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Diplomarbeit

Titel der Arbeit

Adult attachment and interpersonal problems in
survivors of interpersonal trauma

Verfasserin

Lara Pivodic

Angestrebter akademischer Grad

Magistra der Naturwissenschaften (Mag. rer. nat.)

Wien, im Februar 2011

Studienkennzahl: 298

Studienrichtung: Psychologie

Betreuer: Ass.-Prof. Dr. Thomas Ehring, Ass.-Prof. Dr. Brigitte Lueger-Schuster

Thesis presented to the Faculty of Psychology of the University of Vienna in partial fulfillment of the requirements for the degree 'Magistra der Naturwissenschaften'

Adult Attachment and Interpersonal Problems in Survivors of Interpersonal Trauma

Lara Pivodic

University of Vienna/University of Amsterdam

February, 2011

ACKNOWLEDGMENTS

I would like to thank the following people for helping me realize this project and complete my university studies.

My supervisor Dr Thomas Ehring for allowing me to complete an inspiring research internship under his supervision at the Department of Clinical Psychology at the University of Amsterdam during which I have developed the idea for this thesis. I would like to thank Thomas for his outstanding professional support, and for finding time whenever I needed thesis-related advice.

Dr Brigitte Lueger-Schuster, my supervisor at the University of Vienna, for supporting this international cooperation and for her valuable feedback on the study design and results.

My parents for valuing education as much as I do, for unconditionally supporting every plan of mine throughout my studies and for being there whenever I needed help or advice. My brother for disagreeing whenever I attempted to undervalue my abilities. My friends and fellow students who I have shared many ups and downs of student life with, as well as many motivating hours of studying. My dear friend Beni for fun times spent together each of us working on their own thesis. My partner for his invaluable professional and emotional support and for encouraging me to keep working until a “quarter past 4”.

The administrators of the following websites for their support in recruiting participants for this project: About.com - Palliative Care, After Silence, Arms of Love, Beyond Indigo - Death and Dying, ehealthforum, Forum for abuse survivors, napac, Pandora’s Project, Psychlinks Online, The Light Beyond, Aphrodite Wounded, Many Voices, Battered Husbands Support, CureZone, Steady Health. Without their help, this study would not have passed the planning phase.

All participants in this research for openly sharing their experiences.

Abstract

Background: Earlier research has shown that the experience of early chronic interpersonal trauma (ECIP) is related to insecure attachment to romantic partners in adulthood. However, it has not been tested to date whether this is specific for early-onset trauma and what the exact relationship is between trauma type, adult attachment and posttraumatic stress disorder (PTSD). The aims of this study were (1) to compare adult attachment in an ECIP group to that in individuals who experienced a late-onset, an early single or a non-interpersonal trauma, and (2) to test whether adult attachment mediates the relationship between the experience of interpersonal trauma and PTSD symptom severity.

Material and methods: Two hundred and sixty English-speaking Internet users, recruited through trauma-or health-related websites, completed a set of online questionnaires assessing trauma history, adult attachment security, interpersonal problems, PTSD symptom severity, as well as screenings of depression and borderline personality disorder. Attachment security was assessed with the Experiences in Close Relationships Revised scale (Fraley et al., 2000) which taps the two adult attachment dimensions avoidance and anxiety.

Results: Following the application of exclusion criteria, 209 individuals (190 women) remained in the sample. The early chronic interpersonal trauma group ($n = 130$), which included individuals sexually or physically abused in childhood, reported significantly more attachment avoidance and anxiety than the late interpersonal ($n = 31$) and the non-interpersonal trauma group ($n = 24$). However, no difference was found between early short-term ($n = 24$) and early chronic traumas. Furthermore, adult attachment showed to be a partial mediator of the association between trauma type and PTSD symptom severity.

Conclusion: Attachment-related avoidance and anxiety in adulthood may be a consistent sequel of early interpersonal trauma and may contribute to the development of PTSD. Future research needs to test whether insecure adult attachment is a unique sequel of interpersonal trauma or whether it stems from increased PTSD symptom severity following interpersonal trauma.

Keywords: interpersonal trauma, childhood abuse, adult attachment, interpersonal problems, posttraumatic stress disorder, online study

TABLE OF CONTENTS

Adult attachment and interpersonal problems among survivors of early chronic interpersonal trauma	8
1 Introduction.....	10
1.1 The concept of interpersonal trauma.....	10
1.1.1 Definition of a traumatic stressor.....	10
1.1.2 Type I versus type II childhood trauma	10
1.1.3 Types of interpersonal trauma	12
1.2 Epidemiology of early chronic interpersonal trauma.....	14
1.3 Hypotheses regarding the impact of early chronic interpersonal trauma on attachment and interpersonal representations	16
1.4 Evidence regarding long-term consequences of early chronic interpersonal trauma.....	18
1.4.1 Posttraumatic stress disorder.....	18
1.4.2 Complex psychopathology following interpersonal trauma	21
1.5 Attachment in the context of early chronic interpersonal trauma.....	30
1.5.1 Applying attachment theory to the study of interpersonal trauma.....	30
1.5.2 Theories of attachment.....	31
1.5.3 Continuity of attachment from infancy to adulthood.....	36
1.5.4 Assessing adult attachment styles.....	37
1.5.5 Association between childhood abuse and attachment patterns in adulthood	40
1.5.6 Attachment security as a mediator between interpersonal trauma and posttraumatic psychopathology	43
1.5.7 Implications of the evidence	47
1.6 Interpersonal problems in the context of early chronic interpersonal trauma	48
1.6.1 Hypotheses about interpersonal problems in adulthood following childhood abuse.....	48

1.6.2	Evidence for interpersonal problems following early-onset interpersonal trauma.....	49
1.6.3	Implications of the evidence	51
1.7	Methodological problems of research on the psychological consequences of early chronic interpersonal trauma.....	52
1.8	Potentials and limitations of online data collection	54
1.8.1	Advantages of online questionnaires	55
1.8.2	Methodological limitations of online questionnaires.....	56
1.8.3	Ethical aspects of Web-based studies	58
1.9	Summary and implications of the literature.....	60
1.10	Research questions and hypotheses	62
1.10.1	Hypotheses	64
2	Method	65
2.1	Participants.....	65
2.2	Sample size and power analysis.....	71
2.3	Measures	71
2.3.1	Romantic attachment in adulthood	73
2.3.2	Interpersonal problems.....	73
2.3.3	History of traumatic experiences	78
2.3.4	PTSD symptom severity	79
2.3.5	Depression screening	80
2.3.6	Screening for borderline personality disorder.....	81
2.4	Procedure	81
2.5	Statistical analyses	83
2.5.1	Hypothesis tests	83
2.5.2	Effect sizes	83
2.5.3	Assumptions of statistical hypothesis tests	84
2.5.4	Missing values	84

ATTACHMENT IN SURVIVORS OF INTERPERSONAL TRAUMA	7
3 Results.....	85
3.1 Comparison of completers versus drop-outs.....	86
3.2 Analysis.....	87
3.2.1 Hypothesis 1: Adult attachment and trauma type	87
3.2.2 Hypothesis 2: Adult attachment and PTSD symptom severity.....	89
3.2.3 Hypothesis 3: Influence of PTSD symptoms on the association between adult attachment and trauma type	89
3.2.4 Hypothesis 4: Mediating effect of adult attachment.....	90
3.2.5 Robustness of the obtained results.....	95
3.2.6 Explorative analysis of interpersonal problems.....	97
4 Discussion.....	99
4.1 Limitations	107
4.2 Conclusion	109
LIST OF FIGURES	111
LIST OF TABLES.....	111
LIST OF APPENDICES.....	112
REFERENCES	113
APPENDIX.....	126

This thesis was written according to the 6th edition of the Publication Manual of the American Psychological Association (American Psychological Association [APA], 2009, cited by OWL Purdue Online Writing Lab, 2010), the *Journal Article Reporting Standards* (JARS, 2008) and the *Checklist for Reporting Results of Internet E-Surveys* (CHERRIES; Eysenbach, 2004). Contrary to the requirements of the APA Publication Manual (2009), double spacing of the text could not be employed due to lack of space. Furthermore, for reasons of clarity, instead of an indent, larger line spacing was included before each new paragraph.

Adult attachment and interpersonal problems among survivors of early chronic interpersonal trauma

Early chronic interpersonal trauma, such as physical or sexual abuse in childhood, constitutes a drastic threat to an individual's physical and psychological integrity (Briere & Elliott, 1994). Experiences of abuse have the potential to leave a wide range of detrimental traces in the affected individual's mind and behavior. These trauma sequelae may be both short- and long-termed and they are likely to interfere with various aspects of an individual's psychosocial functioning. The association between childhood abuse and posttraumatic stress disorder (PTSD) has been supported by many investigations and among a wide variety of community and clinical samples (e.g., Briggs & Joyce, 1997; Cloitre, Scarvalone, & Difede, 1997; van der Kolk, Roth, Pelcovitz, Sunday, & Spinazzola, 2005). However, apart from experiencing PTSD, childhood abuse survivors often additionally face more complex symptoms which affect various domains of their psychosocial functioning (van der Kolk et al., 2005).

Early and long-standing traumatic experiences in an interpersonal context, such as the parent-child relationship, are assumed to have particularly detrimental effects on a child's developing view of the self in interpersonal relationships (Cole & Putnam, 1992) and on their attachment patterns (Limke, Showers, & Zeigler-Hill, 2010). Therefore, the impact of these traumatic experiences is likely to be reflected in insecure attachment and interpersonal problems. The fact that disturbances in attachment are not restricted to parent-child attachment but are often carried on to adulthood, where they can affect an individual's intimate partner relationships, makes them particularly severe. Some authors suggest that interpersonal traumas which occurred repeatedly and which began at an early point of the child's life are more likely to be associated with interpersonal problems, compared to non-interpersonal traumas (e.g., disasters), or traumas which occurred only once or which had a late onset (e.g., van der Kolk et al., 2005). However, to the author's knowledge, there are no published studies to date comparing the impact of different types of interpersonal trauma on attachment security. Hence, one of the aims of the present thesis is to clarify the association between different forms of traumatic experiences and adult attachment patterns. Besides, this

study intends to investigate the role of PTSD within the relationship of traumatic experiences and adult attachment security.

The introduction of this thesis includes a theoretical review of the research on early chronic interpersonal trauma, its effects on mental health, and its relationship with attachment security and interpersonal problems in adulthood. Furthermore, methodological aspects concerning the study of complex sequelae of early chronic interpersonal trauma will be discussed followed by methodological and ethical considerations regarding Web-based data collection. The second part of the present thesis includes the description of the empirical study which emerged from the analysis of the current literature on the consequences of interpersonal trauma.

1 Introduction

1.1 The concept of interpersonal trauma

1.1.1 Definition of a traumatic stressor

The diagnostic and statistical manual of mental disorders IV (DSM-IV-TR, 4th ed., American Psychiatric Association [APA], 2000) provides criteria for stressors that can potentially evoke PTSD. These requirements include (1) that an individual was exposed to one or more events that involved actual death or the threat of death or serious injury of oneself or others, or a threat to one's own or others' physical integrity and (2) that the individual responds to these events with intense fear, helplessness, or horror. In children this response may instead involve disorganized or agitated behavior.

Briere (2004) postulated that a stressor's potential to evoke PTSD largely depends on whether it involves unintended acts (e.g., motor vehicle accidents) and non-human origins (e.g., floods, earthquakes) or whether it results from intended interpersonal violence. Violence and abuse is associated with more posttraumatic symptomatology than unintended acts or natural disasters (Briere & Elliott, 2000). The following two sections review different approaches to a categorization of traumatic events that are of interpersonal nature. First, a dichotomous concept is described. Subsequently, a second approach is introduced which takes into account more than two types of interpersonal trauma.

1.1.2 Type I versus type II childhood trauma

In a review of characteristics of traumatic experiences in childhood, Lenore Terr (1991) defined childhood trauma as "the mental result of one sudden, external blow or a series of blows, rendering the young person temporarily helpless and breaking past ordinary coping and defensive operations" (p. 323). Besides, in her definition of childhood trauma, the author also includes conditions that are "marked by prolonged and sickening anticipation" (p. 324) on the part of the child that result from the experienced abuse. Terr postulates four sets of consequences of childhood abuse that are unrelated to the child's age at the time of abuse: (a) strongly visualized or otherwise repeatedly perceived memories, (b) repetitive behaviors

(e.g., play and behavioral re-enactments of the trauma), (c) trauma-specific fears, and (d) changed attitudes about people, aspects of life, and the future (e.g., sense of a limited future, mistrust in people) (p. 324).

Terr (1991) divides traumatic experiences in childhood into two broad categories named *type I* and *type II* childhood traumas. Type I trauma indicates an unanticipated single distressing event that typically leads to reactions that meet the criteria of PTSD (re-experiencing, avoidance, and physiological hyperarousal). Events that classify as type I traumas are, for example, a single accident, a circumscribed natural disaster, or a single assault by another person. Children affected by type I trauma are assumed to exhibit complete, detailed memories of the traumatic event, retrospective cognitive reappraisals and reinterpretations, as well as misperceptions, visual hallucinations and time distortions.

Contrary to this, traumas that Terr (1991) classifies as type II traumas are characterized by exposure to multiple, repeated, long-standing, and extremely stressful events. Childhood physical and sexual abuse represent two of these extreme events. The symptoms exhibited by children who were affected by type II trauma are assumed to be different from those following type I traumas. According to Terr, what contributes to the particular sequelae of type II trauma is the continuous anticipation of further distressing events which is evoked by repeated exposure to traumatic situations. In order to protect themselves, the affected children employ various coping strategies and defense mechanisms that become manifest in the posttraumatic symptoms frequently observed in victims of long-standing trauma.

Furthermore, these defense operations are usually applied over a long period of time and thus often lead to profound changes in the individual's character. The disturbances caused by type II trauma are assumed to extend beyond the ones following type I trauma in that they include denial and psychic numbing, depersonalization and dissociation (which may result in multiple personality disorder), and aggression turned against others or the self. According to Terr, type I traumas do not have the same detrimental effect on the child's personality, because their sequelae appear to be restricted to experiences that are connected to the initial trauma.

Finally, Terr (1991) described traumas that do not fit unambiguously into one of the two categories but rather appear as crossover conditions between type I and type II. These scenarios occur when a single psychological blow leaves ongoing consequences (e.g., death of a parent, handicap following an accident, prolonged hospitalization). In summary, Terr's

distinction between acute and chronic traumatic events suggests that the intensity, frequency, and duration of a traumatic stressor may have a profound impact on both the nature and severity of the survivor's subsequent posttraumatic reactions.

While Terr (1991) points out important differences between single traumas and long-standing, repeated traumatic events, she provides only two categories to describe the various manifestations of interpersonal trauma. Arguing that two categories do not suffice to cover the entire range of interpersonal traumas, Solomon and Heide (1999) suggested a third category named type III trauma in order to account for multiple events of extreme sexual or physical violence experienced early in childhood at the hands of one or more perpetrators. There is a possibility that the application of only two categories masks meaningful differences *within* the group of long-standing interpersonal traumas that could explain differential effects of interpersonal trauma on mental health (e.g., age at the onset of the trauma, duration of the trauma). Terr's type II trauma category is likely to comprise a number of aspects of traumatic experiences that should be distinguished in order to get a clearer picture of how these particular trauma characteristics relate to posttraumatic stress symptoms.

In the present investigation, traumatic experiences will be distinguished according to three dimensions: interpersonal versus non-interpersonal trauma, single versus repeated/chronic trauma, and the survivors' age at the onset of the trauma. The next section provides a closer look at this distinction.

1.1.3 Types of interpersonal trauma

For the present investigation it is particularly important to distinguish clearly between interpersonal and non-interpersonal traumas as well as between different types of interpersonal trauma. The empirical study that is part of this thesis tests the prediction that different types of interpersonal trauma have differential effects on an individual's psychosocial functioning, thus an unambiguous terminology and clear definitions of the examined trauma types are needed. To the author's knowledge, however, the literature does not contain established and widely accepted definitions of the various forms of interpersonal trauma. Therefore, the present section provides the criteria according to which interpersonal traumas are distinguished in the present investigation.

In the literature, there is no clear definition for *interpersonal trauma*. In this thesis, it will be defined as a collective term for traumatic events that occur in an interpersonal context, meaning that the traumatic event is deliberately caused by another individual while engaging in a direct interaction with the traumatized person. Examples are sexual and physical assault and abuse. Interpersonal traumas are often distinguished from accidental traumas such as traffic accidents or natural disasters.

Furthermore, traumatic events can be classified in terms of the survivor's age when they experienced the trauma for the first time. The term *early trauma* indicates that the traumatic experience occurred at an early point of physiological and psychological development, which refers to childhood or adolescence. In a number of studies, traumas that occurred before the age of 14 were defined as early traumas, whereas those that occurred at the age of 14 or later were labeled *late traumas* (e.g., Liem & Boudewyn, 1999; Noll, Horowitz, Bonanno, Trickett, & Putnam, 2003; van der Kolk et al., 2005). However, some authors applied different age limits to distinguish between early and late onset, such as the age of 13 (Roth, Newman, Pelcovitz, van der Kolk, & Mandel, 1997), 15 (Limke et al., 2010), or 18 (Briere & Elliott, 2003; Cloitre, et al., 1997; DiLillo & Long, 1999).

Finally, traumatic events can be classified as to whether they occurred once or repeatedly. A *single trauma* is a circumscribed traumatic event that a given individual has experienced only once. Note, however, that one person can experience several single traumas that belong to different trauma categories (e.g., a car accident and an earthquake). The term *repeated trauma* is thus used to refer to one particular type of traumatic experience which has occurred several or many times throughout a person's life. Some repeated traumas are labeled *chronic*, suggesting that the person was exposed to the respective events regularly over an extended period of time. Herman (1992) characterizes prolonged, repeated trauma (as opposed to a circumscribed traumatic event) as a situation in which the affected person is in a "state of captivity, unable to flee, and under the control of the perpetrator" (p. 377). According to this author, such conditions are found in prisons, concentration camps, slave labor camps, some religious cults, brothels and other institutions of organized sexual exploitation, as well as in some families (p. 378). As Herman further notes, this state of captivity is characterized by a special type of relationship between victim and perpetrator which is marked by "coercive

control” (p.378). This control may be of physical as well as economic, social, and psychological nature.

The previous specification of interpersonal trauma types makes clear that the term *early chronic interpersonal trauma* refers to a long-standing experience of traumatic events which are deliberately caused by another individual and which had their first occurrence during an early period of the affected individual’s physiological and psychological development. For the purpose of conceptual clarity, in the present review the term early chronic interpersonal trauma is restricted to cases of long-standing childhood sexual abuse or childhood physical abuse which are characterized by an early onset. Accordingly, the research data presented in this review are drawn from studies of physical and sexual abuse. Experiences covered by the term *childhood sexual abuse* include attempted and actual intercourse, oral-genital contact, fondling of genitals, exposing children to sexual activity of adults or pornography, exhibitionism, and the use of children for prostitution or pornography (Putnam, 2003). The definition of physical abuse provided by Johnson (2002) includes (a) the use of an instrument on any part of the body and (b) tissue damage (beyond temporary redness due to a slap) by a hand which was caused by impact, pinching, shaking, penetration, heat, a caustic substance or a drug. This definition specifies that this damage is caused by a parent guardian, or custodial caretaker.

1.2 Epidemiology of early chronic interpersonal trauma

Prevalence data for childhood abuse are often based on retrospective accounts of adults about their childhood experiences. Data regarding prevalence and incidence can also be obtained from public records or records of professionals or institutions that offer support to abuse survivors. However, these numbers may be rather conservative estimates of the actual frequencies because the officially reported cases of childhood abuse presumably represent only a fraction of the actual number. Furthermore, the reported rates for sexual abuse among men are likely to underestimate the actual prevalence in the male population (Romano & De Luca, 2001). Romano and De Luca (2001) noted that research has paid less attention to male survivors of sexual abuse which may be due to the fact that girls appear to be more at risk of being assaulted. Furthermore, these authors noted that boys and men seem to be reluctant to report sexual abuse. According to these authors, one reason for this may be the fact that society perceives victimization and the need for help as unmasculine. A second reason which

may prevent some affected men to report their experiences could be the association of sexual abuse by a male perpetrator with homosexuality. Finally, clinicians seem to rarely ask male clients about histories of childhood sexual abuse (Lab, Feigenbaum, de Silva, 2000).

In 2008 (most recent data available), 16.1% of childhood maltreatment survivors were affected by physical abuse and 9.1% by sexual abuse (U.S. Department of Health and Human Services, 2008). The remaining abuse survivors had experienced other forms of maltreatment. Approximately half of the childhood abuse survivors were female. 32.6% of all affected children were younger than 4 years old. 23.6% were 4 to 7 years old, and 18.9% were in the age group from 8 to 11 years. In approximately 80.0% percent of all cases, the perpetrators were parents, out of which approximately 90.0% were biological parents. Other relatives made up for 6.5% of cases. Based on reports to the Child Protective Services in the United States, van der Kolk et al. (2001) reported that children who were living in single-parent families had a greater risk of being affected by physical and sexual abuse.

In a random civilian sample from the United States, Briere and Elliott (2003) obtained prevalence rates for sexual abuse of roughly 14% for men and 32% for women. Approximately 22% of men and 19.5% of women met criteria for physical abuse in childhood. Individuals who had experienced sexual abuse were more likely than non-traumatized individuals to have been exposed to physical abuse as well, and vice versa. Regarding victimization in adults, Briere and Elliott (2003) reported that 36% of their participants (32% of men, 36% of women) have been physically or sexually abused at least at one occasion at the age of 18 or later. In this investigation, adult victimization occurred more often in individuals with histories of childhood sexual or childhood physical abuse than in individuals without prior experience of abuse.

In accordance with the numbers provided by Briere and Elliott (2003), a review of the literature suggested that girls are more likely than boys to be affected by sexual abuse. Rates for female children ranged from 1% to 51% versus 1% to 14% for male children (Pereda, Guilera, Forns, & Gómez-Benito, 2009b). Similar prevalence rates with regard to childhood sexual abuse were reported by random community samples from Canada (Hébert, Tourigny, Cyr, McDuff, and Joly, 2009), Australia (Dunne, Purdie, Cook, Boyle, and Najman, 2003), and the United Kingdom (May-Chahal & Cawson, 2005). One exception is a study by Dunne et al. (2003) who found that more men than women reported unwanted non-penetrative

sexual contact before the age of 16 (9.2% vs. 2.4%, respectively), whereas more women than men reported unwanted penetrative sexual contacts (9.5% vs. 3.3%, respectively).

The reviewed epidemiological studies indicate that a significant proportion of the general adult population report exposure to childhood physical or sexual abuse.¹ However, in this context it is important to bear in mind that part of the reported data reflects the prevalence of childhood sexual abuse as from several decades ago, since the respondents were already adults at the time of assessment. The obtained prevalence rates show substantial variation which is likely to be determined by discrepancies in the definition of childhood abuse, the sample studied (e.g. clinical vs. non-clinical), the assessment methods, as well as the context in which data were collected (Pereda et al., 2009b; Putnam, 2003).

The following section addresses several prominent theoretical conceptualizations of mechanisms through which interpersonal trauma in childhood is assumed to disrupt the formation of interpersonal bonds and representations of interpersonal situations.

Subsequently, results of empirical studies will be presented that investigated the long-term consequences of interpersonal trauma. In this review of the evidence, special attention will be paid to consequences in the interpersonal domain.

1.3 Hypotheses regarding the impact of early chronic interpersonal trauma on attachment and interpersonal representations

A number of authors hold the view that the nature of events classified as early chronic interpersonal trauma differs substantially from that of traumas which do not involve an interpersonal context, occur only once or happen at a later point in life (e.g., Cloitre, Miranda, Stovall-McClough, & Han, 2005; van der Kolk, 2005; van der Kolk et al., 2005). Early chronic interpersonal trauma in the form of prolonged physical or sexual abuse in childhood is most often committed by the child's parent or another family member (van der Kolk, Hopper, & Crozier, 2001). Therefore, it is assumed that physical and sexual abuse in childhood or early adolescence affects the individual in a crucial phase and in a crucial context for the development of social skills and interpersonal bonds (Briere & Elliott, 1994;

¹ Note that the presented studies only referred to populations in particular Western English-speaking countries. Prevalence rates in other countries, and particularly in other culture groups, may be substantially different.

Cole & Putnam, 1992; van der Kolk, 2005). Van der Kolk (2005) postulates that physical or sexual abuse that is committed by a caregiver puts the affected child in a situation in which the person who is supposed to be a source of support, safety, and protection, at the same time becomes a cause of distress, pain, humiliation and insecurity. This view is shared by Cole and Putnam (1992) who assume that sexual abuse by a parent “violates the child’s basic beliefs about safety and trust in relationships, disturbing both the sense of self and the ability to have satisfying relationships in which one feels loved and protected” (p. 175).

In the context of secure attachment, caregivers are able to help children regulate their emotional states and maintain or restore their sense of safety and control in situations of danger or distress. However, if the caregivers themselves are the source of distress due to their violent, neglectful, inconsistent or emotionally absent behavior, they cannot serve as a source of security and emotional relief (van der Kolk, 2005). This results in a breakdown of the child’s ability to regulate their own internal states which van der Kolk and Courtois (2005) claim to be “the core of traumatic stress” (p. 386). At the same time it is hypothesized that abused children become unable to rely on others for help because they do not experience their immediate environment as a source of support (van der Kolk, 2005). Ford (2009) postulated that continuous efforts to cope with recurring experiences of maltreatment affect the development of core self-regulatory abilities which emerge in childhood and are carried on to adulthood. One of these self-regulatory abilities is secure attachment.

According to attachment theorists, the way a child experiences the availability, support, and acceptance provided by its caregiver has a strong influence on the way it will approach social situations later in life (Bartholomew, 1990; Bartholomew & Horowitz, 1991). Therefore, individuals who were assaulted during an early phase of psychosocial development and who did not have the opportunity to experience a loving and supportive relationship with a caregiver are expected to face difficulties in social behavior and relationships later in life. In particular, the loss of a sense of predictability and continuity of other people’s behaviors may result in a lack of impulse control, distrust in others, problems with intimacy and eventually social isolation (van der Kolk, 2005). Banyard et al. (2001) provided a theoretical explanation of the effects of childhood abuse that is based on learning theory. Inadequate coping mechanisms that are elicited by early chronic interpersonal trauma are assumed to turn into generalized dysfunctional coping strategies in various situations which may result in

increased psychological distress later in life. In section 1.4, empirical studies will be described that tested these predictions.

Based on the described theoretical concepts, a developmentally sensitive analysis of the impact of interpersonal trauma has been called for that analyzes the impact of early-onset interpersonal trauma as a function of the child's developmental stage and the particular developmental tasks they are confronted with (e.g., Cole & Putnam, 1992; van der Kolk, 2005; van der Kolk & Courtois, 2005). The following section gives an overview of the research that aimed to test predictions regarding the adverse effects of early-onset interpersonal trauma.

1.4 Evidence regarding long-term consequences of early chronic interpersonal trauma

A substantial amount of empirical evidence suggests that interpersonal trauma, especially if it occurred early in childhood and was chronic in nature, is linked to a wide array of adult psychopathology. Apart from causing immediate and short-term effects in childhood (for a review, see Briere & Elliott, 1994), abuse also appears to be linked to long-term consequences that last throughout adulthood (for a review, see Briere & Spinazzola, 2005). Given the substantial heterogeneity in acts classified as childhood abuse, as well as a host of mediating and moderating survivor-related, trauma-related, and environmental variables, a large variety in individuals' psychosocial adjustment to the trauma is observed. The sections of this chapter will review several themes from the existing literature on emotional and cognitive long-term effects of early chronic interpersonal trauma. First, the field of posttraumatic stress disorder will be addressed, followed by a description of more complex and diverse symptom clusters related to interpersonal trauma.

1.4.1 Posttraumatic stress disorder

Several studies have shown that early chronic interpersonal trauma is linked to posttraumatic stress disorder (PTSD) and PTSD symptoms (Briggs & Joyce, 1997; Cloitre et al., 1997; Ford, Stockton, Kaltman, & Green, 2006; Griffing et al., 2006; van der Kolk et al., 2005). Feerick and Snow (2005) found that traumas involving attempted or completed intercourse are associated with more PTSD symptoms than traumas involving fondling (but no attempted or actual intercourse), or non-contact exposure experiences. A similar result was reported by

Briggs and Joyce (1997). Moreover, these authors showed that the association between childhood sexual abuse by intercourse and PTSD symptoms remained significant when general psychopathology was controlled for. In the same publication, Briggs and Joyce also found that the number of abusive episodes involving intercourse was associated with the likelihood of experiencing PTSD symptoms.

Diagnostic criteria of PTSD. Since the inclusion of posttraumatic stress disorder (PTSD) in the diagnostic and statistical manual of mental disorders IV (DSM-III, 3rd ed., American Psychiatric Association [APA], 1980), this diagnostic category has been revised twice, but its fundamental diagnostic criteria were not substantially modified. According to DSM-IV-TR, posttraumatic stress disorder (PTSD) comprises characteristic symptoms following exposure to an extreme traumatic event which are defined by seven diagnostic criteria. Criterion A1 and A2 define which criteria an event need to meet and which reactions the person needs to show in order for this event to be called a traumatic stressor. These two criteria were introduced in section 1.1.1. PTSD is an exception to other disorders described in DSM-IV-TR in that the presence of a defined cause (i.e., a major stressor) is a necessary (but not sufficient) requirement for the diagnosis. The three central symptom clusters of PTSD are defined by criteria B, C, and D. The first describes persistent re-experiencing of the traumatic event (B), the second is concerned with persistent avoidance of trauma-associated stimuli (C), and the third criterion is related to persistent symptoms of increased arousal that were not present before the trauma (D). Criterion E specifies that, for PTSD to be diagnosed, these symptoms (criteria B, C, and D) need to persist for more than one month and criterion F requires the disturbances to cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

In the 10th revision of the International Statistical Classification of Diseases (ICD-10, World Health Organization [WHO], 1992), the diagnostic criteria for posttraumatic stress disorder are found in chapter V in the section ‘neurotic, stress-related and somatoform disorders’. In this classification, criterion A requires the exposure to a “stressful event or situation (either short or long lasting) of exceptionally threatening or catastrophic nature, which is likely to cause pervasive distress in almost anyone” (p. 120). Criterion B refers to re-experiencing and intrusion, and criterion C is concerned with actual or preferred avoidance of situations that are associated with the stressor. Criterion D requires at least one of two symptoms: either (1)

the inability to recall aspects of the exposure to the stressor, or (2) persistent symptoms of increased psychological sensitivity or arousal which were not present prior to the traumatic experience (e.g., difficulty in falling or staying asleep). Finally, criterion E indicates that criteria A, B, and C should have occurred within six months following a traumatic event or the end of a traumatic phase.

Epidemiology of PTSD in adulthood. In a replication of the National Comorbidity Survey², Kessler et al. (2005a) reported that 6.8% of English-speaking people in the United States aged 18 years or older have experienced symptoms that meet the diagnostic criteria of PTSD as defined by DSM-IV. For the 12-month prevalence of PTSD, the authors obtained a rate of 3.5%. In the European Study of the Epidemiology of Mental Disorders, certain types of stressors were more likely than others to be associated with PTSD. The events most frequently linked to PTSD were rape, being beaten up by a spouse or a romantic partner, an undisclosed private event (e.g., incest), having a child who is affected by a serious illness, being beaten up by a caregiver, and being stalked (Darves-Bornoz et al., 2008). In a prospective investigation, Widom (1999) found that children who were sexually and/or physically abused had an increased risk for PTSD when they were followed-up approximately 20 years after the abuse had occurred.

