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Trauma, Posttraumatic Stress and Dissociation Among Swedish Adolescents. Evaluation of Questionnaires

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To my children Sven, Tomas and Sara

Contents

Abstract

The main aim of this thesis has been to investigate trauma and dissociation among Swedish adolescents and to evaluate the psychometric properties such as reliability and various kinds of validity of three screening instruments for assessment of dissociation and other symptoms of post traumatic stress. The three instruments in question have been Dis-Q-Sweden, A-DES and TSCC, the symptoms measured by these instruments are neither easy to capture nor easy for the adolescent to talk about. Therefore these self report scales are essential. A second aim has been to compare the results with results from other countries and to develop preliminary Swedish norms for the clinician to use. Age and gender differences have been looked upon as well as assessed symptoms connected to known experienced trauma/sexual and/or physical abuse and self-reported trauma in normal and clinical populations.

The populations, in this thesis have been children and adolescents age 10 -19 years old from the general population; the clinical groups have had the same age range. All children and adolescents in the clinical groups have been sexually and/or physically abused. Participants have answered the questionnaires Dis-Q-Sweden, A-DES and/or TSCC and their answers have been statistically analysed.

All three instruments have been shown to have good reliability, such as internal consistency and test-retest. Validity has been established through factor analyses, concurrent, and criterion related validity. Clinical groups with known experienced trauma/sexual abuse and/or physical abuse gave significantly higher scores on all the instruments compared to normative groups. Also self-reported trauma in a normative group gave significantly higher scores even if the significances are not as high as between the normative and clinical groups. Girls scored significantly higher than boys in both the clinical and normative groups. Girls in the age range 14-15 years old gave the significantly highest scores on both Dis-Q-Sweden and A-DES. Swedish adolescents gave lower mean scores on all three instruments than have been reported from other studies in other countries. The scores from the clinical groups gave about the same mean as have been reported elsewhere.

The conclusion from this thesis is that all the three questionnaires Dis-Q-Sweden, A-DES and TSCC have shown satisfactory psychometrics properties and can very well be used by Swedish clinicians in Child and Adolescents Psychiatry.

Svensk sammanfattning

Huvudsyftet med den här avhandlingen har varit att undersöka trauma och dissociation bland svenska ungdomar samt att undersöka de psykometriska egenskaperna såsom reliabilitet och olika typer av validitet hos tre screening instrument som avser att mäta dissociation så väl som andra symptom på post traumatisk stress. De tre instrumenten har varit Dis-Q-Sweden, A-DES och TSCC. De symptom som mäts med dessa instrument är inte så lätta att fånga eller för ungdomar att prata om, vilket gör att dessa självsvarsformulär är väsentliga. Ett annat syfte har varit att jämföra våra resultat med resultat från andra länder och att få fram preliminära svenska normer. Ålders och köns skillnader har undersökts samt uppmätta symptoms samband med känt trauma såsom, sexuellt övergrepp eller och/fysisk misshandel så väl som självrapporterat trauma i den normativa och kliniska gruppen.

Populationerna i den här avhandlingen har varit barn och ungdomar mellan 10-19 år. I de kliniska grupperna hade alla varit utsatta för sexuella övergrepp eller/och blivit fysisk misshandlade. Alla deltagarna har fått fylla i formulären Dis-Q-Sweden, A-DES eller/och TSCC, deras svar har sedan bearbetats och analyserats statistiskt.

Alla tre instrumenten har visat sig ha god reliabilitet såsom *internal consistecy* och *test-retest.* Validiteten har undersökts och etablerats genom faktoranalyser, *samtidig validitet* och *kriterierelaterad validitet*. Kliniska grupper där det varit känt att sexuellt övergrepp och/eller fysisk misshandel förekommit gav signifikant höge värden på alla instrumenten jämfört med normalgrupperna. Även de ungdomar som i normal gruppen uppgivit att de varit med om något trauma hade signifikant högre värden än de som inte uppgivit att de varit med om något trauma, även om signifikans nivån inte var lika hög som mellan normal grupperna och de kliniska grupperna.

Ett annat resultat var att flickor ger signifikant högre värden än pojkar i både de kliniska grupperna och i normal grupperna. Det är framförallt flickor i åldern 14-15 år som gav de högsta värdena på både Dis-Q-Sweden och A-DES.

Svenska ungdomar har lägre medelvärden än vad som rapporterats från andra studier och från andra länder. Medelvärden i de kliniska grupperna var ungefär som de medelvärden som rapporterats från studier i andra länder.

Konklusionen i den här avhandlingen är att alla de tre undersökta självsvarsformulären; Dis-Q-Sweden, A-,DES och TSCC har sunda psykometriska egenskaper och kan mycket väl användas av kliniker inom svensk Barn och Ungdoms Psykiatri.

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Abbreviations

A-DES = Adolescent Dissociative Experience Scale

CAPS-C = Clinician – Administered PTSD for Children and Adolescents

CDC = Childrens Dissociative Checklist

CITES-R= Children's Impact of Traumatic Events Scale

CPSS = Child PTSD Symptom Scale

CPTS-RI = Children PTSD Reaction Index

CPTSDI = Children's PTSD Inventory

CRTES = Children's Reaction to Traumatic Events Scale

DES = Dissociative Experience Scale

DID = Dissociative Identity Disorders

Dis-Q = Dissociation Questionnaire

Dis-Q-Sweden = Dissociation Questionnaire Sweden

DSM-IV= Diagnostic and Statistical Manual of Mental Disorders 4th edition

DSRS= the Birleson Depression Self-Rating Scale

IES = Impact of Event Scale

ISSD = International Society for the Study of Dissociation

MDI =Multiscale Dissociation Inventory

MID= Multidimensional Inventory of Dissociation

MPD= Multiple Personality Disorder

PCA = Principal Component Analysis

PTSD= Post Traumatic Stress Disorder

SCID-D= Structural Clinical Interview for DSM-IV - Dissociation

TSCC= Trauma Symptom Checklist for Children

YSR= Youth Self Report

List of Papers

The present thesis is based on the following studies, which will be referred to in the text by their Roman numerals.

Paper I

Svedin, C.G., Nilsson, D. & Lindell, C. (2004). Traumatic experiences and dissociative symptoms among Swedish adolescents. A pilot study using Dis-Q-Sweden. *Nordic Journal of Psychiatry*, *58*, 349-355.

Paper II

Nilsson, D. & Svedin, C.G (2006). Evaluation of the Swedish version of Dissociation Questionnaire (DIS-Q), Dis-Q-Sweden, Among Adolescents. *Journal of Trauma & Dissociation, 7,* 65-69

Paper III

Nilsson, D. & Svedin, C.G (2006). Dissociation among Swedish Adolescents and the connection to trauma. An Evaluation of the Swedish version of Adolescent Dissociative Experience Scale. *Journal of Nervous and Mental Disease, 194,* 684-689.

Paper IV

Nilsson, D., Wadsby, M., & Svedin, C.G.

The psychometric properties of the Trauma Symptom Checklist for Children (TSCC) in a sample of Swedish Children. Submitted manuscript.

Introduction

Dissociation

General

The term dissociation is derived from the Greek term “dis” (off) and “sociare” (unite or connect). Dissociation means bring apart split off or disconnects elements that have something in common and is the opposite of association. It has been described in many cultures (Diseth, 2005; Putnam, 1997) as well as in the literature (Dirie, 1998; Kretész, 1992). Dissociation is a well-known voluntary act taken by prisoners to take away the pain of torture (Wood & Sexton, 1997). Dissociation is often mentioned and research has pointed out at that it is a reaction to overwhelming trauma (Terr, 1991) and often appears in connection with sexual and physical abuse (Chu & Dill, 1990; Vanderlinden, 1993).

Dissociation entered the Western mental health field with the work of the late French psychiatrist and psychologist Pierre Janet (van der Kolk & van der Hart, 1989). It is said that Freud shared Janet’s view of dissociation but did not follow that track when he got too much opposition for his belief in the “real” trauma. Freud instead turned his sight to the “unconscious wish” for incestuous love (McWilliams, 2000). Janet’s clinical description of dissociation fell into oblivion until the beginning of 1980 when Richard Kluft wrote a series of articles where he in detail described the clinical phenomenology of childhood MPD (Kluft, 1984; 1985a; 1985b). Frank W. Putnam has also with his many articles, books, and development of screening instruments made large contributions to the field of dissociation. Richard Lowenstein (1991) was the first to sort out the myriad of symptoms described in MPD patients into meaningful clusters, and the diagnosis of dissociative disorders finally was introduced into the DSM system in the beginnings of the 1990ies.

Research and knowledge about dissociation have since then grown tremendously. As knowledge of dissociation has grown, research and interest has been spreading to mental health personel all over the world. Researchers in the Scandinavian countries, though, have waited a long time to enter the arena, but finally in, 2003-2005, four articles were published by Scandinavian researchers (Diseth, 2005; Diseth & Christie, 2005; Lipsanen, Saarijärvi, & Lauerma, 2003; Svedin, Nilsson, & Lindell, 2004).

