



# LUND UNIVERSITY

## LIFE EVENTS, STRESS AND COPING

Sunnqvist, Charlotta

2009

[Link to publication](#)

*Citation for published version (APA):*

Sunnqvist, C. (2009). *LIFE EVENTS, STRESS AND COPING*. [Doctoral Thesis (compilation), Psychiatry (Lund)]. Department of Clinical Sciences, Psychiatry.

*Total number of authors:*

1

### General rights

Unless other specific re-use rights are stated the following general rights apply:

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

Read more about Creative commons licenses: <https://creativecommons.org/licenses/>

### Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

LUND UNIVERSITY

PO Box 117  
221 00 Lund  
+46 46-222 00 00

From the Department of Clinical Sciences, Division of Psychiatry,  
Medical Faculty,  
Lund University, Sweden 2009

# **LIFE EVENTS, STRESS AND COPING**

**Suicidal patients in a time - perspective**

**Charlotta Sunnqvist**

**AKADEMISK AVHANDLING**



**LUND**  
UNIVERSITY

**Fakultetsopponent: Docent Margda Waern**  
Institutionen för Neurovetenskap och Fysiologi,  
Sahlgrenska Akademin, Göteborgs Universitet

## Abstract

In order to increase the understanding of suicidal behaviour, the general aim of the thesis is to gain a profound knowledge of the suicidal individual, and hence to find and ensure a preventive strategy. This will be accomplished by finding and trying new methods for evaluation of suicide risk.

The Suicide Assessments Scale, SUAS, and a new self-rating version, SUAS-S were tested. These scales are sensitive to change of suicidality over time, and both of them seem to be valid and reliable suicide rating scales, which might aid the clinician in the assessment of suicide risk.

A time-geographic life charting was invented and tested. This model promotes systematic descriptions of the patient's life events (social and burdensome) over time, and geographical sites are used as anchors for autobiographical memories. A so called lifeline follows each individual and provides information on the person's social capacity, as well as information on predisposing, stressful or precipitating life events.

Vulnerability for adverse life events by measuring biological stress markers among suicide attempters was tested. High catecholaminergic markers in CSF (MHPG) and urine (NA/A) were found in suicide attempters, who had been sexually abused in childhood, and we found low urine-cortisol in suicide attempters who felt neglected by parents during childhood and adolescence.

A variety of factors have been identified as being risk factors for suicidal behaviour, and one of them is the handling of stressful events (coping). The coping-strategies used by suicide attempters and comparison groups were investigated. Suicide attempters at long term follow up and healthy controls used more adaptive problem solving strategies than patients, who had recently made a suicide attempt, or psychiatric controls, who both used more maladaptive coping strategies.

A person's suicidal intent is often difficult to understand, so therefore an investigation of a time geographic life charting, in combination with a survey of coping capacities during life, and degree of suicidality (SUAS-S) by the time of a suicide attempt, was made. The combination of these methods offered a firm and comprehensive picture of the patient's life situation, which in our opinion, facilitates an assessment of suicidal intent.

By using multidisciplinary methods, ranging from biological investigations to psychosocial as well as environmental approaches, we suggest three typical pathways to a suicide attempt, the first where the involved persons mainly use adaptive coping and rate low scores on the SUAS-S, the second where both maladaptive and adaptive coping are used, and where the SUAS-S scores are on a moderate level, and third where maladaptive coping is the common way of handling stressful events, and where SUAS-S scores are high.

*To Lars,  
Fredrika and John*



# TABLE OF CONTENTS

<b>ORIGINAL PAPERS</b>	7
<b>INTRODUCTION</b>	9
<b>BACKGROUND</b>	11
<b>Models of suicidal behaviour</b>	11
The suicidal process	11
The stress-diathesis model	12
Personality characteristics and a psychological explanation	13
Genes and environment	14
<b>Risk factors of suicidal behaviour</b>	15
<b>Assessment of suicidality</b>	16
Rating scales	17
The Suicide Assessment Scale (SUAS)	17
Life charting	18
Life events	19
Coping	19
Biological aspects	20
<b>Auxiliary assessments</b>	21
Time geography	21
Autobiographical memories	22
<b>Protective factors</b>	23
<b>AIMS</b>	25
<b>MATERIAL AND METHODS</b>	26
<b>Definition of a suicide attempt</b>	26
<b>Participants</b>	26
The original study	26
The follow - up study	26
Healthy controls	27
Emergency suicide attempters	28
<b>Psychiatric diagnoses of participants</b>	30
<b>Methods</b>	32
Ratings (paper I, III, IV and V)	32
Semi structured interview (paper II and III)	34
Time-geographic life chart (paper II and V)	34
Biochemical markers (paper III)	37

The qualitative research method	38
Statistical methods	39
<b>Ethical approval</b>	40
<b>REVIEW OF RESULTS AND COMMENTS</b>	41
<b>Paper I</b> Evaluation of a modified interview version and of a self-rating version of the Suicide Assessment Scale	41
<b>Paper II</b> Time-geography: a model for psychiatric life charting?	44
<b>Paper III</b> Suicide attempters: biological stressmarkers and adverse life events	46
<b>Paper IV</b> Coping strategies used by suicide attempters and comparison groups	49
<b>Paper V</b> A time-geographic life chart in combination with SUAS-S and COPE; a strategy to improve the understanding of the suicidal process.	53
<b>DISCUSSION</b>	57
<b>Main findings</b>	57
Psychosocial stress and the kindling phenomenon	60
The global assessment of suicide risk	61
Time geography life charting and autobiographical memories	62
A therapeutic intervention	63
<b>Conclusions</b>	65
<b>Implications for future research</b>	65
<b>Populärvetenskaplig sammanfattning</b>	66
<b>References</b>	72
<b>Acknowledgements</b>	87
<b>Appendix 1</b>	89

# ORIGINAL PAPERS

The thesis is based on the following papers, which will be referred to in the text by their Roman numerals:

**I.** Niméus A, Hjalmarsson Ståhlfors F, Sunnvist C, Stanley B, and Träskman-Bendz L. **Evaluation of a modified interview version and of a self-rating version of the Suicide Assessment Scale.**

European Psychiatry 2006; 21: 7: 471-7.

**II.** Sunnvist C, Persson U, Lenntorp B, Träskman-Bendz L.

**Time-geography: a model for psychiatric life charting?**

Journal of Psychiatric and Mental Health Nursing 2007; 14: 3: 250-7

**III.** Sunnvist C, Westrin Å, Träskman-Bendz L.

**Suicide attempters: Biological stressmarkers and adverse life events.**

Journal of European Archives of Psychiatry + Clinical Neurosciences 2008; 258: 456-462

**IV.** Sunnvist C, Träskman-Bendz L, Westrin Å.

**Coping strategies used by suicide attempters and comparison groups.**

Manuscript 2009 for Archives of Suicide Research

**V.** Sunnvist C, Persson U, Westrin Å, Träskman-Bendz L, and Lenntorp

**B. A time-geographic life chart in combination with SUAS-S and COPE; a strategy to improve the understanding of the suicidal process.**

Manuscript 2009 submitted to Acta Psychiatrica Scandinavica

The papers are reprinted with permission of the publishers.





# INTRODUCTION

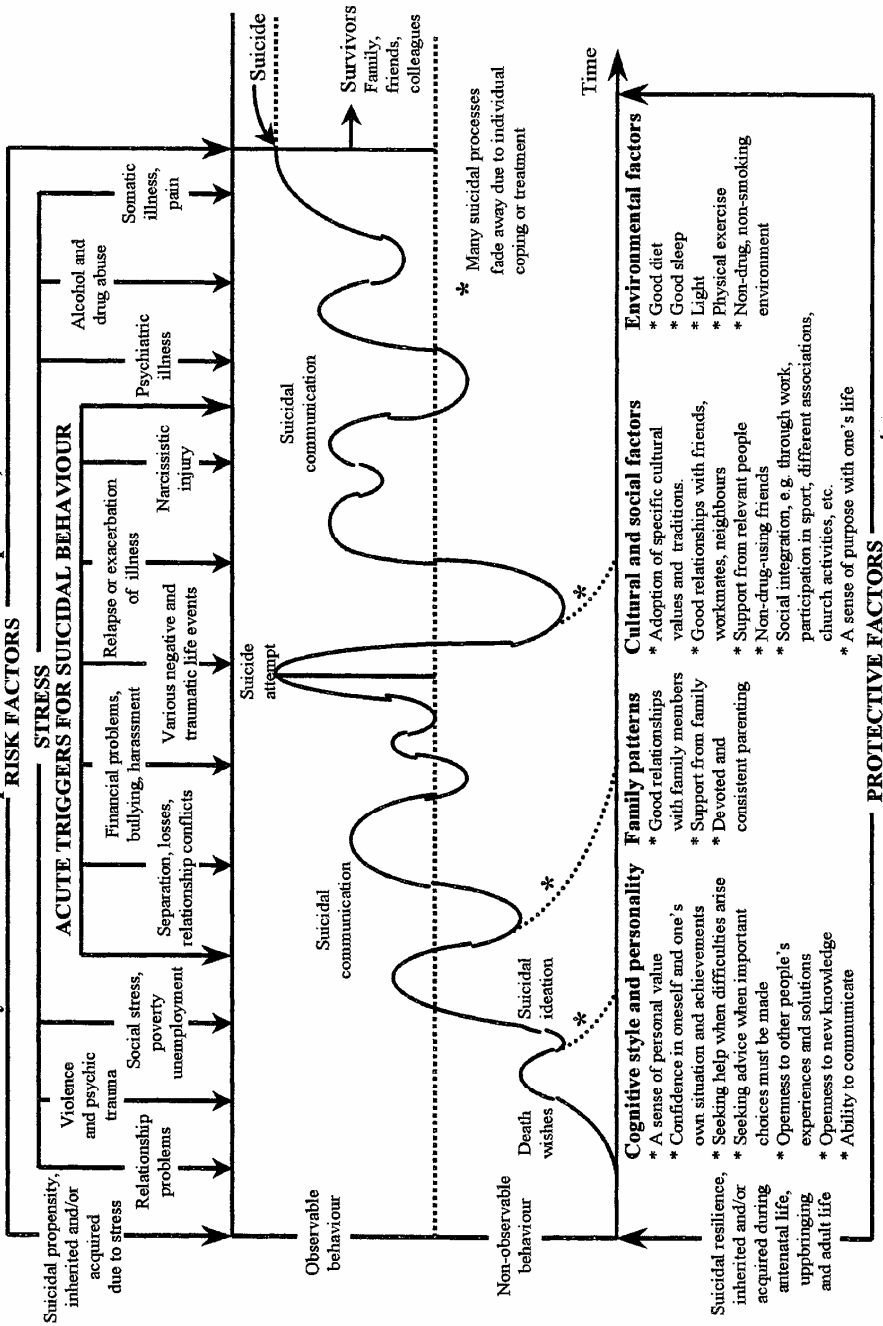
According to The World Health Organization (WHO), someone commits suicide every 40 seconds, and thus making suicide one of the leading causes of death in the world. Every year about one million people of the world commit suicide, and about 160 000 of them have lived in Europe (WHO, 2000).

In Sweden, approximately 1200 people, 800 men and 400 women, committed suicide during 2006 (Centre for Epidemiology, 2008). In the ages of 15-44 years, suicide is the main cause of death for males and the second cause among women (Centre for Epidemiology, 2008).

The occurrence of attempted suicides is commonly considered to be at least ten times the suicide rate. Suicide completers have often suffered from depression and anxiety for several years, and may also have had a history of previous suicide attempt (s). Approximately 60 % of persons who have made a suicide attempt have been treated in mental health services (Centre for Epidemiology, 2002). Between 25 and 65% of these have previously made one or more suicide attempt(s), and approximately 15% repeated a suicide attempt within one year, most of them within six months (Beskow, 1979; Öjehagen et al, 1991; Öjehagen et al, 1992; Runeson et al, 1996; Isometsä & Lönnqvist, 1998). According to follow-up studies in Sweden (Nordstrom et al, 1995; Johnsson Fridell et al, 1996), approximately 10-15 % of those who made serious suicide attempts later committed suicide. This means that 80-90% of suicide attempters find other ways to deal with their lives. Therefore, it is of great importance to get to know the course of the illness and the occurrence of distressing life events, so that preventive interventions can be made in an early phase of the suicidal process.

Suicidal behaviour is a consequence of a complex interaction between environmental, biological and psychosocial matters. Therefore the treatment of suicidal behaviour should be multidisciplinary, using biological and psychosocial as well as environmental approaches. In the present thesis I have described new methods to evaluate suicidal behaviour so that new preventive strategies can be introduced.

# **Stress-vulnerability model and development of the suicidal process, from suicidal ideation to suicide**



**Figure 1:** The stress – vulnerability model and development of the suicidal process, from suicidal ideation to suicide (Ramberg, 2003; p 14).

# Background

## Models of suicidal behaviour

There are different models of describing suicidal behaviour (e.g. biological and psychological), and the suicidal process describes the development from the first serious suicidal thought to attempted or completed suicide.