PTSD following interpersonal trauma: The influence of intervening factors. As mentioned in the previous section, 20% of women and 10% of men who were exposed to a traumatic event develop PTSD. But this also means that the majority of people (80-90%) who were affected by a traumatic stressor do not develop PTSD (Kessler et al., 2005b). This suggests that the occurrence of a traumatic stressor is a necessary but not a sufficient contributor to the emergence of PTSD (Ford, 2009). As with the majority of mental disorders, various biological, psychological, and social factors seem to be involved in the development of PTSD following a traumatic experience as well as in the resilience towards posttraumatic stress.

Among the factors associated with a greater likelihood of developing PTSD following interpersonal trauma, empirical studies found sex (Ford, 2009), an early onset of the trauma (Kaplow & Widom, 2007; van der Kolk et al., 2005; Roth et al., 1997), severity of the

² The National Comorbidity Survey was the first nationally representative survey of mental health among the general population. Structured psychiatric interviews were used to assess DSM-III-R (APA, 1987) disorders.

traumatic stressor (Brewin, Andrews, & Valentine, 2009), prior traumatic experiences (Ozer, Best, Lipsey, & Weiss, 2003), general violence in the family (Ford, 2009), as well as race, socioeconomic status, and psychological functioning prior to the trauma (for a review, see Briere, 2004). Feerick and Snow's (2005) findings suggest that an early age of onset may be associated with lower levels of PTSD in adulthood. However, the more frequent findings are the ones indicating that an early trauma onset is associated with a greater risk for mental disorders compared to late-onset traumatic experiences (e.g., Kaplow & Widom, 2007; van der Kolk et al., 2005; Roth et al., 1997). Characteristics of stressors that have shown to increase the likelihood or severity of PTSD include intentional acts of violence (as opposed to non-interpersonal events), presence of life threat, physical injury, unpredictability and uncontrollability, and sexual (as opposed to non-sexual) victimization (Briere, 2004). Assuming that these characteristics apply to early chronic interpersonal trauma, one can conclude that affected individuals may be especially prone to developing PTSD.

Just as there are factors that appear to be associated with an increased risk of PTSD, other factors have been found to be linked to lower rates of PTSD. In a review of findings regarding potential protective factors, Ford (2009) mentions coping self-efficacy, social support, and intellectual capacities and education (because they are linked to socioeconomic resources which may increase a person's access to other two protective factors). Ford suggests that these resources help the distressed individual resist or resiliently recover from PTSD. In particular the third protective factor, the availability of social support, is consistently reported to be linked to lower rates of PTSD following interpersonal trauma (Brewin et al., 2000; Vogt, King, & King, 2007).

1.4.2 Complex psychopathology following interpersonal trauma

The diagnostic criteria for PTSD as described for the first time in DSM-III (American Psychiatric Association [APA], 1980) were derived from the study of reactions experienced by American combat troops who were exposed to war trauma in Vietnam. Despite being a very useful diagnostic category for a number of traumatic events, PTSD has shown to be but one part of the difficulties experienced by survivors of child abuse, domestic violence, and other forms of prolonged interpersonal trauma (Briere & Spinazzola, 2005; Ford et al., 2006; van der Kolk, 2007, van der Kolk & Courtois, 2005). A substantial number of investigations indicated that adults and adolescents who were a target of interpersonal violence in childhood

are often affected by difficulties that are posttraumatic in nature but that extend beyond the range of PTSD-symptoms specified by DSM-IV or ICD-10 (e.g., Briere & Elliott, 2003; Briere & Spinazzola, 2005; Ford et al., 2006, Maniglio, 2009).

Briere and Elliott (2003) applied the Trauma Symptom Inventory (TSI; Briere, 1995) to assess psychological sequelae among adults physically or sexually abused as children. The TSI consists of the following 10 clinical scales: anxious arousal, depression, anger-irritability, intrusive experiences, defensive avoidance, dissociation, sexual concerns, dysfunctional sexual behavior, impaired self-reference, and tension reduction behavior. Among adults with a history of sexual abuse in childhood, Briere and Elliott (2003) found elevated degrees on all 10 scales of the TSI. Physical abuse in childhood was associated with all TSI scales except the ones related to sexual symptoms and tension reduction behavior. A study using data collected for the National Comorbidity Survey (see section 1.4.1) showed that female adult survivors of childhood sexual abuse were affected by mood disorders, anxiety disorders (including agoraphobia, panic disorder, social phobia, posttraumatic stress disorder), and a number of substance disorders including drug and alcohol problems and dependence (Molnar, Buka, & Kessler, 2001). In the same study, childhood sexual abuse of boys was significantly related to posttraumatic stress disorder, alcohol dependence, drug problems, and drug dependence. In addition to these symptoms, a review by Maniglio (2009) includes reports of dissociative, somatoform, and personality disorders as well as self-injurious behavior and suicidal ideation. Additionally, childhood sexual abuse appears to be linked to borderline personality disorder (Zlotnick, Mattia, & Zimmerman, 2001b). Apart from psychiatric diagnoses, several other psychosocial disturbances were found in survivors of early interpersonal trauma, such as impaired sense of self, difficulties with affect regulation, dysfunctional interpersonal relations, inadequate cognitive schemata, and avoidance reactions (for a review, see Briere & Spinazzola, 2005). Briere and Jordan (2009) assigned long-term psychological outcomes of childhood maltreatment to nine categories: posttraumatic stress (intrusive reliving experiences, avoidance, hyperarousal), cognitive disturbance (e.g., negative mental representations leading to low self-esteem, expectation of rejection, etc.), mood disturbance (anxiety, depression, anger), somatization (e.g., chronic pelvic pain, genitourinary problems), disturbance of identity and self-awareness, chronic interpersonal problems, difficulties with emotion regulation, and use of avoidance as a coping mechanism (including dissociation, substance abuse, and tension reduction behaviors).

Trauma characteristics related to complex posttraumatic symptoms. The current section addresses several aspects of traumatic experiences that have shown to be related to trauma symptom complexity in empirical studies. It is important to note, however, that the term ‘symptom complexity’ has not been clearly defined in the literature. The various studies investigating this phenomenon employed different operationalizations to assess the degree of complexity of posttraumatic symptoms. While some defined symptom complexity as the number of different types of symptomatology reported (e.g., Briere, Kaltman, & Green, 2008), others referred to systematic concepts of complex trauma-related symptoms, such as DESNOS which will be described later in this chapter (e.g., Ford et al., 2006).

Trauma type. Briere et al. (2008) showed that early interpersonal traumas, such as child rape, child physical abuse, threats with a weapon, attempted rape and other forms of sexual contact in childhood are more strongly associated with symptom complexity than other forms of childhood trauma (e.g., a life-threatening accident, robbery or mugging with a weapon, physical assault other than physical abuse). In a study conducted by Ford et al. (2006), even a single incident of interpersonal trauma was sufficient to raise levels of complex posttraumatic symptoms, whereas a single non-interpersonal trauma did not have this effect.

Cumulative trauma. Briere et al. (2008) reported that the number of trauma types an individual has experienced is related to the complexity of trauma-related symptoms (defined as the simultaneous experience of different kinds of symptoms). Cumulative trauma remained a predictor of complex posttraumatic symptomatology even when the traumas with a presumably significant impact, such as rape and child physical abuse, were controlled for. In turn, childhood rape and physical abuse remained significant predictors of symptom complexity, even when cumulative trauma was taken into account, suggesting that these two types of assault by themselves constitute severe threats to psychological functioning. Similar findings regarding the connection between the number of abuse incidents and complex posttraumatic symptoms were reported by Briere and Elliott (2003) and Cloitre et al. (2009).

Age of onset. Even though complex posttraumatic symptoms are not restricted to those who were physically or sexually abused as children, evidence indicates that interpersonal trauma at an early age is more likely to be linked to these complex adaptations than late onset interpersonal victimization (e.g., Cloitre et al., 1997; Kaplow & Widom, 2007; van der Kolk

et al., 2005). Cloitre et al. (1997) reported that women who were assaulted both in childhood and in adulthood were at a higher risk of developing complex symptoms such as alexithymia, dissociation and suicide attempts compared to women who were assaulted as adults or who were not assaulted at all. At the same time, these groups did not differ regarding the severity of PTSD symptoms they reported. Similarly, van der Kolk et al. (2005) reported that, in an early-onset interpersonal trauma group, there was a higher prevalence of PTSD together with complex posttraumatic symptoms than PTSD alone. At the same time, no such difference was found for late-onset interpersonal traumas. Contrary to these findings, Roth et al. (1997) did not find an association between age of onset and the presence of complex symptomatology. The same applies to an investigation by Briere and Elliott (2003). Instead, in this study, sexual abuse at a later age predicted a higher degree of complex psychopathology. It is possible that a short period between the trauma and the time of assessment contributed to the increase in symptoms in this study. However, this contradiction in the evidence indicates that we still do not have a clear understanding of the exact relationships between posttraumatic symptom complexity and various aspects of the traumatic experience.

To sum up the evidence, the literature on psychological trauma suggests that the diagnostic category of PTSD is a valuable and useful concept for the description of posttraumatic reactions following single stressful events. At the same time, there is empirical evidence suggesting that early chronic interpersonal trauma, usually in the form of childhood sexual or physical abuse, is connected to a more complex symptomatology, which is not covered by the conventional PTSD diagnosis, and which is assumed to reflect the impact of the trauma on the development of self and social functioning. However, it should be pointed out that there is some ambiguity in the results of the studies that investigated complex posttraumatic symptoms. For example, as mentioned previously, it is not clear whether an early- or a late-onset interpersonal trauma is more likely to be followed by complex symptomatology. To date, there are only very few studies that have systematically compared different types of interpersonal trauma with regard to complex trauma-related psychopathology and that have taken into account the age of onset and different degrees of trauma chronicity (e.g., van der Kolk et al. 2005). Further research is needed in order to understand the exact nature of the relationship between complex trauma-related symptoms and particular characteristics of interpersonal trauma.

Complexity versus comorbidity. There are different points of view as to whether complex posttraumatic symptoms that co-occur with PTSD constitute an independent and consistent adaptation to interpersonal trauma or whether they should be viewed as comorbid conditions in addition to PTSD. The International Consensus Group on Depression and Anxiety came to the conclusion that PTSD is associated with an increased risk of comorbid disorders (Ballenger et al., 2000). According to this group's statement, a diagnosis of PTSD without comorbid conditions does not adequately describe the typical reactions observed among individuals seeking treatment for psychological trauma. Similarly Spinazzola, Blaustein, and van der Kolk (2005) postulated that PTSD rarely occurs in "pure" form, without comorbid disorders. The Australian National Comorbidity Study (Creamer, Burgess, & McFarlane, 2001) reported that 88% of individuals with PTSD suffer from at least one other disorder, typically major depressive disorder (48%) and alcohol abuse (52%). This study also showed that Axis II diagnoses were significantly more frequent among people with PTSD as compared to people without PTSD.

Given these findings, it has been criticized that complex posttraumatic symptoms are often perceived as secondary to the "core" posttraumatic psychopathology (van der Kolk & Courtois, 2005). Moreover, they are among the most frequently applied exclusion criteria in PTSD research (Spinazzola et al., 2005). Spinazzola et al. (2005) concluded that this practice causes the typical treatment-seeking population presenting with symptoms that usually come along with PTSD to be excluded from studies for the sake of increasing internal validity. However, as the authors note, this exclusion of supposed confounding variables happens at the cost of external validity, thereby making it difficult to develop comprehensive and effective treatments for those who are most severely affected by trauma. Contrary to this view, in a meta-analysis, Olatunji, Cisler, and Tolin (2010) observed that substantial rates of comorbidity are common in random clinical trials (RCTs) of anxiety disorders, including PTSD. The authors concluded from these results that treatments deemed efficacious based on these RCTs are suited for real life patients affected by anxiety disorders and comorbid conditions. Furthermore, this study has found that in the case of PTSD, the degree of comorbidity correlated positively with effect sizes in treatment outcome studies, suggesting that comorbidity was associated with more favorable treatment outcomes (of disorder-specific, mostly cognitive-behavioral interventions) for patients diagnosed with PTSD.

Olatunji et al. (2010) suggested that efforts to design treatments that simultaneously address the core anxiety disorder and comorbid conditions may be premature as in particular cases, treatment of the core symptoms may improve the outcome for both the anxiety disorder and comorbid symptoms. However, criticism over the separate analysis of PTSD and complex trauma sequelae has remained strong in the literature and has led to the proposition of a number of systematic descriptions of complex posttraumatic psychopathology. These approaches aim to describe and classify complex trauma-related symptoms in independent diagnostic categories. The following section reviews the most prominent of these concepts.

Propositions for a systematic classification of complex trauma sequelae. In this section, three approaches will be presented that aimed to combine the variety of complex posttraumatic symptoms into single, independent diagnostic frameworks. First, a concept developed by Herman (1992) will be reviewed, followed by the categories of developmental trauma disorder (DTD; van der Kolk, 2005) and DESNOS (Roth et al., 1997; van der Kolk et al, 1996).

Conceptualization by Herman (1992). Arguing for the existence of a complex form of posttraumatic disorder in survivors of early prolonged trauma, Herman (1992) proposed an extensive description of three “areas of disturbance” (p. 379) encountered by individuals who had been exposed to long-standing traumatic events. The first area addresses symptomatic sequelae (somatic, cognitive, affective, behavioral, and relational) of prolonged victimization, the second deals with characterological consequences, and the third area is concerned with survivors’ vulnerability for repeated harm. The characterological aspect includes pathological changes in relationships and in identity, which are assumed to be consequences of the coercive control exerted by the perpetrator. Both types of pathological changes are assumed to cause the victim to experience insecurity and helplessness and thus offer a possible explanation for the observation that many survivors of childhood abuse exhibit instable attachment to others in adulthood and engage in intense but unstable relationships (see section 1.5.1). The third domain of disturbances in survivors of prolonged trauma refers to the repetition of harm following prolonged victimization which includes intrusive memories, as well as somato-sensory and behavioral re-enactments of the traumatic experiences. Furthermore, this domain addresses the observation that abuse survivors are at increased risk

of repeated harm, either self-inflicted or at the hands of others (e.g., rape, sexual harassment, battering). The issue of re-traumatization is addressed in section 1.6.2.

Developmental trauma disorder. In case of children survivors, complex symptoms following repeated abuse have been integrated into the diagnostic category of ‘Developmental Trauma Disorder’ (DTD) as proposed by van der Kolk (2005). The diagnosis of DTD requires “multiple or chronic exposure to one or more forms of developmentally adverse interpersonal trauma” (van der Kolk, 2005, p. 14) as well as the subjective experience of rage, betrayal, fear, resignation, defeat, or shame in response to the trauma. The diagnostic criteria of DTD include symptoms of dysregulation (affective, somatic, behavioral, cognitive, relational, and self-attributional) as a response to trauma cues, persistently altered attributions and expectancies (e.g., reduced expectation to be protected by others), and functional impairment (e.g., of educational and familial functions).

DESNOS. With regard to adult survivors of early interpersonal trauma, complex posttraumatic symptoms have been most frequently described using the concepts of *complex PTSD* (Herman, 1992) and *disorders of extreme stress not otherwise specified* (DESNOS; van der Kolk et al, 1996; Roth et al., 1997). The latter became a very prominent systematization of complex posttraumatic psychopathology experienced by survivors of repeated and prolonged trauma and was studied among various populations (e.g., Ford, 1999, 2006; Ford & Smith, 2008; van der Kolk et al., 1996, 2005; Pelcovitz et al., 1997; Roth et al., 1997). According to Roth et al. (1997), DESNOS constitutes a clinical presentation which is rooted in the “profound impact that traumatic experiences may have on self-regulation, self-definition, interpersonal functioning, and adaptational style” (p. 540). It consists of seven symptom clusters which were derived from research on the effects of chronic interpersonal trauma. These clusters address alterations in the following areas of self-regulation and psychosocial functioning: (I) regulation of affect and impulses (e.g., modulation of anger, difficulty modulating sexual involvement), (II) attention or consciousness (e.g., amnesia, transient dissociative episodes), (III) somatization (e.g., chronic pain, conversion symptoms), (IV) self-perception (e.g., guilt, responsibility, shame), (V) perception of the perpetrator (e.g., idealization of the perpetrator, preoccupation with hurting perpetrator), (VI) relations with others (e.g., inability to trust, revictimization), and (VII) systems of meaning (e.g., despair

and hopelessness). Pelcovitz et al. (1997) developed a structured interview for the assessment of DESNOS symptoms (Structured Interview for Disorders of Extreme Stress, [SIDES]).

In empirical studies, DESNOS symptoms have shown to occur more often among survivors of early childhood abuse, in particular sexual abuse, and survivors of interpersonal violence than among individuals who have experienced non-interpersonal traumas such as accidents or illnesses (Ford et al., 2006; van der Kolk, 2005; Roth et al., 1997). Furthermore, van der Kolk et al. (2005) found that individuals affected by an early onset and a longer duration of an interpersonal trauma reported a combination of PTSD and DESNOS symptoms more frequently than individuals with a late onset and a shorter duration of the trauma. At the same time, no association was found between an early onset or a long exposure to trauma and PTSD alone. While van der Kolk et al. (2005) reported prevalence rates for each DESNOS symptom cluster, the authors did not provide information about the prevalence of full DESNOS in their sample.

It is apparent, that the DESNOS categories substantially differ from the diagnostic criteria of PTSD. In DSM-IV-TR, PTSD is classified as an anxiety disorder, whereas DESNOS describes a broader set of impairments which are reflected in high degrees of emotional stress, dissociation, loss of trust in relationships, loss of a sense of meaning in life, and chronic health problems without identifiable medical causes (Ford et al., 2006). However, there is evidence that symptoms of DESNOS only occur in combination with PTSD, and not by themselves (Pelcovitz et al., 1997; van der Kolk et al., 2005) which causes unclarity as to whether they represent a qualitatively different type of posttraumatic reaction or whether they are comorbid conditions of PTSD that arise from a particularly severe trauma. What adds to the skepticism regarding the concept of DESNOS is the fact that Ford et al. (2006) hardly obtained any cases of full DESNOS (i.e., individuals who endorsed all DESNOS symptoms) among the participants in their study. Instead, their participants reported rather single symptom clusters of DESNOS that appeared to be largely independent of one another. Unfortunately, van der Kolk et al. (2005) did not report the prevalence of full DESNOS in their sample, according to the diagnostic criteria specified by Pelcovitz et al. (1997), but only the frequencies of the single DESNOS symptom clusters.

Neither of the described systematizations of complex adaptations to trauma has been included in the DSM-IV or ICD-10 nomenclature. Instead, DSM-IV introduced a cluster of complex posttraumatic symptoms under the term ‘associated features of PTSD’. The ICD-10 refers to complex posttraumatic reactions with a category termed “enduring personality change after catastrophic experience”.

Summary and evaluation of the evidence. Early chronic interpersonal trauma appears to be associated with a particular constellation of symptoms which co-occur with PTSD and which are less frequently found in survivors of late onset interpersonal or non-chronic trauma or among individuals exposed to disaster. At the same time, PTSD does not appear to vary as a function of the trauma type (interpersonal trauma vs. disaster), the age of onset or the duration of an interpersonal trauma. However, the conclusion that sequelae of early chronic interpersonal trauma are consistent and best described by a unitary concept like DESNOS appears to be premature for several reasons. First, as mentioned in this chapter, studies showed that cognitive or cognitive-behavioral treatment of PTSD may be effective even when comorbid disorders are not taken into account simultaneously (Olatunji et al., 2010). Second, there appears to be a substantial overlap between the symptoms of DESNOS and borderline personality disorder (BPD) (e.g., Driessen et al., 2002; Scoboria, Ford, Lin, & Frisman, 2002) and to the author’s knowledge, no clear guidelines exist as to how these two concepts should be distinguished. Third, investigations provide an unclear picture of the prevalence of full DESNOS. While Roth et al. (1997) reported that 50% of their sample met the criteria for DESNOS, it was only 1% in the study by Ford et al. (2006). Thus, it would be problematic to establish DESNOS as an independent diagnostic category before there is more certainty about how consistently its symptom clusters are reported by individuals with early-onset interpersonal trauma. There is a certain degree of variation in the types of traumas experienced by the participants of the described studies that may have contributed to this inconsistency in the results. Perhaps it is the sequelae of only a particular subtype of early chronic interpersonal trauma that are adequately described by the DESNOS concept. Other subtypes may be linked to different patterns of complex symptomatology. Therefore, an alternative approach to the investigation of complex trauma-related symptoms could be to focus on several separate clusters of complex symptoms that emerge following an early chronic interpersonal trauma rather than on one broad category such as DESNOS.

Subsequent to this review of complex posttraumatic symptomatology following early chronic interpersonal trauma, the introduction will focus on one particular complex sequel, namely attachment insecurity in adulthood. There is a substantial amount of evidence indicating that adult attachment is affected by early interpersonal trauma and, in turn, affects a number of other psychological processes of trauma survivors. However, unlike in the case of DESNOS, there hardly any evidence on how the age of onset and chronicity of interpersonal traumas affect adult attachment security. As the subsequent empirical study compares adult attachment security in individuals who had been exposed to different types of interpersonal trauma, the following sections will give an overview of the existing theoretical and empirical literature regarding this phenomenon.

1.5 Attachment in the context of early chronic interpersonal trauma

1.5.1 Applying attachment theory to the study of interpersonal trauma

As was stated before, long-standing interpersonal trauma such as sexual or physical abuse often occurs in an intrafamilial context and is presumed to be characterized by a lack of predictability regarding the perpetrator's actions and an ongoing fear of further assaults (see section 1.3). Thus, interpersonal violence which occurs at an early age is expected to interfere with the formation of adequate representations of interpersonal relationships and to undermine the development of a sense of trust, safety, and predictability in interactions with others. In 1992, Pamela C. Alexander published a theoretical paper with the aim to promote the application of attachment theory as a framework for the study of the antecedents and consequences of childhood sexual abuse. According to Alexander (1992), attachment theory "attempts to explain the development and potential distortion of intrapsychic processes such as emotion and cognition within the context of relationships" (p. 185). The author argued that attachment theory can contribute to a more profound understanding of the circumstances that surround the occurrence of childhood sexual abuse and of its long-term effects on psychological functioning and relationship styles. In particular, she suggested that the examination of attachment patterns within the affected child's family could help investigate the factors that precede the abuse and variables that mediate its long-term effects on intrapsychic processes.

Family dysfunction is a well documented associated factor of childhood abuse (Kellogg & Menard, 2003; Klonsky & Moyer, 2008, Mullen, Martin, Anderson, Romans, & Herbison, 1996; Widom, 1999). Individuals who were abused in childhood are more likely to have lived in a dysfunctional family environment which includes, for example, being raised by parents who had been arrested, who received welfare, or who had alcohol or drug problems (Widom, 1999). Furthermore, adverse family environments are characterized by factors such as poor parenting, family violence, parents' separation while the child is young, physical punishment, or a lack of parental warmth (for a review, see Weiss, Longhurst, & Mazure, 1999). Further research that aimed to identify intrafamilial risk factors for the onset of abuse will not be reviewed here as this exceeds the thematic scope of this thesis.

According to the attachment literature, individuals differ in their quality of attachment, with quality referring to security or insecurity of attachment. Insecure attachment is then further described in terms of the kind of insecurity (e.g., anxious, avoidant, disorganized attachment) (Shaver, Belsky, & Brennan, 2000). Before the empirical evidence regarding the association of childhood abuse and attachment patterns is reviewed, a short overview of conceptualizations of attachment in childhood and in adulthood will be provided.

1.5.2 Theories of attachment

Attachment in childhood. The perhaps most influential theory of attachment in childhood was developed by John Bowlby (1973, 1980, 1982) and Mary Ainsworth (Ainsworth, Blehar, Waters, and Wall, 1978) in a common effort. In the following sections, the terms attachment figure and caregiver will be used interchangeably in order to refer to the individual, or the individuals, that the child's attachment is primarily directed at.

According to Bowlby (1982), attachment is a universal and biologically based bond with a caregiver who – in evolutionary terms – serves the protection of the infant and thereby secures its survival. A child's attachment system is most apparent in situations of anxiety, fear, illness and fatigue during which the child seeks contact with its caregiver in order to increase their sense of security (Bartholomew, 1990). Depending on whether the caregiver is sensitive or insensitive to the child's attachment signals and whether he or she responds to these signals adequately, the child will either experience a feeling of safety or one of

insecurity and stress. Bowlby (1973) postulates that a child's attachment style is represented by two internal working models: the model of the self and the model of the other. These mental constructions are formed following the internalization of early experiences regarding the physical and emotional availability of the attachment figure. The model of the self comprises the children's expectations concerning their own role in relationships and is characterized by "whether or not the self is judged to be the sort of person towards whom anyone, and the attachment figure in particular, is likely to respond in a helpful way" (Bowlby, 1973, p. 204). The model of the other is concerned with others' roles in relationships and the question "whether or not the attachment figure is judged to be the sort of person who in general responds to calls for support and protection" (Bowlby, 1973, p. 204). The internal working models subsequently guide children's predictions and interpretations regarding both the behavior of the attachment figure and their own reactions. According to Bowlby (1980) the interaction patterns that characterize these working models become increasingly automatic in the course of the infant's development and thereby become largely stable representations. Abuse by a caregiver constitutes an extreme case of rejection which causes the child to experience intense stress and insecurity. The inadequate behavior of the attachment figure during these adverse interpersonal experiences is therefore likely to disrupt the process of establishing secure attachment patterns with early caregivers (Alexander, 1992).

In observational studies using the 'Strange Situation', Ainsworth et al. (1978) obtained evidence for three distinct attachment patterns: secure, avoidant, and anxious-resistant. Main and Solomon (1990) later suggested a fourth attachment pattern called disorganized/disoriented attachment in order to account for infants who present no coherent strategy for dealing with the separation from and reunion with their caregiver. Instead, these children exhibit various disorganized and contradictory behavior patterns that are assumed to correspond to their contradictory perception of the abusive attachment figure. A large body of evidence supports the hypothesized link between parents' responsiveness and children's attachment security as well as the association between children's attachment behaviors and their mental representations of the self and their caregivers (Cassidy & Shaver, 2008). For in-depth information on the respective investigations, consult Cassidy and Shaver (2008).

Attachment in adulthood. It is assumed that attachment styles that are developed in childhood persist throughout the lifespan and are transferred to various types of affectional bonds in adulthood (Ainsworth, 1989). Kim Bartholomew, who has provided a large body of research on adult attachment, holds the view that intimate partner relationships are the most important attachment relationships in adulthood (Bartholomew, 1990). The present section introduces the lines of research regarding adult attachment that have shown to be the most important ones over the last 20 to 25 years (Shaver et al., 2000).

Concept underlying the Adult Attachment Interview. An early approach to the conceptualization of adult attachment was introduced with the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1996). This interview procedure resulted from the application of Ainsworth's observational methods (e.g., Ainsworth et al., 1978) to the study of parents' "mental representation of the self in relation to attachment" (Main, Kaplan, & Cassidy, 1985, p. 67). The AAI assesses adults' attachment patterns by asking about their memories of their relationships with attachment figures during childhood.

Three-category model of adult attachment. A second line of research on adult attachment quality was coined by Hazan and Shaver (1987) who pointed out parallels between Bowlby's and Ainsworth's three qualities of infant attachment (secure, avoidant, and anxious/ambivalent) on the one hand and behavioral and emotional patterns in adult love relationships on the other hand. They argued that attachment patterns that are expressed in romantic relationships are related to childhood experiences with the caregiver. In fact, Hazan and Shaver were the first to provide empirical support for an attachment-based approach to romantic love. They applied the three mutually exclusive attachment patterns that were originally developed to describe childhood attachment (secure, avoidant, anxious/ambivalent), to the study of adult attachment and found that the assignment of participants to these three categories corresponded to various criterion variables regarding intimate attachment in the expected way (Hazan & Shaver, 1987).

Two-dimensional/Four-category model of adult attachment by Bartholomew (1990).

Bartholomew (1990) introduced a new approach to conceptualizing adult attachment by integrating the notion of internal working models of the self and other (Bowlby, 1973, 1982) into her model. This resulted in the introduction of a dimensional approach to adult

attachment and the formulation of two distinct dimensions of attachment: *dependence* which is related to the model of the self and *avoidance* which refers to the model of the other (Figure 1).

		MODEL OF SELF (Dependence)	
		Positive (low)	Negative (high)
MODEL OF OTHER (Avoidance)	Positive (low)	<p>SECURE Comfortable with intimacy and autonomy</p>	<p>PREOCCUPIED Preoccupied with relationships</p>
	Negative (high)	<p>DISMISSING Dismissing of intimacy</p>	<p>FEARFUL Fearful of intimacy Socially avoidant</p>

Figure 1. Two-dimensional model of adult attachment (Bartholomew, 1990)

According to Bartholomew (1990), these attachment dimensions are reflected in particular social response styles of individuals and thereby become manifest in their behavior. As shown in Figure 1, the degree of dependence varies from low (self-esteem is largely internalized and does not require external confirmation) to high (self-esteem requires others' ongoing acceptance) whereas high and low avoidance refer to whether a person does or does not seek close contact with others, depending on their expectations of aversive consequences.

Bartholomew labeled the four attachment categories *secure*, *preoccupied*, *dismissing*, and *fearful*. In this context, secure attachment indicates a sense of worthiness combined with the expectation that other people are generally accepting and responsive. Preoccupied attachment indicates a sense of unworthiness combined with a positive evaluation of others. Individuals belonging to the fearfully attached group desire social contact and intimacy but avoid it out of distrust and fear of rejection. Just like the fearful style, the attachment category labeled dismissing describes individuals who view others as uncaring and rejecting but, at the same time, perceive themselves as worthy of others' love. These individuals deny having attachment needs and thus passively avoid close relationships.

Bartholomew developed this model of adult attachment as a result of her conclusion that three-category models of adult attachment (e.g., Hazan & Shaver, 1987) do not consider the fact that the avoidance of attachment may differ according to a person's motivation to become or not to become attached to others. Three-category models contain only one category for avoidant attachment, which represents fear of closeness but excludes the possibility that an individual is not interested in becoming attached to others in the first place. Taking this into account, Bartholomew (1990) included both the fearful and the dismissing type into her model of adult attachment. Individuals belonging to both groups avoid becoming attached (high avoidance) but they differ in the extent to which they depend on others for maintaining a positive self-regard (high vs. low dependence) (Bartholomew & Horowitz, 1991). Similarly, the preoccupied and fearful groups both strongly depend on others' acceptance but they differ in their efforts to engage in close relationships. While the preoccupied individuals reach out to others, the ones described as fearful restrict closeness to others in order to avoid potential disappointment. Bartholomew (1990) emphasized that the proposed attachment styles are solely prototypes, which means that members of one category vary in their degree of typicality. It is likely that a given person's experiences will not uniformly match a single category but rather be more or less representative of two or more prototypes.

Studies conducted by Bartholomew and Horowitz (1991) provide strong evidence for the validity of the four proposed attachment categories which they assessed using both a semistructured interview and a self-report questionnaire. The obtained correlations between the four attachment types as well as between each attachment type and 15 other rating scales corresponded to expectations. Furthermore, the results reported by Bartholomew and Horowitz support the two-dimensional structure of adult attachment types. Measures of self-concept and sociability distinguished both a positive from a negative model of the self and a positive from a negative model of the other, respectively. In a subsequent study, Griffin and Bartholomew (1994) obtained evidence for convergent and discriminant validity of the proposed four attachment categories.

Two-dimensional model of adult attachment by Brennan, Clark, and Shaver (1998). Brennan, Clark, and Shaver (1998) analyzed a large number of self-report measures of adult attachment and found two separate dimensions to underlie all scales that they had examined, which they

termed *avoidance* and *anxiety*. According to Brennan et al., these dimensions represent the same constructs as the ones proposed by Bartholomew (1990) with the exception that Brennan et al. used the term anxiety instead of dependence. In this context, attachment-related anxiety indicates the extent to which individuals feel secure or insecure about their partner's availability and responsiveness. Attachment-related avoidance refers to the extent to which individuals feel uncomfortable or secure being close to others and depending on others. Following the identification of these attachment-related dimensions, Brennan et al. (1998) proposed a two-dimensional model of adult attachment with the aim to combine all self-report measures of adult attachment into a single framework and thus to construct a uniform assessment method. The authors used Bartholomew's labels (secure, preoccupied, dismissing, fearful) in order to mark the four attachment patterns that result from the combination of the dichotomized avoidance and anxiety dimensions. However, they pointed out the advantages of a dimensional assessment of avoidance and anxiety on separate scales over an assignment of individuals to attachment categories claiming that dimensional procedures lead to a more precise measurement. Section 1.5.4 provides a closer look at this discussion as well as at several methods for assessing adult attachment.

