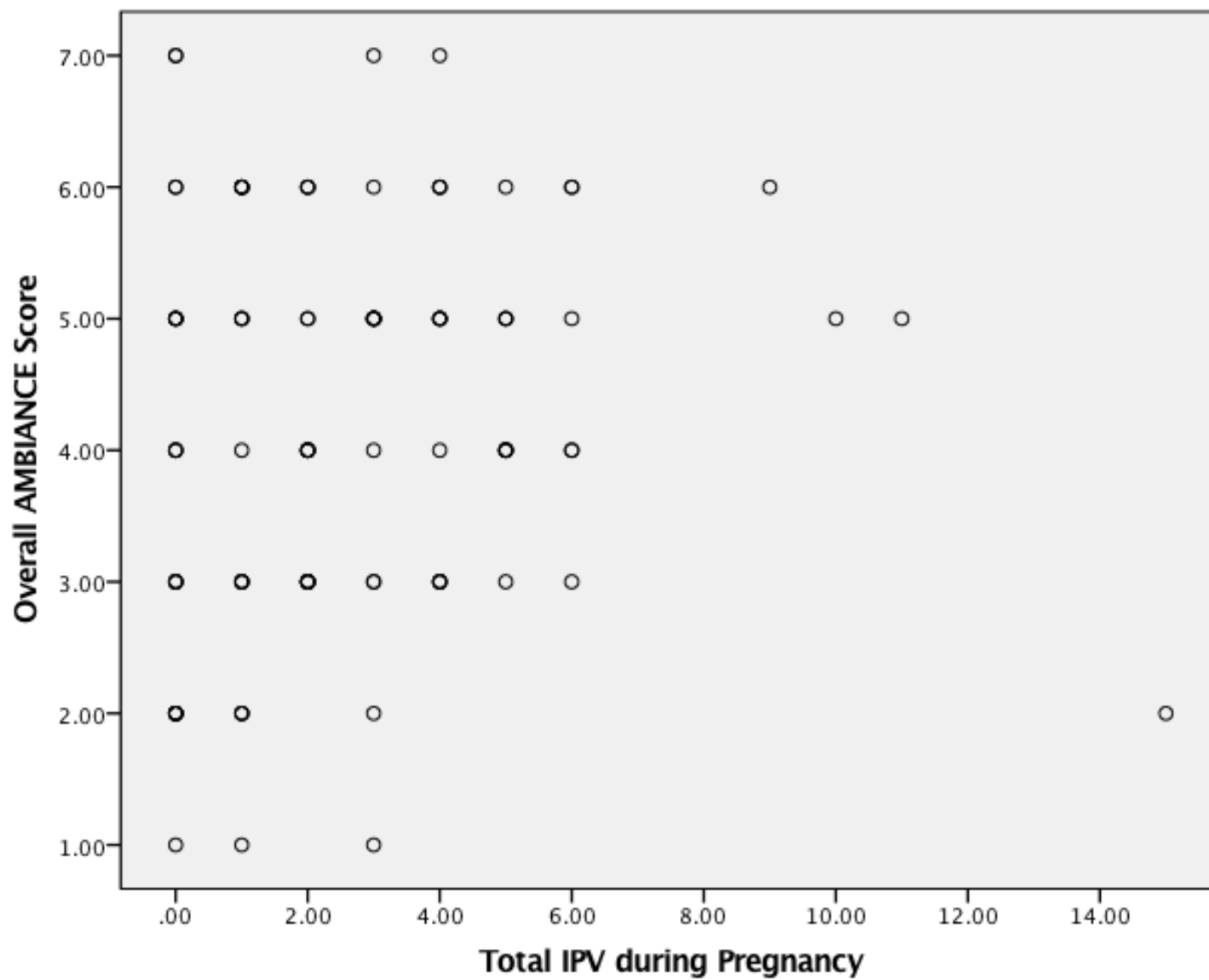
Appendix e.51

Association between withdrawal and dysphoric arousal symptoms during pregnancy



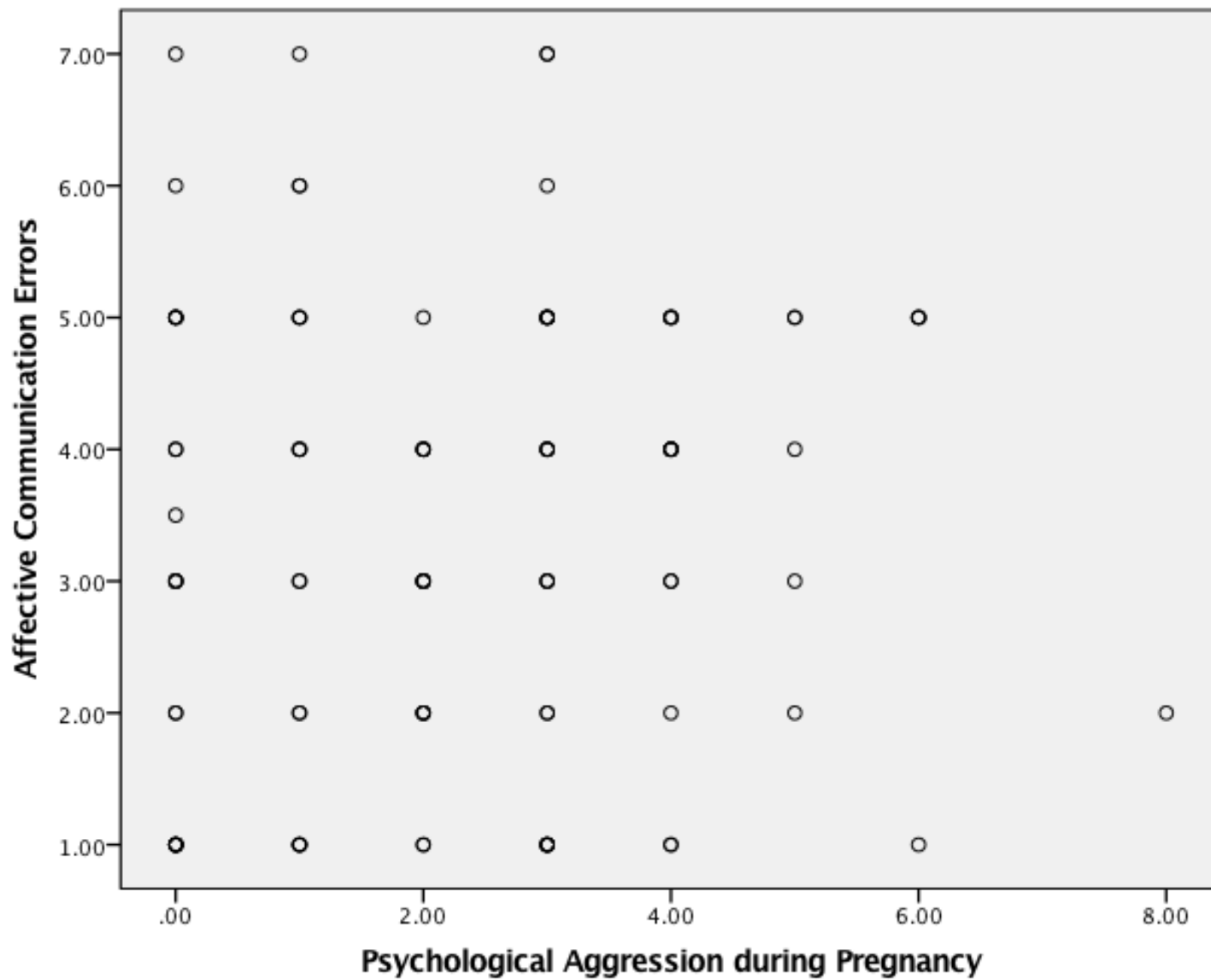
Appendix e.52

Association between withdrawal and anxious arousal symptoms during pregnancy



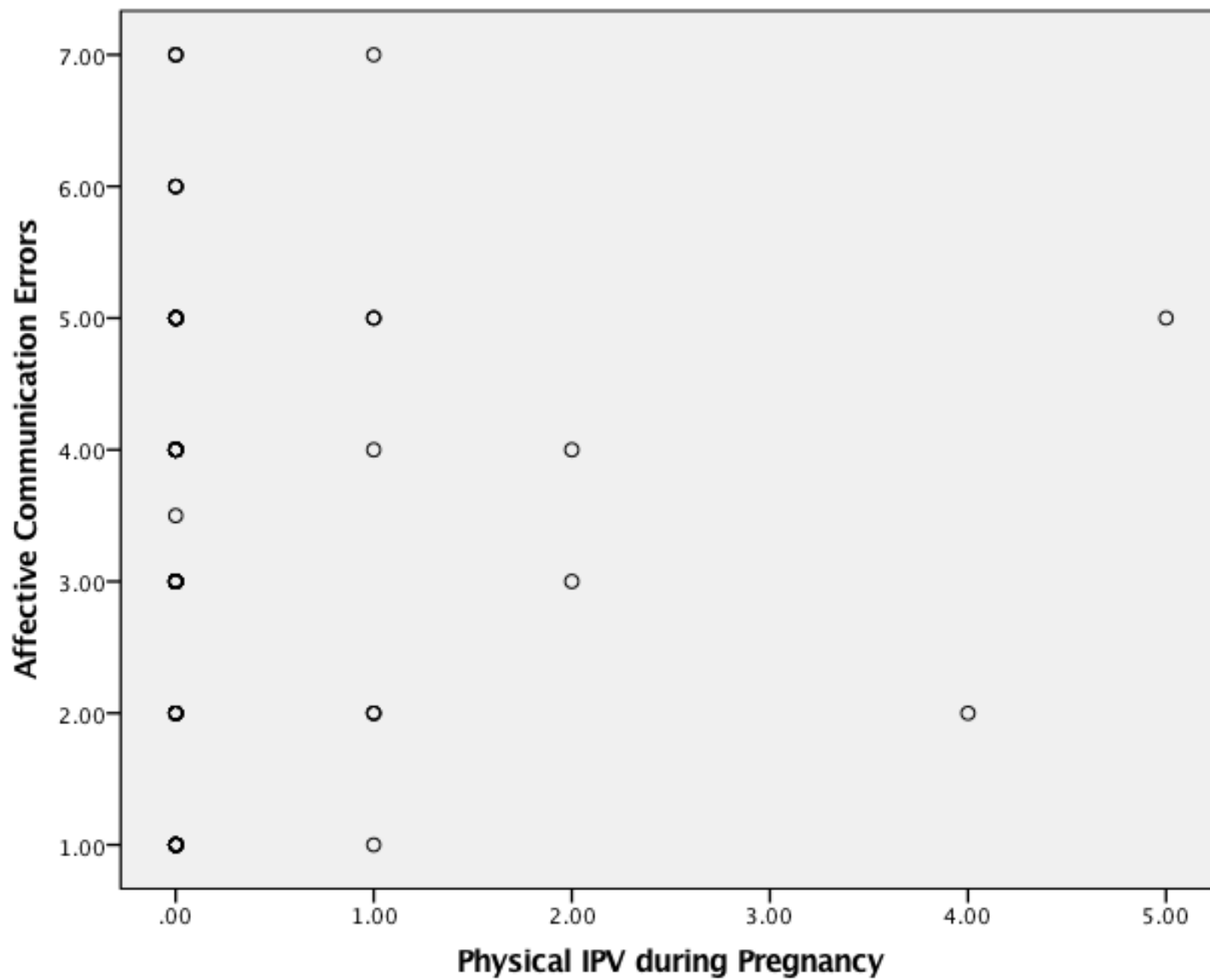
Appendix e.53