### The suicidal process

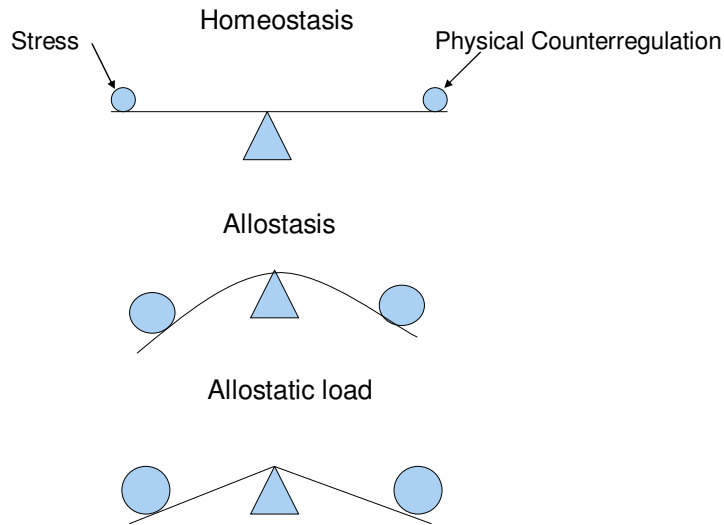
The suicidal process (figure 1) describes an individual's interaction with his/her surroundings in relation to vulnerability and sensitivity for e.g. stressful situations. The process starts with feelings of despair, followed by suicidal thoughts and plans, suicidal communication to others, and finally, a suicide attempt and/or completed suicide occurs (Beskow, 1979; Hawton & Van Heeringen, 2002; Van Heeringen, 2001; Ramberg, 2003). According to a cohort study in Great Britain, fewer than 1 in 200 people who experience suicidal thoughts move on to death from suicide (Gunnell et al, 2004). Different prospective studies have shown that 1-3% of suicide attempters will die by suicide within one year (Sakinofsky, 1997; Rygnestad, 1982), up to 9% within five years (Bille-Brahe and Jessen, 1994; Hepple and Quinton, 1997), and about 11% after five years or more, according to longitudinal studies (Nordentoft, 1993; Nordström, 1995; Rygnestad, 1997). The suicidal process changes over time with fluctuating severity. Several investigations have shown that people communicated their suicidal intent before they committed suicide (Handwerk et al, 1998). The suicidal communication can be divided into direct and indirect verbal or nonverbal communication. Suicidal intentions might be difficult for significant others to understand (Wasserman et al, 2008). Ringel (1976) described "the pre-suicidal syndrome" as a specific psychic state of mind that leads to a suicidal act. The syndrome has three principal components: constriction (the world around becomes more and more one-sided), inhibited aggression turned toward the self, and fantasies about committing suicide. The suicidal process assumes the existence of an underlying and persistent vulnerability that is constituted of biological,

psychological and personality characteristics, which may become apparent under the influence of specific stressors, such as stressful life events (Van Heeringen, 2001).

#### The stress-diathesis model

Mann (1998) suggested a stress-diathesis model for suicidal behaviour, which describes an interaction between acute phenomena, i.e. “stress” and a constant vulnerability, i.e. “diathesis”, reflecting genetic factors, childhood adversities and/or dietary factors. This model involves the biological stress system, the hypothalamic-pituitary-adrenal (HPA) axis, and the sympathetic – adrenal medullary system (SAM). By use of a specific feedback mechanism, these systems act to retain the neuroendocrine balance. In a stressful situation the brain’s relay stations (the limbic system, the hippocampus and the amygdale) are activated. Corticotrophin releasing hormone (CRH) is secreted from the hypothalamus and stimulates the pituitary to increase adrenocorticotrophic hormone (ACTH). The blood system transports these hormones to the adrenal cortex, where cortisol is secreted. CRH also stimulates SAM activity, which is observed in the blood as secretion of catecholamines, i.e. noradrenaline, dopamine and adrenaline (Herman et al, 1996).

The homeostasis versus allostasis stress model (figure 2), presented by McEwen (1995a and 1995b), seems to play an important role in order to understand mechanisms behind stress and emotional disorders, and possibly also suicidal behaviour.



**Figure 2:** Homeostasis, allostasis, and allostatic load

The reaction of stress can depend on different factors such as the stressor itself, personality, and the mental and/or physical condition (Selye, 1950).

#### Personality characteristics and a psychological explanation

Different personality characteristics seem to be significant for suicidal persons. One of them is a lack of impulse control that seems to play an important role, especially in self destructive behaviour of adolescents (Hawton, 1982; Soloff et al, 1994; Dervic et al, 2008; Langhinrichsen-Rohling and Lamis, 2008). Several studies have focused on impulsive behaviour (Apter et al, 1993; Evans et al, 1996; Wyder and De Leo, 2007), and they have confirmed that there could be an increased suicide risk when an impulsive person feels defeated. Some studies have seen that patients with a family history of suicidal behaviour present with more impulsive and aggressive behaviour than others (Diaconu and Turecki, 2009; Roy, 2006; Mann et al, 2005).

Neuringer (1976) found that suicidal persons have more problems with dichotomous thinking (all or nothing; black or white) than non suicidal persons, regardless of psychiatric state. He has also found that suicidal persons were more cognitively rigid in their thinking, and less able to solve problems than non suicidal persons. Wilson et al (1995) tried to replicate this finding among suicide attempters and found that rigid thinking was not apparent, but rather difficulties to use adaptive coping. Several studies have focused on problem solving difficulties among suicidal persons (Schotte & Clum, 1982; Linehan et al, 1987; Orbach et al, 1990). According to Williams (1996), successful problem solving depends on the quality and type of memories that individuals are able to retrieve. Suicidal patients often have bad problem solving abilities, because they have a weak access to specific memories. Therefore, it is important for suicidal patients to activate their autobiographical memories, so that they can recall and use specific coping strategies against stress (Pollock & Williams, 2004, 1998; Evans et al, 1992). Another important variable related to personality is the proneness of feeling hopeless, (Levenson and Neuringer, 1971; McLeavey, 1987; Wilson et al, 1995; Pompili et al, 2008).

Different psychological variables such as impulsivity, dichotomous thinking, cognitive rigidity, weak problem-solving ability, autobiographical memory problems and hopelessness play an important role in the Williams (1997) “entrapment” model. According to Williams, suicidal behaviour is a “cry of pain”, which means that a suicide, or a suicide attempt, is an escape from a trap along with feelings of being defeated or enclosed (Williams and Pollock, 2001).

### Genes and environment

The interplay of genes and environment and suicidal behaviour has become an increasing research field of interest. In the search of genes for suicidal behaviour, genes involving neurotransmitter systems e.g. serotonergic or noradrenergic systems, as well as the HPA axis are of interest. The interaction between childhood stress and temperament is

often discussed. In a prospective - longitudinal study, Caspi et al (2003) found evidence that individuals who experienced stressful events during childhood, exhibited more depressive symptoms, diagnosable depression and/or suicidality by the age of 26, if they had one or two copies of the short allele of the serotonin transporter (5-HTT). For many years, Kendler and his colleagues have tried to examine the interaction between the 5-HTT genotype, stress and depression (Kendler et al, 2005). They tried to replicate the Caspi et al (2003) findings in a random sample of twins, and they found that individuals with the short 5HTT allele exhibited more depressive symptoms, diagnosable depression, and suicidality in relation to stressful life events than did individuals who were homozygous for the long allele (Kendler et al, 2005).

## **Risk factors of suicidal behaviour**

In the field of suicide research, a number of well established risk factors for suicidal behaviours have been identified through retrospective or prospective investigations (Michel, 2000). One of the major risk factors for suicide is a prior suicide attempt (Maris, 1992; Foster et al, 1997; Niméus, 2000) and repetition of suicide attempt(s), where a violent method is even a stronger predictor (Hawton et al, 2000; Skogman et al, 2004; Holmstrand et al, 2006).

Psychiatric disorders: Approximately 90% of those who commit suicide have suffered from a psychiatric disorder, such as unipolar or bipolar disorder, anxiety disorder, substance abuse and/or schizophrenia (Berglund and Öjehagen, 1998; Brådvik and Berglund, 2000; Waern, 2002). Comorbidity of psychiatric disorders increases the risk of both suicide attempt and suicide (Hawton et al, 2003; Pagura et al, 2008). It has been demonstrated in many studies that heredity for suicide is regarded as a risk factor (Mann et al, 2005; Roy, 2004; Brent et al, 2008; Brodsky and Stanley, 2008). A critical point for a suicidal person, seen in several studies, is the time immediately after discharge from psychiatric hospitalization (Jacobs, 1999; Mortensen, 2000; Sullivan et al, 2005).

Somatic disorders: Apart from a psychiatric disorder, a physical illness and above all, different kinds of cancer, neurological disorders, and



chronic pain are risk factors for suicide or/and suicide attempt (Björkenstam et al, 2005; Stenager and Stenager, 2008).

Life events: Childhood trauma (Ystgaard et al, 2004) and several other adverse life experiences, such as separation and object losses, changes in living conditions, financial difficulties, and problems at work (Cavanagh et al, 1999; Hagnell, 1980) have been found to be associated with an increasing number of suicide attempts and suicide. Significant for these situations are concomitant psychological risk factors such as maladaptive coping strategies, impulsive behaviour, and feelings of hopelessness and/or loneliness (Schotte and Clum, 1987; Rudd et al 1994; Apter, 1993).

Socio-demographic factors: Male gender, old age, and to be single or unemployed are also discussed as risk factors for suicide (Hawton and van Heeringen, 2002; Qin et al 2003). Skogman et al (2004) noted significant sex differences, which are important to take into account in the assessment of suicide risk. They showed that men who made a suicide attempt, and who later committed suicide, more often than women made a violent suicide attempt and/or reported previous suicide attempt(s).

Neurobiological factors: Researches have focused on the relationship between serotonin function, impulsiveness, aggression and suicidal behaviour (e.g. Brodsky et al, 2006; Lindström et al, 2004; Träskman et al, 1981), and have found that this relationship appears to have a genetic basis (e.g. Roy and Linnoila, 1988; Bah et al, 2008).

## **Assessment of suicidality**

After a suicide attempt, a semi-structured assessment is recommended by Hawton and van Heeringen (2002). Apart from the interview, different tools such as rating scales, life charts and/or sampling for biological analyses can be used. Factors that should be covered during the interview of suicide attempters are: life events that preceded the attempt, social, domestic and occupational circumstances, family and personal history, psychiatric disorder (including alcohol/drug dependence) and a psychiatric history, including previous suicide attempt(s), coping resources, suicidal intent and motives, as well as risk factors for further suicidal behaviour (suicide attempt, suicide). It is also important to contact significant others,

because they can provide valuable additional information to the global assessment of the patient, and perhaps they need guidance and support themselves (Magne-Ingvar and Öjehagen, 1999b).

### Rating scales

Several rating scales can be relevant in the assessment of suicidality, for example the Scale for Suicidal Intent (SIS) (Beck et al, 1974b; Niméus et al, 2002), the Hopelessness scale (HS) (Beck et al, 1974a; Niméus et al, 1997), and the assessment of suicide risk from the SAD PERSONS (Patterson et al, 1983). The Comprehensive Psychopathological Rating Scale (CPRS), from which the Montgomery – Åsberg Depression Rating Scale (MADRS) was extracted (Montgomery & Asberg, 1979) is helpful for evaluating the severity of depression. Stanley et al (1986) developed a new scale, which was designed to be sensitive for changes of suicidality over time.

### The Suicide Assessment Scale (SUAS)

The Suicide Assessment Scale, the SAS – later called SUAS, is an interview based rating scale, constructed by Stanley et al (1986). It has the following considerations: 1. To measure both observable and reported symptomatology, associated with suicidality. 2. Not to be linked to a specific diagnosis. 3. To be sensitive to change of suicidality over time.

In the first study of SUAS, the authors found an interrater reliability of the items, varying between 0.78 - 0.88. The validity of the scale was satisfactory, as suicide attempters were scored significantly higher than non suicide attempters. The original SUAS version correlated significantly with the Scale for Suicidal Ideation (Beck et al, 1988) and the suicide item in the Hamilton Depression Rating Scale. Niméus et al (2000) carried out a prospective study of the scale, and found high SUAS scores to predict suicide within one year after a suicide attempt. Recently, a self rating version was constructed, the SUAS-S, which is described in this thesis (papers I and V). Both kinds of SUAS are numeric scales consisting of 20

items. Each item is graded 0 - 4 points in a Likert scale fashion, and with a maximum score of 80.

The SUAS-items were originally grouped into five areas; affect, bodily states, control and coping, emotional reactivity, and suicidal thoughts and behaviour (Stanley et al, 1986). Niméus (2000) made a factor analysis of the actual SUAS-ratings of suicide attempters, which yielded four factors, which to some extent differed from the original subgroupings. Factor 1 had the highest loading, and it concerned nihilistic thoughts and the suicidal items. Factor 2 mainly included mood, energy and coping abilities, and factor 3 was related to fearfulness, physical tension and lack of control. Factor 4 reflected suspiciousness, hostility and impulsivity. The item “somatic concern” was not included because of low loadings.

Both SUAS and SUAS-S seem to be good complements and aids in the assessment of suicide risk. Our research group is currently validating the SUAS-S in an extended psychiatric population.

### Life Charting

Life charting is a schematic method to describe a person's life and illness course, and was pioneered by Kraepelin (1921) and Meyer (1948). In psychiatry, it has been used for many years for different purposes. The Post (Roy-Byrne et al, 1985) procedure was introduced for charting of patients with bipolar disorder (Livianos-Aldana & Rojo-Moreno, 2006; Ehnvall & Ågren, 2002), because it visualizes the repetition of cycles and their durations. Fortune et al (2007) used life charts to identify the suicidal process among 27 young people, who died by suicide. They found three types of suicidal processes, and one of them reflected longstanding behavioural problems. The second process was seen among youngsters with psychiatric disorders. The third process occurred among those who previously had been functioning well, but who reacted with suicide to an adverse event.