1.5.3 Continuity of attachment from infancy to adulthood

Bowlby (1982, 1980) postulated that internal working models remain stable throughout an individual's ontogenetic development if no drastic changes in the caregiving environment or in relationships occur. Major shifts in the caregiving environment require adaptation and therefore have the potential to cause changes in the individual's internal working models. Bowlby makes no statement about the stability of the internal working models once an individual has reached adulthood but Fraley (2010) noted that to date, researchers still do not have a strong understanding of the factors that may influence an adult's attachment style. In a longitudinal study, Waters, Merrick, Treboux, Crowell, and Albersheim (2000) assessed adults' attachment quality and compared these results to the same individuals' data in a study involving the 'Strange Situation' (Ainsworth et al., 1978) in which they had participated 20 years before. Adult attachment was assessed using the Adult Attachment Interview (AAI; George et al., 1996). On the one hand, the results of this investigation provide evidence for the stability of attachment patterns from infancy to early adulthood. On the other hand, they also indicate that attachment patterns remain open to revision in light of stressful life events.

Infants who had experienced one or more stressful life events according to the reports of their mothers were more likely to change from secure to insecure attachment than infants for whom no such events were reported. Another study involving a sample at risk for poor developmental outcomes did not find evidence for continuity of attachment patterns from infancy to late adolescence, thus providing further indication that adverse life events may lead to shifts in attachment security (Weinfield, Sroufe, & Egeland, 2000; Weinfield, Whaley, & Egeland, 2004). However, the same authors also noted that the AAI may not be appropriate for assessing attachment styles among late adolescents. Furthermore, some of the discontinuity in attachment may be attributable to the different attachment measures used in infancy and in adolescence, which in many cases were the 'Strange Situation' and the AAI, respectively. Nonetheless, the findings concerning the continuity of attachment patterns provide relevant support for the notion, that "attachment is not a static personal quality, but an adaptive, context sensitive, relational quality" (Weinfield et al., 2004, p. 90). It is important to note that Bartholomew (1990) pointed out methodological problems with regard to the comparison of stability rates. She argued that researchers rarely consider differences in stability indicators that are expected by chance.

1.5.4 Assessing adult attachment styles

Measures of adult attachment can be distinguished according to four aspects: *domain* (family, peer, or romantic relationships), *method* (interview, Q-sort, or self-report), *dimensionality* (categories, prototype ratings, or dimensions), and *categorization systems* (Brennan & Shaver, 1998). Despite this variation in the approaches, Brennan and Shaver (1998) concluded that there is substantial consistency among the various types of attachment measures.

A large part of the section on attachment in adulthood (section 1.5.2) has been devoted to two-dimensional models (e.g.; Bartholomew 1990; Brennan et al., 1998) which describe the combination of attachment-related anxiety/dependence³ and avoidance into four prototypic attachment patterns. This approach provided the groundwork for a number of self-report measures used for the assessment of adult attachment styles. A different approach, the Adult

³ Bartholomew (1990) uses the term dependence, whereas Brennan et al. (1998) apply the term anxiety. According to Brennan et al. (1998) the terms represent the same construct.

Attachment Interview (AAI; George et al., 1985; Main & Goldwyn, 1998), is an interview procedure and was mentioned before in section 1.5.2. Despite being uniquely revealing (Brennan et al., 1998), interview methods are often too time-consuming to be applied in empirical investigations (Bartholomew & Horowitz, 1991).

In older self-report questionnaires, for example the Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991), individuals were asked to classify their attachment style according to one of the four attachment patterns which were introduced in the previous section. On the other hand, instruments such as the Experiences in Close Relationships (ECR, Brennan et al., 1998) and the Experiences in Close Relationships –Revised (ECR-R, Fraley, Waller, & Brennan, 2000) use 36 items that tap attachment-related avoidance and anxiety on two separate dimensions. The Relationship Styles Questionnaire (RSQ; Griffin & Bartholomew, 1994a) contains 30 items which were derived from Hazan and Shaver's (1987) attachment measure, Bartholomew and Horowitz's (1991) Relationship Questionnaire, and the Adult Attachment Scale by Collins and Read (1990). The RSQ can be used to assess Bartholomew's (1990) four attachment styles on a dimensional level. These scores can then be used to compute scores for the two underlying attachment dimensions, dependence and avoidance.

Categorical versus dimensional assessment. Simpson (1990) noted that the categorization of attachment styles may preclude the assessment of “meaningful individual difference variability that exists within each category” (p. 973). Furthermore, categorical measures do not permit the assignment of a given individual to more than one category despite the fact that some adults' attachment styles may be best described as a combination of two categories (Bartholomew, 1994). Thus, categorical measures, such as the RQ (Bartholomew & Horowitz, 1991), may yield inaccurate results. This is especially the case if they are used to study the continuity of attachment patterns as they do not represent changes in attachment styles in an adequate way (Bartholomew, 1990; Fraley & Waller, 1998). Fraley and Waller (1998) criticized that categorical instruments are based on the unsubstantiated assumption that attachment styles are independent of each other. Therefore, they promoted the use of graduated measures which yield continuous and separate scores for each dimension. Another advantage of dimensional approaches is the fact that, as opposed to categorical measures, they allow for an estimation of the measurement error and carry greater reliability, validity

and statistical power (Fraley & Waller, 1998). Brennan et al. (1998) noted that dimensional measures may help participants avoid the temptation to give socially desirable or otherwise biased responses when asked to classify themselves as securely or insecurely attached as in the RQ. Moreover, dimensional assessment does not require individuals to have such a high degree of insight into their own intrapsychic processes as categorical self-classification does (Brennan et al. 1998).

For these reasons, it was chosen to apply a dimensional measure of adult romantic attachment in the empirical study that is part of this thesis. For the investigation of the influence of various types of interpersonal trauma on adult attachment it appears more useful to assess the attachment dimensions of avoidance and anxiety (Brennan et al., 1998) rather than the four attachment categories, as dimensional measures are thought to represent differences in attachment security more accurately (Fraley & Waller, 1998). Instead of classifying individuals into four categories, the present study will look at their position on the two attachment dimensions as a function of the trauma they have experienced.

Impact of relationship functioning. A critical point of self-report measures of adult attachment is that they are potentially confounded with relationship functioning, which is a correlate of attachment security (Bartholomew, 1994). Based on correlational evidence, it cannot be concluded unambiguously whether secure attachment helps build well-functioning relationships or whether satisfying relationships cause individuals to describe themselves as securely attached on a self-report questionnaire (Bartholomew, 1994).

The present section provided an overview of the way attachment theory is applied as a framework for the study of consequences of early chronic interpersonal trauma. Furthermore, the underlying theories of attachment in childhood and adulthood as well as corresponding methods for assessing attachment security were reviewed. The following two sections focus on empirical evidence regarding two questions. Section 1.5.5 discusses studies that investigated whether childhood abuse is associated with insecure attachment styles. Subsequently, section 1.5.6 will address possible answers to the question whether attachment style has an influence on mental health once childhood abuse has occurred.

1.5.5 Association between childhood abuse and attachment patterns in adulthood

Bartholomew (1990) addressed the transition of insecure attachment from childhood to adulthood by noting that "adult avoidance of intimacy has its roots in early attachment experiences in which emotional vulnerability comes to be associated with parental rejection" (p. 173). Bearing in mind the described attachment processes in childhood, it appears likely that an early violation of the child's sense of safety, trust and predictability by a caregiver will be reflected in attachment-related problems in adulthood.

Using the Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991), Roche et al. (1999) found that childhood sexual abuse was significantly related to attachment styles in adulthood in a student sample. In this study, three groups were compared: (a) non-abused individuals, (b) individuals with a history of intrafamilial sexual abuse, and (c) individuals who had experienced extrafamilial sexual abuse. The no-abuse group showed more secure and less fearful attachment than the other two groups. Furthermore, the intrafamilial abuse group was less secure, more fearful, and less dismissing than the extrafamilial abuse group, indicating particularly detrimental consequences of abuse that occurred within the family context. This result is consistent with the notion that the family context is the primary environment in which attachment is developed during childhood (Bowlby 1973/1982). The three groups also differed on the avoidance and dependence dimensions of adult attachment. The no-abuse group exhibited lower dependence than both abuse groups and the extrafamilial abuse group reported a lower dependence than the intrafamilial abuse group. The no-abuse group also indicated lower avoidance than the two abuse groups. However, the two abuse groups showed no difference on the avoidance dimension. Two limitations of the study by Roche et al. (1999) are particularly apparent. First, a categorical measure of adult attachment was applied; second, a student sample was studied. Students' romantic relationships are likely to differ from adult intimate relationships in that young people have not yet had enough time to establish long-lasting and stable bonds to a partner as it is the case in samples of older individuals (Bartholomew, 1994).

Dimitrova et al. (2010) found that survivors of childhood sexual abuse differ from non-traumatized individuals on the dimension of attachment anxiety, but not with regard to attachment avoidance. Contrary to this, in an investigation by Limke et al. (2010), a group of

female college students sexually maltreated before the age of 15 indicated both more attachment-related avoidance and attachment-related anxiety when compared to a non-maltreated group. Note, however, that the comparability of this result to the previously reported ones is restricted as Limke et al. used a different measure to assess the attachment-related avoidance and anxiety (i.e., a questionnaire developed by Simpson, 1990).

Insecurity in adult attachment was also found in survivors of adult interpersonal trauma. Elwood and Williams (2007) found that a history of adult interpersonal trauma among a student sample is related to the two dimensions of adult attachment. The authors applied the attachment model proposed by Brennan et al. (1998) and found that trauma survivors endorse higher levels of attachment anxiety than individuals who were not affected by a traumatic experience. However, the authors failed to detect a corresponding relationship between adult interpersonal trauma and attachment avoidance. This pattern of findings suggests that survivors of interpersonal trauma may not be more likely to avoid intimacy than non-traumatized individuals. But at the same time their high level of attachment anxiety indicates that they feel less secure in relationships and have more difficulties trusting their partner than non-abused individuals.

It is important to bear in mind that none of the studies which were reported in the present section can draw firm conclusions regarding a causal effect of early chronic interpersonal trauma on attachment-related difficulties. The exact nature of this association remains uncertain as a consequence of the cross-sectional study designs that were applied in these investigations. The evidence does not make clear whether insecure attachment patterns in childhood (which are then carried on into adulthood) precede childhood abuse or whether children develop insecure attachment styles as a consequence of the abuse. Well-planned prospective study designs could help resolve this question. Nonetheless, existing evidence supports the notion that interpersonal trauma, and especially intrafamilial abuse, is associated with difficulties in the domain of attachment in adult romantic relationships.

What has remained unanswered, however, is the question whether increased attachment avoidance and anxiety are specific to early-onset and chronic interpersonal trauma or whether they occur in individuals who experienced any type of interpersonal trauma. Having in mind that attachment patterns are established early in childhood (section 1.5.2), it appears likely that a history of early chronic interpersonal trauma is associated with more insecure

attachment than a history of a late-onset interpersonal trauma (e.g., in late adolescence or adulthood). Likewise, chronic exposure to interpersonal violence at a young age, during which the emotional and cognitive foundations of attachment are being established, could lead to more severe disruptions in attachment security than single occurrences of interpersonal violence, that did not cause a constant violation of the child's trust in their caregiver. Empirical studies investigating the impact of early onset and chronicity of interpersonal trauma on attachment patterns are scarce which has prevented researchers from gaining a more differentiated view of this relationship. Therefore, the present empirical investigation will compare individuals with histories of early chronic interpersonal trauma to individuals who have experienced other forms of trauma with regard to adult attachment insecurity. If early chronic interpersonal trauma shows to be associated with particularly high degrees of attachment insecurity, researchers and practitioners should be encouraged to develop and improve treatment plans that fit the specific attachment-related needs experienced by this group of trauma survivors.

Implications for clinical practice. The need for treatments that address impaired attachment patterns in abuse survivors has been recognized in the literature and has resulted in the development of an evidence-based two-phased cognitive behavioral treatment addressing the specific difficulties encountered by adult survivors of childhood abuse. The Skills Training in Affective and Interpersonal Regulation plus Modified Prolonged Exposure (STAIR/MPE; Levitt & Cloitre, 2005) addresses interpersonal functioning and emotion-regulation skills in the first phase of the treatment in order to prepare the client for prolonged imaginal exposure in the second phase. The work on the client's interpersonal schemas is considered the "unifying theme" (Levitt & Cloitre, 2005, p. 42) of the treatment and aims to identify and alter perceptions of the self and others that have been disrupted by experiences of abuse. One of the purposes of the first phase of the treatment is to change dysfunctional interpersonal schemas, for example from "to be attached means to be abused" to "I can be close to others and expect to be treated well" (Levitt & Cloitre, 2005, p. 42), which should subsequently help individuals maintain positive interpersonal relationships. In-session role plays, schema sheets, and practice in "real life" situations are applied in order to acquire and practice newly proposed schemas.

Knowledge of attachment-related difficulties, such as increased attachment anxiety and avoidance in romantic relationships, that are potentially specific to survivors of early chronic childhood abuse could serve as an encouragement to further tailor treatments to address the specific attachment-related needs of this particular group of abuse survivors.

1.5.6 Attachment security as a mediator between interpersonal trauma and posttraumatic psychopathology

Although, on an accumulated level, survivors of interpersonal trauma tend to have more problems with psychological functioning compared to their non-abused peers, not every abused individual develops posttraumatic symptoms as a response to the violence they have experienced (Briere & Elliott, 1994; Collishaw et al., 2007, Lynskey & Fergusson, 1997). This has led researchers to the assumption that there may be additional factors involved that influence the relationship between interpersonal trauma and later psychological functioning (e.g. Ozer et al., 2003; Shapiro & Levendosky, 1999). Research on this subject has yielded both internal and external variables that were thought to constitute such factors (e.g.; Aspelmeier, Elliott, & Smith, 2007; Browne & Winkelman, 2007; Collishaw et al., 2007; Elwood & Williams, 2007; Muller, Sicoli, & Lemieux, 2000; Roche et al., 1999; Shapiro & Levendosky, 1999). In the following sections, attachment security will be discussed as one of these intervening variables. Theoretical grounds as well as empirical evidence regarding its influence on PTSD following interpersonal trauma will be reviewed.

Moderational versus mediational models. In the empirical literature, different approaches have been used to investigate the potential influence of third variables. While many studies employed mediational models, some tested moderational effects. According to Baron and Kenny (1986), a mediating variable accounts for the relationship between a predictor and an outcome variable. If, for example, attachment insecurity mediates the relationship between a traumatic life event and posttraumatic stress symptoms, this means that the trauma causes changes in attachment which in turn lead to the posttraumatic stress symptoms. A moderating variable, on the other hand, influences the strength and/or direction of an already existing association between a predictor and an outcome. The choice which model to test depends on prior theoretical assumptions regarding the nature of the presumed influence of the third variable as well as observed associations between the respective variables. Baron and Kenny (1986) suggest testing a mediational model if there is a strong association between the

predictor and the outcome variable. A moderational model, on the other hand, should be tested if this association is weak or inconsistent.

Theoretical grounds. As interpersonal trauma, most notably physical and sexual abuse, is embedded in an interpersonal context, the quality of social relationships was deemed a possible mediator between this type of trauma and its impact on the survivor's mental health (Alexander, 1992; Collishaw et al., 2007). Studies investigating the mediating effect of a person's experiences in social relationships frequently applied attachment theory as a conceptual framework because it is interpersonal relationships in which attachment patterns are assumed to be primarily established and maintained (Sandberg et al., 2010). The attachment-related working models of the self (dependence/anxiety) and of the other (avoidance) are developed early in life through the child's relationship with his or her primary caregiver (Bowlby, 1973; see section 1.5.2). Therefore, these internal working models are likely to be particularly affected by adverse interpersonal events in childhood. In turn, attachment patterns are expected to either bring forward or prevent trauma-related psychosocial problems, depending on whether they are classified as secure or insecure. (Roche et al., 1999) Riggs et al. (2007) reported a significant association between the attachment dimensions avoidance and anxiety on the one hand and PTSD on the other hand. A significant association between attachment anxiety and PTSD was also reported by Muller et al. (2000), but in this study attachment avoidance and PTSD were unrelated. As for the mechanisms underlying this relationship, Cloitre et al. (2008) found empirical support for an effect of attachment insecurity on functional impairment, following childhood abuse, through emotion regulation on the one hand and expectations of social support on the other hand. Similarly, Benoit, Bouthillier, Moss, Rousseau, and Brunet (2010) found that the association between attachment security and PTSD, following trauma in adulthood, is established through the mediating effect of emotion-focused coping strategies.

Although a link between attachment security and PTSD has been established, the mechanisms underlying this association have not yet been clearly identified (Benoit et al., 2010). Cloitre et al. (2008) suggested that attachment insecurity may affect emotion regulation which, in turn, could increase the chances of developing PTSD. Muller et al. (2000) follow the same approach by postulating that both insecure attachment and PTSD are related to problems of affect regulation. Children are assumed to learn to regulate their

affective states in interactions with their primary caregivers (Alexander, 1992). However, certain attachment styles may not permit the acquisition of adequate emotion regulation strategies and may thereby increase an individual's vulnerability for developing PTSD (Muller et al., 2000). Sandberg et al. (2010) suggested three pathways through which disrupted attachment patterns may contribute to posttraumatic stress. First, others may become internally represented as malevolent or dangerous while the self may be perceived as helpless and vulnerable. This, in turn, may undermine a person's sense of safety and security. Second, guilt, shame, and other negative feelings that are related to insecure attachment may impair a person's strategies for effective emotion regulation and thereby increase the risk for posttraumatic stress. Third, due to the perception of others as rejecting, inconsistent, or non-trustworthy, the affected individual's perception or use of social support may be affected.

The following sections of this chapter will present empirical evidence regarding the mediating effect of attachment insecurity on PTSD and other indicators of psychological functioning. Besides, two studies will be reviewed that tested a moderational model.

Evidence regarding a mediating effect of attachment. Roche et al. (1999) applied Bartholomew's (1990) four-category model of attachment in adulthood in order to examine the role of attachment in the context of childhood sexual abuse. Using the Relationship Questionnaire (RQ, Bartholomew & Horowitz, 1991), Roche et al. found that the relationship between childhood sexual abuse and trauma-related symptoms later in life is mediated by the individual's attachment style. When attachment type was taken into account, childhood sexual abuse did not predict the degree of trauma-related symptoms, assessed with the Trauma Symptom Inventory (TSI; Briere, 1995). At the same time, the association between attachment and trauma-related symptom levels remained constant when childhood sexual abuse was controlled for. Shapiro and Levendosky's (1999) findings suggest that high attachment security is significantly associated with low psychological distress among adolescents (operationalized by measures of depression and trauma-related symptoms) who were exposed to sexual abuse as children. A path analysis supported the assumption that attachment security mediates the relationship between childhood sexual abuse and psychological distress. Similarly, Dimitrova et al. (2010) found that the extent to which a person feels comfortable with closeness and intimacy in relationships mediates the effect of childhood sexual abuse on psychological functioning (assessed by the DSM-IV Global

Assessment of Functioning). Both Shapiro and Levendosky (1999) and Dimitrova et al. (2010) applied the Adult Attachment Scale (AAS; Collins & Read, 1990) for the assessment of attachment styles. Cloitre, Stovall-McClough, Zorbas, and Charuvastra (2008) studied a sample of individuals with a history of childhood sexual abuse and found that participants with insecure attachment had greater functional impairment than those reporting secure attachment. Results of a path analysis suggested that insecure attachment has an indirect effect on a person's functional status through two intervening variables: reduced expectations of social support on the one hand and inadequate regulation of negative emotions on the other hand.

Several studies that applied the two-dimensional model of adult attachment reported only partial support for a mediating effect of attachment. Sandberg et al. (2010) and Limke et al. (2010) found attachment-related anxiety to mediate the relationship between sexual maltreatment and psychological adjustment, but did not obtain the same result for the avoidance dimension.

Evidence regarding a moderating effect of attachment. Investigations that tested a moderating effect of attachment insecurity obtained heterogeneous results. In a study involving a female student sample, Aspelmeier et al. (2007) did not find that attachment security in close-adult relationships, assessed categorically, moderates the effect of childhood sexual abuse on trauma-related symptoms.

Moderational effects of attachment were also tested with individuals abused in adulthood. Scott and Babcock (2010) obtained empirical support for a moderating effect of both attachment avoidance and dependence⁴ on PTSD. Contrary to this finding, Elwood and Williams (2007) did not find that attachment-related avoidance and anxiety moderate the association between adult interpersonal trauma and psychological functioning. A possible explanation for this discrepancy in results could be that the participants in Elwood and Williams' (2007) study were college students who were not necessarily involved in romantic relationships (Scott & Babcock, 2010), while Scott and Babcock (2010) recruited a community sample of individuals that were all living in a relationship. Furthermore, these

⁴ The construct attachment dependence corresponds to attachment anxiety according to Brennan et al. (1998).

two studies used different measures of attachment and trauma-related symptoms and Scott and Babcock (2010) focused on physical abuse while Elwood and Williams included individuals who had experienced either physical or sexual abuse.

1.5.7 Implications of the evidence

The existing evidence indicates that experiences of early chronic interpersonal trauma, such as childhood physical or sexual abuse, are related to insecure attachment patterns in adulthood. As this connection was established mostly by cross-sectional study designs, no conclusion with regard to causation or the direction of influence between the variables can be drawn. It is a plausible interpretation that early chronic interpersonal trauma violates an individual's basic trust in their social environment and thus contributes to the formation of inadequate models of the self and others. However, insecure attachment may just as well be a preexisting risk factor for the onset of early chronic interpersonal trauma. Alternatively, the onset of early chronic interpersonal trauma and insecure attachment may both result from a dysfunctional family structure or other factors in the victim's environment (e.g., poverty).

The reported findings concerning the mediating role of attachment largely support the notion that attachment is a mediating variable for the influence of early chronic interpersonal trauma on psychological functioning. Attachment insecurity appears to be a factor through which early chronic interpersonal trauma leads to posttraumatic symptomatology. However, this is not the only plausible explanation for the reported findings. Although posttraumatic stress is usually modeled as an outcome variable, it is also possible that posttraumatic stress reactions influence the way individuals respond to self-report measures of adult attachment (Sandberg et al., 2010). Prospective studies could help researchers come to less ambiguous conclusions about the nature of the associations between early chronic interpersonal trauma, psychological adjustment and attachment styles.

Roche et al. (1999) pointed out that the search for mediating variables between early chronic interpersonal trauma and psychological adjustment is guided by efforts to identify factors that are involved in the development and maintenance of posttraumatic psychopathology in order to guide prevention and treatment. Factors, that have empirically shown to be involved in the development of PTSD following interpersonal trauma, could be addressed by therapeutic

intervention in order to help individuals discover better coping strategies and thereby reduce the impact of traumatic experiences on their mental health (Roche et al., 1999). As attachment security could be one such intervening factor, the present study will seek to replicate the reported findings that indicated a mediating effect of attachment security on the association between interpersonal trauma and psychological functioning (i.e., PTSD).

1.6 Interpersonal problems in the context of early chronic interpersonal trauma

As part of the presentation of her two-dimensional model of adult attachment, Bartholomew (1990) noted that “individual differences in styles of interpersonal interaction are the fundamental phenomena that attachment theory is designed to explain” (p. 169). Moreover, she postulated that it is interpersonal mechanisms through which internal working models of the self and the other are expressed and maintained. It therefore appears likely that individuals who were assaulted at an early stage of development and who did not have the opportunity to establish secure attachment with a caregiver will face immediate and long-term difficulties in the interpersonal domain. The term ‘interpersonal problems’ describes various behavioral and emotional difficulties encountered by individuals in interactions with other people. The interpersonal areas that are supposed to be affected by experiences of abuse include a wide array of the survivor’s “relationships with particular individuals in their lives (e.g., spouses and partners, friends, children, and other family members), as well as the many dimensions upon which those relationships might be impacted . . . (e.g., communication, trust, intimacy, etc.)” (DiLillo, 2001, p. 561). The following section introduces several theoretical assumptions as to why and how early chronic interpersonal trauma may lead to interpersonal problems. Subsequently, empirical evidence regarding the connection between early chronic interpersonal trauma and disturbances in the interpersonal domain will be reviewed.

1.6.1 Hypotheses about interpersonal problems in adulthood following childhood abuse

Attachment theory is one of several theoretical frameworks that have been applied to explain the link between childhood abuse and impaired adult interpersonal functioning. Bartholomew (1990), for example, argued that interpersonal problems are related to the attachment patterns individuals have established in the course of their development. Other approaches include

theoretical concepts by Finkelhor and Browne (1985), Briere (1992b) and Polusny and Follette (1995). Finkelhor and Browne (1985) propose four concurrent traumagenic dynamics which set in when a child is exposed to sexual abuse and which lead to the distinctive effects of this type of trauma. These four dynamics include traumatic sexualization, betrayal, powerlessness and stigmatization. According to Briere (1992b), continuous sexual abuse in childhood leads to interpersonal problems in three steps. The first step comprises immediate reactions to the abuse, involving posttraumatic stress, cognitive distortions and disturbances in psychological development. In the second step, accommodation processes to the ongoing abuse and coping behaviors (e.g., avoidance, passivity, sexualization) set in with the aim to reduce pain and to increase the feeling of safety. The third step includes long-term consequences of abuse which reflect the impact of the immediate reactions to the abuse as well as their subsequent impact on the individual's psychological development. The ongoing presence of these long-term effects in adulthood is presumed to interfere with daily interpersonal functioning and to prevent the adult from gaining support from interpersonal relationships (Briere 1992b). Polusny and Follette (1995) developed a model that explains the connection between childhood sexual abuse and its long-term effects on the basis of inadequate coping strategies that are rooted in emotional avoidance. Examples for such coping strategies include dissociation, self-mutilation, substance abuse, casual sexual relationships, and avoidance of intimate relationships. Even though these behaviors may provide initial relief to the survivor's distress, on the long run they are likely to be followed by negative reactions such as feelings of social isolation, sexual dysfunction and revictimization.

Interpersonal problems are considered to be a complex sequel of early and repeated trauma (van der Kolk et al., 2005), which is why they constitute one of the DESNOS subcategories (see section 1.4.2).

1.6.2 Evidence for interpersonal problems following early-onset interpersonal trauma

General problems in the interpersonal domain. Many adult survivors of childhood abuse report difficulties in establishing and maintaining social relationships. Levitt and Cloitre (2005) reported that interpersonal problems are the most frequently cited reason for seeking treatment among women with histories of childhood abuse. These disturbances include a

poorer understanding of social causality (Callahan et al., 2003; Kernhof et al., 2008), low self-esteem as well as being shy, uneasy, and self-conscious or misunderstood in interpersonal relationships (Callahan et al., 2003). Women sexually abused in childhood describe themselves as overly solicitous and exploitable (Kernhof et al., 2008) and as having more problems with being assertive compared to women without histories of sexual abuse (Cloitre et al., 1997). At the same time, Cloitre et al. (1997) found sexually abused women to show higher degrees of control and responsibility than non-abused women. The authors argue that these results indicate confusion about power dynamics in interpersonal relationships as for the abused individual it might not be clear when to be submissive and when to take control and responsibility over a situation. Such a constellation of problems may make these women particularly prone to conflicts in relationships and further sexual or physical assaults (Kernhof et al., 2008). Indeed, a large number of investigations indicated that survivors of early chronic interpersonal trauma are at increased risk of revictimization. This means that they are at risk of experiencing further sexual or physical assaults after the exposure to the initial traumatic event (e.g., Banyard, Williams, & Siegel, 2001; Dietrich, 2007; Messman-Moore & Long, 2000; Nishith, Mechanic, & Resick, 2000; Noll, Horowitz, Bonanno, Trickett, & Putnam, 2003; Sanders & Moore, 1999). In turn, repeated exposure to interpersonal trauma makes individuals particularly likely to develop PTSD, a greater severity of PTSD symptoms (Follette & Vijay, 2008; Nishith et al., 2000, Ozer et al., 2003) as well as other mental health problems (Banyard et al., 2001) compared to a single trauma exposure (for a review, see Classen, Paresh, & Aggarwal, 2005). On the one hand, it is contextual or environmental factors which continue to put the individual at risk of further exposure to traumatic stressors (e.g., growing up in a dysfunctional family environment) (Banyard et al., 2001). On the other hand, psychological consequences of the initial traumatic experience, such as the previously described interpersonal problems, may contribute to retraumatization (Dietrich, 2007).

Intimate partner relationships and sexual functioning. Studies involving women with histories of childhood sexual abuse suggest that their interpersonal problems are often related to intimate partner relationships and sexual functioning (e.g., Davis & Petretic-Jackson, 2000; DiLillo & Long, 1999; Rumstein-McKean & Hunsley, 2001). This notion is consistent with the view promoted by attachment theorists saying that early disruptions of interpersonal

bonds by childhood abuse are likely to be followed by insecure attachment in adulthood, particularly with regard to intimate relationships. According to the empirical evidence, survivors of childhood sexual abuse are prone to sexual dysfunction (Davis & Petretic-Jackson, 2000), lower satisfaction in intimate relationships, a lower level of trust in their partners and a poorer communication between partners (DiLillo & Long, 1999). Furthermore, they report engagement in high-risk sexual activities (e.g., increased number of sexual relationships, lower use of contraception measures, prostitution) as well as a lack of sexual satisfaction (for a review, see DiLillo, 2001). Evidence of elevated rates of separation and divorce in samples of survivors of childhood sexual abuse serves as a further indicator of low interpersonal functioning in intimate partner relationships (Mullen, Martin, Anderson, Romans, & Herbison, 1994).

1.6.3 Implications of the evidence

The empirical literature seems to largely agree on the conclusion that early chronic interpersonal trauma is linked to interpersonal problems in various contexts that non-abused individuals are not affected by. However, most of these studies solely compared individuals who reported early-onset interpersonal trauma with individuals who did not report any traumatic experience. Thus, no clear conclusions can be made as to whether interpersonal problems are specific to early-onset and chronic interpersonal trauma or whether they occur in all types of interpersonal trauma. Direct comparisons of different types of interpersonal trauma with regard to both attachment insecurity and interpersonal problems are rare even though they could provide valuable information about, for example, the role of age of onset and chronicity of physical or sexual abuse in the development of interpersonal disturbances. A better understanding of this relationship could support the development of more specific interventions targeting interpersonal problems that arise as a consequence of particular forms of interpersonal trauma. For this reason, the present investigation will seek to relate both the degree of attachment insecurity as well as interpersonal problems to the type of interpersonal trauma that individuals have experienced.

Apart from the lack of consideration of different trauma types, studies on the consequences of interpersonal trauma are also affected by a number of methodological problems that limit the conclusions that these studies permit as well as the generalizability of their results. Thus,

before describing the empirical study that is part of this thesis, the most apparent of these problems and their implications will be reviewed.

1.7 Methodological problems of research on the psychological consequences of early chronic interpersonal trauma

Without claiming completeness, the present section provides a review of methodological issues that need to be taken into account when planning investigations of the psychological consequences of interpersonal trauma.