Dissociation in Children and adolescents

Most of the research and literature published concerning dissociation has concentrated on adults. However, since the late 1990 this has changed, with Frank W Putnams' writings and publications on dissociation among children and adolescents. Today there are articles and books about dissociation in children and adolescents in which efforts are made to understand dissociation during childhood and adolescence (Armstrong, Putnam, Carlson, Libero, & Smith, 1997; Farrington, Waller, Smerden, Faupel, 2001; Kisiel, & Lyons, 2001; Muris, Merckelbach, & Peeters, 2003; Putnam, 1993a; 1993b, Putnam, Helmers, & Trickett, 1993; Putnam & Peterson, 1994; Putnam, 1997, Silberg, 1998; Smith, & Carlsson, 1996;).

Even if the field of dissociation among children and adolescents is growing, there is a great need for more research to better understand why and how some children and adolescents dissociate and others do not.

Post traumatic Stress Disorder (PTSD)

General

It has been known since World War I that trauma plays an important role in the development of mental disorders, but it was not until 1980 that PTSD was included in the DSM system (Perrin, Smith, & Yule, 2000). Since this introduction there has been much research and today we know a lot of how to assess and treat PTSD. We now know, for example, that everybody who is exposed to trauma will not develop PTSD (Perrin et al., 2000). Prevalence in the adult normal population is around 1-14% but is of course higher in a population where everybody has been exposed to trauma. The percentage varies from study to study depending on the culture in which the study has been done and on the instruments that have been used. Epidemiological studies have shown that there are gender differences; women are twice as likely as men to develop PTSD during some period of their lifetime (Norris, Foster, & Weisshaar, 2002; National Center for PTSD, 2006). Men are more likely to be exposed to potentially traumatic events than women with the exception of sexual violence. This exception though is important because sexual violence is associated with the highest conditional risk of PTSD in both men and women. The risk for the development of PTSD for females begins already in adolescence and continues throughout the years of adulthood and middle age (Norris et al., 2002).

Children and adolescents

Unlike the majority of disorders in the DSM, criteria for PTSD include both the trauma and its etiology. For the adult population we know that trauma is a necessary but not sufficient cause of PTSD (Berliner & Saunders, 1997; Yehuda & McFarlane, 1995). The adult literature strongly suggests that the development of PTSD can not be predicted simply on the basis of the severity of the trauma itself.

When it comes to children and adolescents the picture is less clear. There is research pointing in two opposite directions, some research suggesting no relationship between the objective characteristics of the trauma and the development of PTSD and other research pointing to the importance of the objective characteristics of the trauma for the development of PTSD (Perrin, et al., 2000).

Before the introduction of PTSD in the DSM system, workers generally relied on case reports (Dyb, 2005; Perrin, et al., 2000). Terr, in the United States (1981; 1983) was the first to more systematically describe children's reactions after they were the victims in a bus kidnapping. Pynoos thereafter presented research on children's reactions after natural disasters and theorized about children's psychological and physical development and reaction to trauma (Pynoos & Nader, 1988; Pynoos, Steinberg & Wraith, 1995).

Today there is much research concerning children and adolescents and the development of PTSD even tough it is still true that the majority of research has been conducted on adult populations.

Few studies have been conducted that examine the rates of exposure and the development of PTSDs in children and adolescents from the general population. Results from these studies indicate that 15-43% of girls and 14-43% of boys have experienced at least one traumatic event during their life-time in the United States (National Center for PTSD, 2006). Of the children and adolescents who have experienced a trauma 3-15% of the girls and 1-6% of the boys met the criteria for PTSD.

Risk factors that have been shown to increase the likelihood that children will develop PTSD are: severity of the traumatic event, the parental reaction to the traumatic event, and the temporal proximity to the traumatic event (National Center for PTSD, 2006).

Research has also shown that interpersonal trauma such as violence, rape and assault is more likely to result in PTSD than other types of trauma (Norris, et al., 2002). There is also a relation between the risk of PTSD and the total number of previous traumas a child or an

adolescent has experienced, with the greater numbers of traumatic events increasing the risk for developing PTSD (National Center for PTSD, 2006).
Many studies (Norris et al., 2002) indicate that girls are at a higher risk for developing PTSD than similarly exposed boys.

Scales

General

Dissociation and PTSD were, in common with most other diseases, first recognized and reported on in clinical case studies (Diseth, 2005; Silberg, 2000). The initiating process in the medical and psychological sciences, the case study that results because the clinician's eye has seen what others have not, is what leads others to raise questions and develop hypotheses for study. A case study, however, is not a reliable procedure for verification and assessing significance so for the continuation of investigation larger studies need to take place. Larger quantitative studies are needed to objectify and quantify behavioral observations and to permit statistical comparisons. Here rating scales have their place even if they are not the only tools for objectifying behavior. Although they have limitations they can be said to be the backbone of much psychiatric research (Yuwider & Wetterberg, 2004).
Yuwider and Wetterberg (2004) describe three types of rating scales that have been developed: scales to quantify general morbidity in epidemiological surveys of populations for psychiatric diseases, scales to objectify diagnosis, and scales to objectify changes in symptom severity. They point out the importance of choosing the right scale for the items it is designed to measure.
In general it is an advantage to use an already existing scale as this will make it possible to compare data (Fife-Schaw, 1995). Changing a scale only a little, or adding some items may, make comparisons impossible. When using a rating scale it is always necessary to establish reliability and validity, in the culture where it is to be used. To employ rating scales is considered to be valuable as it is not so time consuming and they are easy to administer. To achieve these goals, it is necessary that the scale is comprehensive yet is not too time-consuming to fill in as motivation tends to decline with effort. Nevertheless, the time must not be so short as to be superficial.

Overview of the Research Field

Definitions of Dissociation

The definitions of dissociation have varied over the years but at the core of the concept of dissociation is the recognition that there is always a lack of integration of consciousness (Putnam, 1993; Vanderlinden, 1993). Putnam (1993) based on West's (1967) description writes: "*dissociation as a psycho-physiological process that alters a person's thoughts, feelings, or actions so for a period of time certain information is not associated or integrated with other information as it normally or logically is"* (p, 40). This definition integrates both body and soul. Putnam (1993) writes that dissociation is a complex psychopathological process that occurs on a continuum ranging from minor normative dissociation (e.g. daydreaming) to psychiatric conditions (e.g. dissociative identity disorders). Pathological dissociation is conceptualized as a disturbance in the integrative functions of identity, memory and consciousness (Brunner, Parzer, Schuld, & Resch, 2000) and according to Steinberg (1995) the global concept of dissociation contains five core symptoms such as 1) amnesia, 2) depersonalization, 3) derealization, 4) identity confusion, and 5) identity alteration. Finally, in DSM-IV it is stated "*The essential feature of the Dissociative Disorders is a disruption in the usually integrated functions of consciousness, memory, identity, or perception of the environment.* " (1994). Herein lies amnesia, depersonalization, derealization, identity confusion and identity alteration. Also according to Steinberg (ISSD -Toronto conference 2005) all these five symptoms are required to set the diagnosis of Dissociative Identity Disorder, DID (former MPD).

In 1996 Waller, Putnam and Carlson reanalyzed data using the Dissociative Experience Scale (DES) and found that weighted score was derived from only eight items on this often used scale for adults. This score is named DES-Taxon and taps feelings of depersonalization, divided identity, amnesia and auditory hallucinations. From this research, the question arose to of whether or not dissociation should be considered on a continuum where one extreme is daydreaming and at the other extreme is DID or if there is a typological difference between these two extremes. This argument is still going on. DES-Taxon has been used for adolescents but it has not been validated for this population (Ogawa, Sroufe, Weinfield, Carlson, & Egeland, 1997; Silberg, 2000; Waller & Ross, 1997).

Measures

Measures of dissociation have played a crucial role in establishing the clinical significance of dissociative disorders, notably the dissociative disorder and posttraumatic stress disorder (Armstrong et al., 1997).

In order to describe the phenomenon of dissociation, its prevalence, and in order to plan a therapeutic approach several instruments have been developed. The instruments may be divided into observer ratings, self-report questionnaires, and interviews.

Observer ratings

There is one instrument for observer reports developed for children, the Child Dissociation Checklist (Putnam et al., 1993). This Checklist has been shown to have good reliability and validity (Putnam et al., 1993; Putnam & Peterson, 1994; Zoroglu, Tuzun, Osturk, & Sar, 2002). It is a good instrument but the results from a screening should be interpreted with caution as the Checklist is an observer instrument and the observer parent/teacher does not always see the same view as what the child actually feels (Silberg, 2000).