Life charting seems to be an increasing trend in psychiatric care, and the essential idea is that patients' life histories are of primary interest for

diagnosis, care and treatment. In this thesis we used the Hägerstrand (1985) time geography model (paper II and V), and this life chart is drawn together with the patient, which means that it also is a helpful tool in the progress of communication. The time geography life chart illustrates a comprehensive picture of the patient's life situation e.g. social capacity, predisposing life events, stressful and precipitating life events, and also the development of psychiatric illness.

### Life events

Several studies have discussed the influence of predisposed and precipitating life events on the occurrence of suicidal behaviour. Childhood trauma, including sexual, emotional and physical abuse, as well as emotional and physical neglect, have all been found to be associated with an increasing number of suicide attempts (Roy, 2004). Sexual and physical abuses during childhood have in particular been shown to be strongly and independently associated with repeated suicidal behaviour (Ystgaard et al, 2004). These predisposing and negative life events might cause vulnerabilities for different adverse life situations. Precipitating life experiences such as the loss of a parent or a spouse, family/interpersonal problems, physical ill-health, changes in living conditions, blows to the self-esteem, object losses, problems at work, sickness and moving of house, have been found to be associated with an increasing number of suicide attempts in a person's life (Hagnell & Rorsman, 1980; Cavanagh et al, 1999; Roy, 2004). However, it is not the stressful event *per se* that leads to a serious outcome, but rather the way in which the person copes with it (*vide infra*).

### Coping

Several studies have demonstrated the importance of different coping styles in managing various kinds of stressors (Evans et al, 1992, Edwards et al, 2001, Dieserud et al, 2001). According to Pollock and Williams (1998), the problem-solving difficulties are not important *per se*, but rather the fact that they indicate to the person that there is no escape from the

situation. They suggested that suicidal individuals' lack of problem solving depends on their distorted autobiographical memories. It was found that suicide attempters often produced general and unspecific memories with difficulties to recall coping strategies that had worked before (Pollock & Williams, 2004, Pollock & Williams, 1998; Evans et al, 1992). According to Arie et al (2008), the Williams model can be summarized as follows: negative life events in childhood lead to a deviant autobiographical memory which results in generalizations. The lack of specificity may be related to painful affects, while the lack of specific memories destroys their creative efforts. Therefore, interpersonal problem solving is faulty and leads to hopelessness and suicidal behaviour. Arie et al (2008) tested the Williams theory in adolescents and young adults with suicidal behaviour. Their findings supported the Williams theory, as they found an association between a generalized autobiographical memory, poor interpersonal problem solving and suicidal behaviour. Dieserud et al (2001) presented results showing two paths to a suicide attempt. Both paths included vulnerability factors such as low self esteem, low self efficacy, loneliness and separation/divorce. One path was suggested to comprise factors related to depression and hopelessness, while the other included a negative appraisal of one's own problem solving capacity. In order to understand these pathways to suicidal behaviour, it is necessary to know the person's coping capacity. Suicidal behaviour has been associated with maladaptive coping strategies (Schotte & Clum, 1987; Linehan et al, 1987; Orbach et al, 1990). In this thesis we used the Carver et al (1989) inventory, called COPE, to assess three different ways of responding to stress: problem focused coping, emotional focused coping and avoidance focused coping (papers IV and V). Carver (1997) has also made an abbreviated version of COPE, called brief COPE.

### Biological aspects

From a biological point of view, the patient could be assessed concerning regulation of stress-hormones and peptides e.g. by use of the dexamethason-suppression test (DST) (Westrin et al, 1999). Lumbar cerebrospinal fluid (CSF) could offer information on e.g. monoamine-

metabolites, some of which have been regarded as markers for violent suicidal behaviour (Träskman et al, 1981).

## **Auxiliary assessments**

The purpose of psychiatric care is to promote mental and physical health, and to increase life quality. Suicide prevention necessitates a global and multifactorial knowledge of a person's life and illness course. The implication is to help the patient to see and understand her/his needs and problems, and to encourage a positive change by taking care of the individual's own capacity (McLaughlin, 1999). The primary aim in suicidality research is to increase the understanding and assessment of suicidal behaviour, and for this we need to develop and try new clinical methods.

In collaboration with researchers within the field of Time Geography, researchers at The Lund Suicide Research Centre have constructed a time geographic life charting method. The essential idea is that patients' life histories are of primary interest for diagnosis, care and treatment. The time geographic life chart indicates psychosocial matters and both positive and stressful life events, so from a life long perspective, it contributes to seeing and understanding the patient's current life situation.

### **Time geography**

A short description according to Hägerstrand is as follows: Time geography attempts to consolidate the spatial and temporal perspectives of different disciplines on a solid basis. Time geography is not a subject area *per se*, or a theory in its narrow sense, but rather an attempt to construct a broad structure of thoughts, which may form a framework that is capable of fulfilling two tasks. The first is to receive and bring into contact knowledge from highly distinct scientific areas and from everyday praxis. The second is to reveal relations, the nature of which escape researchers as soon as the object of research is separated from its given milieu in order to study it in isolation, experimentally or in some other way distilled.

The time geography approach thus sets time and space in focus and applies a conceptual apparatus elucidating people's lives (Kjellman, 2003). It can briefly be characterized as an approach especially pertaining to social studies aimed at analysing the interaction of processes in time and space, and to connect knowledge from different fields (Lenntorp, 1992). We suggested a time geographic model for life charting of psychiatric patients (ad modum Hägerstrand, 1985), because this model promotes systematic descriptions of the patient's life events (social and burdensome) over time, so called lifelines. A lifeline follows each individual, and sets continuous events in time and space in focus. Moving is a significant event in a person's life. Depending on the reason and distance, it can cause essential adjustment challenges, and therefore it provides a good start for a lifeline (Lenntorp, 1992). In order to recall such events, autobiographical memories must be activated. An autobiographical memory contains information concerning; self-description, specific events and general events (Conway & Bekerian, 1987). The time geographic life charting method is also supposed to activate memories using the geographic sites for household moves as anchors. The time geographic life charting method has been investigated in this thesis (paper II and V).

#### Autobiographical memory

An autobiographical memory contains personal information concerning general or specific events in a person's life history. Memories are stored episodically, which means that they originate from different events, for example at different times, places, and emotions associated with events, and other conception-based knowledge (Conway & Bekerian, 1987). One striking characteristic of autobiographical memories is that memories always contain knowledge at different levels of specificity, and Conway and Pleydell-Pearce (2000) have described an autobiographical memory knowledge-base, including three broad levels of specificity: lifetime periods, general events and event-specific knowledge.

Lifetime periods: *"My family and I lived in Lund during my junior level at school"* is an example of a life time period with identifiable beginnings

and endings. It can also represent a general knowledge of significant others, common location, activities and characteristics of a period. The content of a lifetime period can also represent a thematic knowledge, for example a relationship theme and a work theme.

General events: are more specific and heterogeneous than lifetime periods, for example “*my first day at school*” or “*my mom and dad walked with me*”, and the events can be both positive and negative, such as a holiday and/or a period of illness.

Event-specific knowledge: “*It was sunny*” and “*I felt so scared and abandoned*” are examples of event specific knowledge, also called flashbulb memories. Extreme flashbulb memories are those after a trauma. According to Williams (1996), suicidal individuals’ inability to solve problems are due to their weak access to positive event specific knowledge.

These three levels of autobiographical memories are linked, and to recall memory, these levels of events need to be disentangled.

## **Protective factors**

Suicide is a rare phenomenon even in risk groups, such as suicide attempters. Yet, suicide is an increasing problem, especially in young people, and it involves a lot of people in the environment. Therefore, suicidal behaviour is an extremely important health and social issue. All psychiatric disorders, particularly mood disorders, schizophrenia, and alcohol and drug dependence are associated with increased rates of suicide (Bertolote et al, 2003). Based on the principal assumption that successful psychotropic treatment of an underlying psychiatric disorder will decrease the risk of suicide, it is reasonable to believe that pharmacotherapy is a preventive strategy (Mann et al, 2005). Little evidence is found concerning psychotherapeutic approaches to suicidal behaviour. Two types of psychotherapy, problem-solving and cognitive –behavioural ones, have in randomized controlled studies been significant in reducing suicidal behaviour (Salkovskis et al, 1990; Linehan et al, 1991; Linehan et al, 1994). Apart from pharmacological and psychotherapeutic interventions, there are some other and useful protective strategies. One important factor



is to reduce availability of a dangerous method, for example poisonous chemical substances and weapons, and to restore the home environment after a suicide attempt. Another important protective factor is social support (Chioqueta and Stiles, 2007; Houle et al, 2008), and to encourage people to seek help. A structured management is essential when taking care of patients after a suicide-attempt, and information such as; signals to be aware of, what to do when suicidal thoughts appear and are overwhelming, ways to cope with suicidal thoughts, and whom to call for help, are important preventive strategies for suicidal individuals (Malone et al, 2000; Träskman-Bendz and Sunnqvist, in press 2009). It is also important to be aware of suicide risk periods in a suicidal person's life. For most people who become suicidal, the period of real risk is relatively brief: from few minutes to a few days, rarely longer (Hawton, 2005). In order to protect suicidal individuals from suicide, a profound assessment of the individual is needed, so that preventive methods could be adequately used.

# AIMS

## General aim

In order to increase the understanding of suicidal behaviour, the general aim of the thesis is to gain an increased knowledge of the suicidal individual by use of new methods, and hence to strengthen preventive strategies.

## The specific aims are

### Among methods

**I.** to explore if SUAS-S is reliable and comparable to the interview version of SUAS

**II.** to evaluate the possible use of time geographic life charts of suicidal patients in clinical psychiatric practice

### Among results

**III.** to look for a vulnerability for adverse life events by measuring biological stress markers among suicide attempters

**IV.** to investigate the coping-strategies used by suicide attempters in the emergency situation and at follow-up, in relation to strategies reported by comparison groups.

**V.** to explore if time geographic life charting, combined with SUAS-S ratings and a survey of coping capacities, potentially illustrates the pathway to suicidal behaviour.

# MATERIAL AND METHODS

## Definition of a suicide attempt

The definition of a suicide attempt in this thesis was formulated by Beck et al (1972): “a situation in which a person has performed an actually or seemingly life - threatening behaviour with the intent of jeopardizing his life, or to give the appearance of such an intent, but which has not resulted in death”.

## Participants

### The original study

Shortly after a suicide attempt, the patients were recruited from the emergency room, the medical intensive care unit, or from a general psychiatric ward at the University hospital of Lund, Sweden. Within a few days, about 50% were referred to a ward, specialised in suicidal behaviour and affective disorders (ward 31). At ward 31, the patients were asked to participate in a research program which contained clinical, biochemical, social and psychological investigations, as well as expert and self -ratings. In the original study, 102 inpatients participated (1986-1992) in the entire program, 50 men and 52 women, and they were all included in a 12-year follow up study.

### The follow - up study

About 12 years later, these 102 suicide attempters were followed up. Before follow up, a recruitment letter was sent out, asking for participation. Later, a research nurse made a phone call, asked for consent, and offered an appointment for a research investigation.

The follow up study started in 1999 and lasted until 2002, and 43 individuals participated, but one person, never turned up.

*Deceased:* During the time from start of the study until the follow up, five patients died a natural death, one was classified as an uncertain suicide, and eleven patients committed suicide. Among the latter, five were men

with a mean age of  $41.2 \pm 18.5$  years, and six were women with a mean age of  $41.8 \pm 17.7$  by the time of the suicide attempt.

*Drop-outs:* Forty-two persons refrained from participating in the follow up. The reasons for not participating were the following: six did not respond, 14 did not give any reasons and had just left a message on the telephone answering machine, or by letter, 8 felt well and did not want to talk about the past, four had problems with a somatic illness, and two did not feel well and were afraid to become worse. Four persons had moved, three abroad and one to the north of Sweden, and one was on a long journey abroad. One person felt insulted by psychiatric care, and therefore did not want to participate, and one did not have permission from a significant other. One person gave “not enough time” as a reason. The drop-out patients ( $n = 42$ ) had the following group characteristics at ward 31: men ( $n = 22$ ), mean age  $35.0 \pm 10.8$  years, women ( $n = 20$ ), mean age  $34.6 \pm 11.4$  years. The main diagnoses at the ward 31, according to the Diagnostic and Statistical manual of Mental disorders 3<sup>rd</sup> edition (DSM III-R) were: major depression (MDD;  $n=10$ ), dysthymia ( $n=7$ ), depression NOS ( $n=8$ ), adjustment disorder ( $n=9$ ), anxiety disorder ( $n=3$ ), psychotic syndrome ( $n=4$ ), and other ( $n=1$ )

*Psychiatric controls:* The control patients were recruited during 2002-2004 from patients who received psychiatric inpatient care during the same time period as the original group of suicide attempters, but had no history of suicide attempt prior to that time. The controls were matched with a suicide attempter according to the International Classification of Diseases (ICD 9, 1978), translated into DSM-III-R (1987) at the time of hospitalisation, as well as matched according to gender and age ( $\pm 5$  years, with one exception of  $\pm 8$  years). The charts of 270 cases were reviewed, 71 were contacted and 23 participated. One of these 23 was excluded because of a suicide attempt was detected before hospitalisation.