Association between overall AMBIANCE score and total IPV during pregnancy



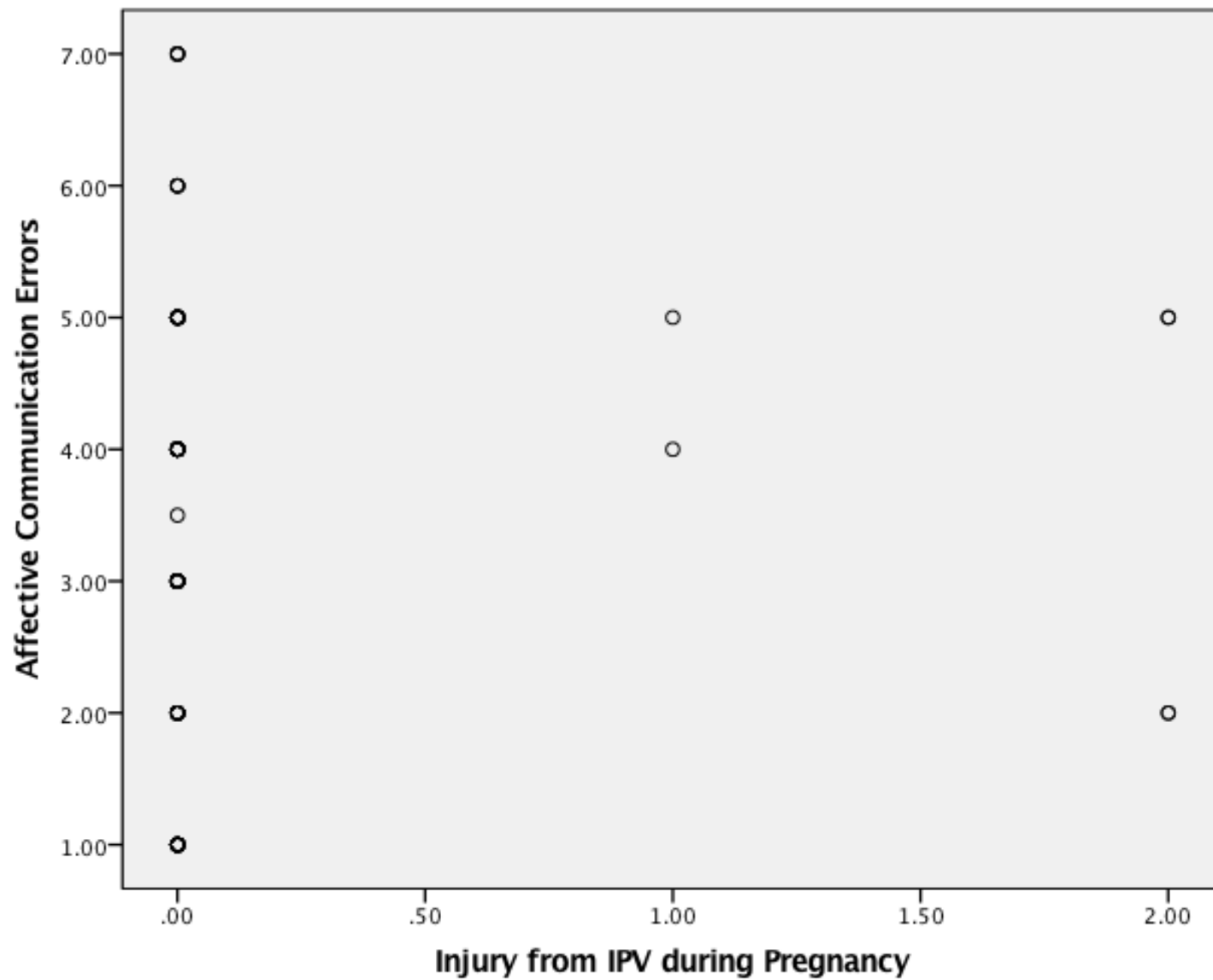
Appendix e.54

Association between affective communication errors and psychological aggression during pregnancy



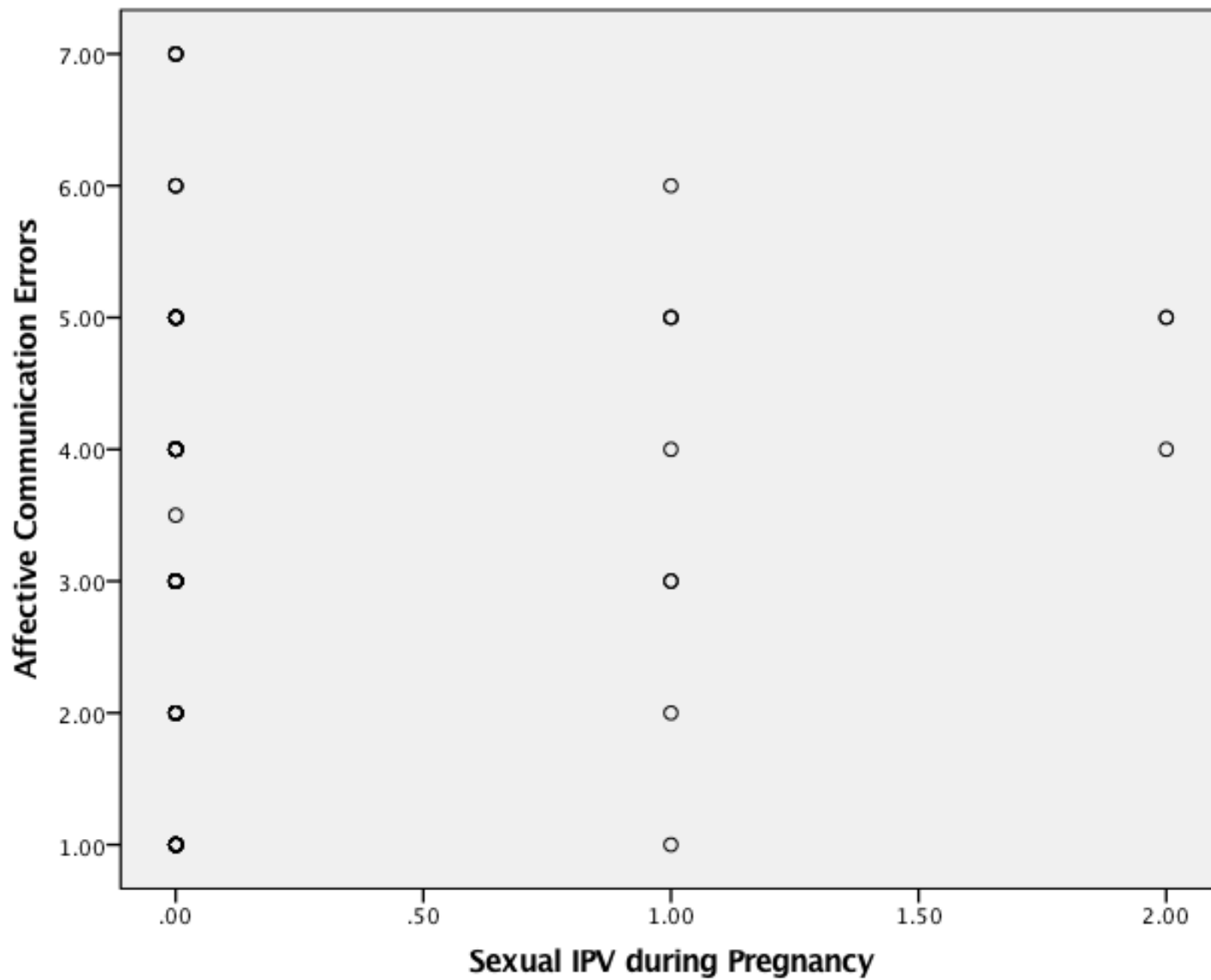
Appendix e.55

Association between affective communication errors and physical IPV during pregnancy