First, criteria for defining and identifying the presence of interpersonal trauma are inconsistent. Discrepancies are usually found in the specific acts that are used to define abuse as well as in age limits which are applied to distinguish early from late abuse. This non-uniformity in criteria is likely to be one of the causes of heterogeneous reports regarding prevalence rates and consequences of interpersonal trauma. Many studies on childhood sexual abuse classify individuals in a dichotomous way as either being or not being survivors of sexual abuse, without further differentiation. In doing so, researchers often collapse various types of abusive experiences that may differ both qualitatively and quantitatively into the same group, thus precluding the detection of variation in trauma consequences as a function of different types of abuse (DiLillo, 2001). To prevent this pitfall, researchers need to make sensible distinctions between different types of interpersonal trauma and thereby form more homogenous comparison groups. Such an approach was applied in the present study in that relatively homogenous groups were formed representing individuals who had experienced different types of interpersonal trauma (distinguished according to age of onset and chronicity of the trauma). This approach could help obtain more differentiated predictions and less ambiguous findings regarding psychological consequences of interpersonal trauma.

The second methodological aspect which requires consideration is related to the fact that research on sequelae of interpersonal trauma mostly relies on individual's retrospective accounts of traumatic experiences as a method of assessing the presence of abuse and its characteristics (DiLillo, 2001). However, the passage of time may distort memories of abusive experiences. Some individuals may not report cases of abuse that have actually occurred, and others may report false memories of abuse. Especially details of the abusive

experience, such as the age of onset, the age difference to the perpetrator, and the duration of the abuse are prone to be reported inaccurately if the abuse dates back a long time. Inaccurate assignment of participants to comparison groups is one of the consequences that may result from individuals' distorted reports of trauma-related memories. This, in turn, may lead to biased conclusions regarding the relationship between specific types of interpersonal trauma and indicators of psychological functioning.

Third, studies on psychological sequelae of interpersonal trauma are characterized by various sampling biases, such as homogenous samples of university students or of individuals who are seeking or undergoing psychological or psychiatric treatment for abuse-related difficulties (Briere & Elliott, 2003; DiLillo, 2001). Neither of these groups accurately represents the rates and the impact of interpersonal trauma in the general population (Briere & Elliott, 2003). As for college students, DiLillo (2001) argued that they tend to be younger, better educated, psychologically better adjusted and less diverse with regard to ethnicity and socioeconomic status than the general population of survivors of interpersonal trauma. In contrast, clinical samples are likely to be less well adjusted and to have experienced more severe forms of trauma than the general population of interpersonal trauma survivors (DiLillo, 2001). Many studies have recruited help-seeking samples that may differ substantially from different groups of abuse survivors. Perhaps these samples do not include those individuals most severely affected by interpersonal trauma because these people may not seek help as they, according to attachment theory, are likely to have lost their trust in others and the belief that other people could help and support them. In addition, it is important to bear in mind that community samples often consist of self-selected individuals who are likely to have specific characteristics which could further bias the sample (DiLillo, 2001).

Fourth, cross-sectional designs, as they are frequently used in studies on consequences of interpersonal trauma, do not permit inferences in terms of causal relationships between childhood abuse and psychological functioning. This issue was already mentioned in sections 1.5.5 and 1.5.7 referring to the association between early chronic interpersonal trauma and attachment styles. Long-term sequelae of childhood abuse not only reflect the impact of specific experiences of maltreatment but also the influence of various complex aspects of the social environment in which the abuse is embedded (Briere & Jordan, 2009). However, with

the prevalent cross-sectional designs, it is difficult to disentangle specific abuse-related effects and potential confounding variables (Maniglio, 2009).

At several points, the present thesis has referred to the advantages of prospective study designs. While prospective designs may help identify temporal links between exposure to childhood violence and adult mental health outcomes, they do not provide conclusive evidence regarding causal relationships (Margolin & Gordis, 2000). Conclusions about causation are limited because the presence and severity of violence cannot be manipulated experimentally. This means that even longitudinal studies cannot fully account for mediating or moderating variables that influence the psychological functioning of adults who were abused as children. But they have the advantage that the conditions which *preceded* the abuse can be assessed (Margolin & Gordis, 2009).

In an attempt to reduce the selectivity of the sample, the recruitment of participants and data collection for the present study was conducted through the Internet. It was expected that, due to the low threshold that the Internet offers for participation, a greater diversity in the sample could be obtained. However, as the scientific literature has raised concerns regarding online studies, it appears important to contrast the limitations of Web-based investigations with their advantages, as done in the following section.

1.8 Potentials and limitations of online data collection

The rapid and extensive development of Web-based research tools offers various possibilities of integrating the Internet into the research process. Online-recruitment of participants, Web-based data collection using e-mail or online questionnaires, Web-experiments, observations in online-communities, electronic feedback and online publication of papers are but some of the extensive possibilities that the development of online technologies has put forth. While they provide various innovative possibilities for the research process, Web-based methods pose both methodological and ethical challenges that need to be addressed when planning, conducting, and analyzing an Internet-based study. The present chapter will focus specifically on Web-based questionnaires and review their potentials as well as methodological and ethical limitations. Because online questionnaires are usually connected to Web-based participant recruitment, these methods will be addressed as well. In the following sections,

the terms 'online', 'Web-based', and 'Internet-based' are used synonymously, while the term 'offline' is used to describe procedures that are not Web-based.

1.8.1 Advantages of online questionnaires

Web-based collection and analysis of research data appears to be associated with high efficiency and economic advantages. At low cost, data of large samples can be assessed (Kraut, Olson, Banaji, Bruckman, Cohen, & Couper, 2004), which is particularly relevant in cases of multinational studies or studies with large numbers of participants. Web-based recruitment methods give researchers access to participant groups who would be very difficult to reach with conventional recruitment methods, such as individuals from geographically remote areas (Gosling, Vazire, Srivastava, & John, 2004). Gosling et al. (2004) noted that Web-based participant recruitment yields more diverse samples with regard to gender, socioeconomic status and geographical area, compared to conventional, offline recruitment methods, which are usually based on homogenous samples of psychology students.

A study conducted by Joinson (1999) provided evidence that Web-based data collection and the resulting anonymity of participants lead to less socially desirable answers compared to paper-pencil methods. In another investigation, stigmatized and illegal behaviors were reported more frequently when the survey was administered on a computer as opposed to a paper-pencil version (Turner et al., 1998).

The technical nature of online surveys comes along with several advantages. Compared to paper-pencil questionnaires, online surveys are more flexible in that questions can be adapted to previous answers or certain characteristics of the participant which is more difficult with paper-pencil procedures. Since online data collection is an automated process, the administration of questionnaires and the subsequent transfer and analysis of data does not depend on the investigator's presence, which enhances the objectivity of the process (Kraut et al., 2004). In addition, electronic data processing allows for an in-depth analysis of the assessment process, for example by registering changes in answers or the time a given participant needs to answer each item. Finally, an important advantage of Web-based surveys is that they guarantee high transparency with regard to the process of data collection.

Members of the scientific community can easily access questionnaires and evaluate them with regard to ethical and methodological standards.

Finally, participants of online surveys are free to choose when and where to take the survey which may help researchers obtain higher participation rates. At the same time, as mentioned in the following section, researchers have less control over the context of data collection which may limit the generalizability of the results obtained online.

1.8.2 Methodological limitations of online questionnaires

Despite several favorable characteristics that are ascribed to online administration of questionnaires, several concerns were voiced which largely address the quality and generalizability of data that are obtained through Web-based procedures.

Sampling bias. The perhaps most apparent problem pertains to a potential bias in samples which have been recruited online. To date, no explicit requirements exist regarding the drawing of representative samples. In fact, many studies rely on self-selection of participants (e.g., who decide to follow a link to a survey that is placed on a website). Doubts about the generalizability of findings obtained with convenience samples are particularly relevant in the context of online studies because characteristics of individuals who use the Internet may not be representative of the targeted population. Eventually, this fact brings up the question whether results obtained with samples that were recruited online can be generalized to the general population.

Internet users may differ from non-users with regard to specific characteristics such as sex, age, income, education and psychosocial adjustment (Gosling et al., 2004). As mentioned before, Gosling et al. (2004) found that online recruited, self-selected samples tend to be more diverse with regard to age, sex, ethnicity and socioeconomic status than samples consisting of college students. Furthermore, research has shown that self-selected samples provide clearer and more complete data compared to not self-selected participants, such as undergraduate students (Pettit, 2002). However, none of these authors attempted to answer the question whether online recruited self-selected samples are more representative of the general population than, for example, clinical samples that are often studied in investigations of childhood abuse.

Even though online data collection enables researchers to access groups of individuals who would remain covert to offline-methods (Lieberman, 2008), there continue to be populations that are hard to access online, such as older persons, homeless people, or people with outdated hardware or software (Gosling et al., 2004). Finally, regarding the preconception that Internet samples are unusually maladjusted (for a summary of preconceptions about Internet questionnaires, see Gosling et al., 2004), empirical data indicate that this concern is unsubstantiated (Kraut et al., 2002).

Drop-outs. For online-surveys, higher drop-out rates are expected, as there is usually no direct contact between participants and researchers (Fricker, Galesic, Tourangeau, & Yan, 2005). In order to control for adverse effects of drop-outs, relevant demographic variables should be assessed at the beginning of the survey. Furthermore, the questionnaire should make it possible to retrieve how many participants left the questionnaire at which item.

Psychometric properties of online questionnaires. Many self-report questionnaires that were initially developed for paper-pencil administration are nowadays being administered online. However, it should not be taken for granted that psychometric properties such as reliability and validity of an online administered questionnaire are equal to the ones of its offline counterpart. Hence, several investigations analyzed the quality criteria of Web-based instruments for data collection and compared them to conventional paper-pencil methods (e.g., Fortson, Scotti, Del Ben, & Chen, 2006; Ritter, Lorig, Laurent, & Matthews, 2004). Read, Farrow, Jaanimägi and Ouimette (2009) analyzed the Web-based version of the Traumatic Life Events Questionnaire (TLEQ; Kubany et al., 2000) and of the PTSD Checklist – Civilian Version (PCL-C, Weathers, Litz, Huska, & Keane, 1991) and compared them to paper-pencil versions of the same measures. They found significant correlations between related constructs in both administration modes as well as between each of the two measures and the Clinician-Administered PTSD Scale (CAPS-1; Blake et al., 1995). Fouladi, McCarthy, and Moller (2002) found only small and unsystematic effects of administration mode on outcomes of self-report questionnaires regarding parental attachment in adulthood and emotion regulation. These effects were further reduced when sex and ethnicity were controlled for. Furthermore, internal consistency and construct validity have shown to be sufficient for both administration types. Several other investigations failed to detect mode-based differences in reliabilities (Fortson et al., 2006; Ritter et al., 2004) and validities

(Buchanan & Smith, 1999a) of health-related self-report questionnaires. Finally, Gosling et al. (2004) made a very important remark about the comparison of online and offline methods. The authors pointed out that, in case of inconsistent findings, it is not justified to conclude automatically that the online method is the inaccurate one.

Intentional distortion of information. Researchers usually have less control over the context in which Web-based questionnaires are completed (e.g., at home, at work, in Internet-café, etc.) and they can rarely assess whether participants invested adequate time and effort to complete the questionnaire or whether they intentionally distorted their answers. These factors that are difficult to control may contribute to a reduction in the validity of the obtained data (Buchanan, 2000). On the other hand, Gosling et al. (2004) assumed that paper-pencil instruments are probably just as prone to deliberate falsification as Web-based methods. For detecting dishonest answers, Johnson (2001) suggests scanning data for long sequences of uniform answers. Additionally, an analysis of the time required to complete the questionnaire may point to participants who answered extremely quickly and thus most likely in a random way, perhaps even not having read the questions. Another method to detect willfully distorted answers is to analyze scale reliabilities and discriminant validities (Gosling et al., 2004). Random or dishonest answers would lower scale reliabilities, while they would cause discriminant validities to increase. This scenario would occur, for example, if individuals wanted to draw a particularly favorable picture of themselves. Gosling et al. (2004) compared online and offline-studies with regard to their reliabilities and discriminant validities and concluded that Web-based surveys are not affected to a greater degree by random or otherwise intentionally distorted answers.

Technical aspects. In order to enhance the comparability of data which were collected over the Internet, simple layouts and designs should be used which will be displayed accurately and in a similar manner on most computers (Whitehead, 2007).

1.8.3 Ethical aspects of Web-based studies

Apart from being confronted with methodological problems, researchers who apply Internet-based data collection methods need to consider several ethical aspects of their procedures. Most of these ethical issues do not differ from those that apply to conventional methods (Whitehead, 2007), but it is important to review them in light of the particular nature of the

Internet. The present review of ethical aspects is largely based on title 45 Code of Federal Regulations, part 46 (2009) issued by the United States Department of Health and Human Services as well as on the Ethical Principles of Psychologists and Code of Conduct of the American Psychological Association, also referred to as the Ethics Code (American Psychological Association, 2002; for a review, see Barchard & Williams, 2008).

Confidentiality. The literature on online research often addresses concerns over the confidentiality of participant data. Offline studies, for which data are often saved on broadly accessible computers, also contain a risk of insufficient confidentiality. But in online studies, it is the data transfer from the participant to the receiver (e.g., the researchers) itself that contains a security risk. The above mentioned Ethics Code requires access to participant data to be both physically and electronically restricted. If personal information is collected, it needs to be saved separately from study data. Additionally, the security of the respective data carrier must be ensured, for example, through the use of adequate anti-virus software. Finally, participants have to be informed whether their data are collected anonymously or not.

Participants' reactions to the questionnaire. Especially when conducting research in the field of clinical psychology, it is difficult to ascertain how the participants react to the questions asked in an online questionnaire. In a study involving trauma survivors, questions about traumatic events may cause participants to experience emotional stress, especially if they are affected by trauma-related emotional problems at the time of assessment. To reduce the risk of study-induced distress, participants must be informed in advance about the nature of the study, the presence of potentially triggering questions, and they need to be given the possibility to contact the investigators through e-mail or telephone. Read et al. (2009) conducted a study among American students with histories of trauma and assessed their acceptance and subjective well-being when presented with questions about their traumatic experiences. No differences between online and paper-pencil conditions were detected, regardless whether participants reported PTSD symptoms or not. However, the generalizability of this investigation may be limited due to the fact that a selective student sample was studied.

Informed consent. In order to ensure that participants are informed about what participation in a given study consists of, online-studies, just like their offline counterparts, require an informed consent (IC). In addition, the Code of Federal Regulations requires a documentation

of the informed consent through a written or electronic signature, except for studies with 'minimal risk'. If an online study does not require a documentation of the informed consent, it is legitimate to provide information to the participants on a page prior to the beginning of the questionnaire. Participants should then be asked to confirm that they have read and understood the information, for example by clicking on a button that will make them proceed to the first page of the questionnaire. The information page should contain possibilities for contacting the authors in case parts of the information have not been understood. Before the completed questionnaire is submitted, participants need to be asked whether they permit the investigators to use their answers for the study. Data collection needs to be followed by a debriefing about the goals, results and conclusions drawn from the study.

Conclusion regarding ethical aspects of online data collection. As for the risks that Web-based data collection poses for participants, Kraut et al. (2004) argued that they do not exceed the risks of offline-methods. In fact, the authors note that risks for participants of online surveys may be even lower due to low perceived social pressure which makes it easier for participants to leave the survey in case they feel troubled. It seems that a general ruling about the risks of online data collection methods is not possible. Instead, for each case, the decision about the use of Web-based versus offline data collection should be based on a separate and independent evaluation of potential advantages and limitations.

1.9 Summary and implications of the literature

Based on the research that was conducted in the field of interpersonal trauma, it appears safe to conclude that the interpersonal consequences of early chronic interpersonal trauma substantially differ from those of traumatic experiences that do not occur in an interpersonal context. On the one hand, early chronic interpersonal trauma showed to be related to complex posttraumatic symptoms described by the DESNOS concept (van der Kolk et al., 2005; Roth et al., 1997); on the other hand, several studies have found that early chronic interpersonal trauma is related to less secure attachment in adulthood (Roche et al., 1999) and high levels of attachment-related anxiety and avoidance (Scott & Babcock, 2010). Similarly, a wide range of interpersonal problems were reported to be linked to childhood abuse (Callahan et al., 2003; Cloitre et al., 1997), which is not surprising given the fact that attachment-related variables are likely to be reflected in interpersonal mechanisms (Bartholomew, 1990). Furthermore attachment (in particular attachment-related anxiety) appears to have a

mediating effect on psychological functioning following childhood abuse (e.g., Roche et al., 1999).

Several theoretical concepts were postulated that could explain these findings. Most of these approaches agree on the assumption that early chronic interpersonal trauma, which largely occurs within the caregiving environment (Briere & Elliott, 2003), undermines children's efforts to gain a sense of trust, predictability and control in interpersonal relationships with their attachment figures (see section 1.3). According to this rationale, the child is prevented from perceiving the attachment figure as a source of acceptance, support and relief in situations of distress. Instead, the abusive caregiver causes the child to experience distress, pain, and insecurity, only to name a few adversities (van der Kolk, 2005). These experiences are assumed to shape the child's representations of interpersonal relationships, which are expected to have substantial influence on how the abuse survivor approaches interpersonal situations later in life.

What has been missing in most of the empirical literature investigating the impact of early chronic interpersonal trauma is a test of the hypothesis that attachment insecurity and interpersonal problems are specific to early chronic interpersonal trauma. Based on the prevalent theoretical argumentation, it is possible that late interpersonal traumas do not have the same impact on attachment security and interpersonal problems as traumas that occur early in life at a critical time for the development of interpersonal representations. Similarly, chronic interpersonal traumas could be more likely than single experiences of interpersonal violence to affect a child's attachment system as they are assumed to cause a constant violation of the child's sense of safety. The existing empirical grounds do not suffice to draw firm conclusions regarding these questions. Therefore, the present study provides a systematic approach to the comparison of different interpersonal trauma types with regard to their association with interpersonal problems and insecure attachment in adult relationships.

The following chapters of this thesis describe this study, the research questions it is guided by as well as its results and their relation to current research and practice.

1.10 Research questions and hypotheses

Empirical evidence supports the notion that interpersonal trauma, and in particular childhood abuse, is linked to insecure attachment patterns in adulthood (Limke et al., 2010, Roche et al., 1999). However, one question that has not been addressed in the empirical literature to date is whether insecure romantic attachment in adulthood is a specific sequel of early chronic interpersonal trauma. The complex trauma sequelae of DESNOS have shown to occur particularly frequently in individuals with histories of early chronic interpersonal trauma (as opposed to histories of late onset, single, and/or non-interpersonal trauma) (e.g., van der Kolk et al., 2005). This pattern of findings is thought to be a result of the impact of ongoing adverse experiences in interpersonal relationships in early childhood (see section 1.3). As this impact is also assumed to be reflected in insecure attachment in both childhood and adulthood, findings similar to the ones for DESNOS are expected for the domain of adult attachment. Therefore, the present study aims to investigate whether individuals who were affected by an early chronic interpersonal trauma exhibit higher levels on the attachment dimensions of avoidance and anxiety (as conceptualized by Brennan et al., 1998) compared to those who faced a non-interpersonal, a non-chronic or a late trauma.

If early chronic interpersonal trauma shows to be associated with higher attachment-related avoidance and anxiety than late, single, or non-interpersonal trauma, this may support the assumption that the adverse impact of childhood abuse on early interpersonal relationships is reflected in insecure attachment patterns in adulthood. At the same time, however, high levels of avoidance and anxiety in individuals who were abused in childhood may be due to PTSD symptoms which are likely to be particularly elevated in this group of people. Thus, it first needs to be clarified whether attachment avoidance and anxiety in adulthood are associated with PTSD symptom severity. Subsequently, the investigation should clarify whether insecure attachment is uniquely related to the trauma or whether this connection is established through the association of PTSD symptom severity with early chronic interpersonal trauma on the one hand and with insecure attachment on the other hand. The present study will investigate whether increased levels of attachment-related anxiety and avoidance are unique consequences of early-onset interpersonal trauma or whether PTSD symptoms explain a significant part of the variation in attachment insecurity. If attachment avoidance and anxiety show to be linked to early chronic interpersonal trauma due to high

levels of PTSD symptoms in this group, this would suggest that treatment of PTSD alone could help increase security of adult attachment.

A number of studies have found a mediating effect of attachment quality on the relationship between childhood abuse and posttraumatic symptomatology (e.g., Dimitrova et al., 2010; Shapiro and Levendosky, 1999). However, in some cases, only attachment-related anxiety was reported to mediate this relationship (e.g., Limke et al., 2010; Sandberg et al., 2010). Few studies have found a moderating effect, but only with regard to adult interpersonal trauma (e.g., Scott & Babcock, 2010). As described in section 1.5.6, the empirical evidence indicates a link between attachment insecurity and PTSD but the theoretical grounds of this link are still vague. A number of researchers argue that attachment insecurity causes inadequate emotion regulation which, in turn, increases the risk of PTSD (Benoit et al., 2010; Cloitre et al., 2008; Muller et al., 2000). Preliminary empirical results obtained by these authors support this theoretical proposition. However, more investigations with different samples are needed in order to rule out potential alternative explanations.

In order to further investigate the role of attachment in the context of interpersonal trauma and posttraumatic symptomatology, the present study seeks to replicate the findings that attachment avoidance and anxiety mediate the association of interpersonal trauma and PTSD.

Besides testing predictions which were derived from the literature, the present study includes an explorative analysis of the association between different types of trauma and difficulties in the interpersonal domain. For this purpose, a questionnaire tapping several areas of interpersonal problems was developed by the author. What is of particular interest in this context is the question which type of trauma is associated with the highest degree of interpersonal problems. Moreover, the relationship between interpersonal problems and PTSD symptoms will be examined as these two phenomena are likely to be interrelated (van der Kolk et al., 2005).

In order to reach a diverse sample of trauma survivors, the present investigation employed an Internet-based method of recruitment and data-collection. Much evidence regarding the interpersonal long-term consequences of childhood abuse is based on studies with either clinical samples or samples of undergraduate university students. However, in order to obtain findings that can be generalized to a more general population, it is inevitable to include

samples that are more diverse with regard to age, sex, level of education, occupation, socioeconomic status, and general psychosocial adjustment.

1.10.1 Hypotheses

The following hypotheses were derived from the research questions:

1. Survivors of early chronic interpersonal trauma report significantly higher attachment-related avoidance and anxiety than survivors of a non-interpersonal trauma, a late interpersonal trauma or an early single interpersonal trauma.
2. Attachment-related avoidance and anxiety are associated with PTSD symptom severity.
3. The differences in attachment-related avoidance and anxiety between the trauma groups (Hypothesis 1) remain significant when PTSD symptom severity is controlled for.
4. Attachment-related avoidance and anxiety have a mediating effect on the relationship between trauma type and PTSD symptom severity.

Furthermore, the association between interpersonal problems and trauma types will be examined in an explorative way.

Hypothesis 4 assumes a mediating effect of attachment on the relationship between trauma type and PTSD symptom severity rather than a moderating one. According to Baron and Kenny (1986), mediating models are best applied in cases of a strong relation between the predictor and the outcome variable. As the following chapters will show, this is the case in the present study with trauma type being strongly associated with PTSD symptom severity. On the other hand, moderator variables are usually introduced when the relation between the predictor and the outcome is unexpectedly weak or inconsistent (Baron & Kenny, 1986).

2 Method

2.1 Participants

The study was conducted as an online study because it was hoped that in this way a larger and more diverse sample of trauma survivors could be reached than when recruiting through clinical institutions. Participants were recruited online in that administrators of certain websites were asked to publish a study announcement as well as the link to the questionnaire on their website. The majority of chosen host websites were concerned with providing information about interpersonal and other types of trauma, trauma-related problems and other emotional difficulties as well as general health-related topics. Furthermore, online self-help organizations and other online communities were contacted and asked to distribute the information and the link to the study among their members. A similar recruitment strategy has shown to be useful in Web-based research conducted by Ehring and Quack (2010), who investigated the association between early chronic interpersonal trauma and emotion regulation difficulties using a set of online questionnaires. These authors reported a high number of participants (approx. 700) and a good distribution of participants across trauma types.

Most host websites and online communities that agreed to publish or distribute the link to the survey addressed topics related to childhood sexual and physical abuse, domestic violence and violence in general. Several other websites were concerned with general mental health-related issues. Many administrators of websites that were not specifically related to the topics of abuse or emotional problems did not agree to publish the link and stated that the study was not related to the theme of their websites. A list of all host websites and online communities can be found in Appendix M.

Figure 2 contains a flow chart indicating the number of participants at different stages of the survey. A total of 700 individuals followed the link on the host websites and thereby accessed the information page of the survey. Out of these, 460 (65.7%) provided informed consent and proceeded to the first page of the survey. 260 participants (37.1% of the total sample, 57.3% of those who started filling in the questionnaire) completed the survey. Data of participants who dropped out before the end the survey were not included in the hypothesis tests. Out of

260 respondents who reached the last page of the survey, data of 209 individuals remained for data analysis following the exclusion of certain respondents (see below).

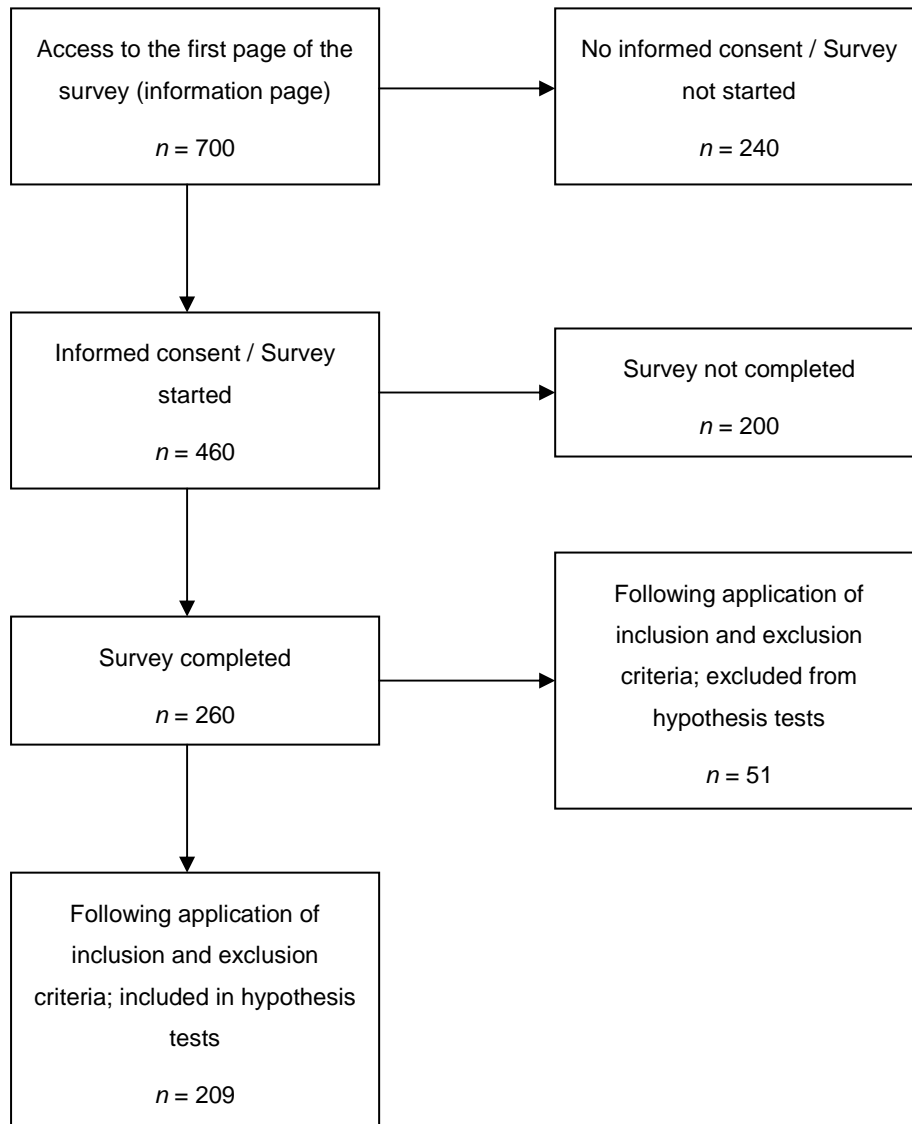


Figure 2. Participant flow chart indicating sample sizes for the different stages of the online survey and subsequent data analysis

The only exclusion criterion was an age below 18 years. Respondents who indicated an age below 18 on the first page of the survey were automatically prevented from proceeding to the following page. Apart from this restriction, the largest possible diversity in the sample was aimed for with regard to demographic characteristics, type of interpersonal or non-

interpersonal trauma, psychosocial functioning, and the presence of psychological or psychiatric treatment.

Traumatic experiences were distinguished in terms of interpersonal versus non-interpersonal nature, duration and age of onset. According to participants' answers on the Trauma History Questionnaire (THQ; Green, 1996) including their descriptions of the traumatic events, and criteria defined a-priori, they were assigned to one of four trauma groups by the author: (1) survivors of non-interpersonal trauma (NIT; e.g., accidents, natural disaster, severe illness, observed traumatic events in others; $n = 24$); (2) survivors of late-onset interpersonal trauma (LIP; age ≥ 14 , $n = 31$); (3) survivors of early-onset single or repeated interpersonal traumas (age < 14) that lasted for less than one year (ESIP; $n = 24$); (4) survivors of early-onset chronic interpersonal trauma (age < 14) that occurred more than three times and lasted for at least one year (ECIP; $n = 130$). Interpersonal trauma included experiences of sexual and/or physical abuse. By applying the age of 14 to distinguish between early and late interpersonal trauma, the approach by van der Kolk et al. (2005) in the DSM-IV field trial was followed. If participants indicated more than one traumatic event on the THQ, a hierarchy of trauma types was applied. Early chronic interpersonal trauma was on top of this hierarchy followed by early onset single or repeated interpersonal trauma, late interpersonal trauma and non-interpersonal trauma at the bottom. A participant who, for example, has experienced both childhood abuse and a severe car accident, was assigned to the early chronic interpersonal trauma group because this trauma is located at a higher position in the hierarchy than the non-interpersonal trauma. In case of inconsistent answers on the THQ (i.e., a participant answering "yes" on the question regarding robbery but describing an event of sexual abuse in the corresponding description), participants were assigned to the trauma group by the author according to the trauma description. If the description of a traumatic event indicated it did not meet the DSM-IV-TR criteria for traumatic stressors, it was coded by the author that the participant had not experienced this particular trauma. Participants who did not provide detailed descriptions were classified according to their yes/no answers on the THQ. A lack of this more detailed information thus had the potential to undermine the accuracy with which participants were assigned to the trauma groups. It appears likely that the assignment of participants who described details of their trauma was more accurate than that of participants who gave "yes" and "no" answers only. A crosstabulation revealed a significant difference between the trauma groups with respect to whether participants provided trauma descriptions

or not, $\chi^2(3, n = 209) = 20.36, p < .001$. In the NIT and ESIP group there were more individuals who did not provide descriptions, while in the ECIP group, more participants did describe their trauma. In the LIP group, half of the participants provided descriptions.

No non-traumatized group was formed as only eight respondents of those who finished the survey (3.1%) did not indicate a single traumatic experience on the THQ. This extremely low number precluded meaningful comparisons between traumatized and non-traumatized individuals. The eight no-traumatized participants were therefore excluded from data analysis.

Out of 260 participants who completed all questionnaires, 8 (3.1%) were excluded because they did not indicate a single traumatic experience on the THQ. 17 participants (6.5%) were excluded because it was not possible to determine which trauma group they belonged to due to incomplete or ambiguous answers on the THQ. Further 24 respondents (9.2%) were excluded because the proportion of missing values for these participants exceeded the critical value of 10% of items per questionnaire (for a description of how missing values were handled, see section 2.5.4). Two additional participants (0.8%) were excluded because of almost entirely extreme values (i.e., values of either 1 or 7) on the ECR-R. One of these two participants wrote in the comments section that the survey did not reflect her experiences in relationships because she had a very comforting relationship with her husband but difficult ones with other people. Finally, data of 209 participants remained for further analysis.