Self-report questionnaires

Self-report questionnaires designed primarily for adults include the Perceptual Alteration Scale, PAS (Sanders, 1986), the Questionnaire of Experiences of Dissociation, QED (Riely,1988), Dissociative Experience Scale, DES (Bernstein & Putnam, 1986), and Dissociation Questionnaire, DIS-Q, (Vanderlinden, van Dyck, Vandereycken, Vertnommen, & Verkes, 1993). Nijenhuis (Nijenhuis et al., 1999) notes that all of these scales measure what he call ‘psychological dissociation’, and he states that what he calls ‘somatoform dissociation’ could be measured better by the Somatoform Dissociation Questionnaire, SDQ-20 (Nijenhuis, Spinhoven, van Dyck, van der Hart, & Vanderlinden, 1996). For adolescents, the Adolescent Dissociation Experience Scale A-DES has been developed (Armstong et al., 1997; Smith & Carlsson, 1996).

Recently, two new scales have been developed, the Multidimensional Inventory of Dissociation (MID) developed by Dell, 2006, and the Multiscale Dissociation Inventory (MDI) developed by Briere, Weathers, & Runtz (2005). The MID contains 218 items and the MDI contains 30 items, both scales seem to be promising but it is too early to know how well they works and more research is needed.

Dis-Q and DES are two screening instruments for dissociation that have shown good reliability and validity in different studies and are two screening instruments that are recommended by the ISSD (International Society for the Study of Dissociations) in their guidelines for the assessment/screening for dissociation (www.issd .org, 1997). DES and Dis-Q have shown high correlation in several studies (Vanderlinden, 1993). Dis-Q is the only instrument for the assessment of dissociation developed in Western Europe.

The DES scale

The DES is a 28 items scale developed in the United States (Bernstein & Putnam, 1986) to capture dissociative symptoms among adult populations. It is an 11 point scale were 0 = never and 10 = always. The scale has been shown to have good to excellent psychometric properties (reliability; internal consistency .83 - .93, test-retest ranging from .79 - .96) and has been validated and used in over 250 studies of patient populations as well as in normal populations in United States as well as in other countries (Carlson, 1997).

The Dis-Q

Dis-Q was developed by Vanderlinden and co-workers and was originally tested on two representative samples in Belgium and in the Netherlands (Vanderlinden, 1993). After factor analysis four subscales resulted: 1) identity confusion; 2) loss of control over behavior, thoughts and emotions; 3) amnesia and 4) absorption. The Dis-Q showed good to excellent internal consistency (Cronbach's alpha .96 for the total scale and .67 - .93 for the subscales. Test-retest reliability was .94 for the total scale and for the subscales .75 - .93). Construct validity showed that patients with dissociative disorders obtained significantly higher scores on Dis-Q than several different clinical samples. Finally, concurrent validity showed a correlation of r=.85 between Dis-Q and DES. Dis-Q also collects data on age, sex, educational level, civil status and a listing of previous experiences of trauma (severe bodily injury, physical abuse, state of war, sexual abuse by a family member or by outside the family, emotional maltreatment, diseases, and other). Dis-Q is suitable for subjects 13 to 14 years old or older.

The Dis-Q has since its development been used and translated in several European countries such as Hungary (Vanderlinden, Varga, Peuskens, & Pieters, 1995), Italy (Santonastaso, Favaro, Olivotto, & Frederici, 1997), France and Switzerland (Mihaescu et al., 1998), the Netherlands (Lange, et al., 1999; Nijenhuis et al. 1996; Nijenhuis, Spinhoven, van Dyck, Van der Hart, & Vanderlinden, 1997; Nijenhuis, Spinhoven, van Dyck van der Hart, Vanderlinden,

1998; Vandereycken & Van Houdenhove, 1996), and Great Britain (Hartman, Crisp, Sedgwick, & Borrow, 2001).

Several international studies have pointed out the necessity to scientifically norm measures of dissociation in the culture where it is to be used (Somer, Dolgin, & Saadon, 2001; Zoroglu, Tuzun, Osturk, & Sar, 2002; Zoroglu, Sar, Tuzun, Tutkun, & Savas, 2002).

International studies where Dis-Q has been used in assessing dissociation among adolescents are few.

A-DES Adolescent Dissociative Experience Scale

A-DES is a screening instrument for capturing dissociative experiences in adolescents aged 11-17 years old. It was developed by Armstrong and co-workers (1997), and Smith and co-workers (1996). The A-DES is a self- report questionnaire with 30 items that quantify the frequency of dissociative experiences. Four subscales are supposed to reflect the main constructs of dissociation: amnesia, absorption and imaginative involvement, passive influence, depersonalization and derealization. However, in two recent studies there have been difficulties finding these theoretically supposed subscales (Farrington et al., 2001; Muris et al., 2003). Both these studies have found that the items in the supposed subscales were scattered all over the subscales, so they stayed with a one-factor solution. In the research literature there is an ongoing discussion of how to look upon the emerging factors of dissociation (Bernstein, Wheathersbee Ellason, Ross, & Vanderlinden, 2001; Briere et al., 2005; Dell, 2006; Farrington et al., 2001; Muris et al., 2003;)

Interviews

The “golden standard” in the field of diagnosis of dissociative disorders is the Structured Clinical Interview for DSM-IV Dissociative Disorder, SCID-D (Steinberg, 1994). It is a semi-structured diagnostic interview for the assessment of symptoms of dissociation, their severity and nature. SCID-D rates the severity of the five core dissociative areas (amnesia, depersonalization, derealization, identity confusion, and identity alteration). SCID-D was developed for, and is mostly used for, the assessment of adults but has been used in some studies with adolescents, one three-case study and one pilot study (Carrion & Steiner, 2000; Steinberg, & Steinberg, 1995). In both of these studies SCID-D seemed to work out well for the assessment of adolescents and dissociation.

Dissociation in research

As studies of diagnostic measures began to establish some kind of validity to the construct of dissociation in children and adolescents, research moved on to examine the relationship between dissociation in children and a variety of historical, family and individual variables. According to Silberg (2000) dissociation was found to relate to parental inconsistency and rejection, fantasy proneness, and to show correlation with family disruption and children's sexual abuse histories and a weak relationship to hypontizability except for a small group of highly hypnotizable and dissociative girls (Putnam, Helmers, Horowitz, & Trickett, 1995).

There are then three main roads that research has followed in seeking an explanation for dissociation and to establish its origins: 1) the correlation with trauma, on the first hand sexual abuse and/or physical abuse, 2) the developmental road with attachment, and 3) the neurobiological road (Diseth, 2005; Silberg, 2000).

Traumatic correlates

Dissociation has since Janet`s days been linked to trauma (van der Kolk & Fisler, 1995; van der Kolk et al., 1996) and there are today several studies where trauma is linked to dissociation in adults (Chu & Dill, 1990; Lange et al., 1999; Vanderlinden, 1993; Nijenhuis, Spinhoven, van Dyck, van der Hart, & Vanderlinden, 1998) and some to dissociation in children and adolescents (Brunner et al., 2000; Sanders & Giolas, 1991).

Dissociative defenses in general seem to be used in the presence of a psychological need to escape overwhelming experiences such as trauma and abuse. Terr (1991) has conceptualized dissociation as a coping strategy used to reduce overwhelming anxiety in situations of extreme stress. She hypothesized that dissociation begins as an individual's defense against overwhelming negative experience. If the negative experience recurs, then this pattern of behavior becomes entrenched over time in one's behavioral repertoire as an automatic uncontrollable response to stress. This theory has been supported by empirical research in which the level of dissociation has been consistently related to both chronicity and severity in retrospective self-report studies (Chu & Dill, 1990; Kisiel & Lyons, 2001; Nijehuis et al., 1998).

Putnam (1993) writes "*Dissociation is widely thought to be an adaptive coping mechanism in the face of severe trauma"* (p, 40). By interfering with the normal storage, retrieval and integration of thoughts, feelings, sensations and memories, dissociation protects the individual

from aspects of the traumatic experience. A history of traumatic experiences results in significant increase in the frequency of dissociative experiences.

Several studies have documented the correlation and relationship between trauma, child sexual abuse and physical abuse (Briere & Runtz, 1988; Diseth, 2005; Putnam, 1995; Sanders, & Giolas, 1991; Silberg, 2000; Waldinger, Swett, Frank, & Miller, 1994). Most of the referred studies are cross sectional studies but Qgawa and co-workers (1997) have, in a longitudinal study examined 168 young adults, whom they followed from birth to 18-19 years old. They examined whether trauma, sense of self, quality of mother-child relationship, temperament, intelligence were related to dissociative symptomatology measured at four times across 19 years. Ogawa and co-workers (1997) found age at onset, chronicity and severity of trauma highly correlated which led to the predicted level of dissociation. He also found that experiencing abuse in infancy was a powerful factor in predicting dissociation at later points in time. Participants who experienced neglect in infancy were more likely to be in the clinical dissociation group.

The most consistent finding reported in the dissociation literature has been that sexual abuse is a precursor to dissociation, even if in all the studies, concerning dissociation in children and adolescents (Brunner et al., 2000; Coons, 1994; Dell & Eisenhower 1990; Hornstein & Putnam, 1996; Putnam, 1997) the findings do not support a direct relationship between trauma and dissociation. A theoretical formulation of dissociation must consider for the strong relationships found (Silberg, 2000).