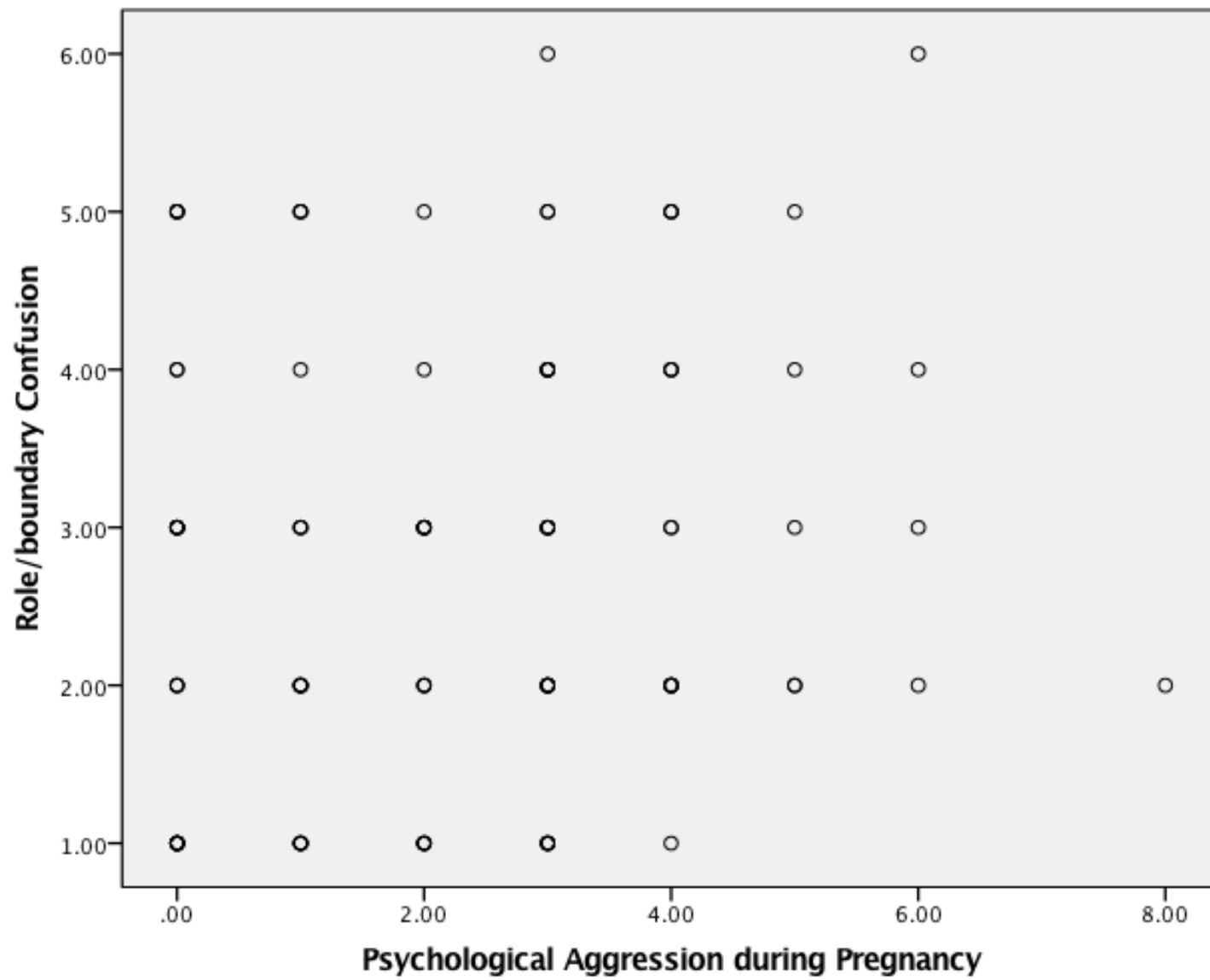
Appendix e.56

Association between affective communication errors and injury from IPV during pregnancy



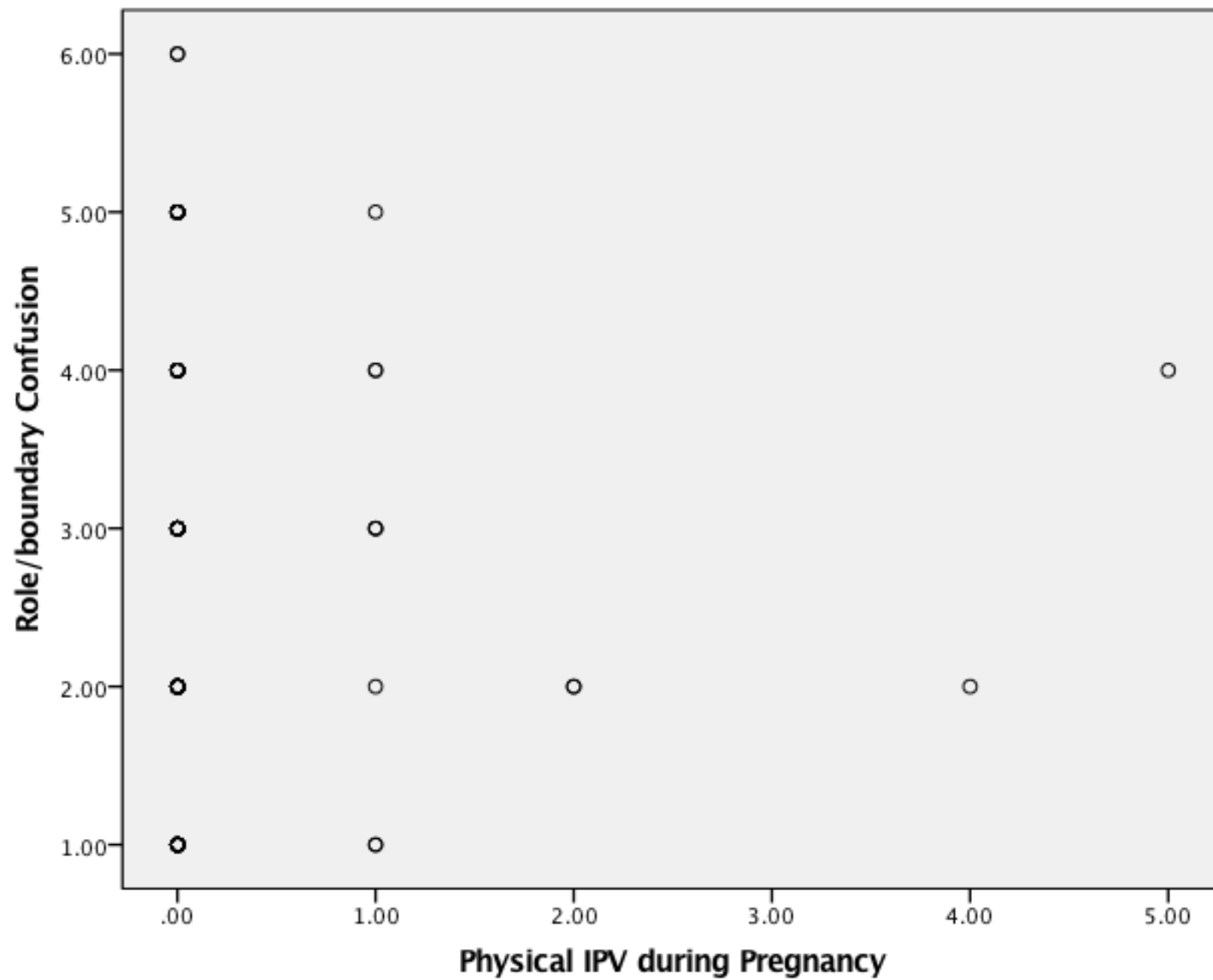
Appendix e.57

Association between affective communication errors and sexual IPV during pregnancy



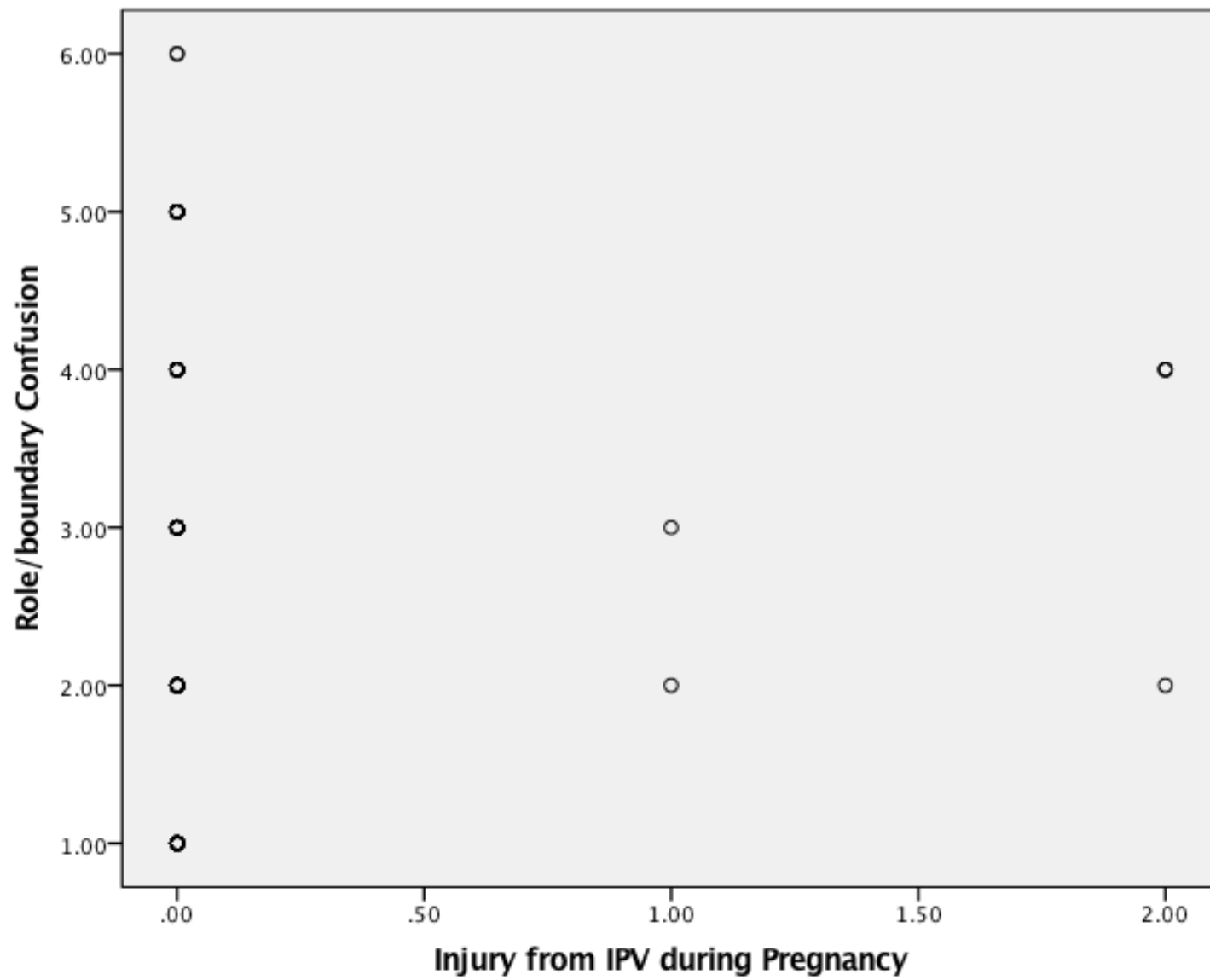
Appendix e.58

Association between role/boundary confusion and psychological aggression during pregnancy