### Healthy controls

From the National Registration during 2002-2003, 198 persons were randomly selected and invited to participate in the study, and 40 persons showed interest, but nine of them were excluded because of disease, and

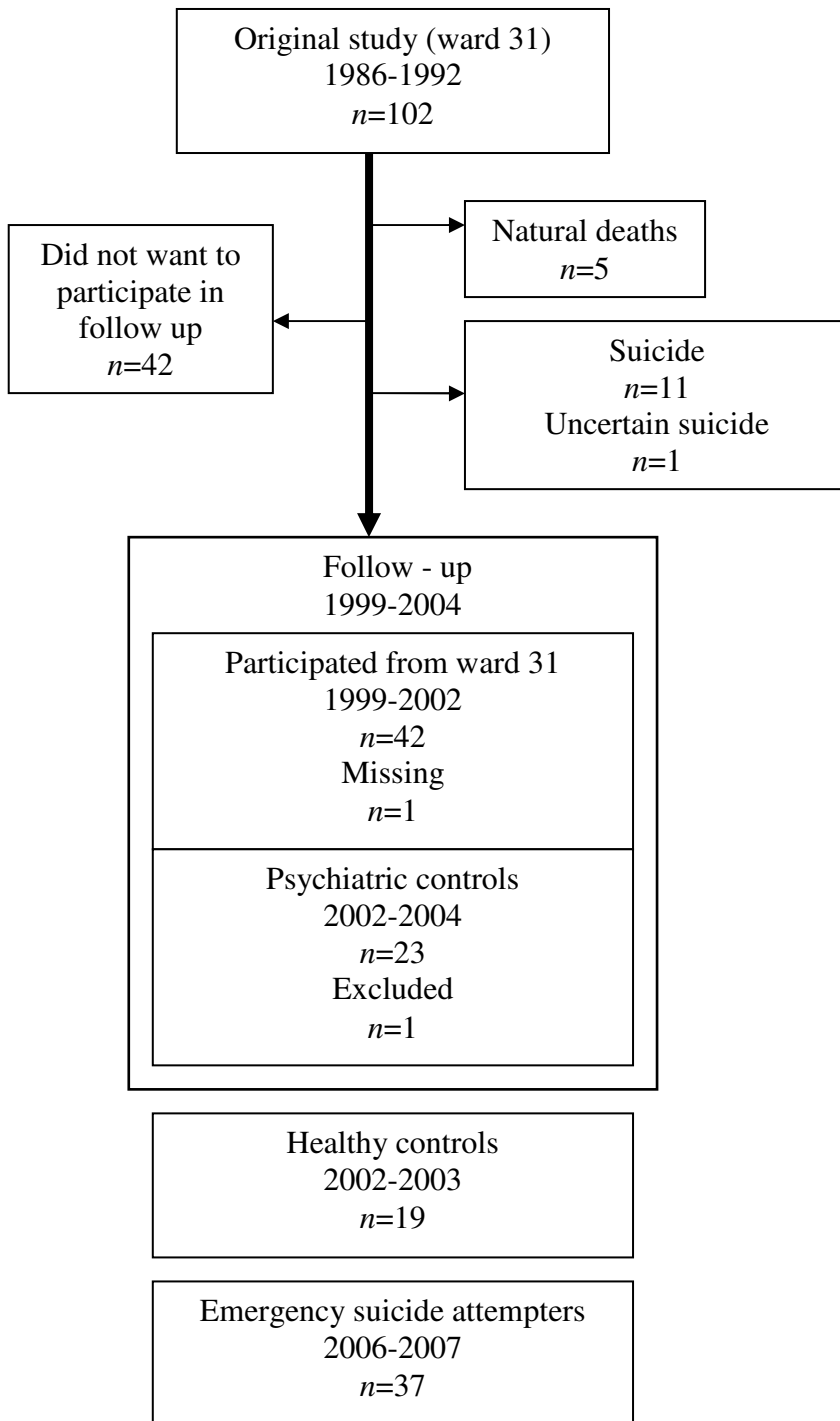
one changed his mind. Twenty-two healthy controls agreed, but 19 actually participated.

#### Emergency suicide attempters (2006-2007)

From the emergency room, the medical intensive care unit, or from a general psychiatric ward at the University hospital of Lund, Sweden, 37 suicide attempters (16 males and 21 females) were recruited shortly after a suicide attempt.

**Table 1:** Summary of the thesis participants

<b>Paper</b>	<b>Subjects</b>
Paper I	64 subjects from the follow-up study (42 former suicide attempters and 22 matched control patients)
Paper II	11 subjects randomly selected from the follow-up study (sex former suicide attempters and five control patients)
Paper III	102 subjects from the original study (ward 31), of whom 42 were followed up.
Paper IV	38 former suicide attempters and 20 psychiatric controls from the follow-up study, 19 healthy controls and 36 emergency suicide attempters
Paper V	23 emergency suicide attempters



**Figure 3:** The participants

## **Psychiatric diagnoses of participants**

The original study: At ward 31, two independent psychiatrists, who were familiar with the Diagnostic and Statistical Manual of Mental Disorders 3<sup>rd</sup> edition, revised (DSM-III-R, 1987) usually diagnosed each patient. After the diagnostic procedure, they reached consensus on the main diagnosis.

Follow - up: At the time of the follow-up of suicide attempters and psychiatric controls, all patients went through a semi-structured interview, SCID II (First et al, 1997), by a specialist in psychiatry together with a resident in psychiatry, and the Diagnostic and Statistical Manual of Mental Disorders 4<sup>th</sup> edition (DSM IV, 1994) was used for diagnostics. Disorders, usually first diagnosed in childhood or adolescence, were not included in the diagnostic procedure. This e.g. means that attention-deficit and disruptive behaviour disorders were not taken into consideration. However, 57 participants in the follow-up study filled in the Wender Utah Rating Scale (WURS; Ward et al, 1993), where 27 % of followed up suicide attempters and 10% of psychiatric controls (N.S.) rated themselves above the cut off score of the WURS attention deficit hyperactivity disorder (ADHD) subscale.

Emergency suicide attempters: All these patients participated in a comprehensive research program identifying bipolar disorder among suicide attempters. The actual suicide attempters went through a structured interview, SCID I and II (First et al, 1997), by a specialist in psychiatry and were diagnosed according to DSM IV (1994).

Healthy controls: The healthy controls were medically examined by a resident in psychiatry and evaluated from the same semi-structured interview as the follow-up patients, concerning current or prior psychiatric or somatic diseases. All included healthy controls had an average lifestyle and denied earlier or current psychiatric disease, alcohol or other substance abuse of their own, or of their first degree relatives.





## Methods

Ratings (paper I, III, IV and V)

The Suicide Assessment Scale (SAS, later called SUAS) (Stanley et al, 1986) is an expert interview-based rating scale with 20 items; sadness and despondency, hostility, energy, hypersensitivity, emotional withdrawal, resourcefulness, perceived loss of control, tension, anxiety, somatic concern, impulsivity, low self-esteem, hopelessness, inability to feel, poor frustration tolerance, suicidal thoughts, purpose of suicide, wish to die, lack of reasons for living and suicidal actions. The SUAS-S is a numeric self rating scale consisting of the same 20 items as SUAS. In both versions of the SUAS, (the modified interview version of SUAS and SUAS-S), each item is rated in terms of severity (0-4 points). In paper I, both the interview-based and the self rating scales were used, and in paper V, only the self-rating version was used.

The Montgomery-Åsberg Depression Rating Scale (MADRS) (Montgomery & Asberg, 1979) is an interview-based depression scale, designed to be sensitive to change in severity of depression. The original MADRS consists of 10 items, each scored 0-3, and one of the items measures suicidal thoughts and/or plans. In paper I, the MADRS was used.

In paper III, the socialisation scale of the The Karolinska Scales of Personality (KSP) (Scalling, 1978; Schalling et al, 1987; Schalling, 1993) was used, and it reflects childhood experiences, school and family adjustment. KSP was routinely administered to suicide attempters at the ward 31, and was readministered at the follow-up. Extreme values of the KSP dimensions measure vulnerability for different forms of psychopathology.

In paper IV and V, the COPE was used. This is a theory based inventory, produced by Carver et al, (1989). We used the original edition, which was translated from English into Swedish by support from the Lund University Department of Languages. The inventory measures 14 types of coping-styles:

**Table 3:** COPE-factors based on the 14 subscales by Carver et al, (1989)

Factor I	Active coping <i>(taking active steps to remove or circumvent the stressor)</i> Planning <i>(how to cope with a stressor and which step to take)</i> Suppression of competing activities <i>(putting other projects aside)</i>
Factor II	Seeking social support – instrumental <i>(for advice or information)</i> Seeking social support – emotional <i>(getting moral support and/or understanding)</i> Focus on & venting of emotions <i>(to focus on distress or upset feelings and to ventilate those feelings)</i>
Factor III	Denial <i>(the person refuses, pretends or acts as if the problem has not happened)</i> Behavioural disengagement <i>(a wish to give up)</i> Mental disengagement <i>(using alternative activities to bring the mind off a problem)</i>
Factor IV	Restraint coping <i>(waiting until an appropriate opportunity)</i> Positive reinterpretation & growth <i>(ability to manage coping with emotions)</i> Acceptance <i>(ability to accept the reality of a stressful situation)</i>
Not included	Turning to religion Alcohol – drug disengagement

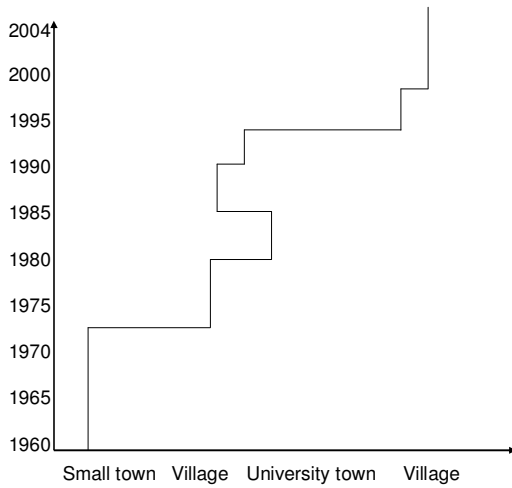
Respondents rate the extent to which each type of coping-strategy is generally used by them to manage stressful situations. A five-point scale ranging from 0 (not at all) to 5 (a lot) was used. Based on the 14 subscales, Carver et al, (1989) conducted a factor analysis, which resulted in four factors; these factors are presented in Table 3 and are used in paper IV.

#### Semi structured interview (paper II and III)

At the follow-up, data concerning stressful life events were collected through semi-structured interviews by a senior psychiatrist together with a resident. The interview guide included multiple choice boxes (mainly “yes” or “no”) that were filled in during the interview, and with additional space for comments. The patients answered detailed questions about their life and life events during four time periods: childhood (0-12 years), adolescence (13-19 years), adulthood before the index suicide attempt (20 years of age – index) and the period after index until the time of follow-up. (Index refers to the suicide attempt and hospitalization at ward 31, and for psychiatric controls it referred to inpatient treatment at the corresponding time). Each period included questions about a number of things, such as contact with medical and psychiatric services, substance abuse, school, career, living conditions, and marital as well as social relationships. The interviewers wrote down the patients’ answers into forms, which were later compiled into a database that allowed statistical analyses of the data. It was from data gathered during these follow-up interviews that the first time geographic life charts, described in paper II, were made. In paper III, a subset of variables of negative life events were used: separation(s), feelings of neglect, sexual abuse, and interpersonal problems.

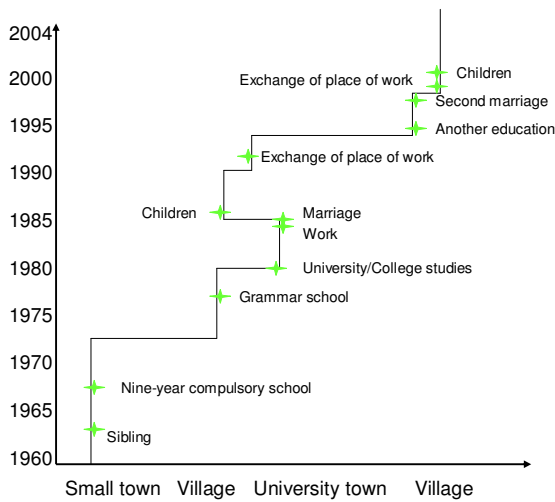
#### Time-geographic life chart (paper II and V)

The interviews were semi – computerised, and the process started by describing the patients’ geographic moves and reasons for moving chronologically.



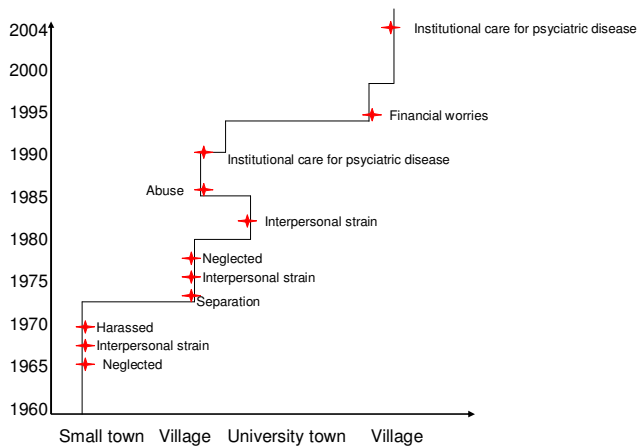
**Figure 4: Geographic moves**

After this, significant social events which occurred while living in each geographical site were added.



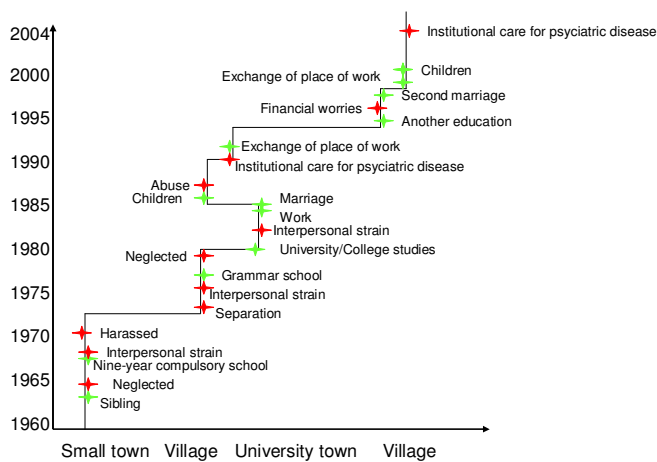
**Figure 5: Social events**

Stressful events along the life-line were entered and the way in which the respective event affected the patients was noted.