No participants had to be excluded based on completion time. The average duration for the completion of the questionnaire, measured in seconds, was $M = 1945$ ($SD = 1333.9$) which is roughly 32 minutes. None of the participants who remained in the analysis following the application of exclusion criteria had a completion time below the cutoff of 10 minutes (which corresponds to less than 2 minutes per questionnaire). This cutoff was established because it appeared likely that a shorter duration would have precluded an accurate and careful completion of the questionnaires.

Table 1 contains information on demographic and other relevant characteristics of the sample which was included in the data analysis. The majority (90.9%) of participants was female. The mean age across all trauma groups was 36.41 years ($SD = 13.03$), ranging from 18 to 69 years.

Table 1

Demographic characteristics of the sample

	NIT (<i>n</i> = 24) <i>M</i> (<i>SD</i>)	LIP (<i>n</i> = 31) <i>M</i> (<i>SD</i>)	ESIP (<i>n</i> = 24) <i>M</i> (<i>SD</i>)	ECIP (<i>n</i> = 130) <i>M</i> (<i>SD</i>)	Total sample (<i>n</i> = 209) <i>M</i> (<i>SD</i>)
Sex <i>n</i> (%)					
Female	19 (20.8)	30 (96.8)	21 (87.5)	120 (92.3)	190 (90.9)
Male	5 (79.2)	1 (3.2)	3 (12.5)	10 (7.7)	19 (9.1)
Age <i>M</i> (<i>SD</i>)	31.79 (10.56)	30.65 (11.29)	34.96 (14.27)	38.91 (13.00)	36.41 (13.03)
Marital status <i>n</i> (%)					
Single	7 (29.2)	14 (45.2)	11 (45.8)	58 (44.6)	90 (43.1)
Married	7 (29.2)	9 (29.0)	9 (37.5)	41 (31.5)	66 (31.6)
Relationship	9 (37.5)	8 (25.8)	3 (12.5)	17 (13.1)	37 (17.7)
Divorced	1 (4.2)	0 (0.0)	0 (0.0)	14 (10.8)	15 (7.2)
Widowed	0 (0.0)	0 (0.0)	1 (4.2)	0 (0.0)	1 (0.4)
Educational level <i>n</i> (%)					
No GED / A Levels	0 (0.0)	2 (6.5)	0 (0.0)	12 (9.2)	14 (6.7)
GED / A Levels	9 (37.5)	14 (45.2)	13 (54.1)	49 (37.7)	85 (40.7)
University	15 (62.5)	13 (42.0)	9 (37.5)	55 (42.3)	92 (44.0)
Professional	0 (0.0)	1 (3.2)	2 (8.3)	10 (7.7)	13 (6.2)
Other	0 (0.0)	1 (3.2)	0 (0.0)	4 (3.1)	5 (2.4)
Occupation <i>n</i> (%)					
Working	7 (29.1)	19 (61.3)	12 (50.0)	66 50.7)	104 (49.7)
Unemployed/homemaker	6 (25.0)	3 (9.7)	6 (25.0)	38 (29.2)	53 (25.4)
Student	10 (41.7)	7 (22.6)	6 (25.0)	17 (13.1)	40 (19.1)
Retired	1 (4.2)	1 (3.2)	0 (0.0)	8 (6.2)	10 (4.8)
Other	0 (0.0)	1 (3.2)	0 (0.0)	1 (0.8)	2 (1.0)

Note. NIT = non-interpersonal trauma, LIP = late-interpersonal trauma, ESIP = early single/repeated interpersonal trauma, ECIP = early chronic interpersonal trauma. University = holds university degree, Professional = Professional qualification. The first column indicates what the numbers in parentheses stand for.

The majority of the sample lived in the United States (52.2%), followed by participants who lived in the United Kingdom (27.3%), and other countries (10.5%). Canada, Australia and Ireland accounted for 5.3%, 2.9%, and 1.4%, respectively. Most participants indicated English as their native language (87.6%). German and the 'other' category were each selected by 4.8% of respondents. The remaining proportion stated French or Spanish as their native language (1.4% and 1.0%, respectively). Across trauma groups, there were no significant differences on the demographic variables, except for marital status, $\chi^2(15, n = 209) = 26.05$, $p = .038$, and age, $F(3, 205) = 4.99$, $p = .002$. Individuals belonging to the ECIP group were significantly older than those belonging to the NIT and the LIP groups.

Table 2

Lifetime relationship, psychological/psychiatric treatment, depression and BPD screening, and PTSD symptom severity by trauma group

	NIT (<i>n</i> = 24) <i>M</i> (<i>SD</i>)	LIP (<i>n</i> = 31) <i>M</i> (<i>SD</i>)	ESIP (<i>n</i> = 24) <i>M</i> (<i>SD</i>)	ECIP (<i>n</i> = 130) <i>M</i> (<i>SD</i>)	Total sample (<i>n</i> = 209) <i>M</i> (<i>SD</i>)	Statistic
Relationship <i>n</i> (%)						
never	1 (4.2)	0 (0.0)	3 (12.5)	7 (5.4)	11 (5.3)	n/a
at least one	23 (95.8)	31 (100.0)	21 (87.5)	123 (94.6)	198 (94.7)	
Treatment <i>n</i> (%)						
received	8 (33.3)	17 (54.8)	16 (66.7)	110 (84.6)	151 (72.2)	$\chi^2(3, n = 209)$ = 33.10***
not received	16 (66.7)	14 (45.2)	8 (33.3)	20 (15.4)	58 (27.8)	
PHQ Depression <i>n</i> (%)						
positive	12 (50.0)	13 (41.9)	10 (41.7)	92 (70.8)	127 (60.8)	$\chi^2(3, n = 209)$ = 14.91**
negative	12 (50.0)	18 (58.1)	14 (58.3)	38 (29.2)	82 (39.2)	
PHQ mean score <i>M</i> (<i>SD</i>)	2.10 (0.85)	2.30 (0.74)	2.21 (0.80)	2.90 (0.81)	2.64 (0.87)	$F(3, 205) =$ 12.07***
MSI-BPD <i>n</i> (%)						
positive	3 (12.5)	17 (54.8)	13 (54.2)	87 (66.9)	120 (57.4)	$\chi^2(3, n = 209)$ = 24.80***
negative	21 (87.5)	14 (45.2)	11 (45.8)	43 (33.1)	89 (42.6)	
MSI-BPD sum score <i>M</i> (<i>SD</i>)	3.46 (2.77)	6.52 (3.05)	6.13 (3.52)	7.40 (2.63)	6.67 (3.07)	$F(3, 205) =$ 13.58***
IES-R mean score <i>M</i> (<i>SD</i>)	2.35 (1.00)	2.82 (0.92)	2.91 (0.86)	3.45 (0.77)	3.16 (0.91)	$F(3, 205) =$ 15.23***

Note. *n* = 209. NIT = non-interpersonal trauma, LIP = late-interpersonal trauma, ESIP = early single/repeated interpersonal trauma, ECIP = early chronic interpersonal trauma. PHQ = Patient Health Questionnaire-Depression, MSI-BPD = McLean Screening instrument for BPD, IES-R = Impact of Event Scale-Revised. 'Never' refers to individuals who have never had an intimate relationship in their life. The definition of the term intimate relationship was left up to the participants. The first column indicates what the numbers in parentheses stand for. Percentages refer to the proportion within the trauma group.

** $p < .01$

*** $p < .001$

Table 2 includes information regarding participants' lifetime relationship and treatment status as well the results of the Impact of Event Scale – Revised (IES-R, Weiss & Marmar, 1997) which assessed PTSD symptom severity. Furthermore, results of screenings for depression and borderline personality disorder (BPD) are presented.

Of all participants, 5.3% had never been in a relationship at the time of assessment. It was not possible to test this variable for differences between the trauma groups due to low cell frequencies. The majority of respondents have received psychological or psychiatric treatment for trauma-related difficulties at some point in their life. As expected, this number differed significantly between the trauma groups. An inspection of the standardized residuals following the chi-square test revealed that the association between trauma type and treatment

is mainly due to the NIT and the ECIP group. In the NIT group, fewer individuals than statistically expected had received treatment while in the ECIP group this was the case for more participants than expected. The trauma groups also differed in the degree of depression symptoms in that the ECIP group reported a significantly higher level of depression symptoms than the other three trauma groups. Furthermore, the ECIP group reported significantly more BPD symptoms than the NIT and the ESIP group, but did not differ from the LIP group. A one-way ANOVA indicated that PTSD symptom severity, as operationalized by the IES-R mean score, differed significantly across the four trauma groups. Planned contrasts revealed significant differences between ECIP and each of the other trauma groups.

2.2 Sample size and power analysis

The required sample size was computed using the program G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007). According to information in the literature, an effect size of $\eta^2 = 0.05$ was assumed for the effect of trauma type on attachment patterns, given an error probability of $\alpha = 0.05$ and a test power of $1 - \beta = 0.80$ (e.g., Aspelmeier et al., 2007; Roche et al., 1999). According to this computation, the required total sample size was $n = 140$, which means $n = 35$ for each comparison group. The planned sample size was not reached in all groups. While the ECIP group exceeded the required size, the size of the NIT, and ESIP groups stayed below the limit. Only the size of the LIP group corresponded to that required by the power analysis.

2.3 Measures

The present section describes the self-report questionnaires that were used for data collection. The applied measures assessed trauma history, two dimensions of adult attachment, PTSD symptom severity, interpersonal problems, as well as symptoms of depression and of borderline personality disorder (BPD). For some measures, the format and the number of items per page differed from the paper-pencil version due to their adaptation to an online format. However, the wording of the items was kept the same as were the response modes (e.g., Likert-type scales). Completion of the survey required approximately 20 to 30 minutes. Each page of the survey contained five to six items. The only exception is the assessment of trauma history which was conducted with one item per page, each asking about one particular

trauma. At the beginning of each questionnaire an instruction was provided that corresponded to the one in the paper-pencil format. One exception is the Trauma History Questionnaire for which the instruction was slightly modified to match the modifications in the questionnaire itself (see below). Another exception is the Impact of Event Scale-Revised for which the instruction had to be slightly changed for technical reasons. In the original version, there is a space in the instruction text where respondents fill in the traumatic event they are thinking of and when it occurred. In the present survey it was not possible to insert such spaces into the instruction text, which is why separate questions asked for the traumatic event and the time of its occurrence. Furthermore, on each subsequent page of the questionnaire, a short form of the instruction was shown in case participants had forgotten parts of it. No completeness check was carried out, therefore participants did not receive an error message if they left items uncompleted. However, at the beginning of each questionnaire respondents were asked to be sure they answer each question. As the authors of the Experiences in Close Relationships – Revised (ECR-R; Fraley, Waller, & Brennan, 2000) suggested, the items of this questionnaire were presented in randomized order to prevent sequence bias (Fraley, 2005). The survey did not provide an option to go to previous pages or to review and change answers. Finally, it is important to note that the settings and locations in which the questionnaires were completed could not be controlled and it is likely that not all participants completed the survey under the same external conditions.

In the following section, the administered questionnaires and their characteristics will be presented. The reported psychometric properties were obtained through offline administration of the respective measures. No data are available with respect to characteristics of the questionnaires in case of online administration. However, as reported in section 1.8.2, the empirical literature suggests that reliability and validity are not compromised if paper-pencil measures are adapted for online administration. Furthermore, evidence supports the assumption that the constructs assessed in these two modes are equivalent (e.g., Buchanan & Smith, 1999a; Fortson et al., 2006; Ritter et al., 2004). Notably, this result was also obtained for measures assessing PTSD symptoms (Read et al., 2009) and parental attachment in adulthood (Fouladi et al., 2002).

The questionnaires are described in the same order in which they were administered in the survey. All questionnaires can be found in the Appendices E through K.

2.3.1 Romantic attachment in adulthood

Romantic attachment in adulthood was assessed with the Experiences in Close Relationships – Revised scale (ECR-R; Fraley, Waller, and Brennan, 2000) which is the successor of the Experiences in Close Relationships (ECR) by Brennan, Clark, and Shaver (1998). The ECR-R assesses the attachment dimensions avoidance (18 items, e.g., “I prefer not to show a partner how I feel deep down”) and anxiety (18 items, e.g., “I’m afraid that I will lose my partner’s love”). Thus, it is based on the two-dimensional conceptualization of adult attachment by Brennan et al. (1998). The authors conceptualized avoidance as discomfort with closeness and discomfort with depending on others, whereas the anxiety dimension describes fear of rejection and abandonment. The ECR-R items constitute statements about issues related to romantic relationships in adulthood. Respondents are asked to indicate their degree of agreement to each statement on a 7-point Likert-type scale ranging from “strongly disagree” to “strongly agree”. The items were derived from an item response analysis of the item pool established by Brennan et al. (1998) for the development of the ECR. Using item response theory (IRT), the authors of the ECR-R selected items for which discrimination values are more evenly distributed across the entire range of the measured trait. Apart from adequate test information functions which are displayed in the paper published by Fraley et al. (2000), the ECR-R has also shown to have adequate classic psychometric properties. Results on both subscales appeared to be stable over a 6-week period (Sibley & Liu, 2004). In the same study internal consistencies amounted to Cronbach’s $\alpha = .91$ for the avoidance subscale and Cronbach’s $\alpha = .93$ for the anxiety subscale. Sibley and Liu (2004) as well as Sibley, Fischer, & Liu (2005) provided evidence for a good fit of the ECR-R to the hypothesized two-factor model. Applying a factor analysis, Sibley et al. (2005) established adequate criterion validity for the ECR-R by using the measure to predict attachment-related emotions in social interactions which were assessed with a diary procedure.

2.3.2 Interpersonal problems

One of the initial aims of this study was to compare the level of interpersonal problems in individuals with an early chronic interpersonal trauma to that in people with histories of early single interpersonal, late interpersonal or non-interpersonal trauma. It was intended to apply the Inventory of Interpersonal Problems – 64 (IIP-64; Horowitz, Alden, Wiggins, & Pincus, 2000) to assess interpersonal problems. However, an online administration of the IIP-64 was

deemed not feasible under the terms set by the publishing house that is holding the copyrights (e.g., password protected access to the survey that would have compromised the anonymity of the participants because a password would have needed to be e-mailed to each participant). As the various versions of the IIP are the measures usually used to assess interpersonal problems and no suitable alternative was found, it was decided to investigate interpersonal problems with a questionnaire written by the author of this thesis. This, however, meant that only an explorative analysis of interpersonal problems could be conducted because no data regarding the validity of this measure are available. In the present investigation this measure will be referred to as *questionnaire of interpersonal problems*.

The first step in the construction of this questionnaire was the identification of frequently reported aspects of interpersonal problems, for example from research regarding the Inventory of Interpersonal Problems (IIP; Horowitz, Rosenberg, Baer, Ureno, & Villasenor, 1988) and Kiesler's (1983) interpersonal circle. The dimensions that were intended to be addressed with this questionnaire were termed (1) *dominant/cold*, (2) *submissive/exploitable*, (3) *socially inhibited*, (4) *detached*, (5) *intrusive*, (6) *instable relationships*, and (7) *general difficulties in relationships*. Initially, five items were developed for each of the dimensions (1) through (3) and four items for each of the dimensions (4) through (7), which resulted in a total of 31 items. The items consist of statements regarding behaviors, feelings, and attitudes in interpersonal contact. They are rated on a 5-point Likert-type scale on which participants indicate the frequency of the described situations from "never" to "very often".

A principal component analysis (PCA) was conducted on the 31 items with oblique rotation (direct oblimin) in order to investigate underlying dimensions other than the proposed subscales. Oblique rotation was chosen because the factors were assumed to be interrelated. The Kaiser-Mayer-Olkin measure confirmed the sampling adequacy for the analysis, $KMO = .85$, and the KMO values for individual items were all above .71, except for one, $KMO = .64$. Correlations between items were large enough for PCA, as indicated by Bartlett's test of sphericity, $\chi^2(465, n = 209) = 2869.40, p < .001$. The pattern and structure matrix of this PCA are displayed in Appendix B. While the pattern matrix is comparable to the factor matrix following orthogonal rotation, the structure matrix takes into account the relationship between factors. Six components had eigenvalues higher than Kaiser's (1960) criterion of 1. However, as the scree plot showed an inflection after the fourth component

only four components were retained. Items were assigned to a particular component when their factor loading on this dimension was above .40.

A second PCA was carried out with the stop criterion of 4 factors. Appendix B contains the pattern and structure matrix of this PCA. Inspection of factor loadings indicated that the first component comprised the Items 3, 5, 11, 18, 20, 25, 27, 30, 31; the second component the Items 1, 4, 8, 9, 10, 12, 17, 22, 24, 29; the third component the Items 6, 7, 14, 21, 26; and the fourth component the Items 2, 13, 15, 16, 19, 23, 28.

A reliability analysis was carried out for each of these components as well as for the questionnaire as a whole. Item 6 was not included in this analysis due to negative covariances with the other items belonging to the same dimension, which violates the assumptions of the reliability model. Thus, the reliability analysis was conducted with 30 items.

The data on reliability revealed that, if Items 19 and 28 were deleted, the internal consistencies of the respective scales would be much higher than if the items were included (Cronbach's $\alpha = .408$ vs. Cronbach's $\alpha = .508$ and Cronbach's $\alpha = .682$, respectively). Therefore, it was decided to exclude these two items from the questionnaire. Exclusion of Items 18 and 21 would have raised the internal consistency of the respective scale only by a little (Cronbach's $\alpha = .862$ vs. Cronbach's $\alpha = .868$ and Cronbach's $\alpha = .742$ vs. Cronbach's $\alpha = .751$, respectively), thus they were retained.

A third PCA was conducted after the Items 6, 19, and 28 had been excluded. Again, the stop criterion was the extraction of four components. The factor loadings (see Appendix B) revealed that the assignment of items to the four dimensions was slightly different from that following the second PCA which was conducted with all 31 items. Inspection of the factor loadings and item contents indicated that the first component represents submissive and socially inhibited behavior and attitudes (Items 3, 5, 11, 20, 25, 27, 30, 31; e.g., "I act according to other people's wishes or orders"), the second component interpersonally dominant behavior and attitudes (Items 1, 9, 12, 15, 22, 29; e.g., "I impose my will on other people"), the third component interpersonally detached behavior and attitudes (Items 7, 13, 14, 21, 26; e.g., "I am not very interested in talking to other people"), and the fourth component general interpersonal problems (Items 2, 4, 8, 10, 16, 17, 18, 23, 24; e.g., "I would be happier if I had better relationships with the people in my life").

Subsequently, a second reliability analysis was conducted with respect to both the four components extracted by the PCA and the questionnaire as a whole. The results are displayed in Table 3.

Table 3

Reliability analysis for the subscales of the questionnaire of interpersonal problems

Subscale and item number	Cronbach's α	Corrected item-total correlation	Subscale and item number	Cronbach's α	Corrected item-total correlation
<i>Submissive/Socially inhibited (1st component)</i>	.868		<i>Detached (3rd component)</i>	.395	
3	,849	,645	7	-,002	,547
5	,859	,553	13	,291	,268 ^b
11	,833	,777	14	,000	,593
20	,856	,581	21	,265	,294 ^b
25	,855	,590	26	,725 ^a	-,425
27	,850	,633			
30	,864	,503			
31	,844	,692			
<i>Dominant (2nd component)</i>	.742		<i>General (4th component)</i>	.835	.
1	,697	,513	2	,808	,638
9	,725	,405	4	,841 ^a	,330
12	,717	,445	8	,803	,673
15	,708	,469	10	,802	,677
22	,709	,466	16	,817	,553
29	,673	,585	17	,825	,486
			18	,836 ^a	,365
			23	,818	,549
			24	,809	,633

Note. $N = 209$. The reliability values were computed with 28 items after missing values were imputed by the mean of the respective item. Reliabilities next to single items indicate Cronbach's α of the respective scale if this item is deleted. The corrected item total correlation indicates the association of an item and the scale it was assigned to.

^a Deletion of the respective item would increase the reliability of the scale it is assigned to.

^b Item total correlation is below the critical value of $r = .3$ (Field, 2009).

In Table 3 it is apparent that the deletion of Item 26 would increase the reliability of the *detached* scale to a great extent. Therefore, Item 26 was the fourth item to be excluded from this questionnaire. Following the deletion of Items 6, 19, 26, and 28, the internal consistencies of all four dimensions were all above the critical value of Cronbach's $\alpha = .70$ (Field, 2009). The overall internal consistency of the mean score across all 27 items was Cronbach's $\alpha = .85$.

A subsequent final PCA with the remaining 27 items revealed that the assignment of items to the components did not differ from the PCA that still included Item 26. Therefore, scores for the four subscales as presented in Table 3 were used for further data analysis. Besides, an overall mean score was computed.

Table 4

Structure matrix of exploratory principal component analysis for the questionnaire of interpersonal problems (N = 209)

Item	Rotated factor loadings			
	1	2	3	4
1	-0,09	0,62	-0,38	-0,12
2	0,37	0,37	0,05	-0,62
3	0,69	-0,38	0,13	-0,18
4	0,04	0,49	-0,30	-0,46
5	0,63	0,02	0,52	-0,28
7	0,15	0,00	0,81	-0,16
8	0,34	0,24	0,37	-0,70
9	0,07	0,51	-0,25	-0,30
10	0,26	0,29	0,03	-0,80
11	0,79	-0,29	0,17	-0,25
12	-0,13	0,48	-0,30	-0,22
13	0,42	0,00	0,64	0,02
14	0,00	-0,15	0,75	-0,23
15	0,14	0,68	-0,03	-0,20
16	0,45	0,40	0,37	-0,45
17	0,15	0,46	0,10	-0,55
18	0,27	-0,17	0,17	-0,59
20	0,70	0,13	0,15	-0,29
21	-0,32	-0,38	0,57	0,00
22	-0,12	0,65	0,01	-0,10
23	0,47	0,13	0,36	-0,54
24	0,18	0,26	0,08	-0,75
25	0,62	-0,29	0,10	-0,35
27	0,76	0,15	-0,08	-0,35
29	0,01	0,73	0,02	-0,25
30	0,65	0,12	0,18	-0,04
31	0,73	-0,12	0,02	-0,41
Eigenvalues	5.13	3.84	3.19	4.45

Note. Analysis following exclusion of Items 6, 19, 26, and 28. Stop criterion was four components. Direct oblimin rotation. Factor loadings above .40 appear in bold. The percentage of the explained variance cannot be indicated for each component separately as the components are correlated following direct oblimin rotation.

Table 4 contains the structure matrix for this final PCA. The pattern matrix can be found in Appendix B. For reasons of space, the exact wording of the questionnaire items is not included in these tables but can be found in Appendix G. Prior to rotation, the four

components explained 53.92% of the variance. Following direct oblimin rotation, no total explained variance can be computed due to the correlation between the components.

2.3.3 History of traumatic experiences

Trauma History was assessed with a modified version of the Trauma History Questionnaire (THQ; Green, 1996), a measure developed for the use in both general and clinical populations. The 24 items of the original THQ (e.g., “Has anyone ever made you have intercourse, oral or anal sex against your will?”) address the lifetime exposure to various traumatic events that meet the A1 criterion for potentially traumatic stressors according to DSM-IV-TR (APA, 2000). There is no particular theoretical orientation underlying the measure. Instead, its aim is to cover a wide range of events that are considered traumatic. The assessed traumatic events are related to crime, general disaster/trauma, and sexual and physical assault (Green, Krupnick, Rowland, Epstein, & Stockton, 1995). The last item asks about the experience of any other extraordinarily stressful situation that was not covered by the previous questions. Respondents indicate in a dichotomous response format (yes/no) whether they have experienced the respective event and, if yes, how often the events have occurred and the respondent’s age at the time of occurrence. Additionally, for sexual and physical assault, the questionnaire assesses whether the events occurred repeatedly and, if yes, how many times and at what age(s). Respondents are also asked to describe the trauma they had experienced in more detail. A study of 25 female college students showed good stability for all traumatic events over a period of two to three months. Stability results ranged from $r = .51$ (for “close person killed”) to $r = 1.0$ (for “seen dead bodies”).

For the purposes of the present study, the THQ was administered in a slightly modified form. As Green et al. (1995) noted, some items of the THQ do not meet the A1 criterion for PTSD according to DSM-IV. Therefore, the first modification consisted of the removal of these items (four in total) as well as of the combination of pairs of items into one item. The removed items addressed the following traumatic events: (1) someone breaking into a person’s home when the person is not there, (2) exposure to dangerous chemicals or radioactivity, (3) news of a serious injury, life-threatening illness or unexpected death of someone close (covered by Item 9 in the modified version), (4) other events of unwanted sexual contact. The last item was removed because the two items addressing sexual assault and abuse (Items 12 and 13) were considered to be general enough to cover nearly all

instances of sexual assault. Furthermore, the intention was to keep the questionnaire short so the whole survey would not consume too much of the participants' time. Several pairs of items were considered very similar and thus were combined into one item each. This applied to the original Items 1 and 2, Items 9 and 10, as well as Items 11 and 12.

The second modification refers to the questions assessing the age of onset and duration of the trauma. For every endorsed traumatic experience, the frequency as well as the age of onset was assessed, which corresponds to the procedure in the original THQ. What is different in the modified version is that the age of onset was assessed for every single occurrence of each trauma. Furthermore, questions about the chronicity of interpersonal traumas were modified from the original version. If a participant responded that they had experienced an interpersonal trauma, on the subsequent page they were asked to indicate whether the trauma occurred once, twice or more than three times. Depending on their answer to this question, they were asked to specify the age(s) at which the events occurred or the age at which they occurred for the first and last time. From this information, the duration of the trauma was computed. Subsequently, participants were given the possibility to describe their traumatic experiences in more detail in their own words. This qualitative information was used to make the assignment of participants to trauma groups more accurate. If a participant had not experienced a particular trauma, no further questions were asked but instead the next item addressing another traumatic experience appeared.

In the present study, interpersonal trauma was conceptualized as the experience of sexual or physical abuse in childhood. Therefore, the Items 12 to 15 in the modified version were considered to assess interpersonal trauma, whereas the other ones were considered to address non-interpersonal traumas.

2.3.4 PTSD symptom severity

The Impact of Event Scale – Revised (IES-R; Weiss & Marmar, 1997) was used to assess the presence and severity of PTSD symptoms. The IES-R is a self-report measure capturing symptomatic responses to a particular traumatic stressor during the previous seven days. It taps the experience of intrusive symptoms, avoidance symptoms, and hyperarousal which conform to the main symptom clusters of PTSD according to DSM-IV. In the present study, the IES-R referred to the traumatic event that the participant deemed most distressing. In

most cases, this was the trauma they had indicated on the THQ. The IES-R comprises 22 items (e.g., “Any reminder brought back feelings about it”; “I had trouble falling asleep”) which are scored on a scale ranging from 0 (“not at all”) to 4 (“extremely”). This measure allows the computation of a sum score, a mean score and separate scores for the three symptom clusters. For the purposes of the present study, the IES-R mean score will be used. Among samples of earthquake survivors, Weiss and Marmar (1997) obtained internal consistencies ranging from Cronbach’s $\alpha = .87$ to Cronbach’s $\alpha = .92$ for intrusion, from Cronbach’s $\alpha = .84$ to Cronbach’s $\alpha = .85$ for avoidance, and from Cronbach’s $\alpha = .79$ to Cronbach’s $\alpha = .90$ for hyperarousal. Furthermore, the authors reported a satisfying test-retest stability for all three dimensions. For the IES-R, no norms or clinical cutoff scores are available (Weiss, 2004), however, as suggested by the test authors, the scores can be interpreted by comparing them to the anchors of the response scale.

2.3.5 Depression screening

In order to screen participants for depression, the depression subscale of the self-report version of the PRIME-MD Patient Health Questionnaire (PHQ; Spitzer, Kroenke, & Williams, 1999) was applied. The PRIME-MD (Primary Care Evaluation of Mental Disorders) by Spitzer, et al. (1994) is a screening instrument that diagnoses mental disorders according to the criteria of DSM-III-R (APA, 1987) and DSM-IV (APA, 1994). In the depression subsection, which contains nine items, participants are asked to indicate how often over the last two weeks they have experienced particular symptoms. Their frequency is indicated on a 4-point scale ranging from “not at all” to “nearly every day”. For the entire screening instrument, Spitzer et al. (1999) reported a sensitivity of .73 and a specificity of .98. The overall accuracy for the depression subsection was reported to be 93%. Diagnoses obtained with the PHQ were shown to be significantly related to those obtained by mental health professionals. Compared to a clinician-administered version of the PRIME-MD, the self-report measure yielded a somewhat lower prevalence of psychiatric disorders (28% vs. 39%). For the present analysis, both a diagnostic statement (positive/negative screening) and a sum score were computed. Using the sum score, the *degree* of depression symptoms could be related to the other variables in this study.

2.3.6 Screening for borderline personality disorder

The screening for borderline personality disorder (BPD) was conducted with the McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD; Zanarini et al., 2003). This measure is based on the diagnostic criteria for BPD as specified in DSM-IV (APA, 1994). It contains ten items with a dichotomous answer format (yes/no). Participants indicate for each item whether the statement applies to them. Each endorsed statement is counted as one point; no point is given for a rejected item. The optimal cutoff score was found to be 7 or more endorsed items, leading to a sensitivity of .81 and a specificity of .85 in non-psychotic and non-manic individuals. Zanarini et al. (2003) reported an internal consistency of Cronbach's $\alpha = .74$ and a test-retest reliability of Spearman's $\rho = .72$ for this measure. Evidence for validity was obtained by relating the MSI-BPD to the BPD module of the Diagnostic Interview of DSM-IV Personality Disorders (DIPD-IV; Zanarini, Frankenburg, Sickel, & Yong, 1996). As in the depression screening, both a diagnostic statement (positive/negative screening) and the sum score of the MSI-BPD (i.e., the number of endorsed items) were computed.

2.4 Procedure

The data for the present study were collected using six self-report questionnaires which were adapted for online administration and combined into one survey. The questionnaires were administered through Unipark, an online service providing solutions for Web-based surveys. The survey was accessible on <http://www.unipark.de/uc/UniAmsterdam> from June 3rd 2010 until October 29th 2010.

The online survey for the present study was open, which means it was accessible to every visitor of the host website without requiring a password. The sample was a self-selected convenience sample in that it consisted of individuals who came across the link on a given website and decided to follow it. Participants did not receive payments or other incentives for completing the questionnaire.

On the host websites, together with the link, a study announcement was published which stated that the goal of the study was to examine how the experience of social situations and interpersonal relationships is related to traumatic or distressing experiences people have encountered in their lives. People who have and who have not had traumatic experiences

were invited to participate, regardless whether they felt troubled by these experiences or not. Furthermore, the announcement pointed out that all data would be treated as strictly confidential and that no information would be collected that could be used to identify respondents. When participants followed the link to the survey, they reached the information page of the online survey which contained more details about the study and participation. A copy of the study announcement as well as of the information page is included in Appendix C and Appendix D. On the information page, participants were informed about the goals of the study, the length of the questionnaire, and measures undertaken to ensure anonymity and confidentiality. Moreover, respondents were informed that parts of the survey address distressing or traumatic experiences that they may have experienced and that responding to the respective questions may trigger negative feelings. Therefore, it was made clear that they could end the survey at any time without stating reasons. Finally, a possibility to contact the responsible researchers was given in case respondents had questions or felt troubled by the contents of the survey. Participants provided informed consent by confirming that they had read and understood the information. This was done by clicking on an accordingly labeled button at the end of the page. The respondents could proceed to the next page only if they provided this confirmation. The following page assessed demographic variables such as sex, age, marital status, number of children, education level, occupation, country of residence, and native language. This page was followed by the questionnaires that were introduced in section 2.3. At the end of the survey, participants were asked to indicate whether they had ever received psychological or psychiatric treatment for trauma-related difficulties. Furthermore, they had the possibility to express comments about the survey. Finally, respondents were asked whether they permit the researchers to use their answers on the survey for the purposes of the present study. Also, they had the opportunity to give their e-mail address in case they wanted to be contacted for further online studies. The e-mail addresses were saved separately from the research data. The procedures that were part of this study as well as the information given to participants and the administered questionnaires were approved by the institutional review board of the University of Amsterdam.