Developmental correlates

Another track of research at the end of the 20th century was the increasing attention to the developmental roots of dissociation and its relevance for understanding at risk children and families. Egeland and Sussman-Stillman (1996) found that parents who gave higher dissociation scores had children who were at higher risk for maltreatment. Ogawa and co-workers (1997) and Carlson (1998) were reanalyzing data from an ongoing longitudinal study and found that those at risk children with disorganized or avoidant styles of attachment were more prone to dissociative pathology. Theoretical models that explain the intricate relation between the development of attachment and the development of dissociative pathology were first developed by Liotti 1995 and then by Fonagy (1998) and Siegel (1999). Liotti (1992) believed that the dissociative pathway involves an early age of onset because it begins with interactions that lead to disorganized attachment. Main and Hesse (1990) proposed that this

interaction begins in infancy when children's working models are still forming. Thus, the trauma to the mother or the child that leads to disorganized attachment must occur either early in the child's life or, in some cases in which the mother has an unresolved trauma it must have occurred before the child was born. Liotti (1995) also postulates that another trauma is required, a severe and chronic trauma after the establishment of disorganized attachment, in order to place the child on the developmental trajectory that leads to dissociation.

Dissociation and the self

Whether or not dissociation appears on a continuum or if there is a typological difference between two types, it is clear that when dissociation begins to be pathological, it can be a disruptive factor in the development of the self (Putnam, 1994; 1995), and a consequence of disturbances in the self (Liotti, 1992).

Ogawa and co-workers (1997) write,"*Pathological dissociation represents a profound distortion of a core self-process." "Self, in fact refers to the integration and organization of diverse aspects of experience"* (p, 856). The definition of dissociation incorporates recognition of a failure to integrate experience, so that dissociation and integration become antagonistic options in the face of a traumatic experience. When experience is acknowledged and accepted integration will follow as the self cannot help seeking meaning and coherence from experience, when experience is dissociated, integration is not possible, and if dissociation "prevails" there is a fragmentation of self.

A coherent well organized self depends on integration, and thus psychopathological-dissociation represents a threat to the optimal development of the self."

Loevinger (1976) she states, that integration is not a function of the self, integration is what the self is.

Neurobiological correlates

The core hypothesis in the understanding of the connection of chronic stress or trauma and dissociative symptoms is the failure of the integrative capacities of the Central Nervous system (CSN), resulting in abnormal memory processing with an inability to integrate and synthesize emotions and sensations (Diseth, 2005).

Today there is research in progress that is trying to clarify the neurobiological basis for and mechanisms of dissociative failure (Diseth, 2005).

The function of the human infant's brain is to develop in stepwise sequences, and during some of these steps the brain is extra sensitive during which particular environmental experiences affect the brain maturation. Some experiences are essential, others cause harm. Active processes in this bio-behavioral system are the mother-infant interaction and the development of self through self-regulation (ontogenesis). It is important to maintain balance between the internal and the external world (Perry et al., 1995)

There are various adaptive mental and physical responses to threat (trauma), including physiological hyperarousal and dissociation.

Diseth (2005) concludes that neurobiological research today suggests that severe trauma may produce a cerebral dysfunction via over-stimulation of the developing limbic and neocortical system, the latest mature parts of the brain and therefore the most vulnerable to harmful stress. Many structural and neurobiological consequences of early stressful experiences in childhood have been identified such as reduced corpus-callosum size, attenuated development of the left neurocortex, hippocampus and amygdale and enhanced electrical irritability in the limbic structures. Several of these brain changes in traumatized children and adolescents are related to different aspects of stress systems, and the neurotoxity of cortisol gives one explanatory model (Diseth, 2005).

Nijenhuis and collegues (Nijenhuis, Spinhoven, Vanderlinden, van Dyck and van der Hart 1998; Nijenhuis, Vandelinden, & Spinhoven, 1998) have applied an animal defense model to dissociative responses, suggesting that the biological roots of dissociative changes (like body anesthesia) and narrowing of the perceptual field may be an evolutionary adaption for organisms to survive in situations of great danger. They work extensively with somatoform dissociation and what they call structural dissociation.

Perry and co-workers (1995) have suggested a model that there should be an evolutionary pattern of response to severe threat, more common in younger children and in girls. They believe that two of the major response sets to threat are hyperarousal, leading to "fight or flight", behaviors, and dissociation, leading to "defeat" or "giving up" behaviors. Each of the patterns has certain adaptive advantages and vulnerabilities. In general, young children (unable to fight or flee) utilize a predominant dissociative response (freeze or surrender). If sufficiently terrorized the "freezing" may escalate into complete dissociation.

However, the study of the neurobiological correlates of dissociation is still in its infancy, and data this far are simply the basis for hypotheses for understanding the integrative failure of dissociation.

Conclusions

Trauma as an etiological factor in both mental and somatoform dissociation has long been known and is well documented. The emergence of neurobiological research during the last decade has started to clarify the neurobiological basis and mechanisms of the childhood trauma. A failure of CNS to integrate and synthesize traumatic experience into an integrated semantic memory has been theoretically conceptualized. Failure in integrative capacities of the mind can affect the child's functioning and further adaption, with hyperarousal, anxiety, depression, post traumatic stress symptoms, aggression, dissociative reactions and educational underachievement to follow. Diseth (2005) states, that with this new research concerning traumatized children, the field is beginning to bridge developmental psychology and neurobiology.

The intensity and duration of response to trauma in children is dependent on a wide variety of factors. One of the most important appears to be the availability of a healthy and responsive caretaker to provide some support and nurturance for the child following the trauma.

Assessment of posttraumatic experiences in children and adolescents

There is a need for systematic post-disaster psychological assessment in order to better understand posttraumatic symptomatology in children and to identify the populations that require early intervention. According to Balaban (2006), research into children's psychological responses to disasters and emergencies is still in its early stage and scales measuring the trauma itself are in early stages of validation. Balaban (2006) states that many of the published studies reporting on children's and adolescent's psychological responses to trauma are contradictory and questions concerning the roles of age and gender differences have not yet been solved. He argues that the lack of definitive information on the epidemiology of traumatic responses in children and adolescents has resulted in assessments being done using a range of instruments of varying reliability. Although we know today, that the potential results of unresolved traumatic response underscore the need for accurate assessment and effective treatment, it is important to have good assessment and screening instruments (Balaban, 2006; Carlsson, 1997; Drake et al., 2001; Nader, 1997; Ohan et al., 2002).

There is research indicating at that early screening not only identifies the level of traumatic response but also may be therapeutically beneficial (Nader, 1997). There are scales available

measuring the response/symptoms after traumatic event/events and scales measuring the trauma itself.

Childhood abuse differs from other trauma because it is often characterized by recurrence, chronicity, and PTSD is only one consequence of abuse (Nader, 1997). Sexual abuse of children and adolescents may induce variability in both short-term and long-time symptoms, and internalizing problems like, anxiety, depression, dissociative disorder, and problems related to PTSD externalizing symptoms such as sexual problems and anger are among the most frequently reported symptoms (Bal, et al., 2003; Wolfe & Birt, 1997). There is also research showing that trauma specific-instruments are necessary to capture these symptoms and that standard assessment or more generic measurements of distress are not sufficient to capture the symptoms of experienced trauma (Fricker & Smith, 2001; Friedrich, 2001; McLeer, Deblinger, Atkins, Foa, & Ralphe, 1988; Wolfe, 1994; Nader 1997). Some of the existing trauma scales are more suitable for general childhood trauma and disasters other than sexual abuse and some of the scales are more specialized in order to make them useful in assessing specific kinds of trauma, e.g. sexual and physical abuse.

Scales

The majority of psychological instruments were not created to evaluate traumatized populations and they therefore do not consider symptoms that are empirically known to be associated with child and adolescent trauma. Most of trauma-related scales for children and adolescents are relatively new, and there are scales developed to assess a range of trauma related symptoms as well as scales developed to measure the trauma itself. As many of these scales are so new, they have not been sufficiently well examined psychometrically, and the database is not yet very large even if it is growing (Balaban, 2006; Ohan et al., 2002). In a series of 10 years review articles about the use of rating scales in child and adolescent psychiatry, Myers & Winter (2002) reviewed practical concepts regarding rating scales and found that *utility, suitability and reactivity* were concepts useful in identifying good scales. They concluded that rating scales are used in research and clinical work because they have considerable *utility*, and they are rapid, accurate and reliable assessments for the psychological functioning of young people, which is also true for trauma rating scales (Ohan et al., 2002). *Suitability* is especially important in evaluating traumatized youths as trauma can disrupt youth's immature cognitive and emotional abilities. *Reactivity* is important as reexamining a trauma could strain a youths functioning, causing clinical regression and invalid responses.

Ohan et al., (2006) concludes that scales assessing trauma must avoid being overly stressful, insensitive, intrusive or lengthy.