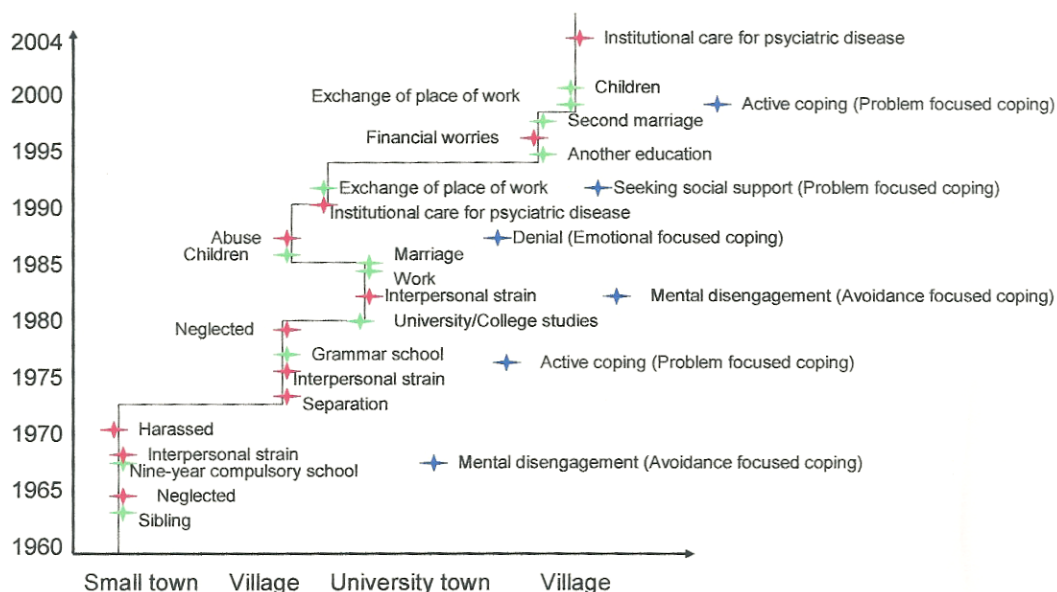


**Figure 6:** Stressful events

Finally, the comprehensive lifeline with both social and stressful life events, connected to geographical moves, was presented to the patients, who were offered to express their emotions.



**Figure 7:** Comprehensive life line



**Figure 8:** A time-geographic life chart with coping strategies

In paper V, after producing the time geographic life chart, every stressful event in the life chart was discussed, and the coping strategy that probably was used to solve the event was analyzed. This strategy was also noted on the chart.

### Biochemical markers (paper III)

At the time of the index suicide attempt (original study), and *before* treatment, lumbar punctures were performed between 8 and 9 am, after one night of fasting. During the lumbar puncture procedure, the patients were sitting upright. The needle was inserted between L4 and L5. Twelve + 6 ml CSF were taken and immediately centrifuged and stored in 2 ml portions at  $-80^{\circ}\text{C}$ . The 3-methoxy-4hydroxyphenylglycole (MHPG) was analysed, according to Swahn et al. (1976).

After the lumbar puncture, 24 h urine was collected during three consecutive days. Cortisol was analyzed with a standard radioimmunassay (Orion Diagnostica Cat. No: 68548, Espoo, Finland) and urinary noradrenaline/adrenaline (U-NA/A) was analysed with an electrochemical detection method according to Eriksson et al (1983). We used the quotient

of NA and A (average value of three days), as it reflects catecholaminergic metabolism.

#### The qualitative research method

Qualitative research aimed at gathering experiences by a person's own written, spoken or observed behaviour. This research mode e.g. investigates why or how decisions were made. A qualitative research can be either descriptive (research that has as its main objective the accurate portrayal of the characteristics of individuals, situations, or groups, and the frequency with which certain phenomena occur), or explorative (a preliminary study designed to develop, or refine hypotheses, or to test and refine the data collection methods) (Polit and Hungler, 1995).

In paper II an interview guide (see appendix 1) was used, and a research assistant was present at each interview session, documenting the life-chart story. The analysis was made by manifest content analysis (Berg, 1998) which means a quantification of narrative qualitative material. The analysis was made in three stages (Burnard, 1996). In the first stage, all participants' events were noted by the main investigator and the research assistant. In the next stage, the events were gathered into subcategories, and this was done by the research nurse and research assistant independently. After this, the investigators together established the subcategories, and all events belonging to each subcategory were counted. In the final stage, each subcategory was reduced to a category.

In paper V, an explorative method was used, because this study investigated new topics in suicidal research, i.e. the description of dimensions belonging to the phenomenon called "the pathway to suicidal behaviour" as well as factors related to it. This exploratory study aimed at answering the following questions: What factors are related to a patient's suicidal behaviour? How can we use a time geographic life chart, combined with degree of suicidality and coping capacities, to illustrate the pathway to suicidal behaviour? After analysing time-geographic life charts, SUAS-S and COPE, three different pathways were identified. The first pathway described low SUAS-S ratings and life chart events which

were predominantly solved by adaptive coping. The second pathway described moderate SUAS-S ratings and life chart events, solved by both adaptive and maladaptive problem solving. The third pathway described high SUAS-S ratings combined with life chart problems which were solved in a maladaptive manner. Each life chart, belonging to the respective pathway group was analyzed by an inductive reasoning method (the process of reasoning from specific observations to more general characteristics) by the main investigator and the research assistant independently, to explore possible group characteristics in a global sense (Polit & Hungler, 1995). The independent findings were then discussed, and the characteristics which were defined by agreement were summarized for each group. In the paper, this approach is described by a case (which was made up from an aggregate of life charts and does not contain any identifiable information).

### Statistical methods

The statistical calculations were made by use of the Statistical package for the Social Sciences, SPSS, version 6.0 in paper I and version 15.0 in paper III-V.

Paper I: Non-parametric statistics were used because the number of observations was small and the SUAS is an ordinal scale. The Mann-Whitney *U*-test was used to detect significant differences between two groups, and Spearman's rank order correlation was used as a measure of association.

Paper III: The *t*-test was used for comparing biological stress markers between the original study and follow-up. Chi-square was used to compare life events between the groups of below and above median biological stress markers, and Spearman's rank order correlation was used as a measure of association between the KSP item *socialisation* at index and at follow-up, as well as CSF- MHPG and NA/A values.

Paper IV: The Mann-Whitney *U*-test was used to compare coping strategies between two groups, and Kruskal Wallis H was used to compare coping strategies of all groups and the Pearson Chi-square to compare gender differences in the different study groups.



Paper V: Spearman's rank order correlation was used as a measure of association between SUAS-S scores and problem solving capacity scores.

## **Ethical approval**

This thesis was carried out at the Lund Suicide Research Centre at the Department of Psychiatry of Lund University Hospital. The Lund University Medical Ethics Committee and later, the Regional Ethics Board had approved the study and all participants gave informed consent.

# REVIEW AND COMMENTS OF RESULTS

## Paper I: Evaluation of a modified interview version and of a self-rating version of the Suicide Assessment Scale

The main purpose of this study was to evaluate the reliability and validity of a modified interview version of SUAS with defined scores, and also a new self-rating version, SUAS-S, was tested.

In total, 64 individuals were studied from the follow-up study. There were 30 men (mean age  $51.2 \pm 7.8$  years, range 35-65) and 34 women (mean  $51.2 \pm 10.9$  years, range 34-78), and thus there was no significant difference in age between them. There were no significant differences in interview SUAS scores between men and women (mean  $6.6 \pm 10.5$ ; median 2.0 vs  $9.1 \pm 11.3$ ; median 4.0). We wanted to see if the distribution of SUAS interview and self-rating scores according to diagnoses were in the same range. In all but one diagnostic groups, i.e. psychosis (N = 2), self-ratings generated somewhat higher scores than did the interview ratings (N.S).

**Table 4:** Distribution of SUAS scores and comparisons by DSM IV diagnoses at follow up.

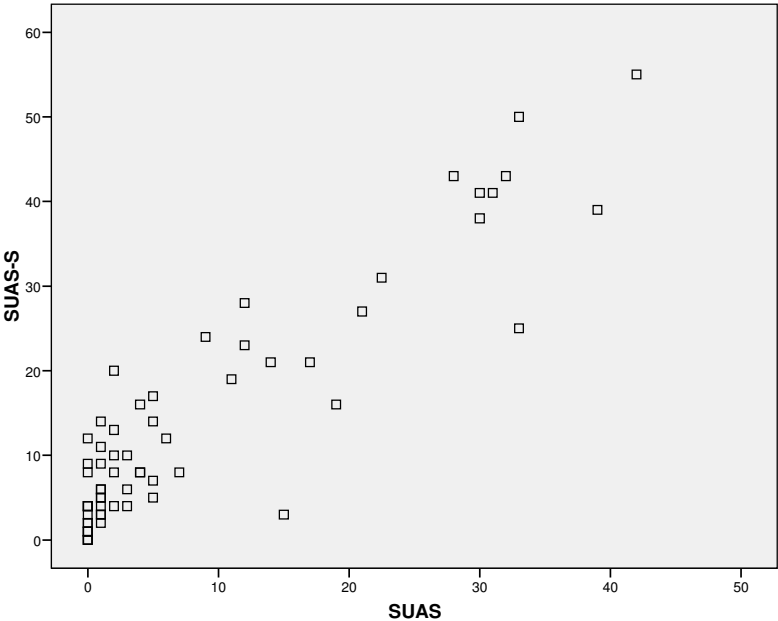
	SUAS interview score				SUAS self-rating score				
	N	Median	Mean	S.D	N	Missing	Median	Mean	S.D
No diagnosis	29	1.0	1.8	2.1	29		4.5	6.6	5.4
MDD	14	2.5	7.5	10.9	14	1	8.0	14.2	13.7
Dysthymia	4	31.5	28.5	14.0	4		45.5	42.5	13.6
Alcoholism	5	1.0	4.4	8.2	5		11.0	10.4	4.7
Anxiety disorder	3	11.0	12.3	8.1	3	1	23.0	23.0	5.7
Psychosis	2	24.0	24.0	12.7	2		14.0	14.0	15.6
Other diagnosis	7	12.0	11.8	10.8	7		23.0	19.7	13.3
Total	64	2.0	7.9	11.0	64	2	9.0	13.9	13.6

No significant differences regarding SUAS interview scores were found between patients with mood disorders (N=18) compared to the others (N=17) (Mann-Whitney *U*-test, NS).

Since the number of subjects was small, the interview based SUAS scores of those who had received an axis I diagnosis (N = 35) were compared with those without (N = 29), and there were significantly higher scores in those with a diagnosis than without ( $11.1 \pm 12.3$ , median 4.5 vs  $1.8. \pm 2.1$ , median 1.0,  $P < 0.01$ ). There were no significant differences between patients suffering from a mood disorder (N = 18, mean  $\pm$  SD score  $11.7 \pm 13.9$ , median 4.0) compared to people with some other axis I diagnosis (N = 17, mean  $\pm$  SD score  $11.6 \pm 11.0$ , median 11.0).

Correlations

Both SUAS-versions correlated significantly with the MADRS (N = 64): SUAS - interview (N = 64); Spearman  $r_s = 0.83$ ,  $P < 0.01$ , and the SUAS-S (N = 61); Spearman  $r_s = 0.78$ ;  $P < 0.01$ . An interrater reliability study was performed by correlating expert ratings (SUAS total) with resident ratings from the same interviews (N = 42), and the reliability was found to be high (Spearman  $r_s = 0.97$ ,  $P < 0.01$ ). The reliability results of individual items varied and had a median of 0.92.



**Figure 9:** Correlation between SUAS-S and SUAS

The validity of the SUAS-S was tested by correlating the score on this scale with the score given by a psychiatrist using the SUAS interview version (N=61). A significant correlation (Spearman  $r_s = 0.82$ ,  $P < 0.01$ ) was found between the total scores of these two scales (figure 9). The correlations between individual items varied and had a median of 0.59. Correlations between individual items were less significant in item 10 (somatic concern) (Spearman  $r_s = 0.32$ ,  $P < 0.05$ ), and significance was missing in item 11 (impulsivity) (Spearman  $r_s = 0.16$ , NS).

### Comments

SUAS is an ordinal scale and not a nominal one, as we have written in the publication. Furthermore, a Kappa analysis would have been more appropriate than a Spearman Rank correlation to test the interrater reliability between expert ratings and resident ratings. Moreover, to our knowledge, the modified interview version of the SUAS was never tried in comparison with the original version, i.e. the version without defined item rating scores. One of the aims was to evaluate whether SUAS reflects suicidality rather than severity of depression by comparing SUAS and MADRS ratings. Both scales have several items in common, such as sadness, anxiety, lack of emotions, fatigue and suicidal thoughts. However, the SUAS includes more items related to suicidality, and those who had an axis I diagnosis (not necessarily MDD) scored higher on the SUAS than did those without. Therefore it seems like SUAS reflects something else than a depressive illness, as suicide is not only a result of depressive illness but other psychiatric illnesses as well.

## **Paper II: Time-geography: a model for psychiatric life charting?**

The aim of this study was to describe and evaluate the possible use of time geographic life charts in clinical psychiatric practice.