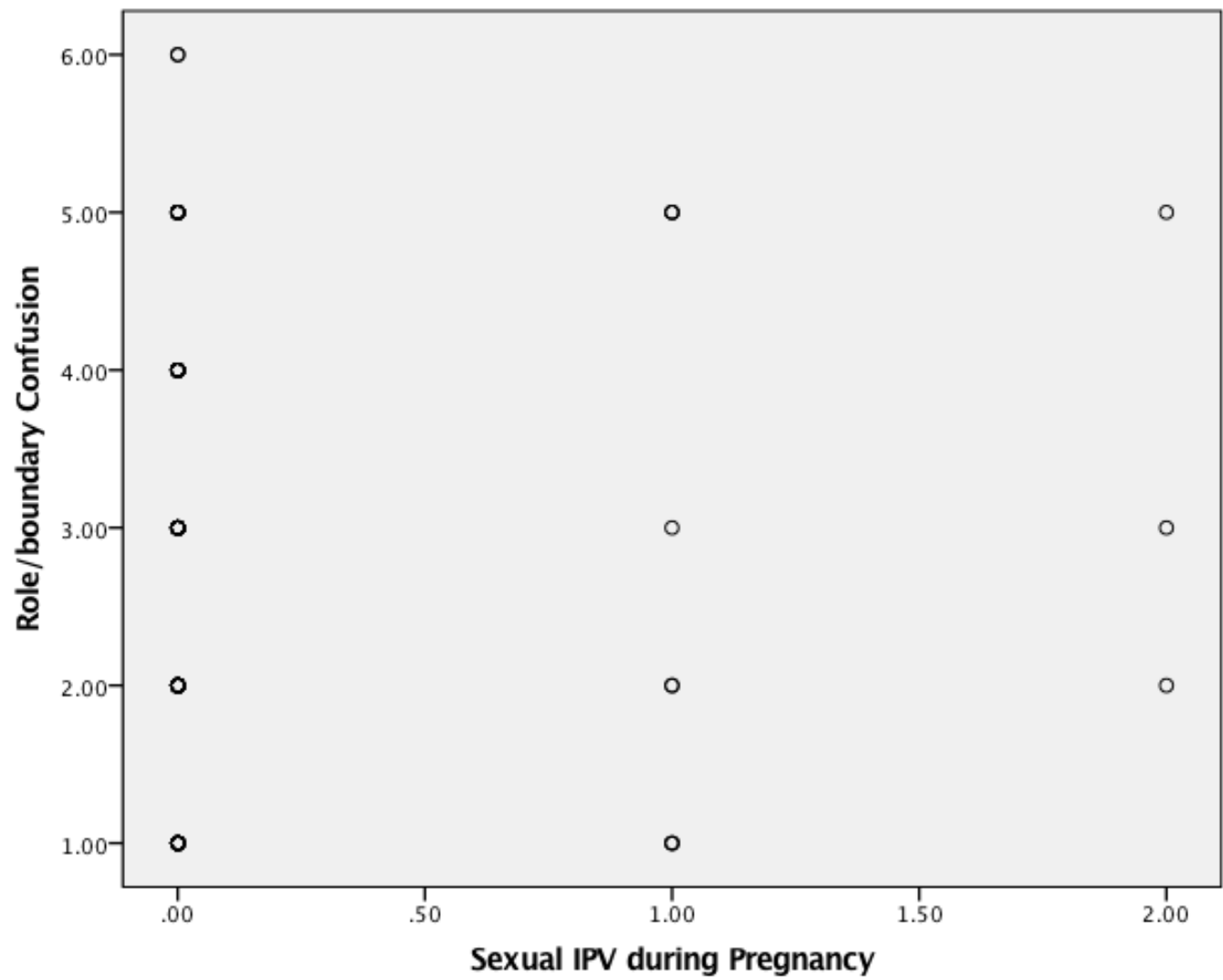
Appendix e.59

Association between role/boundary confusion and physical IPV during pregnancy



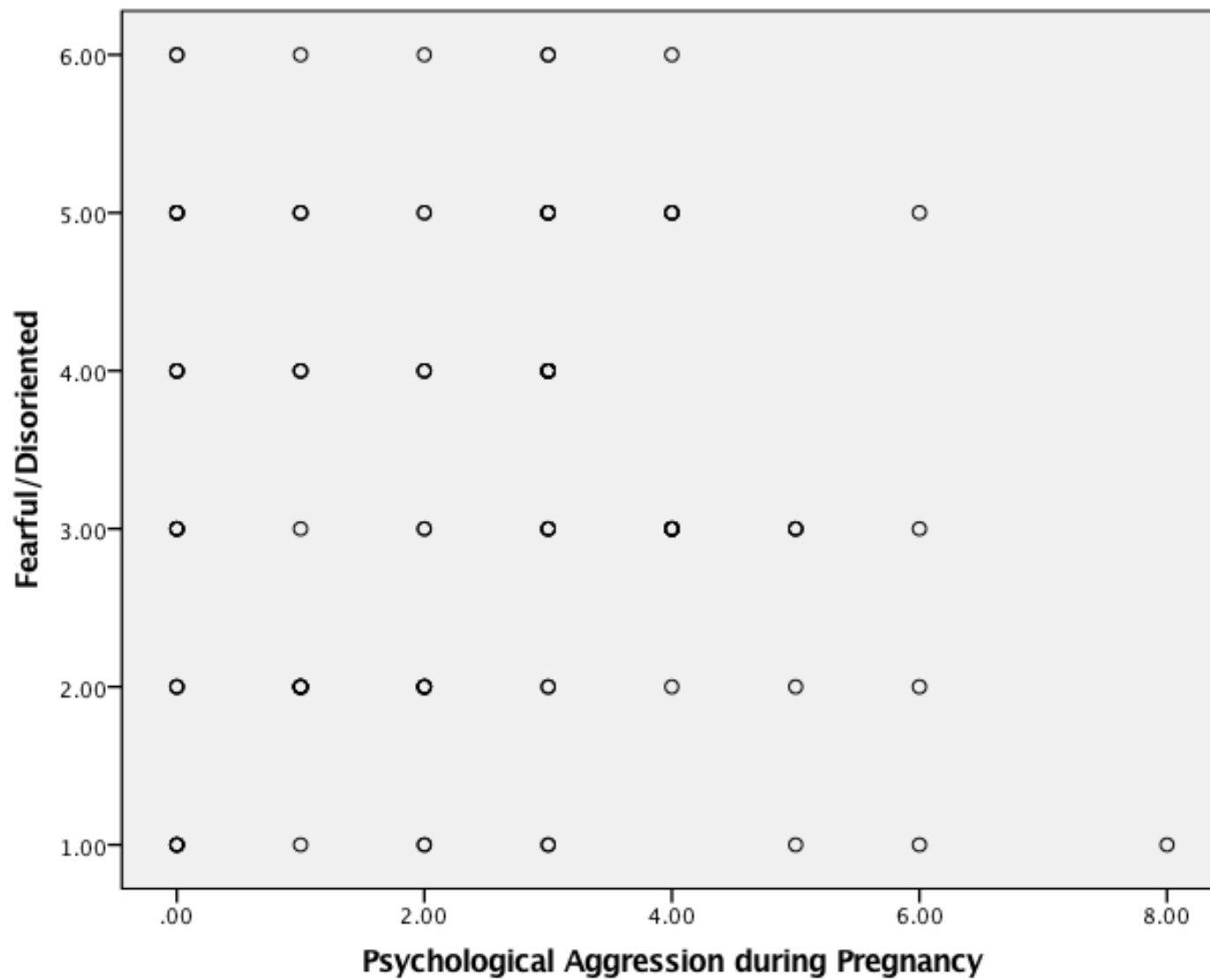
Appendix e.60

Association between role/boundary confusion and injury from IPV during pregnancy



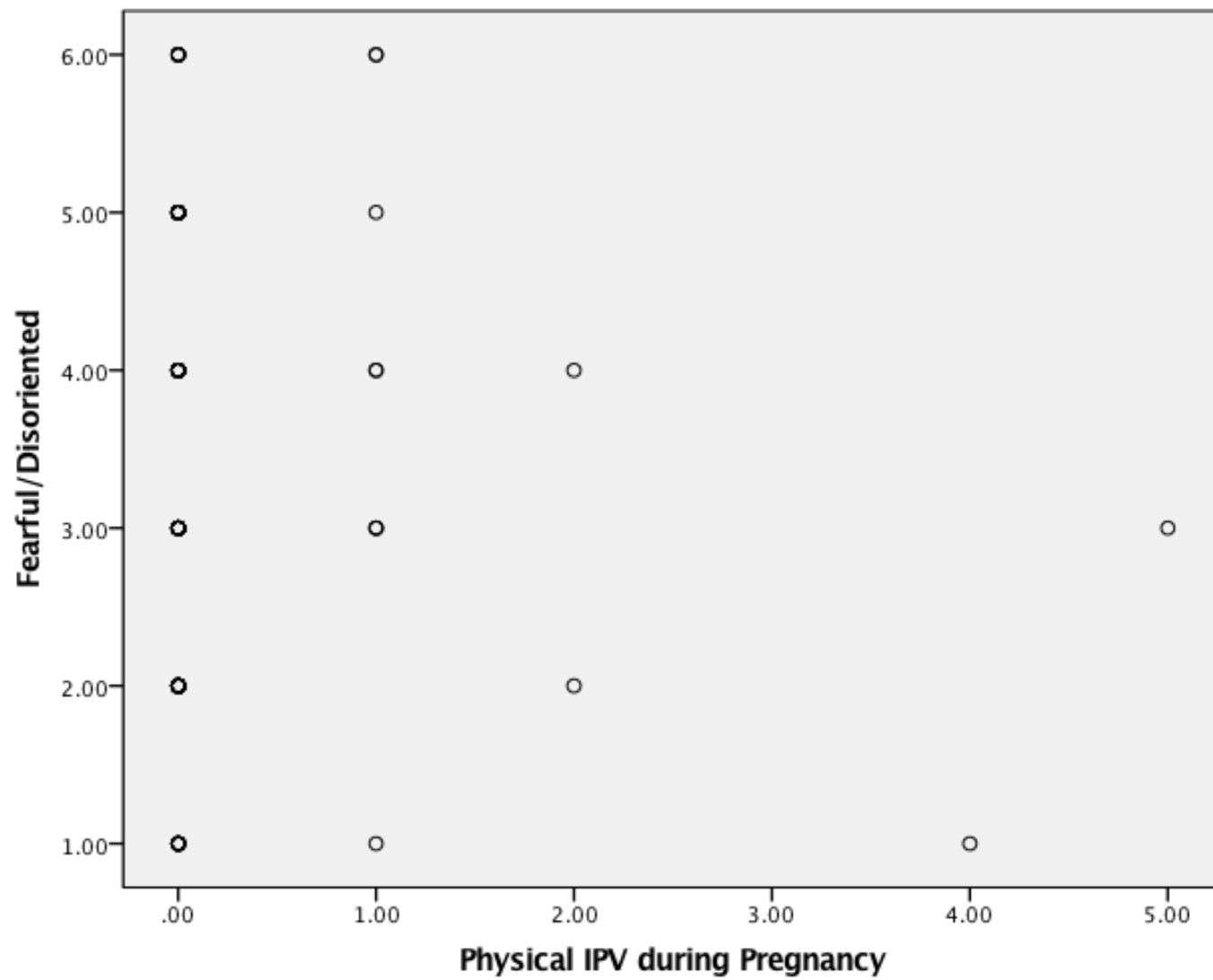
Appendix e.61

Association between role/boundary confusion and sexual IPV during pregnancy



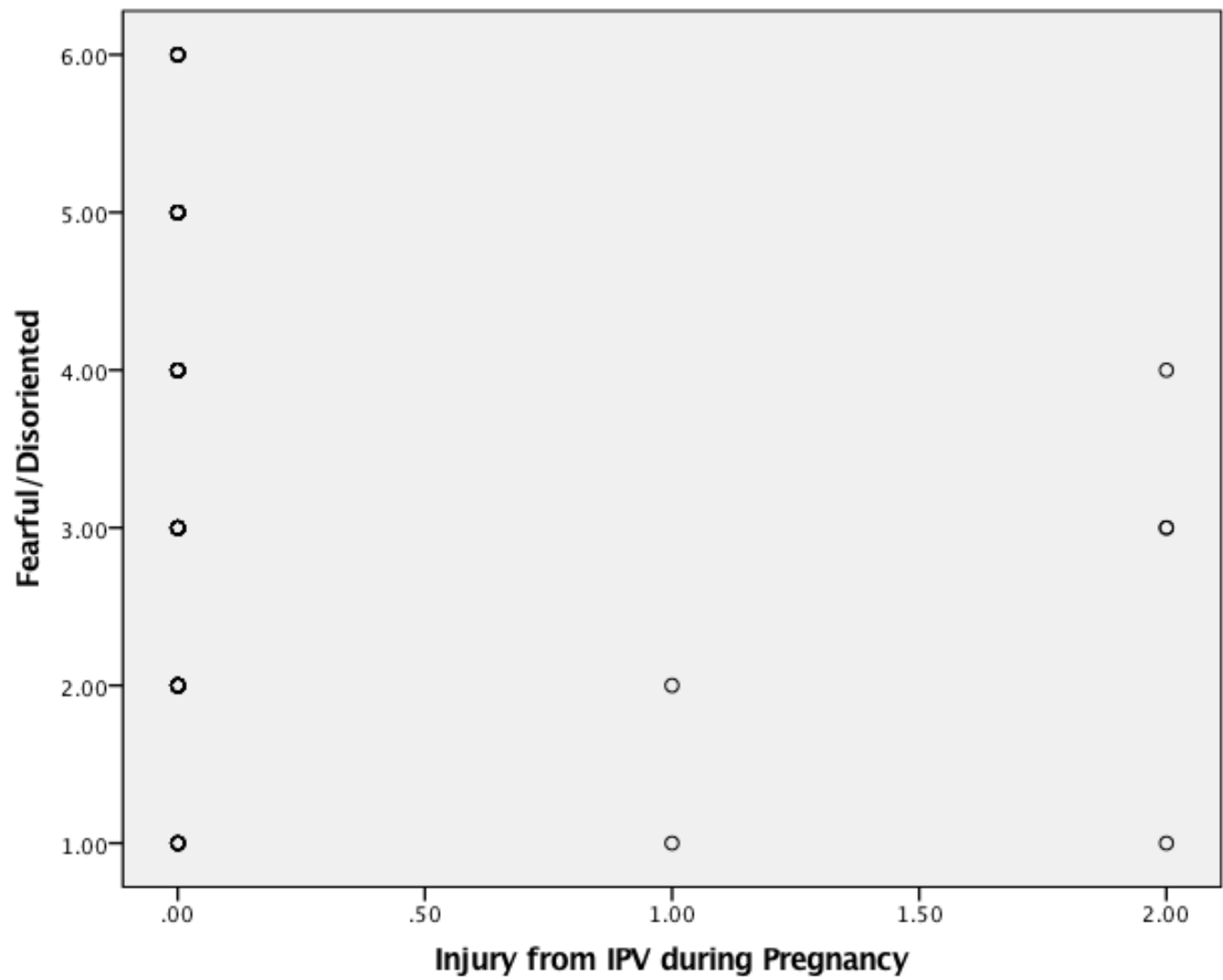
Appendix e.62

Association between fearful/disoriented and psychological aggression during pregnancy