Balaban (2006) listed five criteria to be applied when searching for a useful scale to measure PTSD. It should be: brief (less than 60 minutes are required), a standardized formula, they may be administered by non clinicians, used in disaster or emergency contexts or in longitudinal studies of children and adolescents, and there is published psychometric data behind them. He argued that tests that had these criteria were likely to be the most convenient and useful in post-disaster assessments. He found two scales that met these criteria with the only exception being that they had not been used in disaster and emergency environments; Trauma Symptom Checklist for Children and Multi Dimensional Anxiety Scale for Children.

Many of the PTSD scales are composed of items from the DSM IV and therefore the scales assess the construct of PTSD as it is defined in the DSM. While the overlap between a trauma scale and DSM symptom criteria support the validity of the questionnaires, the overlap creates circulatory definitions and measurement strategies. There could be other reactions that are not included in the DSM that may be important and relevant and that also have construct validity, reactions such as depression, anger, sexual concerns and dissociation.

Scales that are designed to measure PTSD in children and adolescents

Impact of Events Scale (IES)

The IES (Horowitz, Wilner, & Alvarez, 1979**)** was designed to assess the psychological impact of a specific trauma or stressor in adults. It comprises 15 items. This scale was designed before the inclusion of PTSD in the DSM and therefore does not reflect the DSM-IV criteria but it seems to measure a similar construct (Ohan et al., 2006).

This scale has been used as a self-report measure with children and adolescents as young as 8 years of age. The language used in versions for younger children has been simplified, but the questions do not specifically ask how youths manifest their impact of trauma. There is no normative base for children and adolescents.

Children PTSD - Reaction Index (CPTS-RI)

The CPTS-RI **(**Pynoos, Frederick, Nader et al., 1987; Frederick, Pynoos, & Nader, 1992; Pynoos, 2002) has 20 items and is a widely used for measuring PTSD symptoms in children (ages 6-17). CPTS-RI is a clinician administered scale but can be used as self administered for

questioning youths. This scale is based on adult measures of PTSD symptoms and is derived from the DSM using PTSD symptoms such as re-experiencing/numbing, fear/anxiety and concentration/sleep. Concerning the psychometric properties of this scale, it has been stated that internal consistency is moderate to good, test-retest is excellent, and validity is supported. Extensive research on this scale has supported its suitability for children of varying ages, cultures, and traumatic experiences.

Childrens PTSD Inventory (CPTSDI)

The CPTSDI (Saigh, 2002; Saigh, Yasik,. Oberfield et al., 2002) is a relatively new scale. It is clinician administered, has 43 items, and can be used for children and young people ages 7 -18 years old. It is based on the DSM-IV criteria and has five subscales assessing situational reactivity, re-experiencing, avoidance and numbing, increased arousing and subjective impairment. However, these subscales have not been statistically investigated nor confirmed by factor-analysis although other psychometric properties have been investigated and have been found good to be excellent. No normative base is available.

Clinician-Administered PTSD for Children and Adolescents (CAPS-C)

The CAPS-C (Nader et al., 2002) was based on Clinician-Administered PTSD Scale developed for use with adults (Keane, 2002) and has been modified for youths and reflects the DSM-IV criteria. It has 32 items and is suitable for children and young people ages 8-18 years old. It measures the frequency and intensity of symptoms as well as the impact of those symptoms on functioning as indicated by overall distress, coping skills, and impairment.

The psychometric properties of CAPS for adults are good, but only minimal data exist for CAPS-C and a normative base is not available.

Child PTSD Symptom Scale (CPSS)

The Child PTSD Symptom Scale (Foa, 2002; Foa, Johnson, Feeny, N.C., & Tredwell, 2001) is a self -report scale specific to the DSM-IV concept of PTSD. It is intended for youths aged 8 to 15 years. The 17 items assess DSM-IV defined PTSD symptoms with a format and wording that are developmentally suitable for children and adolescents. The three subscales were based on the DSM-IVs' re-experiencing, avoidance and arousal. In addition, the scale also includes 7 items that capture youth's functional impairment as a result of PTSD. These subscales have not been investigated through factor-analysis. Psychometric properties such as internal

consistency and test - retest reliability have been shown to be moderate to good, and validity of CPSS is in accordance with DSM-IV. No normative base is available.

Children's Reaction to Traumatic Events Scale (CRTES)

The Children's Reaction to Traumatic Events scale (Jones, 2002) was based on the IES and the DSM-III R's PTSD criteria with the intention of getting a more developmentally suitable scale than IES. CRTES has 15 items, 6 of them are retained from the original IES and 9 items are new. It is suitable for children between 8-12 years. Only preliminary psychometric properties have been published, and no normative base is available.

Trauma Symptom Checklist for Children (TSCC)

The Trauma Symptom Checklist for Children (Briere, 1996) is a self report, multitrait instrument designed to capture symptoms of traumatic experiences in children and adolescents, aged 8 to 16. It has 54 items. The measure yields two validity scales; Underresponse (Und) and Hyperresponse (Hyp) and, six clinical scales with 9 to 10 items in each: Anxiety (Anx), Depression (Dep), Posttraumatic Stress (Pts), Sexual Concerns (SC), Dissociation (Dis), and Anger (Ang. In addition there are two subscales to the Sexual Concern scale: Sexual Preoccupation (SC-P) and Sexual Distress (SC-D), and two to the Dissociation scale: Fantasy (Dis-F) and Overt Dissociation (Dis-O). Briere's norms are calculated for males and females, and for younger children 8 to 12 years old and older children 13 to 16 years old.

TSCC is considered to be a simple, has an easy to follow format and can be completed by children and adolescents without training (Nader, 1997). TSCC is described as one of the vital and necessary components for the comprehensive, multidimensional clinical assessment of PTSD but can never stand alone as a diagnostic instrument, which Briere also points out (Drake, Bush, & van Gorp, 2001). A normative base is available.

Children's Impact of Traumatic Events Scale (CITES-R)

Children's Impact of Traumatic Events Scale (Wolfe, Gentile, Michienzi, SAS, & Wolfe, 1991), CITES-R, was originally designed to be a structured interview. Wolfe (1996) noted that CITES-R could be completed as paper and pencil self-report scale, e.g. by older children with good reading abilities. CITES-R is a multitrait measure; it has 78 items and 11 subscales. Psychometrically it has been shown to have good reliability such as internal consistency and validity (Briere, 1996; Carlson, 1997; Crouch, et al. 1999; Nader, 1997; Sadowski & Friedrich, 2000). A normative base is not available.

Research in Sweden

Children and adolescents

There has been no research in Sweden on dissociation in children and adolescents except for the study referred to in this thesis. There has been some research on childhood trauma and post traumatic stress concerning children and adolescents. In 1999, Ahmad presented a doctoral thesis *Childhood Trauma and Posttraumatic Stress Disorder. A developmental and Cross-cultural Approach,* containing six articles in which different aspects of post traumatic stress as experienced by children from Kurdistan were compared with children from Sweden. He found more similarities than differences between children from Kurdistan and Sweden in reporting traumatic experiences and exhibiting posttraumatic stress symptoms. He also found that developmentally based child characteristics have determinant role as protective or vulnerability factors in childhood trauma and PTSD even if socio-cultural factors also played a role. Dyregrov, Frykholm, Lilled, Broberg, & Holmberg, (2003) studied the reactions following a discotheque fire in Gothenburg, Sweden, that killed 63 young people in 1998. They used the IES and a depression scale (DSRS) in the study. They found that the level of trauma was very high, while the depression scores were not so high. Nearly a third of the adolescents showed high levels of posttraumatic stress on the IES. Girls gave higher scores than boys on both depression and posttraumatic stress levels. Broberg, Dyregrov, & Lilled, (2005) reported in another follow up study- 18 months later of those affected by the same discotheque fire that they found 25% of the participants (n=275, girls n=126) met the DSM-IV criteria for PTSD. The level of PTSD was highest in the adolescents with immigrant background. Of the participants, 23% reported having dropped out of school or having repeated a class because of the fire. Girls sought out traditional talking cures more than boys.

Conclusion

The conclusion drawn is that in the field of assessing responses to trauma in children and adolescents there are suitable instruments, but more research is essential. Many of the existing instruments are rather new and need to be subjected to more careful psychometrical investigation and must also be tested in normative populations. More research needs to be done, as it is very important to be able to identify the populations that require early intervention.

Purpose of the Thesis

The main purpose of this thesis was to investigate dissociation and traumatic symptoms among Swedish adolescents and to evaluate the screening instruments: Dissociation Questionnaire (Dis-Q), Adolescent Dissociative Experience Scale (A-DES), and Trauma Symptom Checklist for Children (TSCC) in the Swedish population. A second purpose was to get Swedish norms for these scales. It was of interest to focus on how common dissociative symptoms, trauma and trauma symptoms are in a normative sample of Swedish adolescents and to compare this normative group with clinical populations with experienced trauma such as sexual and/or physical abuse. A third aim was to get sound instruments to screen for dissociation and trauma symptoms so that children and adolescents with these symptoms can get adequate help.