The time geographic life charts of eleven former psychiatric patients were analysed in order to receive systematic descriptions of their life. The analysis showed that the time geographic life-chart model offered much knowledge by only asking about moves, and also provided information on the person's social capacity, as well as information on predisposing, stressful or precipitating life events. All events were ordered in four categories; geographical moves, social capacity, predisposing life events and stressful and precipitating life events.

### The patients' perceptions and benefits of the time geographic life charting

The patients were mostly positive about the time-geographic life chart method. Only one person was hesitant about the method, but he still thought that it was important to include an understanding of background processes in psychiatric treatment. Some individuals thought that the method, by discussing social and stressful events chronologically, gave a comprehensive picture of life, and that the method gave the psychiatric staff a deeper knowledge of a patient than otherwise. One person stated that had this been done earlier in her life, she might have received better help from the psychiatric clinic. One person had the opinion that the method could serve as a valuable tool to understand and to solve his problems, because it offered a survey of his situation. This opinion is in line with that of another person, who thought that the method helped him to see his situation more clearly. Other statements were: *"it was positive and appreciated to look back on life in a comprehensive way"*; *"logical method"*; and *"it felt many times like an aha reaction, this is how it was..."*.

### Comments

All participants in this study had recently participated in our 12-year follow up study, and probably their curiosity about the outcome of this

study made them participate in this investigation. The fact that we already knew a lot about them might have made them more openhearted to tell us about adverse life events.

We had only 11 participants in this study, but we regard this as enough for a qualitative investigation to show that our time geographic life chart gave a comprehensive and structured picture of a person's life.

When it comes to discussing reliability and generalizability, qualitative research may suffer. We therefore used a manifest analysis, explained by Burnad (1996). We did not want to interpret a phenomenon groupwise, but rather to promote systematic descriptions of the participants' life events over time (Graneheim et al, 2004).

**Paper III: Suicide attempters: biological stressmarkers and adverse life events**

The aim was to study stressful life events and biological stressmarkers among psychiatric inpatients who were followed up 12 years after a suicide attempt.

During participation in the original study (index), a lumbar puncture was performed, and the 3-methoxy-4hydroxyphenylglycole (MHPG) in CSF was analysed. 24 h U-NA/A and U-cortisol were also analysed in 102 patients. Forty-two of these were followed-up, and there was no significant difference, concerning CSF-MHPG and U-NA/A, between patients only participating in the original study and those who also entered the follow up study. Neither were there significant differences between suicide victims and survivors concerning CSF-MHPG and U-NA/A (table 5).

**Table 5:** Group comparisons

	CSF-MHPG		U-NA/A		U-Cortisol	
	The original study	Follow up	The original study	Follow up	The original study	Follow up
	N		N		N	
Mean ± SD nmol/l	98	41	80	35	76	32
	42.5±9.2	41.5±9.7	7.3±4.3	7.3±4.0	182.3±102.2	179.5±78.3

	CSF-MHPG		U-NA/A		U-Cortisol	
	Suicide victims	Survivors	Suicide victims	Survivors	Suicide victims	Survivors
	N		N		N	
Mean ± SD nmol/l	11	82	11	67	10	64
	41.2±10.4	42.5±9.2	8.6±4.8	7.1±4.3	169.2±94.7	181.9±101.2

When the patients were followed-up, a semi structured interview was made about lifetime events. The median values of CSF-MHPG, 24 h U-NA/A and 24 h U-cortisol, thus analyzed at the time of the original study (index), served as cut-off points when dividing the patients into two

subgroups. These subgroups were compared among follow-up patients concerning the following life events, which had occurred before the index suicide attempt: interpersonal problems, feelings of neglect, separation, and sexual abuse. The reasons for choosing these life events was that we were interested in early adverse life events, discussed by other researches , so that we could compare our results with theirs ( table 6).

**Table 6:** Life events before index in subgroups according to concentrations below or above the median of CSF-MHPG, U-NA/A, U-Cortisol

	CSF – MHPG		U – NA/A		U – Cortisol	
	Median 41.00 nmol/l		Median 6.25 nmol/l		Median 160.00 nmol/l	
	Below	Above	Below	Above	Below	Above
	<i>n</i>		<i>n</i>		<i>n</i>	
	24	17	17	18	15	17
<b><u>Life events</u></b>						
<b>Interpersonal problems</b>	20	15	16	16	12	17
<b>Feeling of neglect</b>	14	13	11	12	13*	8
<b>Separation</b>	17	16	17	16	13	17
<b>Sexual abuse</b>	2	7**	1	8**	5	2

\* Pearson Chi –square  $P=0.02$  \*\* Pearson Chi –square  $P=0.01$ \*

Correlations

We wanted to compare the catecholaminergic markers in CSF and urine, so we correlated CSF-MHPG and U-NA/A and, as could be expected, a significant correlation was seen (Spearman  $r_s =0.26$ ;  $P=0.022$ ).

We also wanted to validate that the patients’ views concerning predisposed childhood events were stable over time. Therefore scores of the KSP item *socialisation* (reflecting childhood experiences, school and family adjustment), rated at the time of the original study, were correlated with scores rated at the follow-up investigation. A significant correlation was seen (Spearman  $r_s =0.58$ ;  $P\leq0.000$ ).



## Comments

Dropouts: From the original study group, 42 former suicide attempters did not want to participate in the follow up for different reasons (see page 27). We could not find any significant differences according scores on the SUAS between the drop outs and those who were followed up (participants N=42): SUAS median scores 27.0; range 3.0-57.0, and drop outs (participants N=42): SUAS median scores 23.5; range 3.0-67.0, natural deaths (participants N= 5): SUAS median 31.0; range 0.0-43.0 and suicide (participants N=12): SUAS median 24.5; range 0.0-53.0). We cannot rule out that some of the drop outs might have felt healthy, and therefore did not want to participate, but also that some of them wished to forget the circumstances around the suicide attempt. Similar follow-up studies of suicide attempters have suffered from a substantial amount of drop outs (Niméus, 2000; Haw et al, 2001; Nordentoft, 2005; Waern, personal communication, 2009).

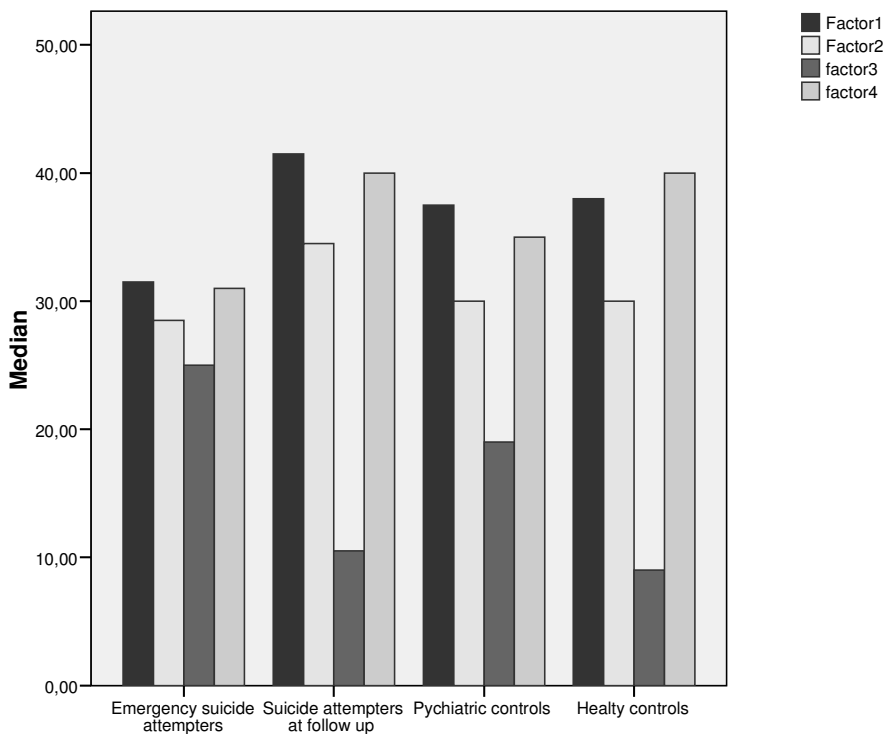
When it comes to the follow-up interviews where we received information on stressful life events before the index suicide attempt, it would have been preferable to have gathered such information by the time of the index suicide attempt as well as at follow up, and furthermore, by use of a reputable questionnaire, such as the one by Paykel (1983): “the Interview for Recent Life Events”. However, deep and semi-structured interviews were made by experienced psychiatrist. To solve the problem of concordance between statements over time concerning adverse life events, we analysed the KSP item “socialization”, which was rated by the patient at both times of investigation. The correlation result turned out to be acceptable.

It had also been preferable to have CSF and/or urinary measures at both occasions, but we did not expect the patients to be medication- free at follow – up. According to Bäckman et al (2000), antidepressant treatment resulted in a long-term decrease of CSF MHPG, and Träskman et al (1980) found that cortisol concentrations in CSF were significantly reduced after treatment with a tricyclic antidepressant (clomipramine hydrochloride).

**Paper IV: Coping strategies used by suicide attempters and comparison groups**

This is a first step to better understand the coping-strategies reported by suicide attempters in an acute and a long term follow-up situation, in relation to strategies reported by comparison groups. Our hypothesis was that suicide attempters in general would use weaker coping strategies than others.

Thirty-eight followed up suicide attempters, 20 psychiatric and 19 healthy controls, and 36 emergency suicide attempters filled in the COPE inventory. There were significant differences between the study groups in factor I, III-IV. There were no significant differences between the study groups in factor II.



**Figure 10: The different study groups and their median scores of factor I-IV.**

Factor I: Active coping, planning and suppression of competing activities. Suicide attempters at follow up had the highest value (median 42.0; total score 60; range 1.0-58.0), followed by healthy controls (median 38.0; range 21.0-56.0), psychiatric controls at follow up (median 34.0; range 17.0 – 53.0) and emergency suicide attempters (median 31.0; range 0.0-48.0), respectively (Kruskal Wallis H,  $p=0.001$ ) (figure 10).

Factor II: Seeking social support instrumental and emotions, and focus on & venting of emotions.

There were no significant differences between the study groups in factor II. Suicide attempters at follow up had the highest value (median 35.0; total score 60; range 2.0-50.0), followed by psychiatric controls at follow up (median 31.0; range 8.0 – 48.0), healthy controls (median 30.0; range 13.0-49.0), and emergency suicide attempters (median 28.0; range 5.0-54.0) (figure 10).

Factor III: Denial, behavioural disengagement and mental disengagement.

According to factor III, recent suicide attempters had the highest (median 25.0; total score 60; range 4.0-52.0), followed by psychiatric controls (median 18.0; range 6.0-25.0), suicide attempters at follow up (median = 10.0; range 1.0 – 37.0) and healthy controls (median 10.0; range 0.0 – 17.0) respectively (Kruskal Wallis H,  $p\leq 0.000$ ) (figure 10).

Factor IV: Restraint coping, positive reinterpretation & growth and acceptance.

According to factor IV, suicide attempters at follow up had the highest scores (median = 40.0; total score 60; range 8.0-52.0), followed by healthy controls (median = 40.0; range 25.0-48.0), and then by psychiatric controls (median = 34.0; range 14.0 – 57.0), and finally recent suicide attempters (median = 30.0; range 3.0-48.0), respectively (Kruskal Wallis H  $p\leq 0.000$ ) (figure 10).

### Gender differences and COPE factors

There were no significant differences between men and women in the COPE factors I-IV in the study group of suicide attempters at follow up. In the three other study groups (emergency suicide attempters, psychiatric controls and healthy controls), men had significantly lower scores than

women in COPE factor II (seeking social support instrumental and emotions, and focus on & venting of emotions). Emergency suicide attempters had significant gender differences in factor IV (restraint coping, positive reinterpretation & growth and acceptance), where women had significantly lower scores than men.

Suicide attempters and psychiatric controls at follow up - in remission and non-remitted

Among the suicide attempters at follow up, there were 17 participants (of 38) who did not receive an axis I diagnosis at that time. The suicide attempters who had gained health, scored significantly higher on factor IV than did the still ill (median 47; range 8.0-52.0 vs median 38.5; range 25.0-47.0) Mann Whitney U ( $p = 0.017$ ). Factor I, II and III did not differ between the two groups.

Ten out of twenty participants in the group of psychiatric controls did not receive an axis I diagnosis at follow-up. Among them, no significant differences between the subjects who had gained health and the still ill appeared in factor I, II, III or IV.

## Comments

The dropouts:

The original study: The dropouts are explained on page 45.

Psychiatric controls: Charts of 270 cases were reviewed, but only 71 were contacted, mainly because of a suicide attempt in their past. These 71 patients had not participated in a research study before and were probably therefore hesitant to participate.

Healthy controls: From the National Registration, 198 were randomly selected, but only 19 were interested to participate in a comprehensive research program dealing with psychiatric matters. This group is of course not representative for a normal population.

Emergency suicide attempters: From the emergency room, the medical intensive care unit, or from a general psychiatric ward at the University

hospital of Lund, Sweden, 37 suicide attempters were recruited shortly after a suicide attempt. The drop out ratio was 43 % (28 suicide attempters), and the mean age  $\pm$  SD of them was  $44.4 \pm 17.0$  years. Ten males and 18 females dropped out, and 68% of these had made intoxications, 11 % intoxications combined with cutting, 11% tried to hang themselves, 4% had used cutting as a method, and concerning the rest, information about choice of suicide attempt is missing.

We compared four different groups; emergency suicide attempters, suicide attempters at follow up, psychiatric controls and healthy individuals. A draw back of the study is that the comparison groups were not matched according to diagnosis, sex and age.