2.5 Statistical analyses

2.5.1 Hypothesis tests

Differences in the attachment dimensions of avoidance and anxiety between the trauma groups (Hypothesis 1) were assessed using a MANOVA. Significant main effects were followed up by separate ANOVAs for each outcome variable and planned simple contrasts comparing the early chronic interpersonal trauma group to each of the other trauma groups. Simple contrasts were chosen for the follow-up because the hypothesis predicted that the non-interpersonal, late interpersonal, and early single interpersonal trauma groups would all differ from the early single interpersonal trauma group.

Associations between the attachment dimensions and PTSD (Hypothesis 2) were assessed with Pearson product-moment correlations.

Differences in attachment avoidance and anxiety between the four trauma groups, taking into account the effect of PTSD (Hypothesis 3), were intended to be assessed with a MANCOVA with the IES-R score as the covariate. Significant main effects of trauma type were intended to be followed up by ANCOVAs and planned simple contrasts comparing the early chronic interpersonal group to the other three trauma groups. The rationale for the application of simple contrasts for this hypothesis test is the same as for the test of Hypothesis 1.

To test the mediating effect of attachment avoidance and attachment anxiety on the relationship between trauma type and PTSD a set of regression analyses was carried out according to the suggestions by Baron and Kenny (1986). Section 3.2.4 contains further details about this procedure. For each attachment dimension, a separate mediator analysis was conducted.

2.5.2 Effect sizes

For the results of the statistical tests, apart from p-values, effect sizes were computed in order to obtain a better understanding of the results. For univariate and multivariate ANOVAs, the effect size η^2 , which is the same as Pearson's correlation coefficient r^2 , will be used. Effect sizes will be evaluated according to the suggestions provided by Cohen (1988, 1992). With regard to univariate ANOVA, η^2 values of .01, .06, and .14 represent small, medium, and

large effects, respectively. Regarding multivariate ANOVA, small, medium, and large effects correspond to η^2 values of .02, .15, and .26, respectively. Pearson's correlation coefficient $r = .10$ indicates a small effect, $r = .20$ a medium effect, and $r = .50$ a large effect.

2.5.3 Assumptions of statistical hypothesis tests

Before running the statistical hypothesis tests, it was checked whether the assumptions of the respective statistical procedures are met. With respect to ANOVA and MANOVA, normal distribution of variables was tested using the Kolmogorov-Smirnov test with Lilliefors' significance correction, Levene's test was applied for tests of homogeneity of variances (relevant for ANOVA) and Box's test for homogeneity of covariance matrices (relevant for MANOVA). With regard to the assumptions of regression analysis, multicollinearity values are acceptable if the variance inflation factor (VIF) is not higher than 10 on average and if the tolerance values are not below 0.2 (Field, 2009). Homoscedasticity was tested by looking at the scatterplot of the standardized predicted values of the dependent variable and the standardized residuals. Independence of residuals was tested with the Durbin-Watson test. Residuals are uncorrelated if the test statistic has the value 2. Normal distribution of residuals was tested with Kolmogorov-Smirnov tests.

Whether the assumptions of the statistical procedures were met by the data will be reported in the section covering the respective hypothesis test. There the reader will also find further information on how violations of assumptions and other problems with data distribution were handled.

2.5.4 Missing values

Missing data that occurred in the present study were due to item non-response. The amount of missing values reached from 0.56% on the PHQ depression screening to 3.43% on the IES-R which assessed PTSD symptom severity. The proportion of missing values was 0.77% for the MSI-BPD, 0.85% for the questionnaire of interpersonal problems, and 1.31% for both attachment-related scales of the ECR-R. The percentage of missing values for the THQ could not be assessed unambiguously because not all participants were presented with all items (detailed questions about a given traumatic event were asked only if the participant indicated that they had experienced that type of trauma). Furthermore, some participants did not indicate the age of onset in the designated field but they mentioned it, for example, in the

description of the traumatic experience. However, none of the initial trauma questions which asked about the presence of a given trauma was left unanswered by any of the participants.

For the management of missing data, guidelines provided by Schlomer, Baumann, and Card (2010) were applied. According to their suggestions, cases with more than 10% of missing values per questionnaire were excluded from data analysis. Following the application of this procedure, the following proportions of missing values resulted: 0.12% for the ECR-R, 0.14% for the questionnaire for interpersonal problems, 0.0% for the IES-R, 0.17% for the PHQ depression screening, and 0.0% for the MSI-BPD.

No systematic patterns of missing data were detected. Participants with and without missing values did not differ significantly with regard to age, $t(258) = -1.61, p = .108$, sex, $\chi^2(1, n = 260) = 0.12, p = .726$, education, $\chi^2(7, n = 260) = 6.76, p = .454$, occupation, $\chi^2(6, n = 260) = 11.68, p = .070$, marital status, $\chi^2(5, n = 260) = 3.05, p = .692$ and the utilization of psychological or psychiatric treatment $\chi^2(2, n = 260) = 4.12, p = .128$. There was a significant difference with respect to whether participants have ever had a romantic relationship, $\chi^2(1, n = 260) = 5.33, p = .021$, in that 26.7% of participants who have never been in a relationship were excluded from the analysis compared to 8.6% who have been in a relationship.

Missing data of participants who remained in the analysis were imputed with the means of the respective scales. This method is considered a good solution because the distribution of missing values appeared to be random. As the proportion of missing data is relatively low, this procedure was not expected to cause serious reduction in the variance of the respective variables.

3 Results

In the following sections, the results of the statistical hypothesis tests are presented, followed by results of the explorative analyses with the questionnaire of interpersonal problems. Prior to the hypothesis tests, a statistical comparison of participants who completed the survey and participants who dropped out or were excluded was conducted.

3.1 Comparison of completers versus drop-outs

T-tests were carried out in order to compare participants who provided complete data (i.e., who completed all questionnaires) ($n = 260$) with those who did not complete the survey. As respondents dropped out at various points in the survey, the number of non-completers differed for each questionnaire. Questionnaire data for the non-completer group were available for the ECR-R Anxiety scale ($n = 93$), the ECR-R Avoidance scale ($n = 59$), and the questionnaire of interpersonal problems ($n = 41$). For the IES-R ($n = 3$) and the PHQ ($n = 1$), the number of individuals from the non-completer group was too low for a comparison of respondents with complete and incomplete data. Participants with complete data reported significantly higher scores on the ECR-R subscales anxiety, $t(351) = 5.20, p < .001$, and avoidance, $t(317) = 3.60, p < .001$, as well as on the questionnaire of interpersonal problems $t(45.871) = 2.65, p = .011$.

It was not possible to include all participants who did not complete the questionnaire into the comparisons regarding demographic variables and other characteristics. The reason for this is that many respondents who dropped out did not answer all questions addressing these variables. In particular, there is hardly any information about the treatment status of participants who dropped out because this variable was assessed at the end of the survey. In order to make the survey more sensitive and to prevent high drop-out rates at the beginning, the question about psychological or psychiatric treatment was not asked at the beginning of the survey but at the end following the last questionnaire.

T-tests or Chi²-tests were conducted in order to compare respondents who were included or excluded in the study according to inclusion and exclusion criteria (lack of a traumatic experience, more than 10% of unanswered items per questionnaire). No significant differences were detected with respect to age, $t(258) = -1.59, p = .114$, sex, $\chi^2(1, n = 260) = 0.98, p = .323$, level of education, $\chi^2(7, n = 260) = 3.44, p = .841$, occupation, $\chi^2(6, n = 260) = 3.59, p = .732$, and marital status, $\chi^2(5, n = 260) = 5.10, p = .404$, and received versus non-received psychological or psychiatric treatment, $\chi^2(1, n = 260) = 3.21, p = .073$.

3.2 Analysis

3.2.1 Hypothesis 1: Adult attachment and trauma type

The first hypothesis predicted that survivors of early chronic interpersonal trauma would report significantly higher attachment-related avoidance and anxiety compared to survivors of a non-interpersonal trauma, a late interpersonal trauma or an early single interpersonal trauma. This prediction was tested with a multivariate analysis of variance (MANOVA).

Box's test indicated that the assumption of equal covariance matrices was not met, $F(9, 50929.401) = 2.23, p = .018$, which may cause MANOVA to yield inaccurate results due to the unequal sample sizes in the present study. MANOVA was nevertheless carried out as it is considered a robust test (Field, 2009) but it should be kept in mind that the result of this hypothesis test may be rather liberal because the standard deviation in the group with the largest sample (ECIP) is generally lower than in the smaller sized groups (Field, 2009). In order to reduce the possibility of false conclusions from the parametric test, additional univariate non-parametric tests, namely Kruskal-Wallis tests and subsequent Mann-Whitney tests, were computed for each attachment dimension.

The avoidance and attachment scores followed a normal distribution in all groups except for the early chronic interpersonal trauma group. In this group, the Kolmogorov-Smirnov test statistic was 0.78, $p = .049$, for the avoidance subscale of the ECR-R, and 0.099, $p = .003$ for the anxiety subscale. In the other groups the p -values were above .200 for both subscales. In both cases of non-normality the scores were negatively skewed. The reason for this could be that there were only few individuals with histories of early chronic abuse who reported low attachment avoidance and anxiety. At the same time, due to the larger sample size of the early chronic interpersonal trauma group, the Kolmogorov-Smirnov test statistic was more likely to reach a statistically significant value in this group than in the other three groups. Table 5 shows the descriptive statistics of the attachment-related variables by trauma type as well as the results of the hypothesis test.

Table 5

Attachment-related avoidance and anxiety by trauma type.

	NIT (<i>n</i> = 24) <i>M</i> (<i>SD</i>)	LIP (<i>n</i> = 31) <i>M</i> (<i>SD</i>)	ESIP (<i>n</i> = 24) <i>M</i> (<i>SD</i>)	ECIP (<i>n</i> = 130) <i>M</i> (<i>SD</i>)	(<i>M</i>)ANOVA <i>F</i> (6, 410) or <i>F</i> (3, 205)	η^2
Multivariate ^a					7.37*** (Pillai's <i>V</i> = 0.20)	0.10
ECR-R Avoidance	3.00 (1.21) ^b	4.03 (1.20) ^b	4.02 (0.89)	4.45 (1.01)	13.40***	0.16
ECR-R Anxiety	3.17 (1.34) ^b	4.19 (1.23) ^b	4.42 (1.16)	4.82 (1.08)	15.02***	0.18

Note. NIT = non-interpersonal trauma, LIP = late interpersonal trauma, ESIP = early single/repeated interpersonal trauma, ECI = early chronic interpersonal trauma. ECR-R = Experiences in Close Relationships-Revised.

^a MANOVA with Pillai's trace as test statistic

^b Significant contrast between this group and ECIP group

*** $p < .001$

In Table 6, the corresponding variance-covariance matrix for the two attachment dimensions is displayed.

Table 6

Variance-Covariance matrix for both attachment dimensions

	ECR-R Avoidance	ECR-R Anxiety
ECR-R Avoidance	1,31	
ECR-R Anxiety	1,21	1,56

Note. *n* = 209.

The a-priori adopted type I error rate was $\alpha = .05$. Using Pillai's trace, the MANOVA revealed a significant effect of trauma type on attachment-related anxiety and avoidance and a medium effect size. Separate univariate ANOVA's also found significant effects of trauma type on attachment avoidance and on attachment anxiety, both of which showed large effect sizes. These results were followed up with planned contrasts which revealed that the ECIP group reported significantly higher attachment avoidance and anxiety than both the NIT and the LIP group, whereas there was no evidence for a significant contrast between the ECIP and the ESIP group (Table 7).

Table 7

p-values for planned contrasts between trauma groups with regard to attachment avoidance and anxiety

ECR-R Avoidance	NIT	LIP	ESIP
ECIP	<.001	.043	.064
ECR-R Anxiety	NIT	LIP	ESIP
ECIP	<.001	.006	.119

Note. $n = 209$. NIT = non-interpersonal trauma, LIP = late interpersonal trauma, ESIP = early single/repeated interpersonal trauma, ECIP = early chronic interpersonal trauma.

The non-parametric Kruskal-Wallis tests and subsequent Mann-Whitney tests yielded the same results regarding group differences as the MANOVA and the planned contrasts thus they will not be reviewed in more detail.

3.2.2 Hypothesis 2: Adult attachment and PTSD symptom severity

The second hypothesis predicted that the attachment dimensions avoidance and anxiety are correlated with the severity of PTSD symptoms. The significance of the Pearson correlations was tested at an a-priori type I error rate of $\alpha = .05$. In line with the prediction, the IES-R mean score showed significant positive Pearson correlations with both avoidance and anxiety, corresponding to a large effect size (Table 8).

Table 8

Pearson correlation coefficients between PTSD symptom severity and attachment-related avoidance and anxiety

	1.	2.	3.
1. IES-R mean score	-	.45***	.43***
2. ECR-R Avoidance		-	.85***
3. ECR-R Anxiety			-

Note. $n = 209$. IES-R = Impact of Event Scale-Revised, ECR-R = Experiences in Close Relationships-Revised.
*** $p < .001$

3.2.3 Hypothesis 3: Influence of PTSD symptoms on the association between adult attachment and trauma type

The third hypothesis predicted that differences in attachment-related avoidance and anxiety between the trauma groups will remain significant when PTSD symptom severity is

controlled for. To test this hypothesis, it was initially planned to conduct an ANCOVA, with PTSD symptom severity as the covariate. One of the assumptions of ANCOVA is that the grouping variable and the covariate are statistically independent (Miller & Chapman, 2001). However, an ANOVA conducted with the present data revealed significant differences in PTSD symptom severity as a function of trauma type (Table 9).

Table 9

PTSD symptom severity by trauma type

	NIT (<i>n</i> = 24) <i>M</i> (<i>SD</i>)	LIP (<i>n</i> = 31) <i>M</i> (<i>SD</i>)	ESIP (<i>n</i> = 24) <i>M</i> (<i>SD</i>)	ECIP (<i>n</i> = 130) <i>M</i> (<i>SD</i>)	ANOVA <i>F</i> (3, 205)
IES-R mean score	2.35 (1.00)	2.82 (0.92)	2.91 (0.86)	3.45 (0.77)	15.23***

Note. NIT = non-interpersonal trauma, LIP = late interpersonal trauma, ESIP = early single/repeated interpersonal trauma, ECI = early chronic interpersonal trauma. IES-R = Impact of Event Scale-Revised.
*** $p < .001$

Inclusion of a covariate that is associated with the grouping variable may reduce the effect of the grouping variable. In such a case, the independent variable is altered in a way that is conceptually not meaningful, which precludes valid conclusions from the obtained results (for an extensive discussion of this problem, see Miller & Chapman, 2001). In other words, if trauma type is associated with PTSD symptom severity, it is not possible to analyze which effect trauma type would have on adult attachment if it was not associated with PTSD symptom severity (Miller & Chapman, 2001). Thus, with the present sample, it was not possible to conduct a methodologically sound test of Hypothesis 3.

3.2.4 Hypothesis 4: Mediating effect of adult attachment

The fourth hypothesis predicted that attachment-related avoidance and anxiety in adulthood have a mediating effect on the association between trauma type and the severity of PTSD symptoms. According to Baron and Kenny (1986), a variable has a mediating effect if (a) variation in the independent variable significantly accounts for variation in the presumed mediator, (b) variation in the presumed mediator significantly accounts for variation in the dependent variable, and (c) the previously significant association between the independent and the dependent variable is no longer significant, when the associations described in (a) and (b) are controlled. Following the suggestions by Baron and Kenny (1986), the mediational models were each tested with the following set of linear regression equations:

- (a) Regression of the presumed mediator on the independent variable
- (b) Regression of the dependent variable on the independent variable
- (c) Regression of the dependent variable on both the independent variable and the presumed mediator.

Mediation is statistically established when the following conditions are met (Baron & Kenny, 1986): First, the independent variable is a significant predictor of the mediator in equation (a); second, the independent variable is a significant predictor of the dependent variable in equation (b); and third, the mediator is a significant predictor of the dependent variable in equation (c). The effect of the independent on the dependent variable is smaller in the third equation than in the second if all these conditions are fulfilled in the predicted direction.

For the present analysis, six multiple linear regression equations were computed; three for attachment avoidance and three for attachment anxiety. The variable trauma type was dummy-coded with ECIP as the reference category. The statistical assumptions for regression analysis were met in all cases. The Durbin-Watson test statistic was close to 2 for all regression equations, indicating independent residuals. Examination of the variance inflation factors (VIF) and tolerances for each equation indicated a lack of perfect multicollinearity according to the criteria specified by Field (2009). However, a certain degree of multicollinearity is expected and cannot be avoided in mediational analyses due to the correlation of the independent variable with the presumed mediator. Scatterplots revealed that the data met the assumption of homoscedasticity. Furthermore, Kolmogorov-Smirnov tests of the standardized residuals indicated that they were normally distributed. Casewise diagnostics subsequent to the regression analyses suggested that the data produced a fairly accurate model. For the significance tests of the single predictors and the model as a whole, an a-priori type I error rate of $\alpha = .05$ was adopted.

Attachment avoidance. First, ECR-R avoidance (i.e., the presumed mediator) was regressed on trauma type (i.e., independent variable). Table 10 contains the model coefficients for this regression. Trauma type explained a significant amount of variance in the ECR-R avoidance score, which was approximately 16%. All variables related to trauma type, except for the

difference between the ESIP and ECIP group, significantly accounted for the variation in attachment avoidance.

Table 10

Multiple linear regression of attachment avoidance on trauma type

	<i>B</i>	<i>SE (B)</i>	β	<i>t</i>	<i>p</i>
Constant	4.45	0.09		48.25	<.001
NIT vs. ECIP	-1.45	0.23	-.41	-6.22	<.001
LIP vs. ECIP	-0.43	0.21	-.13	-2.04	.043
ESIP vs. ECIP	-0.44	0.23	-.12	-1.86	.064

Note. Dependent variable: ECR-R Avoidance. $R^2 = .16$ ($p < .001$). NIT = non-interpersonal trauma ($n = 24$), LIP = late interpersonal trauma ($n = 31$), ESIP = early single/repeated interpersonal trauma ($n = 24$), ECIP = early chronic interpersonal trauma ($n = 130$).

Second, the IES-R score (i.e., dependent variable) was regressed on trauma type (i.e., independent variable). As Table 11 shows, the variation in the trauma type variables significantly accounted for the variation in the IES-R score. A significant amount of outcome variance, namely 18%, was accounted for by the predictors.

Table 11

Multiple linear regression of PTSD symptom severity on trauma type

	<i>B</i>	<i>SE (B)</i>	β	<i>t</i>	<i>p</i>
Constant	75.79	1.60		47.27	<.001
NIT vs. ECIP	-24.17	4.06	-.39	-5.95	<.001
LIP vs. ECIP	-13.83	3.65	-.25	-3.78	<.001
ESIP vs. ECIP	-11.67	4.06	-.19	-2.87	.004

Note. Dependent variable: IES-R mean score. $R^2 = .18$ ($p < .001$). NIT = non-interpersonal trauma ($n = 24$), LIP = late interpersonal trauma ($n = 31$), ESIP = early single/repeated interpersonal trauma ($n = 24$), ECIP = early chronic interpersonal trauma ($n = 130$).

The third equation was the regression of IES-R (i.e., dependent variable) on both trauma type (i.e., independent variable) and ECR-R avoidance (i.e., the presumed mediator). The results of this analysis are presented in Table 12. ECR-R avoidance significantly accounted for the variance in the IES-R score. When ECR-R avoidance was included in the equation, all variables related to trauma type remained significant predictors of the IES-R score even though their predictive value decreased (compare Table 11 and Table 12). The fact that the inclusion of attachment avoidance did not reduce the predictive value of trauma type to a non-significant level suggests that attachment avoidance does not fully mediate the relationship between trauma type and PTSD symptoms.

Table 12

Multiple linear regression of PTSD symptom severity on trauma type and attachment avoidance

	<i>B</i>	<i>SE (B)</i>	β	<i>t</i>	<i>p</i>
Constant	48.62	5.29		9.19	<.001
NIT vs. ECIP	-15.30	4.16	-.24	-3.68	<.001
LIP vs. ECIP	-11.22	3.46	-.20	-3.24	.001
ESIP vs. ECIP	-9.01	3.84	-.14	-2.34	.020
ECR-Avoidance	6.10	1.14	.35	5.36	<.001

Note. Dependent variable: IES-R mean score. $R^2 = .28$ ($p < .001$). NIT = non-interpersonal trauma ($n = 24$), LIP = late interpersonal trauma ($n = 31$), ESIP = early single/repeated interpersonal trauma ($n = 24$), ECIP = early chronic interpersonal trauma ($n = 130$). ECR-R = Experiences in Close Relationships-Revised.

In order to test the significance of the mediating effect, a procedure proposed by Sobel (1982), which is commonly referred to as the “Sobel test”, was applied. As the independent variable consists of three dummy variables, three separate Sobel tests were conducted, one for each dummy variable. A two-tailed significance test at the $\alpha = .05$ level was conducted. For ECR-R avoidance as the presumed mediator of the relationship between early NIT vs. ECIP and the IES-R mean score, the Sobel test statistic was -4.06 , $p < .001$. In case of LIP vs. ECIP as the independent variable, the Sobel test statistic was -1.91 , $p = .056$, and for ESIP vs. ECIP, it was -1.80 , $p = .072$. These results indicate a significant mediating effect of ECR-R avoidance on the relationship between NIT vs. ECIP and IES-R despite the fact that the difference between NIT and ECIP still had a significant effect on IES-R when attachment avoidance was included in the equation (Table 12). The Sobel tests did not detect a mediating effect of ECR-R avoidance in case of LIP vs. ECIP and ESIP vs. ECIP as independent variables.

Attachment anxiety. In order to test whether attachment anxiety mediates the relationship between trauma type and PTSD symptoms, regressions parallel to the ones in the previous section were carried out. Table 13 contains the results of the first step, which was the regression of ECR-R anxiety (i.e., the presumed mediator) on trauma type (i.e., independent variable). As in the case of attachment avoidance, all variables related to trauma type, except for the difference between ECIP and ESIP, showed to be significant predictors of attachment anxiety. They accounted for a significant amount of outcome variation, namely 18%.

Table 13

Multiple linear regression of attachment anxiety on trauma type

	<i>B</i>	<i>SE (B)</i>	β	<i>t</i>	<i>p</i>
Constant	4.82	0.10		48.15	<.001
NIT vs. ECIP	-1.65	0.25	-.42	-6.50	<.001
LIP vs. ECIP	-0.63	0.23	-.18	-2.75	.006
ESIP vs. ECIP	-0.40	0.25	-.10	-1.56	.119

Note. Dependent variable: ECR-R Anxiety. $R^2 = .18$ ($p < .001$). NIT = non-interpersonal trauma ($n = 24$), LIP = late interpersonal trauma ($n = 31$), ESIP = early single/repeated interpersonal trauma ($n = 24$), ECIP = early chronic interpersonal trauma ($n = 130$).

The second step involved regressing the IES-R score (i.e., dependent variable) on trauma type (i.e., independent variable) which is the same regression equation as in the previous section.

For the results of this regression analysis, the reader is referred to Table 11.

In the third step, the IES-R score (i.e., dependent variable) was regressed on both trauma type (i.e., independent variable) and ECR-R anxiety (i.e., presumed mediator). As Table 14 shows, when ECR-R anxiety was included in the regression equation, all trauma type variables remained significant predictors of the IES-R score, even though their predictive value was reduced. This pattern is parallel to the one obtained with regard to attachment avoidance (Table 12) and suggests that attachment anxiety does not have a complete mediating effect on the association between trauma type and PTSD symptom severity.

Table 14

Multiple linear regression of PTSD symptom severity on trauma type and attachment anxiety

	<i>B</i>	<i>SE (B)</i>	β	<i>t</i>	<i>p</i>
Constant	51.56	5.36		9.63	<.001
NIT vs. ECIP	-15.89	4.25	-.25	-3.74	<.001
LIP vs. ECIP	-10.67	3.54	-.19	-3.01	.003
ESIP vs. ECIP	-9.68	3.89	-.15	-2.49	.014
ECR-Anxiety	5.03	1.07	.31	4.72	<.001

Note. Dependent variable: IES-R mean score. $R^2 = .26$ ($p < .001$). NIT = non-interpersonal trauma ($n = 24$), LIP = late interpersonal trauma ($n = 31$), ESIP = early single/repeated interpersonal trauma ($n = 24$), ECIP = early chronic interpersonal trauma ($n = 130$). ECR-R = Experiences in Close Relationships-Revised.

The Sobel test conducted for ECR-R anxiety as the presumed mediator of the association between NIT vs. ECIP and the IES-R mean score resulted in a test statistic of 3.82, $p < .001$. For LIP vs. ECIP, the Sobel test statistic reached a value of -2.37, $p = .018$ and for ESIP vs. ECIP, the Sobel test statistic had the value -1.51, $p = .130$. As in the case of attachment

avoidance, the results of the Sobel tests suggest a significant mediating effect of attachment anxiety on the association between the NIT vs. ECIP and PTSD symptom severity. Again, the effect is significant despite the fact that the difference between NIT and ECIP was a significant predictor of the IES-R mean score when attachment anxiety was included in the equation (Table 14). For LIP vs. ECIP and ESIP vs. ECIP, no evidence for a mediating effect on the association between trauma type and attachment anxiety was obtained.

3.2.5 Robustness of the obtained results

The previously reported analyses were repeated with several slight variations in order to examine the robustness of the results reported in sections 3.2.1 through 3.2.4. First, as the present sample included far more women than men, a separate analysis was conducted for the female subsample only. Second, separate hypothesis tests were conducted for participants who described their trauma in more detail on the THQ and those who did not use this possibility. As mentioned in section 4.1, it is possible that the rate of misclassified traumatic experiences was higher among participants who did not provide a description but only gave “yes” and “no” answers compared to those who gave more detailed information about the traumatic event they had experienced. Therefore, separate analyses were conducted for both groups of participants in order to examine whether potentially inaccurate classifications may have affected the results of the hypothesis tests. Third, several hypothesis tests were repeated while taking into account the influence of depression and BPD, as these disorders may have an impact on the degree of adult attachment security.

Analysis for the female subsample. A MANOVA which was applied to test Hypothesis 1 revealed significant differences in attachment avoidance and anxiety between the trauma groups. This result, as well as the obtained effect sizes η^2 , is comparable to the ones obtained with the total sample. As with the total sample, the planned single contrasts between NIT and ECIP and LIP and ECIP were significant for both attachment avoidance and anxiety. However, in the female subsample, the analysis also revealed a significant planned contrast between ESIP and ECIP for attachment avoidance, ($p = .035$), which, in the total sample, did not reach significance ($p = .064$). The same contrast for the anxiety dimension was non-significant in both the total sample and the female subsample. Due to unequal covariance matrices in the female subsample, Kruskal-Wallis tests and subsequent Mann-Whitney tests were computed which did not change the initial results with the total sample. Similarly, the

test of Hypothesis 2 with the female subsample did not differ from the initial test including male and female participants. As with the whole sample, Hypothesis 3 could not be tested due to the high correlation between trauma type (i.e., grouping variable) and the IES-R mean score (i.e., covariate) which violates an assumption of ANCOVA. The test of the mediating effect of attachment avoidance and anxiety (Hypothesis 4) generally yielded the same results in the female subsample as in the total sample.

Descriptions of traumatic experiences. For this analysis, participants were divided into two groups according to whether they provided a description of their traumatic experiences or not. The description group included respondents who provided details to every item on the THQ that they had answered with “yes”, indicating that they have experienced the respective traumatic event. The no-description group, on the other hand, included participants who did not give a description of at least one traumatic event that they reported to have experienced. One hundred and eleven (53%) respondents provided descriptions of the traumas they have experienced, whereas 98 (47%) respondents did not give further information about at least one traumatic event that they had indicated. Unfortunately, the unfavorable distribution of respondents from these two groups across the trauma types and the small sample sizes of the NIT, LIP, and ESIP groups did not permit separate tests of Hypotheses 1 and 4 for participants who did and did not provide trauma descriptions. Correlations revealed that the results obtained for Hypothesis 2 (correlation between ECR-R avoidance and anxiety and IES-R) in the total sample were comparable to the ones obtained for the description and no-description groups separately.

Depression and Borderline Personality Disorder. As the results of the depression and BPD screenings showed to be significantly related to trauma type (Table 2), it was tested whether the results obtained for the hypothesis tests hold if the depression and BPD scores are taken into account. In case of Hypothesis 1, separate analyses were conducted for participants with positive and negative screenings for depression and BPD. With regard to depression, the results of the tests for Hypotheses 1 were the same for each of the two subsamples as for the total sample. However, in both subsamples, some planned contrasts failed to reach significance. It was not possible to conduct this analysis with participants who reported a positive versus a negative BPD screening because there were too few respondents with a positive BPD screening in the NIT and the ESIP groups. As expected, most individuals who

were screened positive for BPD belonged to the ECIP group. Therefore, when interpreting the results for Hypothesis 1 it is important to keep in mind the possible influence of BPD on the association between interpersonal trauma and attachment security.

A partial correlation revealed that the association between the two attachment dimensions and PTSD symptom severity (Hypothesis 2) decreased but remained significant when the effects of depression and BPD (assessed with the PHQ mean score and the MSI-BPD sum score) were controlled for.

It was not possible to conduct the tests for Hypothesis 4 separately for participants with positive versus negative screenings for depression and BPD as this would have resulted in sample sizes too low to conduct a reliable regression analysis with four predictors (i.e., three dummy variables for trauma type and one attachment-related variable).

3.2.6 Explorative analysis of interpersonal problems

This final section of the results chapter covers the explorative investigation of the data collected with the questionnaire of interpersonal problems which was developed by the author of this thesis. Information about the questionnaire itself, a corresponding PCA, and indicators of internal consistency were reported in section 2.3.2. The present section includes findings on the association of problematic interpersonal patterns with both trauma type and PTSD symptom severity. These results were obtained following the exclusion of four items, as suggested by the PCA and the analyses of internal consistencies.

Descriptive statistics and differences between trauma groups. Table 15 shows the descriptive statistics for the overall mean score of the questionnaire of interpersonal problems as well as for each of the four subscales. For the total score, a one-way ANOVA revealed significant differences between the trauma groups at an a-priori type I error rate of $\alpha = .05$. Planned single contrasts with ECIP as reference category revealed that the ECIP group reported a significantly higher degree of interpersonal problems than both the NIT, $p = .001$, and the LIP group, $p = .018$. There was no significant difference to the ESIP group, $p = .052$.

Table 15

Interpersonal problems by trauma type

	NIT (n = 24) M (SD)	LIP (n = 31) M (SD)	ESIP (n = 24) M (SD)	ECIP (n = 130) M (SD)	ANOVA F(3, 205)
Overall mean score	2.74 (0.62)	3.05 (0.39)	3.03 (0.47)	3.24 (0.43)	9.36***
Submissive/Socially inhibited	3.06 (0.77)	3.63 (0.68)	3.51 (0.71)	3.70 (0.07)	4.95** (p = .002)
Dominant	2.32 (0.54)	2.18 (0.46)	2.38 (0.72)	2.32 (0.74)	0.45 (p = .718)
Detached	2.74 (0.83)	2.87 (0.68)	3.20 (0.78)	3.48 (0.79)	9.66***
General	2.72 (0.90)	3.18 (0.67)	2.96 (0.69)	3.34 (0.63)	6.84***

Note. NIT = non-interpersonal trauma, LIP = late interpersonal trauma, ESIP = early single/repeated interpersonal trauma, ECIP = early chronic interpersonal trauma.