Ethical considerations

The studies in this thesis were all approved by the Human Research Ethics Committee, Faculty of Health Sciences, Linköping University.

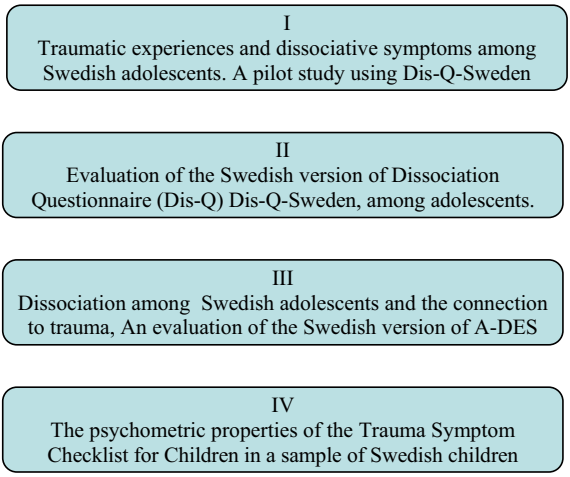
All participants were informed about the research and also parents for children and adolescents under 15 years old and gave their informed consent. The questionnaires were filled in anonymously. All pupils participating had the chance to ask questions while filling in the formulas and if somebody had felt upset or for any other reason wished for help they were informed where to turn. No one made use of this possibility.

Methods and Materials

This thesis was based on four studies all with the purpose of investigating the psychometric properties of the Swedish translation of the screening instruments Dis-Q, A-DES and TSCC. Three independent child and adolescent psychiatric researchers/therapists have carefully translated the three instruments. A consensus procedure was performed and an experienced translator retranslated the agreed upon versions to English with good agreement with the original instruments. The normative subjects included in this thesis all lived in Linköping and its surroundings. Linköping is a city with about 135 000 inhabitants and can be regarded as representative for Sweden in terms of gender distribution, ethnicity and family economic status. The city includes both an urban and a rural area as do most cities in Sweden. Linköping

can not be said to be fully representative model for the three biggest cities in Sweden, Stockholm, Gothenburg and Malmö.

It has been of vital importance to examine reliability; internal consistency and test-retest, and the validity of the instruments. Study I was a pilot study with the purpose of seeing if the concept of dissociation had any relevance for Sweden and Swedish adolescents who had been sexually abused, followed by Study II, III and IV. An overview of the papers is presented below:



The pilot-study showed clearly that dissociation had the same relevance in Sweden as in other countries so the evaluation of instruments measuring dissociative symptoms continued.

The three studies presented are the first quantitative studies in Sweden concerning dissociation, dissociation in a normative population and in clinical populations. The fourth and the last study, contains measures of dissociation but is a scale that more broadly screens for symptoms of trauma and then more specifically for symptoms after sexual or/and physical abuse. There was a need for Swedish norms as there are reasons to believe that norms differ in various cultures.

A summary of the study groups and methods used is presented in Table 1.

Table 1.

	Paper I	Paper II	Paper III	Paper IV
Total normal group n=	216	400	400	728
Test-rest n=	30	79	79	79
Boys n=	108	209	209	367
Girls n=	108	191	191	361
Clinical group n=	30	74	20	90
Mixed group n=		22		
Age range	13-19	12-19	12 -19	8-17
Scales used	Dis-Q, YSR	Dis-Q, SCID-D	Dis-Q, A-DES	TSCC, Dis- Q
Statistical program	Statview	SPSS 11.5	SPSS 11.5	SPSS 13.0
Statistics	Kruskal-Wallis test Mann-Whitney *U*-test Pearson's Correlation	Cronbach's alpha Guttman Splithalf Spearman-Brown Pearson's Correlation Factor analysis, *t*-test ANOVA	Cronbach's alpha Guttman Splithalf Spearman-Brown Pearson's Correlation Factor analysis, Kolmogrov-Smirnov's test *t*-test ANOVA	Cronbach's alpha Pearson's correlation Factor analysis, *t*-test ANOVA

Statistical methods Paper I, Paper II, Paper III and IV

The statistical program SPSS has been used throughout the thesis. Reliability was examined with Cronbach's alpha, and in some of the papers Guttman's split half and Spearman Browns coefficients were also used. Investigation of test-retest reliability was done as it belongs to the psychometric properties of a psychological instrument; another reason is also that the evaluated instruments can in the future be used for further research measuring therapeutic outcomes. Then it is of importance to have knowledge about the stability of the questionnaire.

In all the papers except the pilot study, we have chosen to conduct factor analysis to investigate the constructs of the scales. We chose confirmatory factor analysis as all the scales had presumed factors built in the scales, but in paper IV an exploratory factor analysis was also employed.

Non-parametric statistics have been used only in the pilot study. We have used parametric statistics even if dissociation and trauma symptoms can be assumed not to be normally distributed which was also the case in our material. However, as the sample sizes were ≥ 30 in most cases normal approximation should theoretically be suitable. In accordance with statistics today there is a growing body of evidence that parametric tests are valid even for small samples and for data that depart from the normal distribution (Hays, 1988). In addition, non-parametric tests produced similar results as parametric tests so we stayed with the parametric tests.

To test the significance of the differences between the normative groups and the clinical groups, *t*-test was used. When the variances of the two groups differed significantly (tested by means of the Levene's test) the degrees of freedom and t-values were adjusted accordingly. Two-way analysis of variance (ANOVA) with the (mean) total score as the dependent variable and gender as well as age as independent factors were used to estimate differences within the normative group. Pearson´s correlation was used to test the correlation between the two measures of dissociation.

Paper I - The Pilot Study

Background and Procedure

The first study started with the need to understand adolescents and more specifically the dissociative symptoms of adolescents who had been sexually abused. No scale or screening instrument in Swedish existed, and the research on adults in the western countries had just started. No such research existed on children and adolescents. There were two screening instruments, Dissociative Experience Scale (DES), (Bernstein, & Putnam, 1986) and Dissociation Questionnaire (Dis-Q) (Vanderlinden, 1993), developed and recommended by the International Society for the Study of Dissociation (ISSD, 1997). As Dis-Q was developed in Western Europe and was recommended (ISSD conference, Chester, 1996) for use in our culture Dis-Q was chosen to be translated, and evaluated. After the translation procedure, contact was taken with schools from the compulsory school system and from upper secondary school, first with letters to the headmasters and then with information to teachers, parents and pupils. After informed consent was obtained, the pupils were contacted.

Material

The samples consisted of four classes from the compulsory school system age 15-16 years (*n*= 110) representing different socio-economic areas in Linköping and five classes from the upper secondary school representing five different educational programs for 17-19 year old students (*n*=106). In all, 216 completed the Dis-Q, 108 were boys and 108 were girls. In order to study the correlation between dissociation measured by Dis-Q and general behaviour problems, the older sample also completed Youth Self Report (YSR), (Achenbach, 1991). The questionnaires were collected by one researcher who stayed in the classroom during the time (40 minutes) when the pupils answered the Dis-Q and YSR. Questions were taken care of right in the classroom.

The participation rate in this study was 94% (216/230); the drop outs were eight boys and six girls, who were absent mostly because of sickness on the day for the research.

The clinical group, 30 adolescents, was chosen from child and adolescent's psychiatry outpatient's clinics, BUP-Elefanten (a specialized clinic for treatment of abused children) and the Child and Family Team of the Refugee Medical Centre at the University Hospital in Linköping. This group consisted of 25 girls and 5 boys.

Test-retest was done in one class from the 9th grade with three weeks in between.

Summary of Results

Reliability

In this pilot study of dissociation and Dis-Q, from here on called Dis-Q-Sweden, the reliability; internal consistency (Cronbach's alpha =.96, Guttman split half coefficient =.92, both the whole scale) and test-retest reliability (Spearman rho= .77) showed satisfactory outcome.

Self reported trauma

The normative sample could be divided in two groups, one with no reported trauma and one with self reported trauma. Of the 216 participating adolescents, 53 or 24.5%, reported one or more traumatic experiences. The most common traumatic experience among boys was physical abuse (7/104) and severe bodily injury (7/104). Among girls, emotional maltreatment (9/104) and war experiences (9/104) were the most frequent. In the clinical group, sexual abuse (19/29 cases), physical abuse (12/29) and emotional maltreatment (11/29) were the most common reported experiences. Multiple self-reported traumas were more common in the

clinical group (19/29) than in the normative group (7/53). This difference was statistically significant (*p<.0001).*

Dissociative symptoms

The clinical group had significantly higher scores on the total scale and on all the subscales (*p<.0001).* The normative group with self reported trauma also had significantly higher scores on the total scale (*p<.01)* than the normative group without self-reported trauma.
In the normative group as a whole, the girls scored higher than the boys.

Trauma, general behaviour and dissociation

The correlation between the total score on Dis-Q-Sweden and the total YSR score was r=.79 (*p<.0001).* There was no difference between boys and girls when it came to general behaviour problems measured by YSR, but the students that reported trauma (25/106) showed higher levels of general behaviour problems, which was true for boys but not for girls.