Information about axis II diagnoses could probably have brought an understanding of the results in this paper. Young adults seem to have difficulties with interpersonal problem solving (Linehan, 1987; Arie et al, 2008), perhaps due to an axis II diagnosis, and this might be one reason why emergency suicide attempters used more maladaptive coping strategies.

In the study group of emergency suicide attempters, women had lower scores than men in the coping strategies; restraint coping, positive reinterpretation & growth and acceptance. This might also be due to an influence of an axis II diagnosis, and especially a borderline personality disorder, as this factor deals with coping strategies where emotional control, acceptance of a situation, and to wait until an appropriate opportunity is of importance.

Another weakness of the present study is that suicide attempters were not studied prospectively, which means that we were unable to follow their coping capacities over time, and in relation to treatment and further experiences of life. To see if the group of emergency suicide attempters and suicide attempters at follow up were similar, we compared the SUAS and SUAS-S scores among those with an MDD ( the most common diagnosis in both study groups), and we found no significant differences. These scale versions had previously been found to be concordant (Niméus et al, 2006).

## **Paper V: A time-geographic life charting combined with SUAS-S and COPE; a strategy to improve the understanding of suicidal behaviour**

The aim of this explorative study was to find out whether a time geographic life chart in combination with a survey of a person's coping capacity and degree of suicidality, rather than each evaluation *per se*, could illustrate the pathway to suicidal behaviour, and therefore be useful when formulating strategies for suicide prevention.

By the time of the suicide attempt, rated problem focused coping, emotional focused coping and avoidance focused coping were correlated to the total scores of the SUAS-S, and a significant association was found between low SUAS-S scores and problem focused coping (Spearman  $r_s = -0.42$ ;  $P=0.05$ ) as well as between high SUAS-S scores and maladaptive coping (Spearman  $r_s = 0.55$ ;  $P=0.007$ ). Within these three subgroups of coping, median values of SUAS-S were calculated, as well as median values of the COPE problem focused coping, emotional focused coping, and avoidance focused coping, respectively (table 7).

Three different types of the suicidal process were identified, when time geographic life charting was combined with the respective levels of rated suicidality and coping capacity.

### Descriptions of the three different subgroups

The first group describes low SUAS-S ratings by the time of the suicide attempt and events in the life chart which were predominantly solved by adaptive coping. Members of this group had a relatively untroubled childhood with few stressful events before 12 years of age, and they were grown up by parents, or grandparents, and with several siblings. They had a good social capacity for education, work and family. Many of them had had problems with substance abuse and/or a severe economic situation for a long time. They often reported heredity for mental illness. This group had been active to seek help for problems with depression, crisis reactions and substance abuse, and they tried actively to solve their problems. The

**Table 7:** SUAS-S scores and coping capacity by the time of a suicide attempt.

- In three coping-subgroups, reflecting adaptive coping, both adaptive and maladaptive coping, and maladaptive coping, respectively, SUAS-S median values and the median values of problem focused coping, emotional focused coping and avoidance focused coping are shown.
- Correlations between total scores on SUAS-S and problem focused coping scores, emotional focused coping scores or avoidance coping scores are shown.

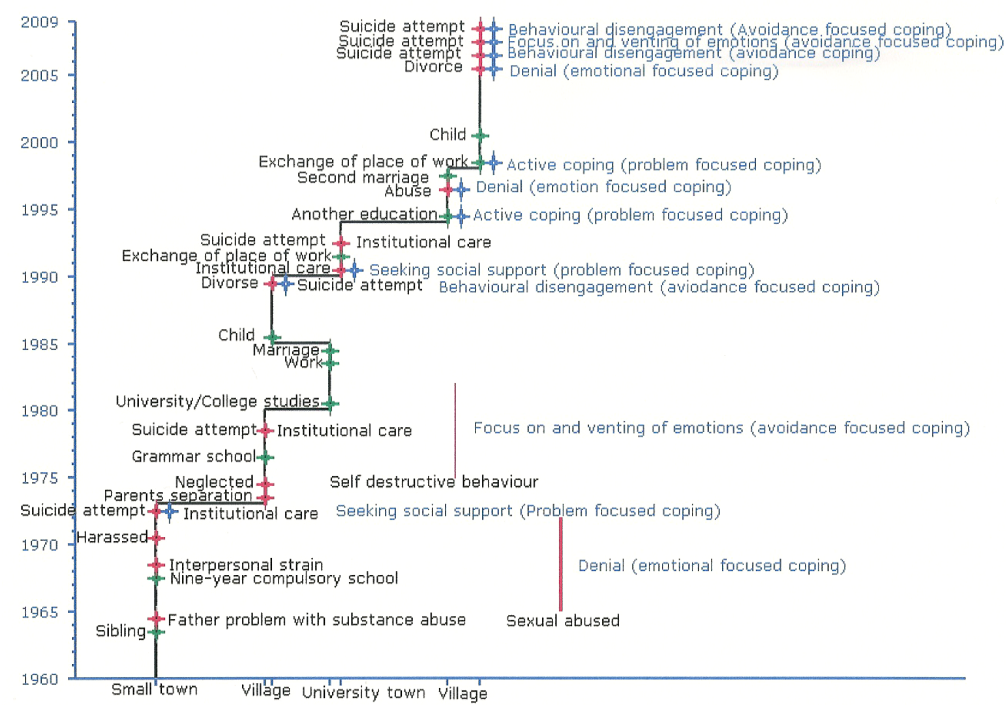
	Subgroups		
	Adaptive coping	Both adaptive and maladaptive coping	Maladaptive coping
<b>SUAS-S</b> (median value) (n) (max 80p)	23.5 (8)*	30.0 (7)	46.0 (8)*
* p=0.001; Mann Whitney U-test			
<b><u>COPE</u></b>			
Problem focused coping (median value) (n) (max 100p)	60.0 (8)	42.0 (6)	38.5 (8)
Correlated with SUAS-S:	-0.42*		
Emotion focused coping (median value) (n)(max 80p)	45.0 (7)	37.0 (7)	32.0 (7)
Correlated with SUAS-S:		NS	
Avoidance focused coping median value) (n)(max 60p)	24.5 (8)	14.0 (7)	36.0 (8)
Correlated with SUAS-S:			0.55**

(n) = number, \* Spearman  $r_s = 0.05$ , \*\* Spearman  $r_s = 0.007$

suicide attempt had been triggered by a stressful event, such as separation/divorce, e.g. the loss of a significant other, or due to problems with substance abuse. The first suicide attempt occurred late in life, and people belonging to this group had only made a few suicide attempts.

The second group describes medium ratings on SUAS-S, and life charts with events solved by both adaptive and maladaptive problem solving.

These persons had either an untroubled childhood, or had been exposed to a few different stressful events. They had good social capacity for education, family and work, but several of them had relational problems which ended with divorce or separation. In this group, the members had problems with social phobia, depression, anxiety and adjustment disorder. Patients belonging to this group had used all coping strategies, but were pervaded by the inability to take action, and the centre of gravity was therefore avoidance coping. The suicide attempt had been triggered by a social crisis, such as losing work, economic difficulties, criminal activity, or a troublesome relationship. Most of them had only made one suicide attempt, but they had problems with destructive behaviour, such as deliberate self harm and/or substance abuse.



**Figure11:** Illustration of a time geographic life chart with high SUAS scores and predominantly maladaptive coping capacity



The third group describes high SUAS-S ratings combined with life chart events with predominantly maladaptive problem solving.

These persons (one example is given in figure 11) had been exposed to different stressful and adverse events during childhood and adolescence, such as early separation from parents, assault, and death/suicide of a parent. Many of them had felt that they had been neglected, and felt less comfort at school because of bullying. They had a good social capacity concerning education, family and work, but they had not been able to work during the last years. In this group, the members had problems with destructive behaviour such as deliberate self harm, eating disorder, and substance abuse. When compared to the other groups, this group had difficulties to ask for help, and often used emotional coping, such as focusing on and venting of emotions, and avoidance coping, such as behavioural and mental disengagement. Heredity for mental illness was common. At the latest suicide attempt, there had been no specific trigger, but a long term psychiatric disease. The suicide attempt debut had been early in life, and patients belonging to this group had made several suicide attempts.

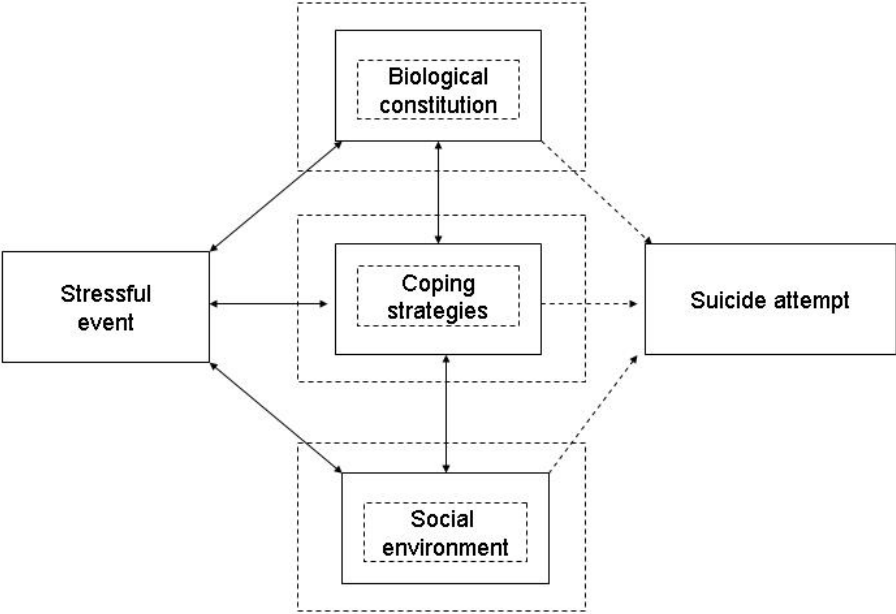
### Comments

This is an explorative study which means that it is a preliminary study designed to develop a hypothesis or to test data collection. There are some limitations, e.g. that the SUAS-S is not yet validated. Still, it seems like the SUAS-S performed well as a screening instrument for further suicidal behaviour, according to different research studies, mentioned before. The writer herself made all life charts (together with the patients), including combining coping capacity suggested by the patients, in relation to events along the lifeline, which therefore might be a bias.

# DISCUSSION

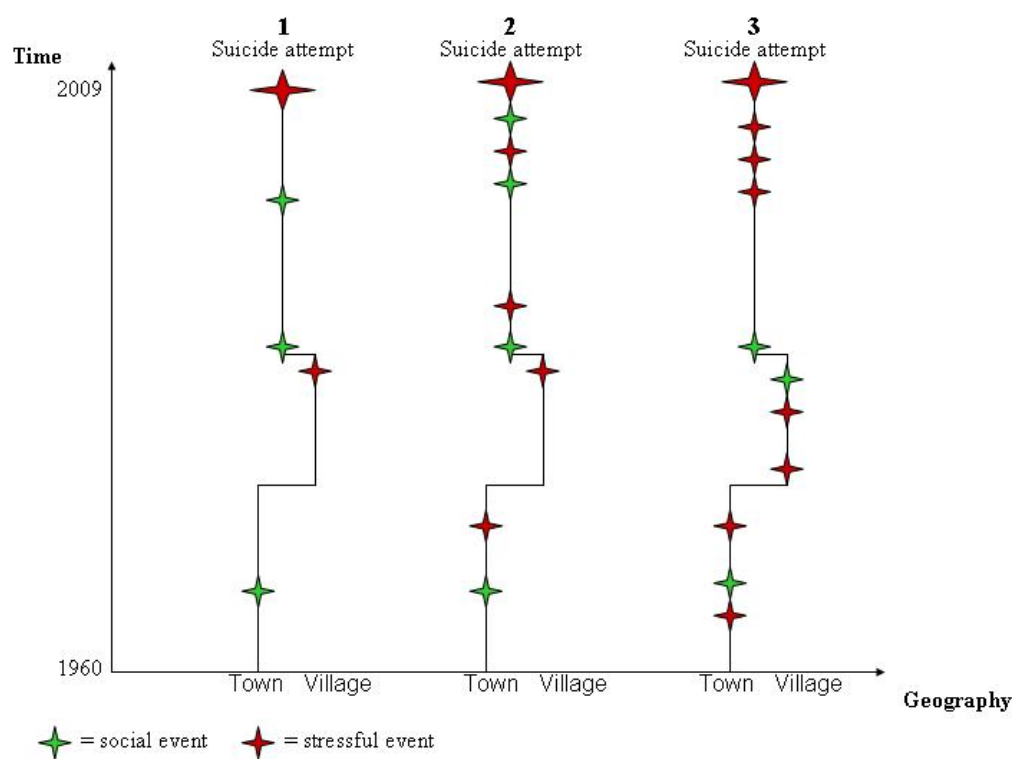
## Main findings

The overall aim of this thesis was to increase the understanding of suicidal behaviour by finding new clinical tools to strengthen the assessment of suicide attempters in order to find strategies preventing them from further suicidal behaviour. We wanted to receive a comprehensive picture of a person’s pathway to suicidal behaviour by using multidisciplinary methods, ranging from biological investigations to psychosocial as well as environmental approaches. In our opinion, biological stress markers play an important role for the development of suicidal behaviour, as deviant levels related to stressful events indicate a vulnerability for adverse reactions to future stressful situations. A person’s coping strategies play an important role for suicidal reactions. Important life events, including protective factors, such as social support, can be detected during time geographic life charting.