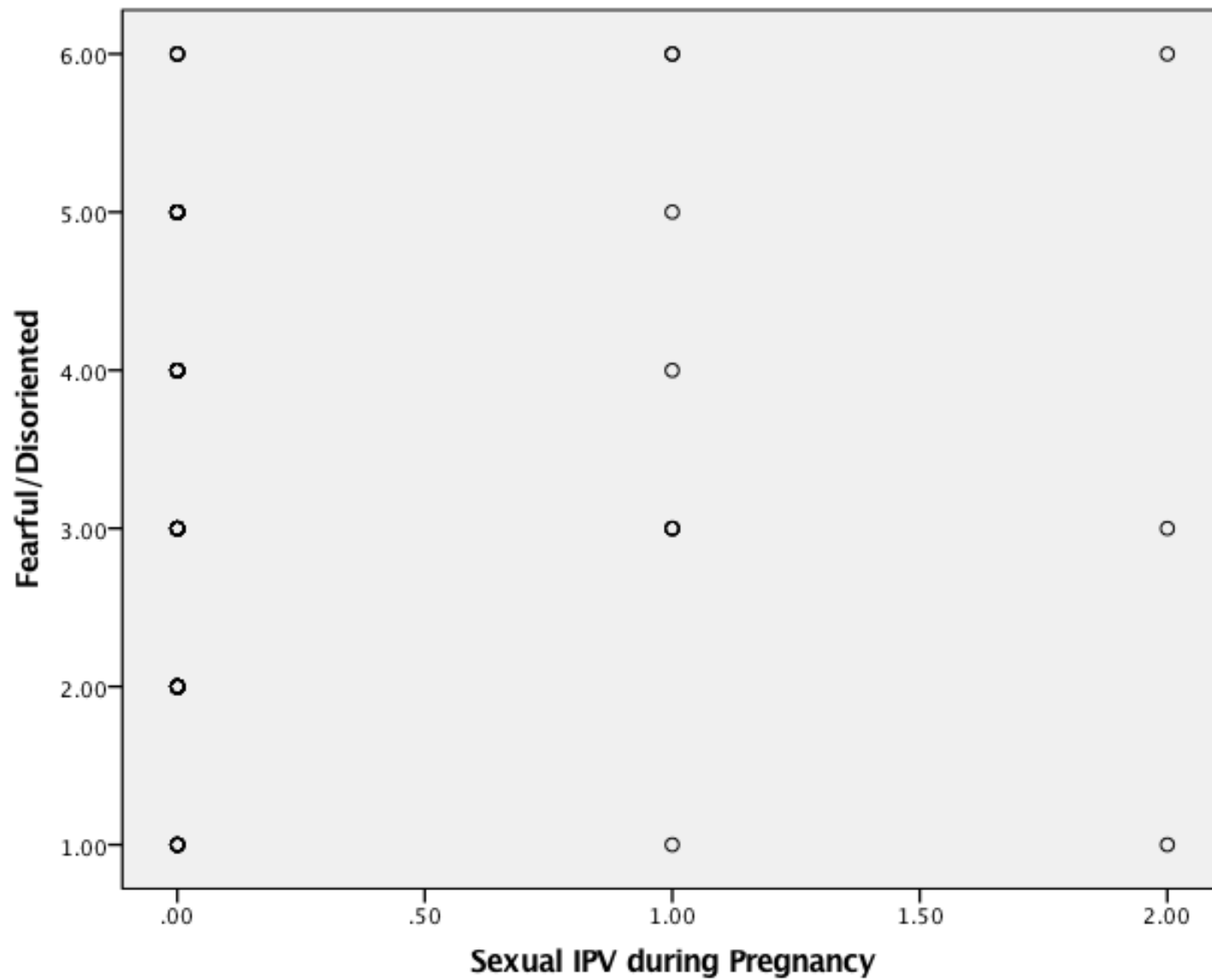
Appendix e.63

Association between fearful/disoriented and physical IPV during pregnancy



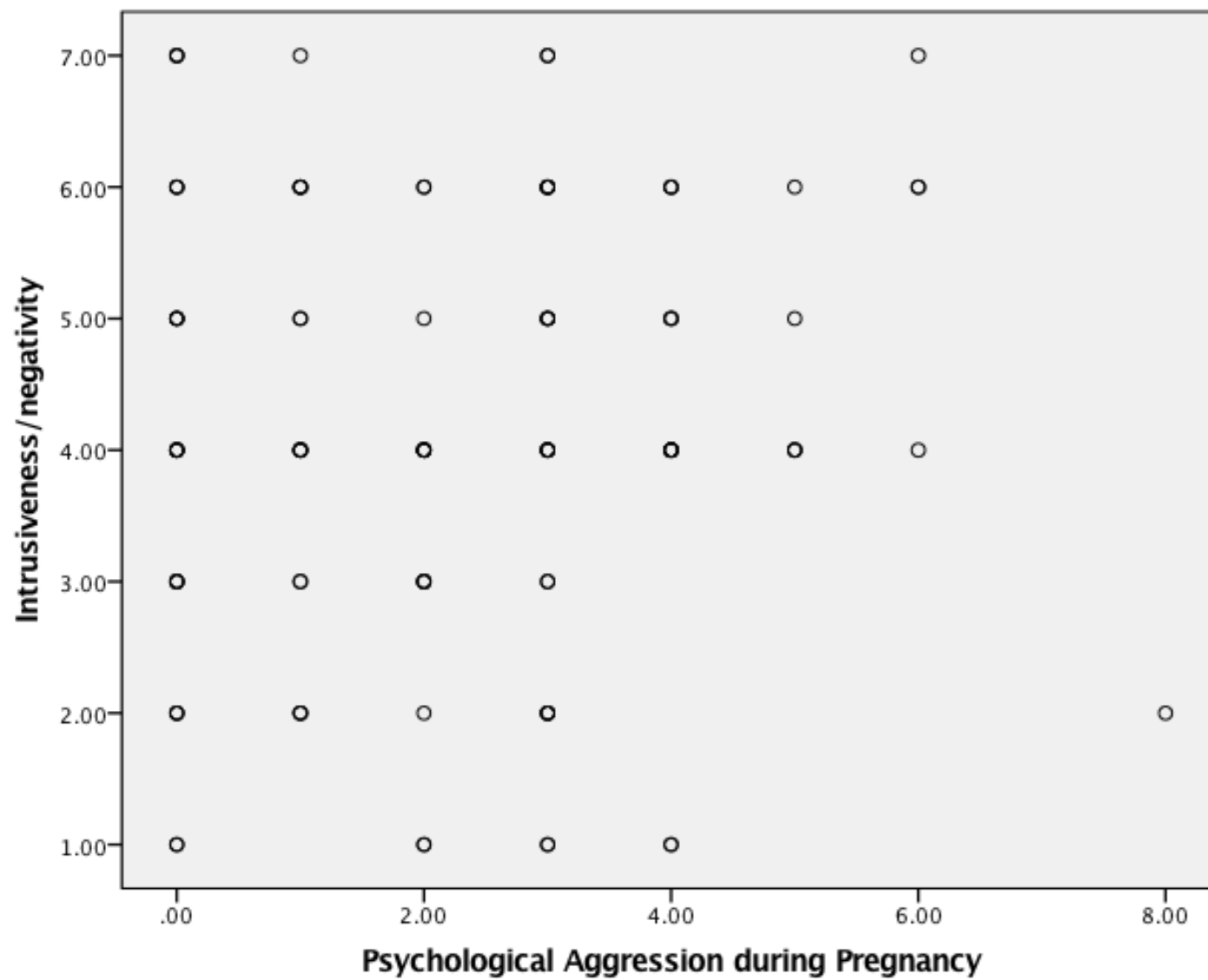
Appendix e.64

Association between fearful/disoriented and injury from IPV during pregnancy