** $p < .01$

*** $p < .001$

As for the subscales, significant group differences were obtained for the dimensions *submissive/socially inhibited*, *detached*, and *general*. Results for all subscales were followed up with planned simple contrasts with ECIP as reference category. On the *submissive/socially inhibited* dimension, the ECIP group scored significantly higher than the NIT group, $p = .001$. The other contrasts were not statistically significant (ECIP – LIP: $p = .638$; ECIP – ESIP: $p = .259$). As for the *detached* dimension, the ECIP group reported higher scores than both the NIT and the LIP group, both $p < .001$. There was no indication for a difference between the ECIP and the ESIP group, $p = .117$. The ECIP group reported significantly higher levels of *general* interpersonal problems than both the NIT, $p = .003$, and the ESIP group, $p = .016$, while no significant difference to the LIP group was obtained, $p = .231$. There was no evidence of group differences on the *dominant* subscale (ECIP – NIT: $p = .991$; ECIP – LIP: $p = .206$; ECIP – ESIP: $p = .694$).

Correlation with PTSD symptom severity and attachment dimensions. As the Pearson correlations in Table 16 show, the IES-R mean score was significantly related to the total interpersonal problems score as well as to all subscales except for *dominant*. A similar result was obtained for both attachment dimensions that significantly correlated with the total score for interpersonal problems and subscales except for *dominant*.

Table 16

Pearson correlation coefficients between dimensions of interpersonal problems, PTSD symptom severity and attachment-related avoidance and anxiety

	1.	2.	3.	4.	5.	6.	7.	8.
1. IES-R mean score	-	.358**	-.043	.342**	.419**	.451**	.455**	.432**
2. IP Submissive		-	-.086	.186**	.456**	.723**	.419**	.443**
3. IP Dominant			-	-.210**	.388**	.411**	.037	.027
4. IP Detached				-	.173*	.363**	.367**	.351**
5. IP General					-	.877**	.598**	.579**
6. IP Overall						-	.600**	.595**
7. ECR-R Avoidance							-	.850**
8. ECR-R Anxiety								-

Note. $n = 209$. IES-R = Impact of Event Scale-Revised, ECR-R = Experiences in Close Relationships-Revised.

* $p < .05$

** $p < .01$

4 Discussion

The present empirical investigation aimed to clarify whether early chronic interpersonal trauma is related to higher rates of avoidance and anxiety in the context of adult romantic attachment compared to early single interpersonal, late interpersonal or non-interpersonal traumas. Furthermore, it was intended to investigate the relationship between trauma type, adult attachment and PTSD symptom severity. The third goal of this study was to test whether adult attachment mediates the relationship between interpersonal trauma and the severity of PTSD symptoms. Aside from testing these predictions, the present study explored the association between different forms of trauma and interpersonal problems as assessed by a questionnaire which was developed in the course of this study. In order to investigate these questions, an Internet-based survey consisting of six questionnaires was administered to a sample of Internet-users who were recruited online.

Overall, the obtained results support the expectation that early-onset traumas which are interpersonal in nature and occur in a chronic manner have a detrimental effect on individuals' romantic attachment patterns in adulthood. The present investigation revealed significant differences in attachment-related avoidance and anxiety between the four trauma types, representing a medium effect. Specifically, the early chronic interpersonal trauma (ECIP) group reported higher degrees of attachment avoidance and anxiety compared to individuals whose trauma was a non-interpersonal one (NIT) or who had experienced a late-onset interpersonal trauma (LIP). However, contrary to the first hypothesis, the ECIP group did not report a higher degree of attachment difficulties than the group of individuals with an interpersonal trauma that did not last for longer than one year (ESIP). Thus, no empirical support was found for the prediction that insecure attachment may be a specific sequel of early chronic interpersonal trauma.

The results suggest that a trauma is more likely to be associated with higher degrees of attachment avoidance and anxiety in adulthood if it is of an interpersonal nature (i.e., if it consists of sexual or physical abuse) and if it occurs at an early point in the individual's life. This finding is consistent with earlier reports according to which childhood abuse is associated with attachment-related avoidance and anxiety (Limke et al., 2010; Roche et al., 1999). Furthermore, this result is in line with theoretical assumptions about the impact of early experiences of abuse on the development of a child's emotions, attitudes and behaviors in interpersonal relationships (e.g., van der Kolk, 2005). According to these postulates, violent acts committed by a person who is supposed to help the child develop a positive representation of the self and a sense of trust in others are likely to hinder the child in developing secure attachment patterns. This maladaptation is then assumed to be carried on into adulthood where it becomes particularly apparent in intimate relationships.

Contrary to expectations, this investigation did not obtain empirical support for the prediction that the chronicity of an interpersonal trauma would contribute to an increase in attachment anxiety and avoidance. No difference in attachment security was found between individuals who experienced short- versus long-term abuse. This finding is particularly surprising given the fact that symptoms of DEPNOS or complex PTSD were shown to be affected by the chronicity of interpersonal trauma (Cloitre et al., 2009; Ford et al., 2006; van der Kolk et al., 2005) and DEPNOS and attachment difficulties are assumed to stem from the same cause

which, globally speaking, is the early and consistent violation of a child's trust in their caregiver (see section 1.3). On the one hand, this finding may suggest that attachment patterns do not differ as a function of the duration of the interpersonal trauma. Perhaps a short abusive episode has the same detrimental impact on an individual's attachment patterns as long-standing abuse. On the other hand, the large difference in sample sizes between the ECIP and the ESIP group ($n = 130$ vs. $n = 24$, respectively) may have prevented this difference from becoming both statistically significant and practically meaningful. In addition, for some participants it may have been difficult to clearly remember and state the duration of the abuse they had experienced. This constitutes a potential source of inaccuracy in the assignment of respondents to the ESIP and the ECIP group and therefore a potential reason for the lack of a significant difference in the attachment scores between these two groups. Thus, before the conclusion is made that the impact of chronic childhood abuse on the affected individuals' adult attachment is comparable to that of short-term abuse, potential sources of bias need to be sorted out.

In line with the second hypothesis, PTSD symptom severity was strongly associated with attachment-related avoidance and anxiety, as indicated by significant correlations corresponding to large effect sizes. These associations also held when the degree of depression and BPD symptoms was controlled for. It appears likely that the PTSD symptoms and attachment difficulties both stem from the same traumatic experiences in childhood because earlier literature has shown that childhood abuse is linked to both phenomena (e.g., Limke et al., 2010; van der Kolk et al., 2005). Furthermore, insecure attachment may by itself contribute to the development of PTSD, for example by disturbing the acquisition of adequate emotion regulation strategies which, in turn, are likely to increase the chances of developing PTSD (Cloitre et al., 2008; Muller et al., 2000). Based on these assumptions, specific investigations are needed in order to shed light on the exact mechanisms underlying the relationship between these variables.

The association of attachment avoidance and anxiety with PTSD symptoms raises the question whether attachment difficulties are unique sequelae of early interpersonal trauma and its impact on the child's psychosocial development. Alternatively, they could simply be attributable to the elevated levels of PTSD symptoms that the present study has found among

survivors of these types of trauma. In order to clarify this question, the third hypothesis of the present investigation was formulated.

The third hypothesis predicted that potential differences in attachment-related avoidance and anxiety between the four trauma groups would remain significant when the influence of PTSD symptom severity was controlled for. The test of this hypothesis posed two major methodological problems. First, the cell frequencies, resulting from a combination of these two variables, varied substantially and some were too small for conducting an ANCOVA with sufficient power. Specifically, there were very few participants who had experienced an early chronic interpersonal trauma but did not report an elevated severity of PTSD symptoms at the same time. Second, trauma type and the IES-R mean score were significantly related to each other, which is a violation of one of the assumptions of ANCOVA. As Miller and Chapman (2001) stated, the inclusion of a covariate which is significantly related to the grouping variable does not “control” for the effect of the covariate but rather alters the effect of the grouping variable due to the variance that these two variables share. As a consequence, this procedure is likely to lead to inaccurate results. In our case, this means that, by including PTSD symptoms as a covariate, the variable trauma type would be changed in a conceptually not meaningful way. Its effect would be reduced by the amount of variance that this variable shares with PTSD symptom severity. Hence, results obtained with this procedure would likely not permit general conclusions about the association of trauma type, PTSD symptoms and attachment.

There was no statistical procedure that was judged to be adequate to control for the effect of PTSD symptom severity with the present data. However, in future similar cases, the influence of PTSD could be controlled for by matching participants from various trauma groups in terms of PTSD symptom severity. For the interpretation of the results of the present study, the reader should keep in mind that it is not clear whether insecure adult attachment is a unique consequence of the abuse or perhaps a disturbance that results from PTSD symptoms that have shown to be elevated in individuals with histories of abuse. Similarly, symptoms of BPD may have an influence on the relationship between interpersonal trauma and insecure adult attachment. The present study aimed to control for the effects of BPD but did not recruit a sufficient number of participants who had experienced an interpersonal trauma but did not report BPD symptoms and, vice versa, who reported BPD symptoms without having

experienced an interpersonal trauma. Therefore, besides controlling for the effects of PTSD, future investigations should seek to investigate the role of BPD in this context more closely.

The findings regarding the relationship between age of onset and chronicity of interpersonal traumas and adult attachment insecurity have several theoretical and practical implications. While theoretical models of complex posttraumatic symptoms (e.g., DESNOS) include interpersonal problems in adulthood, they do not explicitly refer to adult attachment insecurity as a complex trauma sequel. However, attachment patterns are thought to be an underlying dimension which becomes observable in interpersonal mechanisms (Bartholomew, 1990). A systematic inclusion of attachment insecurity into concepts of complex trauma sequelae is desirable as this step could encourage clinicians to target interpersonal problems of abuse survivors by addressing their specific attachment-related difficulties. As mentioned in section 1.5.5, the two-phased treatment program STAIR/MPE (Levitt & Cloitre, 2005) pays special regard to the modification of dysfunctional models of the self and other in the first phase. This program and other related approaches could benefit from a more profound knowledge of the specific attachment-related disturbances following particular types of interpersonal trauma.

As survivors of early-onset interpersonal trauma reported higher degrees of adult attachment insecurity than the late-onset group, theoretical models of complex trauma sequelae should seek to differentiate more explicitly between the early- and late-onset groups with regard to their attachment-related or interpersonal difficulties. For example, the DESNOS symptom clusters of interpersonal problems are equally applied to survivors of childhood abuse as well to those who endured marital violence (van der Kolk et al., 2005). However, the results of the present study suggest that adult attachment insecurity, which is related to interpersonal problems according to Bartholomew (1990), may differ systematically depending on the survivor's age at the trauma onset. Furthermore, Ehring and Quack (2010) reported emotion regulation difficulties, another complex trauma-related symptom cluster, to be particularly elevated in survivors of early chronic interpersonal trauma as opposed to late-onset, non-interpersonal and/or non-chronic traumas. These pieces of evidence call for a closer investigation of these and other complex trauma sequelae experienced specifically by survivors of early-onset chronic interpersonal trauma. A more profound understanding of the

psychosocial difficulties experienced by this group of individuals could help to shed light on their specific needs that need to be addressed in clinical practice.

The fourth hypothesis predicted that attachment-related avoidance and anxiety would have a mediating effect on the relationship between trauma type and the severity of PTSD symptoms. For both attachment dimensions, evidence of partial mediation was obtained only for the independent variable representing the difference between non-interpersonal and early chronic interpersonal trauma. This finding indicates that the influence of early chronic interpersonal trauma on PTSD is partly established by attachment insecurity as an intervening variable. However, there was no evidence that attachment is a mediator if the difference between early chronic interpersonal trauma and early single or late interpersonal trauma served as the independent variable. Earlier investigations reported complete rather than partial mediation of attachment (e.g., Dimitrova et al., 2010; Roche et al., 1999; Shapiro & Levendosky, 1999). However, Limke et al. (2010) only found attachment-related anxiety to mediate the relationship between sexual maltreatment and psychological adjustment and did not obtain the same finding with regard to attachment-related avoidance. This discrepancy in findings may be due to dissimilarities among the studied samples (earlier investigations studied mostly adolescents or college students), different measures of adult attachment (some of the studies used categorical instead of dimensional measures), different definitions of childhood abuse, and different outcome variables (e.g., different measures of trauma-related symptoms, or measures of global psychological functioning). The apparent inconsistency in the empirical evidence regarding a mediating effect of adult attachment should serve as a call for more consistent concepts and assessment methods regarding the characteristics of interpersonal trauma and adult romantic attachment.

The present results regarding the mediating role of attachment are partly in line with the assumption that insecure adult attachment may be involved in the emergence of PTSD in survivors of childhood abuse. A possible mechanism underlying this relationship could be the interference of insecure attachment with the development of adequate emotion regulation strategies (Cloitre et al., 2008; Muller et al., 2000). In turn, a lack of these strategies is likely to be associated with PTSD (Ehring & Quack, 2010). However, in the present study, the evidence for a mediating effect of attachment is weak as only partial mediation was obtained

that was found solely for the difference between non-interpersonal and early chronic interpersonal traumas.

As the last part of this investigation, an explorative analysis of interpersonal problems among survivors of the four types of trauma was conducted. For this purpose, a self-report questionnaire was developed which assessed four dimensions of interpersonal problems. The overall mean score of the questionnaire was strongly related to both PTSD symptom severity and the two attachment dimensions anxiety and avoidance. A similar association between PTSD and interpersonal problems was found by Cloitre et al. (2005). Furthermore, the correlation with attachment is not surprising, as attachment quality is assumed to be reflected in interpersonal representations and behavior (Bartholomew, 1990). As for the separate dimensions of interpersonal problems, PTSD symptom severity was associated with submissive/socially inhibited and detached behavior and attitudes as well as with general interpersonal problems. However, no evidence was obtained for an association of PTSD symptoms with dominant behavior and attitudes. A comparison of the overall level of interpersonal problems between the four trauma groups revealed that survivors of early chronic interpersonal trauma reported significantly more interpersonal problems compared to survivors of non-interpersonal and late interpersonal trauma. At the same time, the early chronic interpersonal trauma group did not differ from the early single interpersonal trauma group on this variable. These results are in line with the findings obtained in the DSM-IV field trial which suggested that childhood abuse is associated with higher levels of DESNOS (which includes interpersonal problems) compared to experiences of disaster and that early-onset abuse is linked to greater DESNOS symptomatology than late-onset abuse (van der Kolk et al., 2005).

The results showed that the ECIP group reported the highest levels of interpersonal problems on most of the separate dimensions. In most cases, the scores were clearly higher than in the non-interpersonally traumatized group. However, for none of the subscales, a clear pattern of differences was found between the three types of interpersonal trauma, which may be due to the questionnaire's limited ability to differentiate sufficiently between these groups. The subscale representing dominant behavior and attitudes was the only one where no difference emerged between the trauma groups. It was also this scale that did not correlate with the severity of PTSD symptoms or with the attachment dimensions of avoidance and anxiety.

This may suggest that dominant interpersonal behavior is not a sequel of interpersonal trauma and therefore is not related to other psychosocial difficulties. On the other hand, it is also possible that this questionnaire failed to tap the essential indicators of dominant behavior. In order to be able to make clearer conclusions regarding the effects of particular types of interpersonal trauma on specific aspects of interpersonal functioning, studies as the present one need to be conducted with established measures of interpersonal problems that possess adequate psychometric properties. The findings based on this questionnaire remain preliminary and should be interpreted with caution as no analysis of validity was conducted. Moreover, the items of the questionnaire likely do not differentiate sufficiently between individuals with high and low levels of interpersonal problems. In light of the positive correlation between PTSD and interpersonal problems, research should also investigate the question whether a potential association between interpersonal trauma and early chronic interpersonal problems holds when PTSD symptoms are taken into account.

The current study offers several advantages over previously reported investigations of consequences of early-onset interpersonal trauma. First, individuals' experiences of trauma were not classified in a dichotomous way (trauma experienced vs. not experienced) but were distinguished according to four different categories, thus rendering the comparison groups more homogenous. As was mentioned in Chapter 1.7, inhomogeneous comparison groups may be a reason for the inconsistency in results reported in the empirical literature. Second, recruited sample was a relatively heterogeneous one with regard to various demographic variables, such as age, level of education, occupation, and geographical area. Unlike many other studies, which studied samples of university students, who tend to be better adjusted than the general population (Maniglio, 2009), the present study included a sample that may be more representative of the rates and the impact of interpersonal trauma in the general population. Several additional advantages of the study are due to the fact that it was Web-based. For a review of these advantages, see section 1.8.1.

Even though the present study offers new insight into the relationship between various types of interpersonal trauma and the quality of adult attachment, it is important to point out several limitations to the conclusions that can be derived from these findings. The following section provides an overview of these aspects.

4.1 Limitations

With respect to all results yielded by the present study, it should be noted that no inferences regarding causation can be drawn due to its cross-sectional design. There is evidence that attachment avoidance and anxiety are related to early interpersonal trauma, but we do not know whether insecure attachment is a consequence of the childhood abuse or whether, for example, insecure attachment is part of a general dysfunctional family environment which also led to the occurrence of the abuse. Indeed, family dysfunction was reported to be an associated factor of childhood abuse (e.g., Widom et al., 1999; Mullen et al., 1996). Longitudinal studies are needed in order to clarify the directions and temporal links of the detected associations. Similarly, the investigation of insecure attachment as a risk factor requires prospective studies which permit conclusions about the temporal order of the onset of abuse, the influence of attachment and the development of posttraumatic stress symptoms.

Furthermore, it is not clear whether the conclusions drawn from this investigation can be generalized to populations of older persons. In the present sample, the proportion of people above the age of 50 was approximately 18%, and only around 4.8% of participants were older than 60 years. Thus, the percentage of older persons in the sample was not large enough in order to generalize the conclusions drawn from this investigation to this part of the population. This could be due to the fact that older people may not use the Internet to the same extent as young people. Another characteristic of the sample was the relatively low number of male participants. Perhaps, this is due to the fact that the host websites were visited mostly by women who thus were more likely to find the link to the survey.

The low sample sizes in the non-interpersonal, late interpersonal, and early single interpersonal trauma groups, as well as the big difference to the sample size in the early chronic interpersonal trauma group posed difficulties for the statistical analyses and may restrict the accuracy of the obtained results. It was mostly websites dealing with childhood abuse and domestic violence that agreed to publish the link to the study. This may explain the high number of participants who were chronically abused in childhood and the disproportionally low number of individuals with other traumas. Unequal sample sizes pose a problem for analysis of variance only when the variances of the comparison groups are not homogenous (Field, 2009). In such cases, non-parametric tests were conducted, out of which none yielded different results compared to their parametric counterparts.

The measures applied in the current study bring about several limitations to the generalizability of the results. Scores yielded by self-report measures of adult attachment may not represent attachment patterns only, but perhaps also other constructs such as the functioning of a current relationship (Bartholomew, 1994). Furthermore, the accuracy of the assignment of participants to trauma groups according to the THQ may have been hampered by the fact that approximately half of the respondents did not provide descriptions of their traumatic experiences. Thus, it was not possible to assess whether the indicated traumas conform to DSM-IV-TR criteria for traumatic stressors and whether they were indicated in the right category. Among the respondents who provided descriptions, several false positives occurred (i.e., traumas that do not meet DSM-IV-TR criteria). This applied in particular to Item 6 (“Have you ever been in a situation in which you feared you might be killed or seriously injured or in which you were seriously injured?”) and Item 10 (“Have you ever had a serious or life-threatening illness?”). This observation corresponds to those made by Green et al. (1995) in the course of the development of the THQ.

The accuracy of the assignment of participants to trauma groups may have been further compromised by the fact that it was based on individuals’ retrospective accounts of the traumas. Memories of this event may have been distorted and details, such as age of onset and duration, may not have been remembered accurately, especially if a long time had passed since the trauma (for some of the individuals, these experiences dated back several decades). This circumstance constitutes a potential source of imprecision in the assignment of respondents to the comparison groups.

PTSD symptom severity was assessed with a self-report measure only, which did not allow for a clinical diagnosis of PTSD. Furthermore, a description of participants in terms of low versus high PTSD symptom severity was difficult due the lack of population norms or cutoff scores (Weiss, 2004). Future research needs to investigate whether the findings of the current study hold when structured clinical interviews are used to establish diagnoses of PTSD in clinical samples.

The present study collected information on whether individuals had ever received psychological or psychiatric treatment for trauma-related difficulties but it did not assess whether they were currently undergoing or seeking treatment. Thus, the association of this variable with security of adult attachment could not be examined. Furthermore, types of early

chronic interpersonal trauma other than sexual or physical abuse were not taken into account. The study did not investigate the impact of emotional abuse and neglect, both of which were found to be associated with increased attachment avoidance and anxiety (Riggs & Kaminski, 2010) and PTSD (Wekerle et al., 2009).

Sections 1.8.2 and 1.8.3 discussed ways in which online surveys and online recruiting could pre-select the sample, influence research results or pose ethical challenges. These limitations also apply to the present study. Only people who were familiar with the use of computers and the Internet were addressed by the recruitment efforts for this investigation. As the link to the questionnaire was mainly placed on trauma- and/or health-related websites, it is possible that mostly individuals were recruited who were ready to confront themselves with the trauma they had experienced as well as with potential health-related consequences. It is likely that this recruitment strategy did not reach individuals who refuse to deal with their traumatic experiences or who choose a different way of dealing with their experiences than looking for information on the Internet. However, it should be pointed out that offline recruitment methods would have likely failed to include these people as well.

Finally, as in most online studies, it was not possible to control the context in which data were collected, which may have reduced the comparability of individuals' answers. Following an inspection for long sequences of uniform answers and a computation of scale reliabilities, no indication was found that answers could have been intentionally distorted by participants.

4.2 Conclusion

Despite the described limitations, the present study provides support for the notion that early chronic interpersonal trauma, such as physical and sexual abuse, differs from non-interpersonal and late forms of interpersonal trauma in that it is associated with attachment insecurity in the domain of intimate relationships. Besides, it was revealed that the degree of both attachment avoidance and attachment anxiety is positively correlated with PTSD symptom severity, which emphasizes the importance of a simultaneous consideration of adult attachment quality and PTSD symptoms when investigating sequelae of interpersonal trauma. Furthermore, this study has pointed out the possibility that insecure adult attachment may be

involved in mediating the effect of early chronic interpersonal trauma on posttraumatic symptoms.

If future research confirms the findings obtained with the present study, practitioners are advised to routinely assess the quality of adult attachment when providing treatment to survivors of childhood sexual or physical abuse. This is especially the case if attachment insecurity shows to be independent of PTSD. Specifically, it could be an effective approach to address adult attachment together with dysfunctional interpersonal mechanisms, because it is precisely these mechanisms in which attachment quality is reflected (Bartholomew, 1990).

Apart from presenting new insight into the relationship of early chronic interpersonal trauma, PTSD, and the domains of adult attachment and interpersonal problems, this thesis has pointed out implications that research in this field may have on clinical practice. Finally, it has aimed to identify new directions for research on changes in adult attachment and interpersonal problems following different forms of interpersonal trauma.

LIST OF FIGURES

Figure 1 Two-dimensional model of adult attachment (Bartholomew, 1990).....	34
Figure 2 Participant flow chart.....	66

LIST OF TABLES

Table 1 Demographic characteristics of the sample.....	68
Table 2 Lifetime relationship, psychological/psychiatric treatment, depression and BPD screening, and PTSD symptom severity by trauma group.....	70
Table 3 Reliability analysis for the subscales of the questionnaire of interpersonal problems.....	76
Table 4 Structure matrix of exploratory principal component analysis for the questionnaire of interpersonal problems.....	77
Table 5 Attachment-related avoidance and anxiety by trauma type.....	88
Table 6 Variance-Covariance matrix for both attachment dimensions.....	88
Table 7 p-values for planned contrasts between trauma groups with regard to attachment avoidance and anxiety.....	89
Table 8 Pearson correlation coefficients between PTSD symptom severity and attachment-related avoidance and anxiety.....	89
Table 9 PTSD symptom severity by trauma type.....	90
Table 10 Multiple linear regression of attachment avoidance on trauma type.....	92
Table 11 Multiple linear regression of PTSD symptom severity on trauma type.....	92
Table 12 Multiple linear regression of PTSD symptom severity on trauma type and attachment avoidance.....	93
Table 13 Multiple linear regression of attachment anxiety on trauma type.....	94
Table 14 Multiple linear regression of PTSD symptom severity on trauma type and attachment anxiety.....	94

Table 15 Interpersonal problems by trauma type.....98

Table 16 Pearson correlation coefficients between PTSD symptom severity and attachment-related avoidance and anxiety99

LIST OF APPENDICES

Appendix A Abstract in German / Zusammenfassung auf Deutsch 126

Appendix B Pattern and structure matrices of exploratory principal component analysis (PCA) for the questionnaire of interpersonal problems 127

Appendix C Study announcement published on the host websites 134

Appendix D Information page and Informed Consent..... 135

Appendix E Collection of demographic information 137

Appendix F Experiences in Relationships – Revised 140

Appendix G Questionnaire of interpersonal problems 144

Appendix H Trauma History Questionnaire, modified version..... 148

Appendix I Impact of Event Scale – Revised 152

Appendix J Patient Health Questionnaire – Depression subscale 154

Appendix K McLean Screening Instrument for Borderline Personality Disorder 155

Appendix L End of the survey 156

Appendix M Host websites that published the link to the survey 158

Appendix N Curriculum Vitae 159

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APPENDIX

Appendix A Abstract in German / Zusammenfassung auf Deutsch

Hintergrund: Studien zeigen, dass das Erleben eines frühen chronischen interpersonellen Traumas (early chronic interpersonal trauma, ECIP) mit unsicherer Bindung zu intimen Partnern(innen) im Erwachsenenalter zusammenhängt. Es wurde bisher jedoch nicht geprüft, ob dies speziell auf frühe Traumata zutrifft und welcherart die Beziehungen zwischen Traumatyp, Bindung im Erwachsenenalter und PTSD sind. Die vorliegende Studie hatte folgende Ziele: (1) Vergleich der Bindungssicherheit in einer ECIP Gruppe mit jener bei Menschen, die ein spätes (Alter ≥ 14 Jahre), ein frühes kurzzeitiges (Alter < 14 Jahre, Dauer < 1 Jahr) oder ein nicht-interpersonelles Trauma erlebt hatten, (2) Prüfung der Hypothese, dass die Bindung im Erwachsenenalter eine Mediatorvariable für den Zusammenhang zwischen dem Erleben eines interpersonellem Traumas und der Stärke von PTSD-Symptomen darstellt.

Methode: Internet-User, die durch trauma- oder gesundheitsbezogene Websites rekrutiert wurden, füllten sechs Online-Fragebögen aus. Erhoben wurden die Traumageschichte, Bindung im Erwachsenenalter, interpersonelle Probleme, PTSD-Symptomstärke, sowie Anzeichen einer Depression und Borderline Persönlichkeitsstörung. Die Bindungssicherheit wurde mit dem Fragebogen Experiences in Close Relationships - Revised (ECR-R; Fraley et al., 2000) erhoben, welcher bindungsbezogene *Vermeidung* und *Ängstlichkeit*, erfasst.

Ergebnisse: Insgesamt bearbeiteten 260 Personen (234 Frauen) den Fragebogen bis zum Schluss. Nach Anwendung der Ausschlusskriterien blieben 209 Personen (190 Frauen) über. Die ECIP Gruppe ($n = 130$) berichtete eine signifikant höhere bindungsbezogene Ängstlichkeit und Vermeidung als spät interpersonell ($n = 31$) oder nicht-interpersonell traumatisierte Personen ($n = 24$). Es gab, konträr zur Erwartung, jedoch keinen Hinweis auf einen Unterschied zur Gruppe der früh kurzzeitig interpersonell traumatisierten Personen ($n = 24$). Weiters war die Bindungsunsicherheit im Erwachsenenalter ein partieller Mediator des Zusammenhangs zwischen Trauma und der PTSD-Symptomstärke.

Schlussfolgerung: Unsichere Bindung im Erwachsenenalter könnte eine konsistente Folge früher interpersoneller Traumata sein sowie zur Entwicklung von PTSD beitragen. Von der künftigen Forschung wird zu klären sein, ob unsichere Bindung speziell auf frühe interpersonelle Traumata zurückzuführen ist oder ob sie eine Folge der PTSD-Symptome ist, die nach einem interpersonellen Trauma auftreten.

Appendix B Pattern and structure matrices of exploratory principal component analysis (PCA) for the questionnaire of interpersonal problems

First PCA

Pattern matrix of exploratory principal component analysis for the questionnaire of interpersonal problems ($N = 09$)

Item	Rotated factor loadings					
	1	2	3	4	5	6
24	0,81	0,06	0,01	-0,06	-0,19	-0,15
8	0,77	0,01	0,17	0,02	-0,01	0,06
2	0,74	0,01	-0,18	-0,02	0,02	0,11
23	0,72	-0,18	0,03	0,11	0,18	-0,01
10	0,68	0,18	0,03	0,09	-0,29	0,01
16	0,51	0,14	0,10	0,08	0,31	0,18
28	-0,51	0,03	0,35	-0,01	-0,29	-0,22
1	0,04	0,62	-0,23	-0,11	0,06	0,00
4	0,18	0,53	-0,10	0,03	-0,26	0,10
12	-0,09	0,69	-0,04	0,01	-0,15	-0,11
15	0,14	0,44	-0,08	-0,12	0,19	0,41
17	0,25	0,60	0,23	0,14	-0,06	-0,05
22	0,04	0,67	0,13	-0,19	0,31	-0,22
26	-0,07	0,54	-0,37	0,21	-0,13	-0,03
29	0,06	0,71	0,13	-0,10	0,18	0,13
14	0,08	0,07	0,82	0,07	-0,03	0,08
7	0,12	0,12	0,75	0,10	0,27	-0,03
21	-0,02	-0,12	0,73	-0,14	-0,14	-0,15
6	0,36	0,10	-0,57	0,08	0,07	-0,17
11	-0,09	-0,06	0,06	0,90	0,01	-0,01
31	0,04	0,09	-0,03	0,82	-0,09	-0,05
3	-0,11	-0,17	0,04	0,82	-0,06	0,03
25	0,09	-0,10	0,02	0,71	-0,06	-0,13
27	0,14	0,09	-0,29	0,64	0,09	0,16
20	0,09	0,09	-0,04	0,56	0,16	0,25
30	-0,02	0,10	-0,07	0,53	0,50	-0,10
5	0,26	-0,04	0,24	0,44	0,32	0,02
13	0,08	-0,15	0,35	0,18	0,45	0,31
18	0,32	-0,01	0,24	0,34	-0,41	0,04
19	0,01	0,29	-0,12	-0,01	0,01	-0,76
9	0,01	0,44	-0,11	-0,01	-0,26	0,56
Eigenvalues	5.49	4.23	3.30	5.19	1.79	2.04

Note. Analysis prior to exclusion of items. Direct oblimin rotation. Factor loadings above .40 appear in bold. The percentage of the explained variance cannot be indicated for each component separately as the components are correlated following direct oblimin rotation.