Paper II - Evaluation of Dis-Q Sweden

Background and Procedure

The usefulness of a screening instrument to capture dissociative symptoms is understandable as dissociative symptoms are not so easy to talk about. A sexually and/or physically abused adolescent with these symptoms does not reveal these symptoms unless asked directly about dissociative symptoms. Yet, when they are asked about dissociation they can show great relief when they recognize the descriptions and discover the possibility of having a conversation dealing with these dissociative symptoms. A conversation about the symptoms can be seen as the starting point for therapy. As the usefulness of the scale was demonstrated in Paper I, we found it essential to continue the evaluation of the scale and to go further in investigating dissociative symptoms.
In the pilot study, there was an indication that girls have higher scores than boys, and this tendency was something, that we wanted to look at more closely in the study on which this second paper is based.

The goal of the second paper was to evaluate the psychometric properties of Dis-Q-Sweden and to compare the results with studies performed in other countries. We needed to replicate the pilot study in bigger samples, both in the normative group and in the clinical group. The intention was to continue to examine the reliability; internal consistency and test-retest more thoroughly, not only for the whole scale but also for the subscales, in the normative and clinical groups.

The validity of the scale also had to be examined more carefully; the construct validity was examined with a factor analysis, concurrent validity with what was considered the "golden standard" which was the SCID-D (Structural Clinical Interview for DSM-IV, Dissociative Disorder) and criterion validity by once again comparing the scores from a normative group and a clinical group. The research procedures with the schools were the same as in the pilot study except that this time there was more pupils participating in the normative group. Also the number of participants in the clinical group was more than double the group in the pilot study.

Materials

The normative sample consisted of 449 pupils who were asked to complete the questionnaire; 400 of these completed the questionnaire. The drop out rate was 11.9% due to sickness on the day for the research. For the purpose of test-retest, 79 (dropouts 11) filled in the questionnaire a second time 3 weeks later. A total of 313 adolescents from compulsory school and 136 from secondary school participated in the study. There were 209 boys and 191 girls after removing the dropouts. The clinical group consisted of 74 adolescents, 64 girls and 10 boys, all of whom had been sexually or/and physically abused. A mixed group consisting of 22 adolescents with unknown clinical or normal background was used to examine the sensitivity and specificity of Dis-Q-Sweden. In this group there were 19 girls and 3 boys.

Summary of Results

Reliability

Internal consistency measured by Cronbach's alpha in the normative group was found to be .97 for the total scale, and for the clinical group the same. Cronbach's alpha for the subscales in the normative group was for the four factors Dis-Q- I, II, III, and IV: .95, .90, .88 and .65. For the clinical group it was .96, .91, .88 and .58 respectively. Test-retest reliability was .79 ($p<.001$), and for the subscales: .80, .74, .75 and .51 (all $p<.001$).

psychological reworking during adolescence. The scale has been found to have good psychometric properties such as good reliability and good validity (Armstrong et al., 1997; Smith & Carlson, 1996).

Even though we in Sweden had chosen Dis-Q as a screening instrument for dissociation among adolescents it became of interest also to investigate A-DES as it was more widely used in the rest of the world.

The procedure in this study was about the same as in paper II. The reliability, internal consistency and test-retest needed to be examined, as did the validity of the scale.

The research procedures with the schools were the same as in paper II. The participants in the clinical group had all been sexually abused and were consecutively collected from a specialized outpatient unit for children and adolescents who have been sexually and/or physically abused.

Materials

A group of 400 adolescents from the normative population completed the questionnaire. The participation rate was 89.1%. In the test-retest group there were 79 adolescents who (dropouts 11) filled in the questionnaire a second time 3 weeks later. A total of 313 adolescents from compulsory school and 136 from secondary school participated in the study. There were 209 boys and 191 girls when the dropouts were removed.

The clinical group consisted of 20 adolescents who had been sexually abused, 18 girls and 2 boys. Questionnaires used except for A-Des were Dis-Q-Sweden.

Summary of Results

Reliability

Internal consistency for A-DES in this study was measured by Cronbach's alpha and found to be .95. Guttman Split half was .82 and Spearman-Brown was .90. Test-retest reliability was found to be r= .71. All these reliability coefficients were calculated on the basis of the whole scale.

Validity

In order to examine the *construct validity* of A-DES a factor analysis was conducted. The confirmatory factor analysis gave four factors explaining 56.6% of the total variance but could not identify the hypothetical suggested four subscales. The items, which were supposed to

belong to one subscale, were scattered across all subscales. A one-factor solution seemed more appropriate.

Two other studies (Farrington et al., 2001; Muris et al., 2003) investigated the factor structure of A-DES and both came to the same conclusion, i.e. a one-factor structure is the most suitable.

Concurrent validity was examined by correlating the total score on A-DES with the total score of Dis-Q Sweden. This correlation was found to be r =.86 for the total group, for the boys .83 and for the girls .88. For the different age groups the correlation was, for 12-13 years r =.82, 14-15 years r=.87 and 16-19 years r=.86. For the adolescents with self-reported experienced trauma the inter-correlations with the total score on A-DES and total score on Dis-Q-Sweden were r=.88. With the self-reported trauma excluded, the correlation was noted to be r=.84 (p<.001).

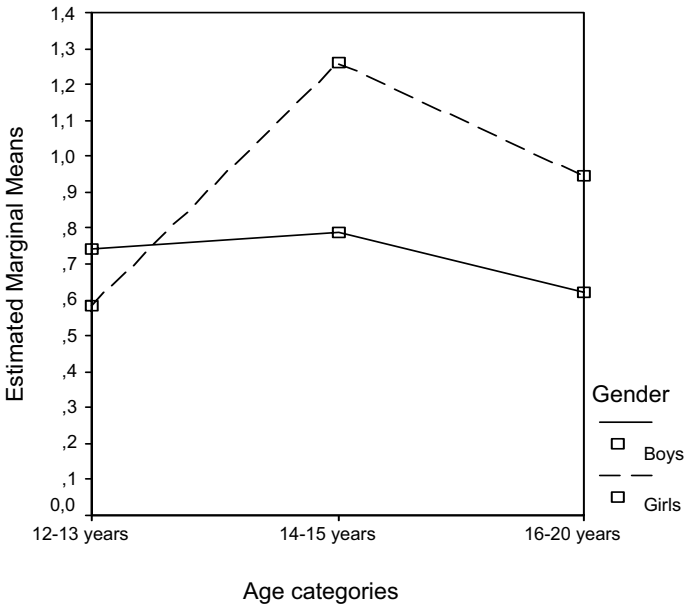
Criterion validity was tested in the course of finding significant differences in total score of A-DES between the normative group and the clinical group. The mean score for the normative group was 0.84 (SD=1.05) and for the clinical group 3.28 (SD=1.89) (p<.001). This difference between the normative group and the clinical group remained when consideration had been taken to age and gender.

Of the adolescents in the normative group, 15.5% answered yes on having experienced trauma. There were significant mean differences between these two groups.

Age and gender differences

Girls scored significantly higher than boys in the normative group (p =.019). There were also significant age differences between the age groups 12-13 years old and 14-15 years old with adolescents in the age group 14-15 having the highest mean. This was mainly explained by the results that girls had higher scores on A-DES in the age group 14-15 years (Figure 2).

Figure 2.



Paper IV - Evaluation TSCC

Background and procedure

The impact of sexual abuse on children was pointed out by Kendall-Tackett, Meyer Williams & Finkelhor as early as 1993 and the sequelale of sexual abuse has since then been the target for many studies. Today much is known about the potential results of unresolved traumatic response, and there is an extensive literature available that provides evidence that failure to resolve moderate to severe traumatic reactions may result in both short term and long term adverse consequences (Nader, 1997). There is at present also evidence that people who experience trauma are more inclined to have children who themselves experience trauma and /or repeated traumas (Nader, 1997; Ogawa et al., 1997). Even though, the known long-term effects of trauma are well established, not everyone who experiences trauma will develop the above mentioned symptoms (Perrin et al., 2000; National Center for PTSD, 2006).

The potential disastrous effects for the single child and the costs for family and society have made it a necessity to have good and sound assessment instruments for capturing the trauma symptoms. Research has shown the need for trauma-specific instruments in order to capture these symptoms and has also shown that standard assessment or more generic measurements of distress are not enough to capture the symptoms of experienced trauma. This is particularly true for children and adolescents who have been sexually abused (Fricker & Smith, 2001; Friedrich, 2001; McLeer et al., 1988; Wolfe et al., 1994; Nader, 1997).

Even if there is no single syndrome characterizing the effects of child sexual abuse, victims are at risk for a variety of problems including PTSD.

With this in mind, it is naturally desirable to have a broad screening instrument. TSCC serves well as an instrument for capturing a wide-range of possible symptoms after sexual and/or physical abuse. What had been important in evaluating the other instruments was of course essential also for TSCC that is to evaluate the psychometric properties of the scale and to get Swedish norms and values.