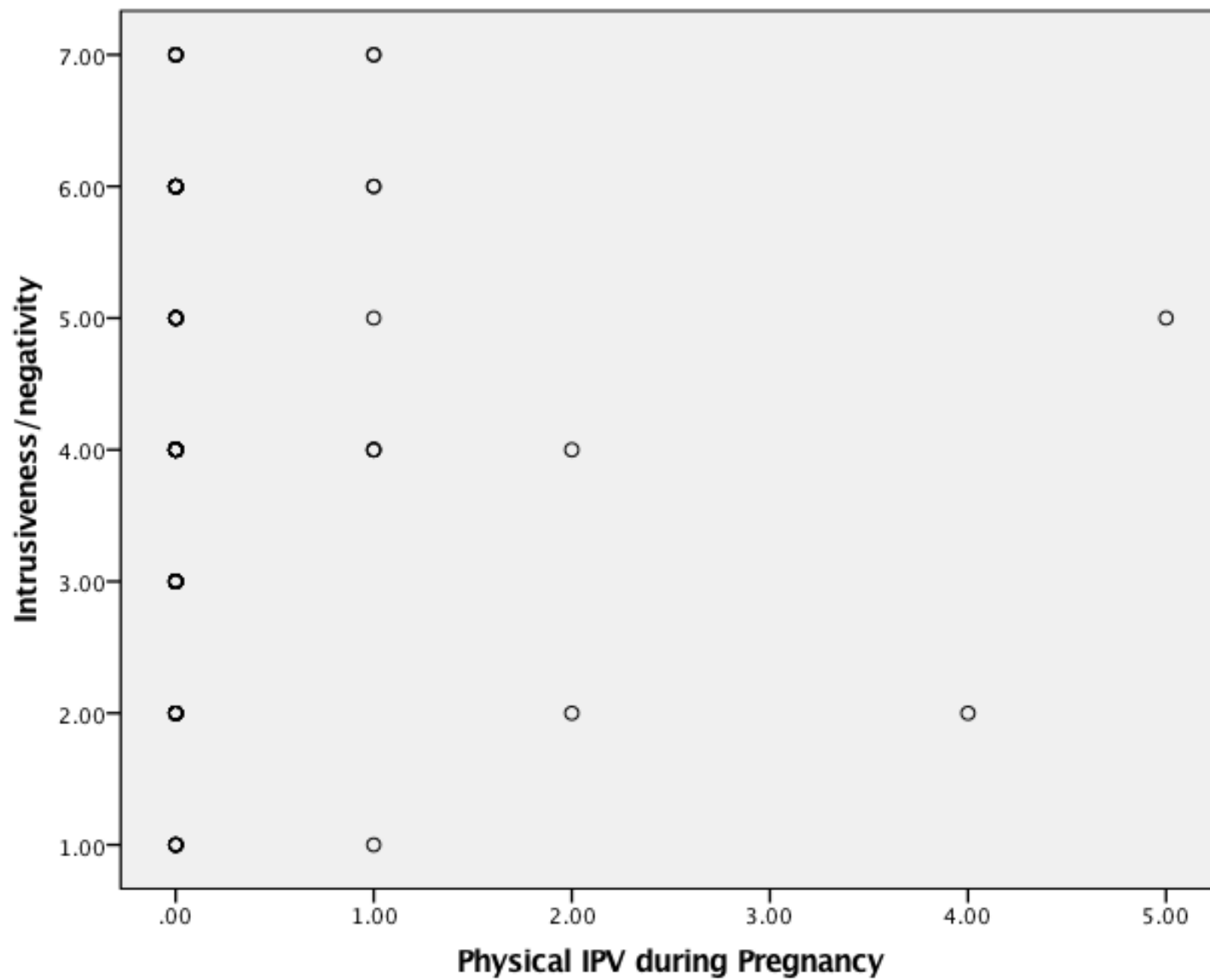
Appendix e.65

Association between fearful/disoriented and sexual IPV during pregnancy



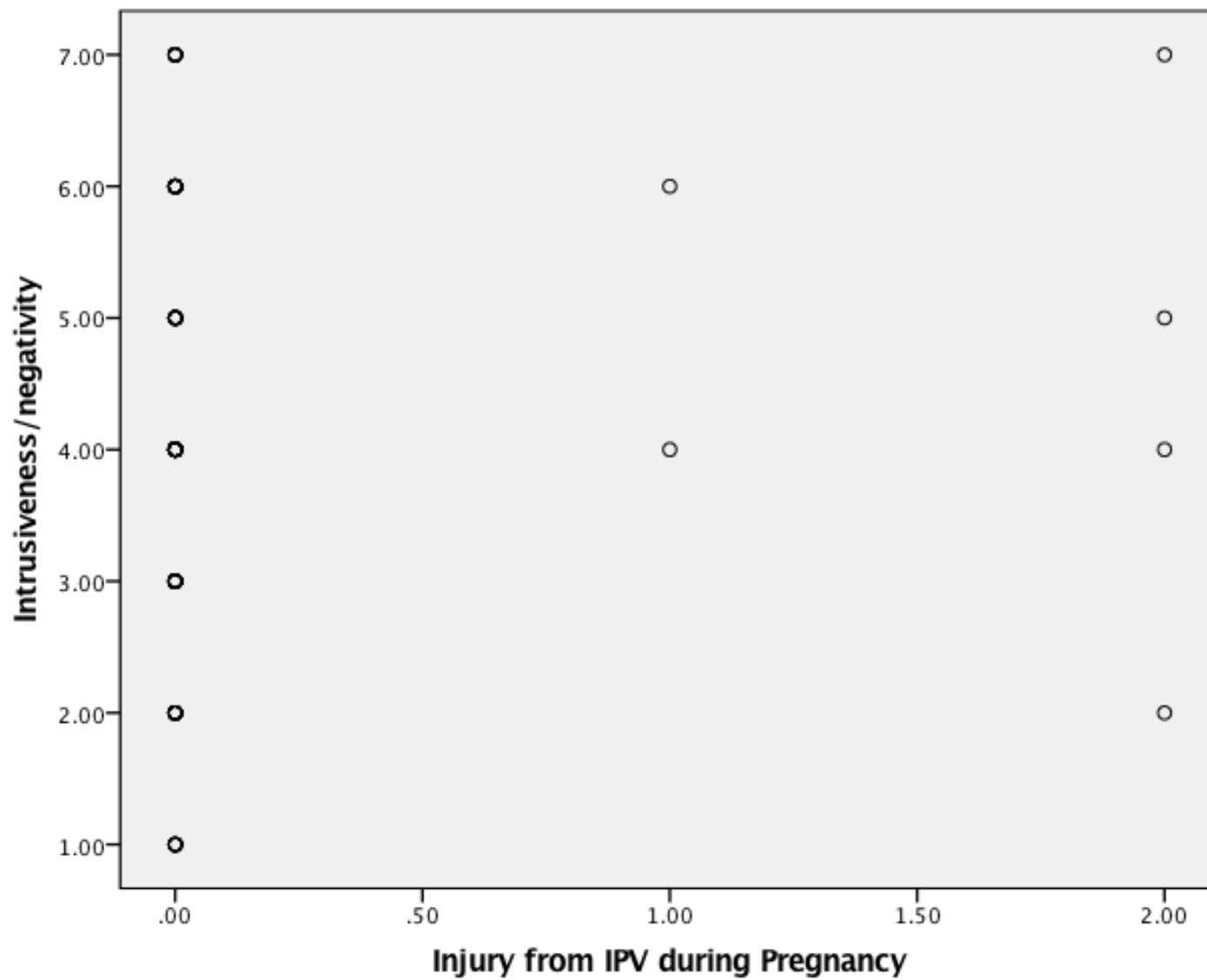
Appendix e.66

Association between intrusiveness/negativity and psychological aggression during pregnancy