Structure matrix of exploratory principal component analysis for the questionnaire of interpersonal problems ($N = 209$)

Item	Rotated factor loadings					
	1	2	3	4	5	6
8	0,80	0,18	0,20	0,30	0,09	0,22
2	0,75	0,26	-0,15	0,25	0,09	0,28
24	0,75	0,28	0,02	0,19	-0,13	0,00
10	0,74	0,37	0,01	0,30	-0,22	0,14
23	0,73	0,01	0,12	0,39	0,26	0,17
16	0,66	0,26	0,11	0,31	0,39	0,34
28	-0,57	-0,20	0,31	-0,23	-0,35	-0,37
29	0,27	0,71	-0,02	-0,09	0,19	0,18
12	0,06	0,67	-0,21	-0,09	-0,18	-0,12
1	0,08	0,66	-0,37	-0,17	0,02	0,02
22	0,15	0,65	0,00	-0,20	0,27	-0,17
17	0,46	0,61	0,11	0,20	-0,03	0,03
4	0,33	0,60	-0,22	0,05	-0,24	0,14
26	0,12	0,59	-0,49	0,12	-0,15	0,00
15	0,32	0,52	-0,18	-0,04	0,23	0,47
14	0,18	-0,09	0,81	0,13	0,03	0,09
7	0,24	-0,02	0,75	0,19	0,32	0,03
21	-0,12	-0,28	0,74	-0,14	-0,14	-0,21
6	0,36	0,31	-0,57	0,16	0,06	-0,06
11	0,21	-0,15	0,11	0,87	0,08	0,06
31	0,34	0,06	-0,02	0,82	-0,02	0,04
3	0,13	-0,25	0,10	0,78	0,00	0,07
25	0,28	-0,12	0,08	0,73	0,00	-0,05
27	0,42	0,16	-0,27	0,69	0,16	0,27
20	0,38	0,10	-0,03	0,63	0,24	0,35
5	0,45	-0,05	0,30	0,58	0,40	0,15
30	0,22	0,07	-0,05	0,55	0,52	0,01
18	0,42	0,02	0,25	0,44	-0,33	0,09
13	0,23	-0,21	0,41	0,30	0,53	0,39
19	-0,08	0,29	-0,17	-0,10	-0,08	-0,75
9	0,22	0,50	-0,24	0,00	-0,21	0,55
Eigenvalues	5.49	4.23	3.30	5.19	1.79	2.04

Note. Analysis prior to exclusion of items. Direct oblimin rotation. Factor loadings over .40 appear in bold. The percentage of the explained variance cannot be indicated for each component separately as the components are correlated following direct oblimin rotation.

Second PCA

Pattern matrix of exploratory principal component analysis for the questionnaire of interpersonal problems ($N = 209$)

Item	Rotated factor loadings			
	1	2	3	4
1	-0,20	0,51	-0,33	0,06
2	0,18	0,40	-0,09	-0,44
3	0,80	-0,24	0,00	0,06
4	0,03	0,61	-0,17	0,07
5	0,47	0,04	0,25	-0,34
6	0,21	0,26	-0,51	-0,06
7	0,06	0,16	0,74	-0,19
8	0,22	0,44	0,27	-0,40
9	-0,12	0,39	-0,27	-0,23
10	0,28	0,60	0,11	-0,12
11	0,87	-0,15	0,01	0,04
12	-0,07	0,61	-0,15	0,30
13	0,11	-0,21	0,31	-0,59
14	0,04	0,15	0,80	-0,08
15	-0,22	0,40	-0,20	-0,45
16	0,14	0,34	0,11	-0,56
17	0,14	0,71	0,17	0,03
18	0,46	0,25	0,27	0,08
19	0,08	0,34	-0,04	0,63
20	0,52	0,04	-0,12	-0,32
21	-0,13	-0,03	0,77	0,20
22	-0,26	0,61	0,07	0,04
23	0,32	0,21	0,16	-0,46
24	0,20	0,57	0,15	-0,13
25	0,77	-0,04	0,04	0,09
26	0,15	0,45	-0,47	0,20
27	0,64	0,08	-0,34	-0,23
28	-0,11	-0,16	0,31	0,59
29	-0,22	0,64	0,00	-0,16
30	0,48	-0,04	-0,12	-0,21
31	0,83	0,08	-0,07	0,09
Eigenvalues	5.47	5.04	3.51	4.00

Note. Analysis prior to exclusion of items. Stop criterion was four components. Direct oblimin rotation. Factor loadings above .40 appear in bold. The percentage of the explained variance cannot be indicated for each component separately as the components are correlated following direct oblimin rotation.

Structure matrix of exploratory principal component analysis for the questionnaire of interpersonal problems ($N = 209$)

Item	Rotated factor loadings			
	1	2	3	4
1	-0,20	0,54	-0,44	0,05
2	0,33	0,51	-0,11	-0,55
3	0,76	-0,18	0,11	-0,12
4	0,05	0,63	-0,28	-0,04
5	0,59	0,10	0,31	-0,49
6	0,20	0,38	-0,53	-0,13
7	0,20	0,07	0,73	-0,28
8	0,40	0,49	0,24	-0,55
9	-0,04	0,47	-0,33	-0,25
10	0,38	0,63	0,04	-0,31
11	0,85	-0,07	0,12	-0,17
12	-0,11	0,57	-0,28	0,23
13	0,28	-0,15	0,40	-0,60
14	0,15	0,03	0,79	-0,17
15	-0,07	0,49	-0,26	-0,45
16	0,34	0,43	0,10	-0,67
17	0,21	0,68	0,06	-0,14
18	0,49	0,23	0,27	-0,11
19	-0,06	0,24	-0,13	0,55
20	0,60	0,17	-0,05	-0,47
21	-0,11	-0,21	0,75	0,19
22	-0,21	0,56	-0,07	0,01
23	0,48	0,29	0,18	-0,59
24	0,30	0,58	0,08	-0,29
25	0,74	0,00	0,11	-0,11
26	0,09	0,51	-0,54	0,11
27	0,68	0,23	-0,28	-0,40
28	-0,26	-0,33	0,29	0,63
29	-0,11	0,65	-0,12	-0,21
30	0,52	0,06	-0,05	-0,32
31	0,81	0,16	-0,01	-0,15
Eigenvalues	5.47	5.04	3.51	4.00

Note. Analysis prior to exclusion of items. Stop criterion was four components. Direct oblimin rotation. Factor loadings above .40 appear in bold. The percentage of the explained variance cannot be indicated for each component separately as the components are correlated following direct oblimin rotation.

Third PCA

Pattern matrix of exploratory principal component analysis for the questionnaire of interpersonal problems ($N = 209$)

Item	Rotated factor loadings			
	1	2	3	4
1	-0,07	0,52	-0,36	-0,05
2	0,22	0,24	-0,01	-0,50
3	0,67	-0,41	-0,01	-0,07
4	-0,05	0,31	-0,30	-0,42
5	0,57	0,09	0,42	-0,09
7	0,04	0,15	0,79	-0,11
8	0,14	0,15	0,29	-0,62
9	0,03	0,39	-0,25	-0,22
10	0,04	0,08	-0,04	-0,77
11	0,76	-0,32	0,01	-0,10
12	-0,16	0,36	-0,33	-0,22
13	0,41	0,19	0,63	0,19
14	-0,14	-0,05	0,72	-0,28
15	0,13	0,67	0,00	-0,03
16	0,34	0,41	0,31	-0,26
17	0,00	0,34	0,04	-0,50
18	0,09	-0,32	0,06	-0,63
20	0,67	0,12	0,02	-0,08
21	-0,42	-0,28	0,59	-0,17
22	-0,14	0,65	0,06	-0,02
23	0,33	0,08	0,28	-0,42
24	-0,04	0,07	0,02	-0,74
25	0,55	-0,37	-0,05	-0,27
26	0,14	0,26	-0,59	-0,18
27	0,75	0,06	-0,21	-0,13
29	-0,03	0,70	0,04	-0,13
30	0,69	0,18	0,07	0,18
31	0,66	-0,23	-0,14	-0,28
Eigenvalues	5.19	3.86	3.45	4.65

Note. Analysis following exclusion of Items 6, 19, and 28. Stop criterion was four components. Direct oblimin rotation. Factor loadings above .40 appear in bold. The percentage of the explained variance cannot be indicated for each component separately as the components are correlated following direct oblimin rotation.

Structure matrix of exploratory principal component analysis for the questionnaire of interpersonal problems ($N = 209$)

Item	Rotated factor loadings			
	1	2	3	4
1	-0,10	0,59	-0,45	-0,14
2	0,37	0,36	-0,01	-0,62
3	0,69	-0,39	0,14	-0,17
4	0,03	0,45	-0,34	-0,47
5	0,64	0,05	0,48	-0,29
7	0,16	0,05	0,78	-0,19
8	0,35	0,25	0,30	-0,71
9	0,06	0,48	-0,30	-0,31
10	0,26	0,26	-0,02	-0,80
11	0,79	-0,29	0,15	-0,24
12	-0,13	0,46	-0,40	-0,25
13	0,43	0,05	0,64	0,00
14	0,02	-0,11	0,72	-0,25
15	0,14	0,68	-0,09	-0,22
16	0,46	0,43	0,29	-0,47
17	0,15	0,45	0,00	-0,58
18	0,28	-0,18	0,15	-0,58
20	0,70	0,14	0,08	-0,30
21	-0,31	-0,34	0,59	0,00
22	-0,12	0,65	-0,06	-0,14
23	0,48	0,14	0,32	-0,54
24	0,18	0,24	0,03	-0,75
25	0,62	-0,30	0,09	-0,34
26	0,12	0,40	-0,61	-0,25
27	0,76	0,13	-0,13	-0,35
29	0,02	0,72	-0,07	-0,28
30	0,65	0,13	0,12	-0,06
31	0,73	-0,14	-0,01	-0,41
Eigenvalues	5.19	3.86	3.45	4.65

Note. Analysis following exclusion of Items 6, 19, and 28. Stop criterion was four components. Direct oblimin rotation. Factor loadings above .40 appear in bold. The percentage of the explained variance cannot be indicated for each component separately as the components are correlated following direct oblimin rotation.

Fourth PCA

Pattern matrix of exploratory principal component analysis for the questionnaire of interpersonal problems ($N = 209$)

Item	Rotated factor loadings			
	1	2	3	4
1	-0,06	0,57	-0,31	-0,04
2	0,23	0,26	0,00	-0,50
3	0,67	-0,41	-0,02	-0,08
4	-0,03	0,37	-0,29	-0,42
5	0,55	0,06	0,44	-0,07
7	0,01	0,08	0,82	-0,07
8	0,12	0,15	0,32	-0,60
9	0,04	0,43	-0,22	-0,22
10	0,05	0,12	-0,03	-0,76
11	0,76	-0,31	0,01	-0,10
12	-0,15	0,41	-0,24	-0,19
13	0,39	0,12	0,62	0,20
14	-0,17	-0,11	0,74	-0,23
15	0,14	0,68	0,03	-0,01
16	0,33	0,39	0,35	-0,24
17	0,00	0,38	0,10	-0,46
18	0,09	-0,30	0,06	-0,62
20	0,67	0,12	0,06	-0,07
21	-0,45	-0,34	0,58	-0,14
22	-0,13	0,66	0,11	0,01
23	0,32	0,07	0,28	-0,41
24	-0,03	0,10	0,03	-0,74
25	0,55	-0,35	-0,04	-0,27
27	0,75	0,10	-0,19	-0,13
29	-0,03	0,72	0,10	-0,09
30	0,68	0,17	0,11	0,19
31	0,67	-0,20	-0,12	-0,28
Eigenvalues	5.13	3.84	3.19	4.45

Note. Analysis following exclusion of Items 6, 19, 26, and 28. Stop criterion was four components. Direct oblimin rotation. Factor loadings above .40 appear in bold. The percentage of the explained variance cannot be indicated for each component separately as the components are correlated following direct oblimin rotation.

Appendix C Study announcement published on the host websites

Dear forum-members,

We would like to invite you to participate in an online survey conducted by the University of Amsterdam. Our aim is to examine how people experience social situations and interpersonal relationships. We are particularly interested in finding out how the experience of social situations is related to traumatic or distressing events people have encountered in their lives.

You can participate by following this link: <http://www.unipark.de/uc/UniAmsterdam/>

Participation includes filling in an anonymous questionnaire. This survey is primarily directed at people who have experienced one or more traumatic events in their life, regardless whether they still feel troubled or not. However, we also invite people who have never had a traumatic experience to participate as their information will also be very valuable for us.

We expect the results of this study to help us improve treatment for people who find it difficult to deal with traumatic life events.

All your data will be treated as strictly confidential. You will not be asked to provide information that could be used to identify you. Moreover, you can leave the survey at any time without giving reasons. This study was approved by the Institutional Review Board at the University of Amsterdam.

Sincerely,

Lara Pivodic

Appendix D Information page and Informed Consent

Dear participant,

This study is part of a research project of the Department of Clinical Psychology at the University of Amsterdam in the Netherlands.

The aim of this survey is to examine how people experience social situations and interpersonal relationships. We are particularly interested in finding out how the experience of social situations is related to traumatic or distressing events people have encountered in their lives. We hope that the results of this study will help us improve treatment for people who find it difficult to deal with traumatic experiences.

This survey is primarily directed at people who have experienced one or more traumatic events in their life, regardless of whether or not they still feel troubled. However, we also invite people who have never had a traumatic experience to participate as their information will also be very valuable for us.

Please note that participants must be at least 18 years of age.

The survey consists of several questionnaires and requires approximately 20-30 minutes. All your data will be treated as strictly confidential and analyzed anonymously. You will not be asked to provide information that could be used to identify you.

You can leave the survey at any point without giving reasons. At the end of the survey we will ask you whether you allow the answers you have given us to be used for the scientific purposes of this study.

Some questions of this survey are about traumatic or distressing experiences that you may have experienced in your life. Filling in this questionnaire may trigger negative feelings. We would therefore like to ask you to take care of yourself while completing the questionnaire and to cancel the survey if answering the questions turns out to be too distressing for you.

Participants who, after completing the survey, wish to receive further information on the subject and results of this study are free to contact either of the persons responsible for this project (see e-mail addresses below). We will be happy to provide you with more detailed information. However, because of the anonymous nature of this survey we cannot give personal feedback.

Thank you very much for considering to participate in this study!

If you have further questions regarding this study, please feel free to contact either:

Dr. Thomas Ehring
t.w.a.ehring@uva.nl

or

Lara Pivodic
a0400292@unet.univie.ac.at

By clicking the circle next to the word “Agree”, you confirm that you have read and understood the information about the study and agree to participate in the survey. If you do not want to participate in the survey, please click the circle next to "Disagree"

- Agree Disagree

Appendix E Collection of demographic information

1. Sex

- male
- female

2. Age

in years

3. What is the highest level of education you have completed?

- less than High School / No exams
- some High School / GSCE
- High School / GED / A Levels
- some College / University
- Degree (BA, BSc)
- Post-graduate degree (e.g., MA, MSc, PhD)
- Professional Qualification
- Other (please specify)

4. What is your current occupation?

- Working, full-time
- Working, part-time
- Student
- Unemployed / Homemaker
- Training / Retraining
- Military Service / Community Service / Gap Year
- Retired

5. What is your marital status?

- single
- married, living with spouse
- married, not living with spouse
- in a relationship
- divorced
- widowed

6. How many children do you have?

7. Which country do you live in?

- Australia
- Canada
- United Kingdom
- Ireland
- USA
- Other (please specify)

8. What is your native language?

- English
- French
- German
- Spanish
- Other (please specify)

Filter⁵: If under 18

2.1 If under 18

Thank you for your interest in our study.

Unfortunately, due to your age, you cannot participate in this survey.

Filter: If single

5.1 Have you ever been in a romantic relationship in the past?

- No
- Yes

⁵ When filters were used, participants, depending on their answers, either proceeded to the next page or were directed to additional or alternative items or notifications.

Appendix G Questionnaire of interpersonal problems (developed by the author of the present study; not published)⁶**Instructions**

Below you will find descriptions of behaviours and attitudes regarding social situations and interactions with other people.

Please indicate for each statement how frequently you experience this (from **never** to **very often**).

Please answer honestly and be sure to answer each question.

1. I impose my will on other people. *Dominant*

- never rarely sometimes often very often

2. I would be happier if I had better relationships with the people in my life. *General*

- never rarely sometimes often very often

3. I act according to other people's wishes or orders. *Submissive / Socially inhibited*

- never rarely sometimes often very often

4. I argue or fight a lot with people I care about. *Dominant*

- never rarely sometimes often very often

5. I feel insecure when talking to other people. *Submissive / Socially inhibited*

- never rarely sometimes often very often

6. When I get to know other people, I want to spend as much time with them as possible. *Detached (excluded)*

- never rarely sometimes often very often

7. I am not very interested in talking to other people. *Detached*

- never rarely sometimes often very often

⁶ The term in the italics next to each item indicates the subscale that the item was assigned to. The names of the subscales were not displayed to the participants

8. Overall, I am unhappy with my relationships with other people (e.g., partner, friends, family).

General

- never rarely sometimes often very often

9. I want others to fulfil my wishes. *Dominant*

- never rarely sometimes often very often

10. My relationships are characterized by many ups and downs. *General*

- never rarely sometimes often very often

11. I do what I think other people want me to do. *Submissive / Socially inhibited*

- never rarely sometimes often very often

12. I tend to ask people who I don't know very well very direct questions about their life. *Dominant*

- never rarely sometimes often very often

13. I avoid approaching people who I don't know very well. *Detached*

- never rarely sometimes often very often

14. I prefer to be on my own rather than being in the company of other people. *Detached*

- never rarely sometimes often very often

15. If I feel harmed by others I want to take revenge. *Dominant*

- never rarely sometimes often very often

16. I wish I could get along better with other people. *General*

- never rarely sometimes often very often

17. People get upset with me easily. *General*

- never rarely sometimes often very often

18. When asked for help, I make big sacrifices without getting anything in return. *General*
- never rarely sometimes often very often
19. I visit other people without being invited. *Could not be assigned to a subscale (excluded)*
- never rarely sometimes often very often
20. I worry about how I am perceived by others. *Submissive / Socially inhibited*
- never rarely sometimes often very often
21. I need other people in my life in order to feel good. *Detached*
- never rarely sometimes often very often
22. I act without paying attention to other people's feelings. *Dominant*
- never rarely sometimes often very often
23. I think that other people are happier with their relationships than I am. *General*
- never rarely sometimes often very often
24. If my relationships are happy, they remain that way for a long period of time. *General*
- never rarely sometimes often very often
25. It is hard for me to say 'No' if others ask me for a favour. *Submissive / Socially inhibited*
- never rarely sometimes often very often
26. I tell others a lot about myself even if I am not asked. *Dominant (excluded)*
- never rarely sometimes often very often
27. I doubt myself if I don't get reassurance from others. *Submissive / Socially inhibited*
- never rarely sometimes often very often

28. I wish I had more contact to other people. *General (excluded)*

- never rarely sometimes often very often

29. I criticize others in a harsh way. *Dominant*

- never rarely sometimes often very often

30. I am sure about my opinions only when they are shared by other people. *Submissive / Socially inhibited*

- never rarely sometimes often very often

31. I spend a lot of time trying to make other people happy. *Submissive / Socially inhibited*

- never rarely sometimes often very often

Appendix H Trauma History Questionnaire (THQ; Green, 1996), modified version**Instructions**

The following is a series of questions about serious or traumatic life events. These types of events actually occur with some regularity (although we would like to believe they are rare) and they affect how people feel about, react to, and/or think about things.

This questionnaire is divided into questions covering crime experiences, general disaster and trauma, and physical and sexual experiences.

For each event, please indicate whether or not it has happened to you by clicking either the circle next to the word "Yes" or the circle next to the word "No". If you have experienced a particular event you will be asked about the number of times it has occurred and your age at that time (give your best guess if you are not sure). You will also have a chance to describe the event if you would like to.

Please answer honestly and be sure to answer each question.

1. Robbery (NIP)⁷

Has anyone ever tried to take something directly from you by using force or the threat of force, such as a stick-up or mugging?

No Yes

Filter: If 'Yes'

(This filter is applied to all questions of the THQ that are answered with "Yes", except for questions 'Sexual Abuse 1', 'Sexual Abuse 2', 'Weapon', and 'Violence without Weapon'.)

Robbery Info

1.1 How many times have you experienced this event?

Please type in the number of times.

1.2 How old were you when this event occurred for the first time?

1.3 ... when it occurred for the second time?

1.4 ... when it occurred for the third time?

1.5 Description

Please describe in more detail, to the best of your memory, what happened in this situation.

(If you prefer not to describe this experience, proceed directly to the next question by clicking the button 'next')

[Text field]

⁷ NIP = Non-interpersonal trauma. This label was not displayed to the participants.

2. Break-in (NIP)

Has anyone ever attempted to or succeeded in breaking into your home when you were there?

- No Yes

3. Accident (NIP)

Have you ever had a serious accident at work, in a car or somewhere else?

- No Yes

4. Natural disaster (NIP)

Have you ever experienced a natural disaster such as a tornado, hurricane, flood, major earthquake, etc., where you felt you or your loved ones were in danger of death or injury?

- No Yes

5. Man-made disaster (NIP)

Have you ever experienced a "man-made" disaster such as a train crash, building collapse, bank robbery, fire, etc., where you felt you or your loved ones were in danger of death or injury?

- No Yes

6. Injury (NIP)

Have you ever been in a situation in which you feared you might be killed or seriously injured or in which you were seriously injured?

- No Yes

7. Witness of injury (NIP)

Have you ever seen someone seriously injured or killed?

- No Yes

8. Murder (NIP)

Have you ever had a close friend or family member murdered, or killed by a drunk driver?

- No Yes

9. Death in family (NIP)

Have you ever had a spouse, romantic partner, or child die?

- No Yes

10. Illness (NIP)

Have you ever had a serious or life-threatening illness?

- No Yes

11. War (NIP)

Have you ever had to engage in combat while in military service in an official or unofficial war zone?

- No Yes

12. Sexual abuse 1 (IP)⁸

Has anyone ever made you have intercourse, oral or anal sex against your will?

- No Yes

⁸ IP = Interpersonal trauma. This label was not displayed to the participants.

Filter: If 'Yes'

(This filter is applied to all questions concerning interpersonal trauma that have been answered with "Yes"; i.e., 'Sexual Abuse 1', 'Sexual Abuse 2', 'Weapon', and 'Violence without Weapon')

12.1 Age

How old were you when you experienced this event?

- When I was 14 years old or younger When I was older than 14 years Both before and after the age of 14

12.2 Frequency

Did you experience this event once, twice or more often?

- once twice more than two times

Filter: If 'once'

12.2.1 How old were you when this event occurred?

Please type in your age (in years) at the time of the event.

Filter: If 'twice'

12.2.2 How old were you when you experienced these events?

Please indicate how old you were (in years) when this event occurred for the first time and at what age you experienced it for the second time.

Age (first time) Age (second time)

Filter: If 'more than two times'

12.2.3 How old were you when you experienced these events?

Please state at what age (in years) you experienced this event for the first time and how old you were when it occurred for the last time.

Age (first time) Age (last time)

12.3 Description

Please describe in more detail, to the best of your memory, what happened in this/these situations. (If you prefer not to describe this experience, you can proceed directly by pressing the button 'continue')

[Text field]

13. Sexual abuse 2 (IP)

Has anyone ever touched private parts of your body, or made you touch theirs, under force or threat or has there been any other situation in which another person tried to force you to have unwanted sexual contact?

- No Yes

14. Weapon (IP)

Has anyone, including family members or friends, ever attacked you with a gun, knife or some other weapon?

- No Yes

15. Violence without weapon (IP)

Have you experienced any other extraordinarily stressful situation or event that was not covered by the previous questions?

- No Yes

16. Other (NIP)

Have you experienced any other extraordinarily stressful situation or event that was not covered by the previous questions?

- No Yes

Appendix I Impact of Event Scale – Revised (IES-R; Weiss & Marmar, 1997)**Instructions**

Below is a list of difficulties that people who have faced stressful events sometimes experience. Please choose a particular life event that you find most distressing at the moment. Read each item and then indicate with respect to the event how distressing each one has been for you **DURING THE PAST SEVEN DAYS**.

Please answer honestly and be sure to answer each question.

Please indicate which stressful life event you are thinking of when answering the following questions.

When did this event occur?

1. Any reminder brought back feelings about it.

- Not at all A little bit Moderately Quite a bit Extremely

2. I had trouble staying asleep.

- Not at all A little bit Moderately Quite a bit Extremely

3. Other things kept making me think about it.

- Not at all A little bit Moderately Quite a bit Extremely

4. I felt irritable and angry.

- Not at all A little bit Moderately Quite a bit Extremely

5. I avoided letting myself get upset when I thought about it or was reminded of it.

- Not at all A little bit Moderately Quite a bit Extremely

6. I thought about it when I didn't mean to.

- Not at all A little bit Moderately Quite a bit Extremely

7. I felt as if it hadn't happened or wasn't real.

- Not at all A little bit Moderately Quite a bit Extremely

8. I stayed away from reminders of it.

- Not at all A little bit Moderately Quite a bit Extremely

9. Pictures about it popped into my mind.

- Not at all A little bit Moderately Quite a bit Extremely

10. I was jumpy and easily startled.

- Not at all A little bit Moderately Quite a bit Extremely

11. I tried not to think about it.

- Not at all A little bit Moderately Quite a bit Extremely

12. I was aware that I still had a lot of feelings about it, but I didn't deal with them.

- Not at all A little bit Moderately Quite a bit Extremely

13. My feelings about it were kind of numb.

- Not at all A little bit Moderately Quite a bit Extremely

14. I found myself acting or feeling like I was back at that time.

- Not at all A little bit Moderately Quite a bit Extremely

15. I had trouble falling asleep.

- Not at all A little bit Moderately Quite a bit Extremely

16. I had waves of strong feelings about it.

- Not at all A little bit Moderately Quite a bit Extremely

17. I tried to remove it from my memory.

- Not at all A little bit Moderately Quite a bit Extremely

18. I had trouble concentrating.

- Not at all A little bit Moderately Quite a bit Extremely

19. I had dreams about it.

- Not at all A little bit Moderately Quite a bit Extremely

20. I felt watchful and on-guard.

- Not at all A little bit Moderately Quite a bit Extremely

21. I tried not to talk about it.

- Not at all A little bit Moderately Quite a bit Extremely

Appendix J Patient Health Questionnaire – Depression subscale (Spitzer, Kroenke, & Williams, 1999)**Instructions**

Over the **last 2 weeks**, how often have you been bothered by any of the following problems?

Please answer honestly and be sure to answer each question.

1. Little interest or pleasure in doing things

- Not at all Several days More than half the days Nearly every day

2. Feeling down, depressed, or hopeless

- Not at all Several days More than half the days Nearly every day

3. Trouble falling or staying asleep, or sleeping too much

- Not at all Several days More than half the days Nearly every day

4. Feeling tired or having little energy

- Not at all Several days More than half the days Nearly every day

5. Poor appetite or overeating

- Not at all Several days More than half the days Nearly every day

6. Feeling bad about yourself - or that you are a failure or have let yourself or your family down

- Not at all Several days More than half the days Nearly every day

7. Trouble concentrating on things, such as reading the newspaper or watching television

- Not at all Several days More than half the days Nearly every day

8. Moving or speaking so slowly that other people could have noticed? Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual

- Not at all Several days More than half the days Nearly every day

9. Thoughts that you would be better off dead or of hurting yourself in some way

- Not at all Several days More than half the days Nearly every day

Appendix K McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD; Zanarini et al., 2003)**Instruction**

Below you will find questions concerning your behavior and feelings in particular situations. Please indicate by clicking either 'Yes' or 'No' whether you have or have not felt or behaved in the described ways.

Please answer honestly and be sure to answer each question.

1. Have any of your closest relationships been troubled by a lot of arguments and repeated breakups?

No Yes

2. Have you deliberately hurt yourself physically (e.g., punched yourself, cut yourself, burned yourself)? How about made a suicide attempt?

No Yes

3. Have you had at least two other problems with impulsivity (e.g., eating binges and spending sprees, drinking too much and verbal outbursts)?

No Yes

4. Have you been extremely moody?

No Yes

5. Have you felt very angry a lot of the time? How about often acted in an angry or sarcastic manner?

No Yes

6. Have you often been distrustful of other people?

No Yes

7. Have you frequently felt unreal or as if things around you were unreal?

No Yes

8. Have you chronically felt empty?

No Yes

9. Have you often felt that you had no idea of who you are or that you have no identity?

No Yes

10. Have you made desperate efforts to avoid feeling abandoned or being abandoned (e.g., repeatedly called someone to reassure yourself that he or she still cared, begged them not to leave you, clung to them physically)?

No Yes

Appendix L End of the survey**Information on treatment**

9.1 Have you ever been or are you currently in psychological or psychiatric treatment for consequences of traumatic experiences?

No Yes

Information on host website

9.2 If you remember, please let us know at which website you have found the link to this survey (Name of the website or URL).

Permission to use data

Do you permit us to use the answers you have given for our research purposes? As stated before, the information you have given us is anonymous. We did not collect any information that could be used to identify you.

No Yes

Contact and comments

You have now completed the questionnaire. Thank you very much for your time and cooperation.

Would you like to be invited to participate in other scientific surveys? If so, please leave your e-mail address here.

Your e-mail address will be kept confidential and saved separately from your other data.

Please feel free to share with us any comments you may have regarding particular questions or instructions or this survey as a whole. This will help us improve the quality of the survey for future participants.

[Text field]

Last page

Thank you very much for participating in this survey.

From the answers you have given us, we expect to gain valuable information on difficulties in attachment and interpersonal contact encountered by individuals who were affected by an interpersonal trauma.

If you would like to receive more information on the goals and results of this study, please write an e-mail to Lara Pivodic (a0400292@unet.univie.ac.at).

It may occur that you notice negative and painful feelings after having completed this questionnaire. For most people, these troubling feelings will disappear shortly hereafter. If you, however, continue to feel distress and/or feel troubled by memories that have been evoked, do not hesitate to contact either of the persons responsible for this study:

Lara Pivodic
lara.pivodic@gmail.com

Dr. Thomas Ehring
t.w.a.ehring@uva.nl

We would appreciate if you forwarded the link to this survey to other people you know.
Thank you very much.

Appendix M Host websites that published the link to the survey

The administrators of the following websites agreed to publish the link to the online-survey on their website:

About.com: Palliative Care

<http://forums.about.com/n/pfx/forum.aspx?nav=messages&webtag=ab-dying&lgnF=y>

After Silence

<http://www.aftersilence.org/forum/>

Arms of Love

<http://members6.boardhost.com/armsoflove/>

Beyond Indigo: Death and Dying

<http://beyondindigo.com/forums/>

ehealthforum

http://ehealthforum.com/health/health_forums.html

Forum for Abuse Survivors

<http://forumforabusesurvivors.webs.com>

napac

<http://www.napac.org.uk>

Pandora's Project

<http://www.pandys.org>

Psychlinks Online

<http://forum.psychlinks.ca/forum.php>

The Light Beyond

<http://www.thelightbeyond.com/forum/forumdisplay.php?s=e9a877c9f65ca64b316ffe6858ec6dd4&f=12>

Aphrodite Wounded

<http://www.aphroditewounded.org/>

Many Voices

<http://www.manyvoicespress.com/>

Battered Husbands Support

<http://www.batteredhusbandssupport.com/board2/index.php>

CureZone

<http://curezone.com/>

Steady Health

<http://www.steadyhealth.com/>

Appendix N Curriculum Vitae**Personal information**

Surname/First name: Pivodic Lara

Address: Grundlgasse 2/10, 1090 Wien, Austria

Date of birth: 7 November, 1985

Nationality: Austrian

Education

2004 – 2011 Psychology studies at the University of Vienna

2008 – 2009 Formal exchange program at the University of Amsterdam (Psychology)

1996 – 2004 Secondary School in Vienna: Diploma qualifying for university admission

Work experience related to the field of clinical and health psychology

since 2010 Instructor for HIV-/AIDS prevention at the Aids Help Centre Vienna

2009 – 2010 Research internship at the Department of Clinical Psychology, University of Amsterdam; supervised by Dr Thomas Ehring

2007 – 2007 Research Internship in Clinical Psychology at the Department of Obstetrics and Gynaecology, University Hospital Graz; supervised by Prof Elfriede Greimel

Training

2007 Participation at the conference 'Soma & Trauma' in Vienna, Austria

2010 Participation at the UNICA Student Conference in Rome, Italy as a representative of the University of Vienna

Voluntary service

2008 – 2009 Project coordinator for a humanitarian and educational project supporting the 'Association of children with special needs and their families' in Derventa, Bosnia and Hercegovina (Antara Foundation, Vienna)

2009 – 2009 Counsellor at an international youth summer camp in Ptusza, Poland (Luethi - Peterson Camps, Hasliberg-Goldern, Switzerland)