The procedure of this study was the same as in paper II and paper III except that the normative group comprised a greater number of pupils. The reliability, internal consistency and test-retest were examined, as was the validity of the scale.

The research procedures with the schools were the same as in paper II and paper III. The participants from the clinical group were consecutively collected from BUP-Elefanten, a Child and Adolescent outpatient clinic for treatment of sexually abused children in the city of Linköping, Sweden.

Materials

807 children and adolescents were available for the study. A total of 728 from this normative group answered the TSCC. The dropouts were largely due on illness of the day for the research (n=49) but there were also dropouts represented by children and adolescents who did not fill in the questionnaire correctly (n=30). Some of the latter group had omitted answers to so many questions that they had to be sorted out according to criteria in the TSCC manual. No school or class invited to participate refused to participate.

There were 367 boys and 361 girls in the study. Mean age and standard deviation were the same for boys and girls (M=13.3, SD=1.8). The material was divided in age groups 8-12 and 13-16.

In the clinical group there were 91 patients, 70 girls and 21 boys, with the mean age of 13.6 years and SD=2.4 (girls M= 13.9 SD =2.2 and boys M=12.3 SD=2.5).

Summary of Results

Reliability

The internal consistency was measured by Cronbach's alpha and found to be in the normative group for the total scale .94, for the clinical scales it ranged between .76 - .86. The internal consistency measured by Cronbach's alpha was in the clinical group ranging between .77 - .88. Test-retest reliability was found to be .81 for the total scale and ranged between .67 - .86 for the subscales.

Validity

The *construct* of the scale was looked at via factor analysis and was done with the combined material of normal group and the clinical group (n= 728 + 91). The principal component analysis displayed a nine-factor solution which explained 56.8% of the total variance (eigenvalues >1). However, a varimax rotated solution restricted to 6 factors which explained 50.7% of the variance. The factor analysis made in this study came close to Briere's factors (1996) and the different clinical scales.

Criterion related validity

There were significant differences between the normative group for all four groups, age and gender groups, and the clinical group on all the clinical scales and the subscales.

For the purpose of strengthening the validity, the scores of the adolescents in the normative group who had self-reported about experienced trauma (n=42) were they compared with the adolescents with no self-reported trauma (n=299). The adolescents who had reported experienced trauma (n=42) had significantly higher scores on the clinical scales of TSCC. The significant differences in means on the clinical scales were as follows; Anx *p=.02,* Dep *p= .04,* Ang *p= .04,* Pts *p= .001,* Dis *p= .05,* (Dis-o *p= .04,* Dis-f *p=ns.)* Sc *p=ns.* (Sc-*p=ns.)*

Means and values in the normative group

One main purpose of this study was to get Swedish norms and values for TSCC, and this was accomplished for the younger children 8-12 years old and for the older group of 13-16 year old boys and girls.

There were significant differences between boys and girls in the normative group on all subscales except anger. Girls scored significantly higher than boys on all the clinical scales except *sexual concerns* where boys scored significantly higher.

Discussion

Paper I, Paper II, Paper III

All these three studies were designed to investigate dissociation and to evaluate the instruments intended to measure dissociative symptoms. These are the first studies in Sweden looking at dissociation among Swedish adolescents. Dis-Q is the only instrument developed in Europe and that is why we started with that instrument in the pilot study. The pilot study gave interesting results as it showed significant differences between a normative group and a clinical group with a background of sexual abuse. The interest shown by child and adolescent psychiatric clinicians in Sweden paved the way for a larger study. The second study confirmed the results from the first study. The psychometrics of Dis-Q-Sweden were shown to have good reliability, for both internal consistency and test-retest and for different kinds of validity measures. A confirmatory factor analysis gave essentially the same solution as Vanderlinden (1993) had found but the fourth factor was weak. An additional reason to investigate A-DES was that A-DES until now been more widely used in the rest of the world. The psychometrics for A-DES were as good as for Dis-Q-Sweden except that the theoretically hypothesised underlying factors could not be found. Two other studies (Farrington et al., 2001; Muris et al., 2003) have shown the same result, and they did as we did when using A-DES, that is stayed with a one-factor solution. Bernstein et al., (2001) compared these two scales and concluded that both measured one dimension of dissociation. Recently Briere et al., (2005) developed a new instrument that is supposed to measure dissociation (MDI) and presented results that supported a five factors solution and they argue that dissociation is a multifaceted collection of distinct but overlapping dimensions as opposed to a unitary trait. They then state that a person can report clinically significant levels of one or two dissociative clusters and at the same time report relative absence of symptoms on other domains. Although the research is interesting, it was conducted on an adult general population. However, the correlation between Dis-Q-Sweden and A-DES was shown to be high (.86) so in some ways it appears that they tend to

measure the same construct. Nevertheless it would probably be premature to make a recommendation concerning which scale to use.

Even if the purposes of the studies have been to evaluate the psychometrics of Dis-Q-Sweden and A-DES all three studies have strengthened the connection between dissociative symptoms and known experienced sexual abuse. Another interesting finding is that girls age 14-15 gave significantly higher scores than boys in the same age. No other study has reported these differences.

The non- clinical adolescent populations gave much lower scores on both Dis-Q-Sweden and A-DES than what has been found in other countries. One reason for this could be that Sweden is a less violent society than other countries. Another reason maybe, that in our studies the three biggest cities have not participated.

Paper IV

Many researchers take the position (Balaban, 2006; Ohan et al., 2002) that there is a great need for more research on children and adolescents concerning etiology, symptomatology, and epidemiology after natural disasters and man made disasters. They (Balban, 2006; Ohan et al., 2002) point to the necessity of having psychometrically good and sound instruments for this purpose. By "psychometrically good and sound" they mean that the instrument must be examined and investigated for reliability; both internal consistency and test-retest and, that various kind of validity have been established, and that there is a normative base. Many of the existing instruments measuring responses to trauma in children and adolescents are relatively new and many of them lack a normative base.

The evaluation of TSCC in a normative group of Swedish adolescents is believed to demonstrate the need for research on children and adolescents and on trauma and its consequences. This is the first study in Sweden investigating TSCC and trauma symptoms in a Swedish normative child and adolescent population, and to our knowledge the only one in Europe with the intention to set norms for the scale. Bal et al., (2003, 2003) sent TSCC to a large number of e children and adolescents in a normal population, but with the intention of investigating other concepts and they have therefore not reported any normative data from the child and adolescent population in Belgium.

The factor analysis strengthened the construct validity of the scale as it came close to Briere's' factors. The reliability has in our study been shown to be psychometrically satisfactory. Internal consistency is rather much the same as Briere (1996) reports from his normative group

and what Bal et al., (2003) reports from their study of a normative group. The internal consistency in our clinical group is a little bit higher than Briere reports on the scales, Depression, and Posttraumatic stress. On the subscale Dissociation, our clinical group showed the same as Briere has reported. Crouch et al., (1999) and Sadowski & Friedrich, (2000) have also investigated the psychometric properties of TSCC in two clinical adolescent samples. From these different reports on internal consistency of TSCC and our study, we draw the conclusion that Cronbach's alphas do not differ very much and that the internal consistency is high to satisfactory in both the normative and clinical populations. As TSCC is said to be a scale sensitive and useful in treatment outcome studies it is surprising that we have not found any studies reporting test-retest reliability. In this study we have investigated test-retest reliability and found it rather satisfactory, even if the subscale Dissociation was as low as .67.

Main Conclusions

1. All the three screening instruments Dis-Q-Sweden, A-DES and TSCC have been shown to be psychometrically (reliability and validity) good and sound and can very well be used in Sweden and used with Swedish norms.

2. Adolescents with known experienced trauma sexual and/or physical abuse (clinical group) give significantly higher scores on all the three screening instruments than normative populations.

3. Adolescents with self-reported traumas give significantly higher scores than adolescents with no self reported traumas.

4. The correlation between Dis-Q-Sweden and A-DES is high (r = .86)

5. Swedish normative adolescents from ordinary cities seem to have fewer dissociative symptoms and less trauma symptoms than reported from the United States and some other countries.

6. Girls in the age group 14-15 years give significantly higher scores on Dis-Q-Sweden and A-DES than boys.

Clinical Implications

This research has given Swedish clinicians in Child and Adolescent Psychiatry three screening instruments, Dis-Q-Sweden, A-DES and TSCC to use in their clinical practice. With these

instruments in hand clinicians can screen for trauma symptoms and dissociative symptoms and be better able to give adequate therapeutic help.

Future Research

For future research it is of interest to examine the results of Dis-Q-Sweden, A-DES and TSCC in our larger cities such as Stockholm, Gothenburg and Malmö and to expand the validation of the scales.

Of interest is also to continue to investigate how common dissociative symptoms are among other clinical groups than children and adolescents who have been sexually and /or physically abused. It is also important to further investigate how common the trauma symptoms measured by TSCC are in ordinary Child and Adolescent Psychiatry. Another research field is to continue to link specific kinds of trauma and the frequency of traumas to specific sets of symptoms.

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