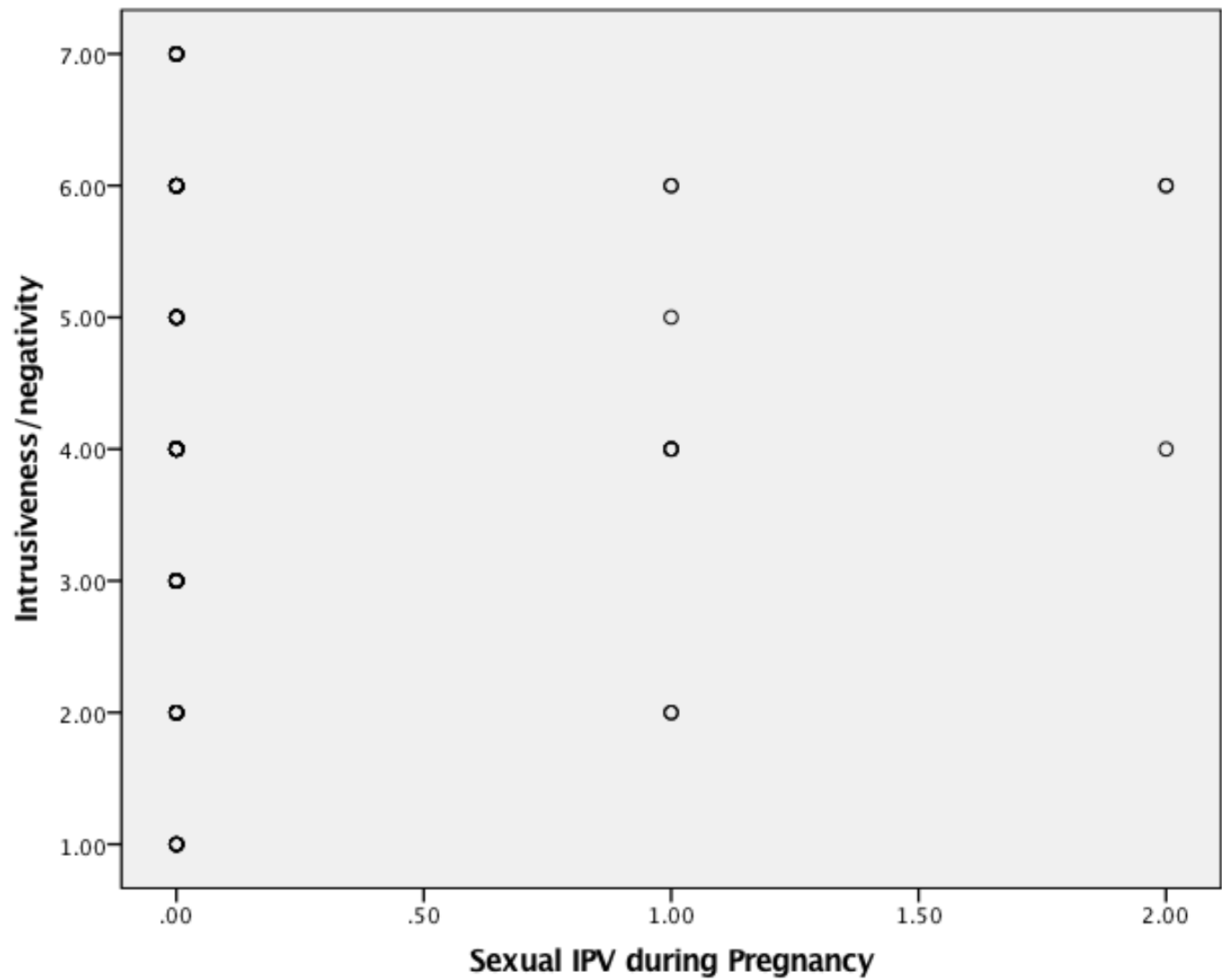
Appendix e.67

Association between intrusiveness/negativity and physical IPV during pregnancy



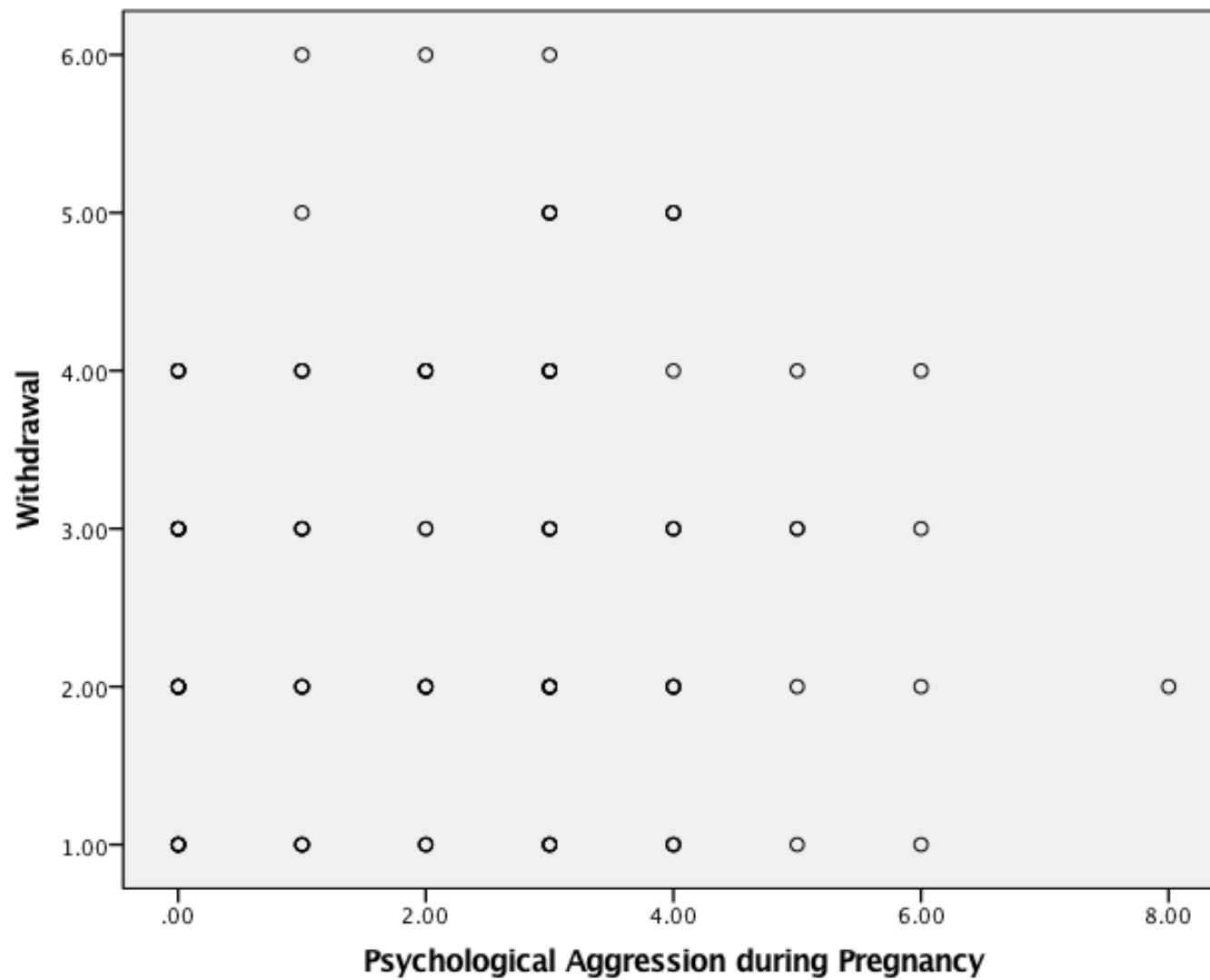
Appendix e.68

Association between intrusiveness/negativity and injury IPV during pregnancy



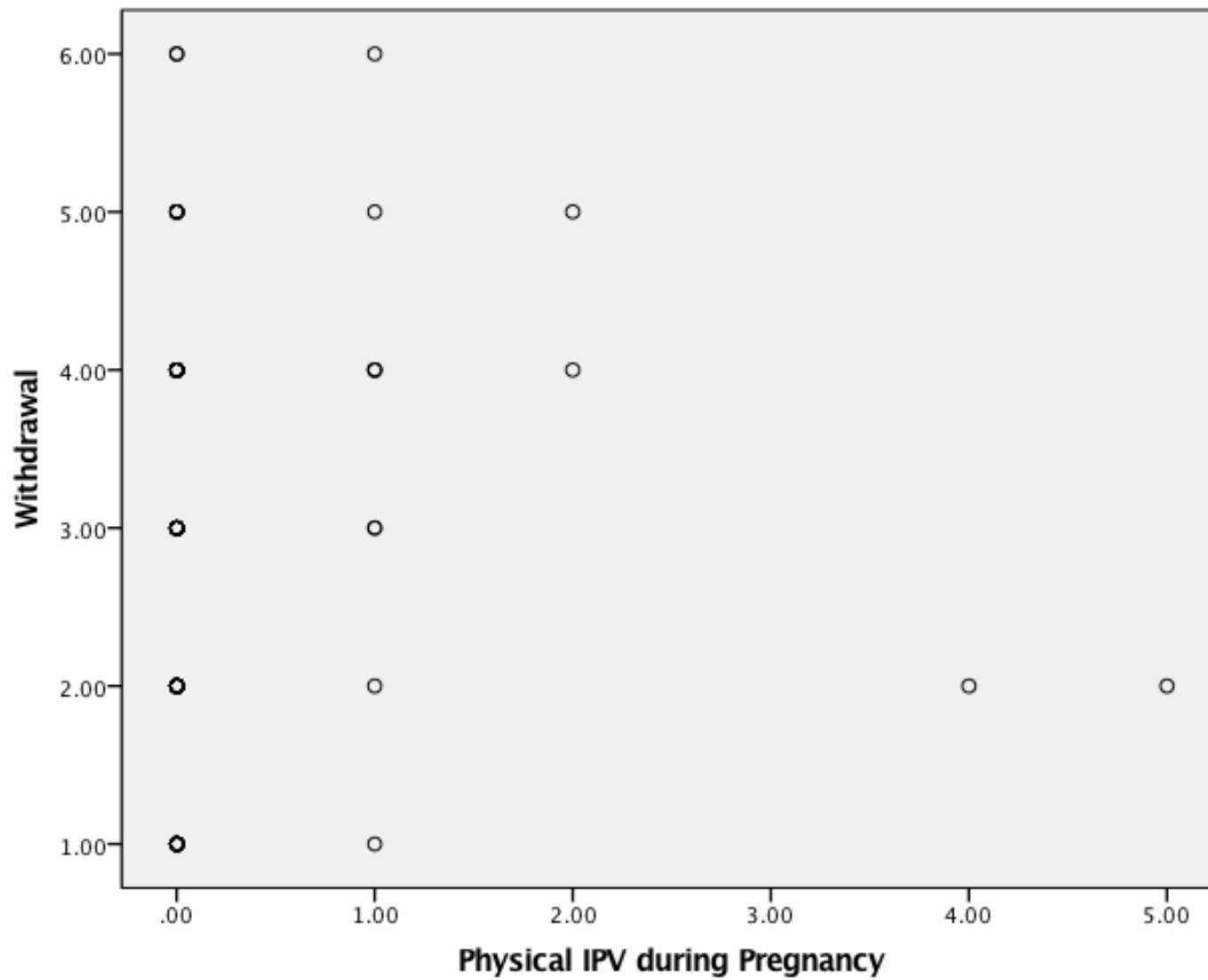
Appendix e.69

Association between intrusiveness/negativity and sexual IPV during pregnancy



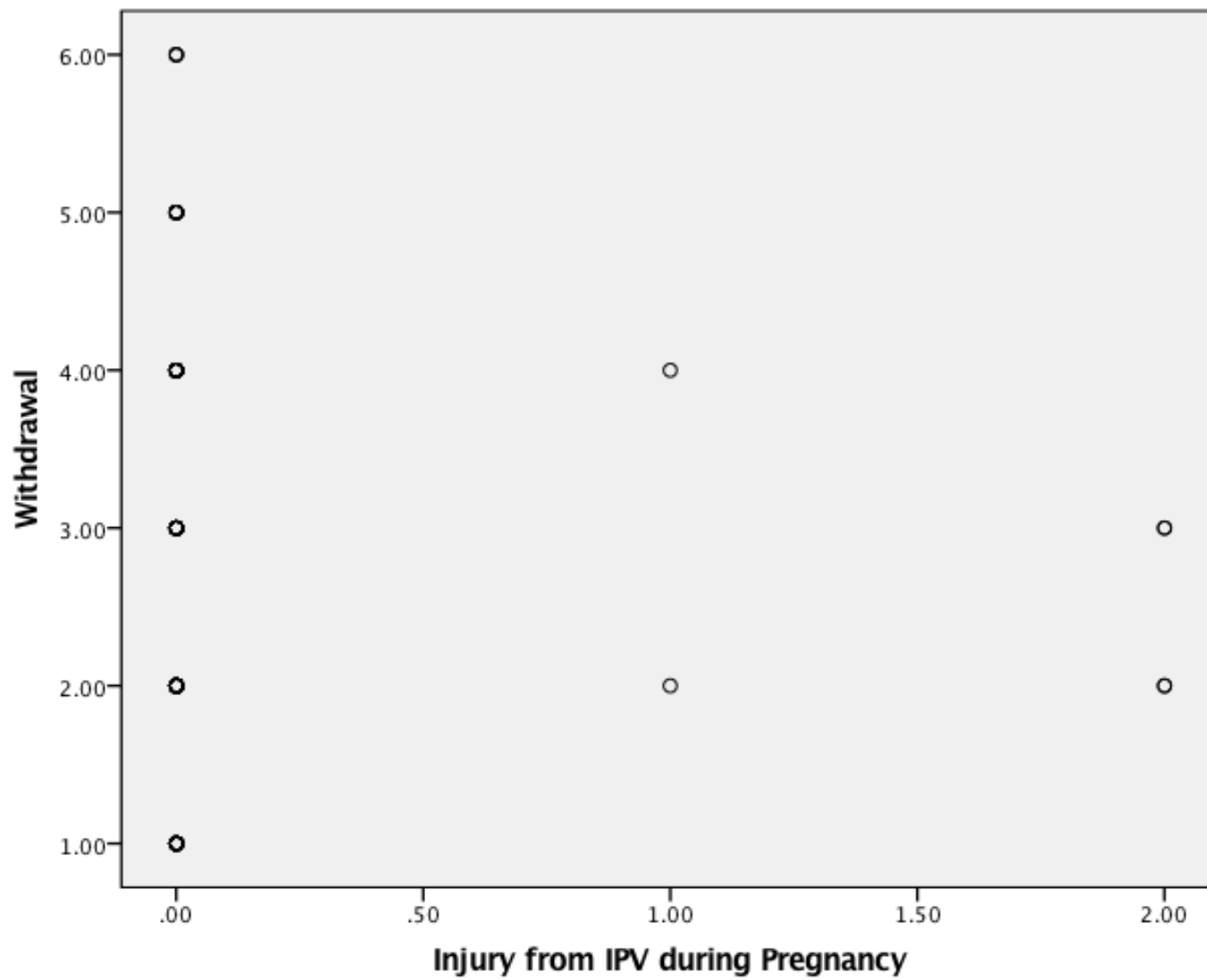
Appendix e.70

Association between withdrawal and psychological aggression during pregnancy



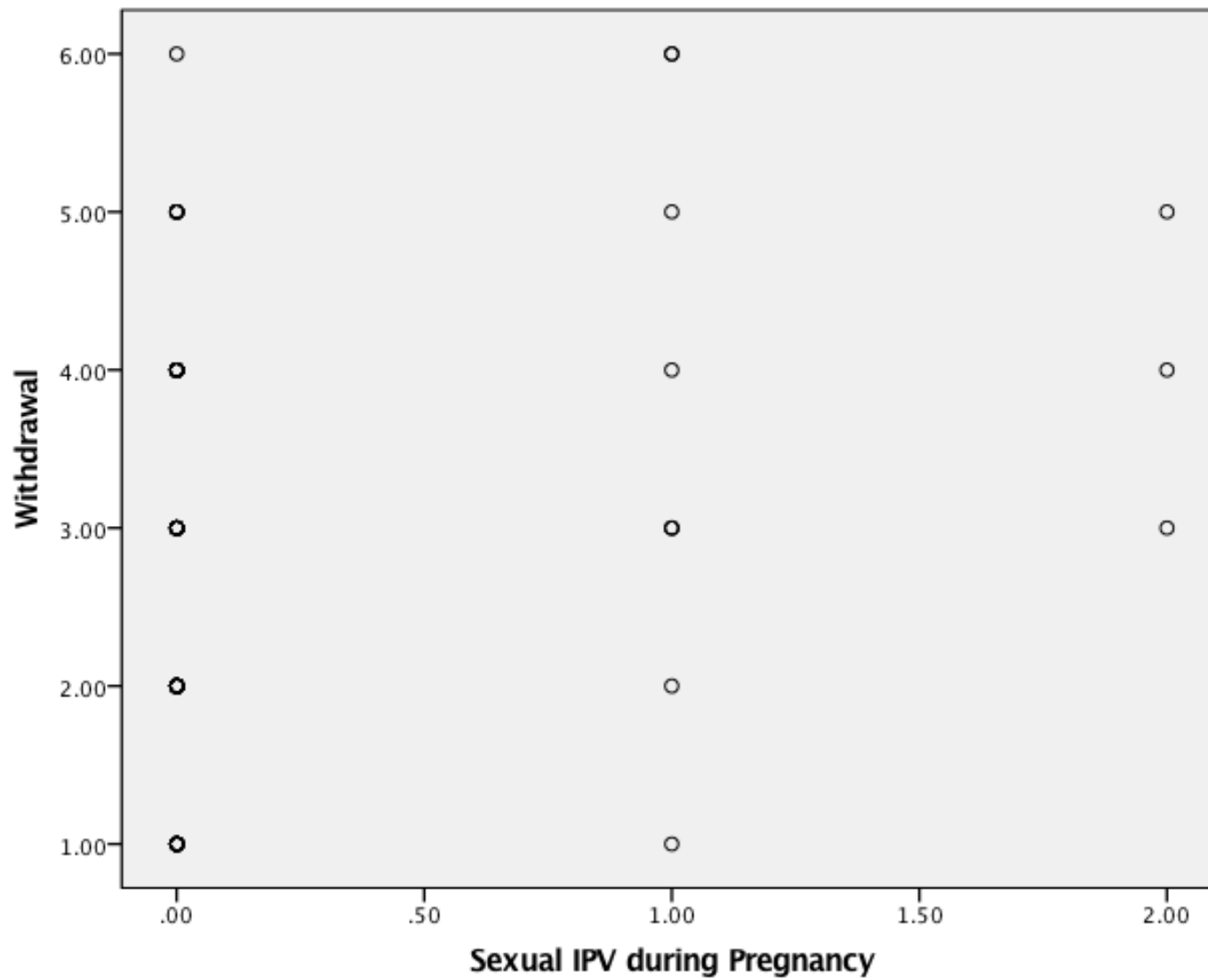
Appendix e.71

Association between withdrawal and physical IPV during pregnancy



Appendix e.72

Association between withdrawal and injury from IPV during pregnancy



Appendix e.73

Association between withdrawal and sexual IPV during pregnancy