**Figure12:** Illustration of relevant factors for suicidal behaviour

The interaction and balance between the factors shown in figure 12 determine adverse behaviours, such as suicide attempts. From comprehensive studies, included in this thesis, we suggest three typical pathways to a suicide attempt, as exemplified in figure, and could be described as follows:



**Figure13:** Pathways to suicidal behaviour

Number 1 (left): A person who probably has a genetic vulnerability for a psychiatric disease. This person uses adaptive coping most of the time. No previous suicidal behaviour is reported. This person has experienced a relatively untroubled childhood, and few stressful events have occurred during his/her life. This individual has a good capacity when dealing with social matters, such as education, work, and family. The suicide attempt was triggered by a stressful event, e.g. separation from a significant other (figure13).

Number 2 (middle): A person who uses both adaptive and maladaptive coping, and who might have experienced suicidal behaviour before. The

person has a good social capacity. He/she will have been exposed to both predisposed and precipitating stressful events before the suicide attempt(s). This person has a psychiatric illness (figure13).

Number 3 (right): This person has heredity for mental illness and suffers from a long term psychiatric disease and/or a personality disorder, and reports previous suicidal behaviour. This is a person who most often uses maladaptive coping. He/she has been exposed to different adverse events during childhood, adolescence and adulthood. The latest suicide attempt was not triggered by a specific event. His/her lifetime social life has probably been variegated (figure13).

Similarly to us, Fortune et al (2007) identified three types of suicidal processes, but among young people who died by suicide. They identified one process characterised by longstanding behavioural problems. The next process was characterised by a psychiatric disorder, and the last process ended by an acute response to life events among those who previously had been functioning well. There are some differences between the Fortune et al charting study and ours. Their design was similar to the ones used for psychological autopsies, while we worked with time geographic life charting together with our patients. Furthermore, we used geographical sites as anchors for memories. Moreover, by using multidisciplinary methods, ranging from biological investigations to psychosocial as well as environmental approaches, we believe that we received a more global picture of the pathway to suicidal behavior than did Fortune et al. A person's coping capacity plays an important role for suicidal reactions. Also, when performing time geographic life charting, not only important life events, but also protective factors, such as social support, have been identified. By using the computerised life charting together with the patient, we improved our communication with the patient, which in turn could serve as an introduction to a good care and treatment. In order to recall events, autobiographical memories must be activated (Conway and Bekerian, 1987). By combining coping capacity and information about suicidality, we illustrate a comprehensive picture of the patient's life situation and risk of suicidal behaviour, without taking psychiatric diagnoses into consideration.

## Psychosocial stress and the kindling phenomenon

In paper III, our theory was that the observed stress system alterations in our suicide attempters have been influenced by one or more stressful events. The noted imbalance in their stress system may reflect a sensitization (kindling) for experiencing new, and possibly less stressful situations than before, but still leading to attempted suicide. We suggested that significant stress-system alterations in relation to some adverse childhood events could be explained by long-term psychobiological effects reflecting an allostatic load (McEwen, 1995a and 1995b). The kindling phenomenon could possibly be discerned in our time geographical life charting (paper V). Kindling has been widely discussed in psychiatric research on affective illnesses. The kindling model was first proposed in the late 1960s by Goddard and colleagues (Goddard et al, 1967), and later introduced to psychiatry by Robert M. Post of the National Institute of Mental Health (USA). He was the first to suggest kindling as an analogy with stress sensitization in mood disorders (Post, 1992). A central issue in the development of suicidal behaviour is the stress – diathesis model, meaning an interaction between a stressful situation and factors that might reflect vulnerabilities, such as genetics and childhood adversities. These vulnerabilities are probably growing stronger over time, and according to the kindling hypothesis, the stressful trigger to adverse behaviours, e.g. a suicide attempt, becomes less important.

Pettit et al (2004) tried to determine the relevance for kindling and sensitization processes in repeated suicide attempts. They tested three hypotheses. If kindling and sensitization processes explain repeated suicide attempts, then as the number of attempts increases, (1) the level of stress prior to an attempt should decrease, (2) the severity of suicidal symptoms should increase, and (3) the lethality of attempts should increase. However, their studies of suicide attempters revealed that the kindling and sensitization phenomenon did not hold true. Their study however had several limitations. They investigated more males than are usually studied in this research area. Furthermore, as the participants were relatively young, they might have been in early stages of the kindling

process. Joiner and Rudd (2000) found that previous episodes of suicidal ideation may have had sensitizing effect on suicide attempts, and as episodes of suicidal ideation accumulated, subsequent episodes of ideation became more easily triggered and severe. In another study which may exemplify kindling mechanisms, Carter (2005) found that patients who had escalating severity of self-poisoning episodes were at high risk of committing suicide.

Predisposing life-events, probably provoked by long-term psychobiological effects, as explained in paper III, are visible in the time geographic life chart. The Post life chart (1992) was developed in order to test the sensitisation (kindling) hypothesis by studying the interplay between stressful life events and affective episodes. Ehnvall and Ågren (2002) have further developed the Post life chart in order to test the homeostatic versus allostatic concept by using the “accumulated burden of mood swings (duration x intensity of illness episode)”.

To prevent suicidal behaviour, it is of great importance to get to know the course of the illness and the occurrence of distressing life events, so that preventive interventions can be done in an early phase. Therefore, a life chart is an important tool where important phenomena's, which are revealed in the chart, could be caught and handled.

The global assessment of suicide risk

Both SUAS and SUAS-S seem to be valid and reliable suicide rating scales, and they might aid the clinician in the assessment of suicide risk. There are important differences concerning the performance of the scales. SUAS is an expert rating scale, meaning an interview-based rating, made by a psychiatrist, and SUAS-S is a self-rating scale, made by the patient him/herself. It is generally known that self-ratings generate higher scores than interview ratings (Thompson, 1989), and during an interview the psychiatrist also has the opportunity to observe the patient. Waern et al (personal communication, 2009) has made a prospective study of consecutive patients presenting at a hospital emergency department in connection with a suicide attempt. They found that SUAS performed well

as a screening instrument for further suicidal behaviour, but only in patients who were referred to psychiatric treatment after an index attempt. Today we are half way through to test the SUAS-S as a screening instrument for suicide risk in an extended psychiatric in - and outpatient population, and so far we have found that SUAS-S scores were significantly higher in patients who later made a suicide attempt, than in patients who did not (personal communication, Mattsson, 2008).

According to Hawton and van Heeringen (2002) a semi - structured assessment of suicidal risk is recommended to cover life events that preceded the suicide attempt, as well as social, domestic and occupational circumstances, family and personal history, psychiatric disorder and psychiatric history, including previous suicide attempt(s), coping resources, suicidal intent and motives as well as risk for a further suicide attempt or suicide. The time geographic life charting illustrates a comprehensive picture of a patient's life situation, e.g. social capacity, predisposing life events, stressful and precipitating life events, and in combination with a survey of a person's coping capacity and SUAS-S, these methods offer a profound understanding of the patients and are therefore useful in the assessment of suicidal intent.

#### Time geography life charting and autobiographical memories

Our time geography life charting is different from others as it uses geography as an anchor, and according to Hägerstrand (1985), the aim is to connect knowledge from different fields of interest, e.g. social, psychological or psychiatric sciences. In our opinion, information on geography can be used to activate the autobiographical memories. In an exploratory study, Knez (2006) has investigated autobiographical memories for places using the Conway and Pleydell-Pearce (2000) model (see page 22) of an autobiographical memory. He found that physical places were mostly categorized as summarized events, and that event-specific knowledge was mainly of analogical imagery type. He also found that the most important places for memory were the ones noticed during childhood. It seems like the time geographic life chart activates the

autobiographical memory according to the knowledge-base of life time periods, described by both Knez (2006) and Conway and Pleydell-Pearce (2000). The life time periods are linked to general events, which in turn are linked to event specific remembrances. According to Williams (1996), successful problem solving depends on the quality of the kind of memories that individuals are able to retrieve, and suicidal patients have bad problem solving because they are unable to find access to specific memories. Hence, it is important for suicidal patients to activate their autobiographical memories, so that they can recall specific coping strategies that have worked before (Pollock & Williams, 2004, Pollock & Williams, 2001; Pollock & Williams, 1998; Evans et al, 1992). The time geographic life charting might be useful in this therapeutic concept.

#### A therapeutic intervention

In paper IV our conclusions were that suicide attempters and matched psychiatric controls at follow up had different coping approaches, and we suggested that this might be an effect of discrepant outpatient treatments. In a systematic review article about suicide prevention strategies, Mann et al (2005) found promising results in reducing repetition of suicidal behaviour by comparing cognitive therapy, problem-solving therapy, intensive care combined with outreach, or interpersonal psychotherapy with standard aftercare. In a study of intensive care plus outreach treatment, the patients were given greater access to the therapist than usual, as home-based treatment was offered instead of appointments at a clinic (Van Heeringen, 1995). In a study of cognitive therapy, the therapists tried to help the participants to develop adaptive ways of coping with stressors (Brown et al, 2005). In a study of problem - solving therapy, problems that had occurred during life were identified, and then a structured and focused approach to solving these problems was used (Gibbons, 1978; Hawton, 1987). Interpersonal therapy, which is a short-term supportive psychodynamic therapy, entails identifying and helping to resolve interpersonal difficulties, which cause or aggravate psychological distress (Guthrie et al, 2001).



Unfortunately, there are few evidence - based approaches for treating suicidal patients. In our follow up study, we only asked if the participants had received outpatient treatment, and did not penetrate which sort of therapy that they had received. This means that we are unable to know and describe the impact of treatment for our results in the follow-up study.

According to Appleby (2002), the main components of a suicide prevention strategy for psychiatric patients are; reduced access to main methods of suicide, identification of high-risk groups, to whom services ought to give priority, more intensive service activity at times of high risk, specific service measures for relapse prevention, maintenance of prophylactic therapy, and routines for and training in risk assessment.

In Lund, Sweden, we had during 1986 – 2001 a Suicide Research Centre, which had services including a consultation liaison with somatic clinics, an inpatient- and an outpatient facility, as well as a unit for aftermaths of suicide. We developed a structured management for suicidal patients, based on confidence-building measures, knowledge and research (Träskman-Bendz and Sunnqvist, in press 2009). Our management included the main elements described by Appleby (2002), and this might be the reason why our suicide attempters twelve years later had improved their coping capacity, so that they were able to use more adaptive problem solving strategies than before.

According to Michel et al (2002), communication is the key issue in the therapeutic relationship with suicidal patients. In order to establish a good therapeutic relationship, the patients must be encouraged to tell us their story about the suicide attempt. The suicidal process of a patient is very individual. A biography published over a long historical period helps us to understand the circumstances of current events (Lenntorp, 1992). In our opinion, the time geographic life charting procedure is a communication tool between patient and staff. The time geography life chart, in combination with assessment of suicidality and coping capacity, will increase a patient's motivation for a therapeutic intervention.

## **Conclusions**

Both SUAS and SUAS-S seem to be valid and reliable rating scales, and thus important aids in the assessment of suicide risk. The relevance of studying stressful events is apparent from our findings of biological stress markers, reflecting a long term strain. We suggest that the information on positive and negative life events and social capacities, received in the time-geographic life chart, combined with patterns of coping strategies will strengthen the comprehensive picture of the patient's life situation. Therefore, our opinion is that these new methods will serve as useful tools in future suicide prevention.

## **Implications for future research**

A challenge for further research will be to implement our suggestion of three pathways to suicidal behaviour in the assessment of suicide attempters. Furthermore, studies are needed to test our methods in extended materials of persons, who are known to be vulnerable for suicidal behaviour, for example those who suffer from severe and comorbid mood disorders, substance abuse/dependence, criminal offenders, and persons with severe personality disorders.

In future research, we find it important to use our detailed psychiatric examinations in relation to the outcome of various psychiatric treatments and care models, and also in relation to environmental aspects.

Once time-geographic life charting, long term coping assessments, and long term assessments of neurobiological factors have been included in regular psychiatric care and treatment, our knowledge about the suicidal individual will become even more optimal than hitherto.

## **Populärvetenskaplig sammanfattning**

(Summary in Swedish)

I Sverige dör cirka 1200 människor (800 män och 400 kvinnor) varje år i suicid. Uppskattningsvis tio gånger fler gör suicidförsök. Suicid är den vanligaste dödsorsaken bland män i åldrarna 15-44 år och den näst vanligaste dödsorsaken för kvinnor i samma åldersgrupp. De flesta som dör i suicid har haft en psykisk sjukdom, och ungefär 60 % har vårdats inom psykiatri. Många gör ett eller flera suicidförsök, och ungefär 10 % av dem som gjort suicidförsök dör i suicid. Det innebär att 90 % "överlever". Därför är det viktigt för oss som arbetar med suicidnära individer att få en helhetsbild av individernas situation, så att vi kan hjälpa till att förebygga suicidalt beteende så tidigt som möjligt.

Avhandlingens syfte är att få förbättrad kunskap och förståelse om suicidala individers livs- och sjukdomsförlopp. För detta behövs olika utredningsstrategier och metoder. Olika riskfaktorer kan kopplas till suicidalt beteende. Förändrade nivåer av stressmarkörer har betraktats dels som riskfaktor för suicidalt beteende, dels som tecken på biokemisk reaktion på stress. En annan riskfaktor för suicidalt beteende är hur en person hanterar en belastande situation. Därför ville vi studera livshändelser, stressmarkörer och problemlösningstrategier hos patienter som gjort suicidförsök och illustrera deras livshistoria med hjälp av en tidsgeografiskt strukturerad anamnes. Denna markerar både positiva och negativa händelser och kan bidra till att delarna och helheten i en människas liv tydliggörs. Vi har också skapat en självskattningsskala, the Suicide Assessment Scale, SUAS, som ska vara behjälplig i bedömning av suicidrisk.

### **Arbete 1**

En suicidbedömningsskala, The Suicide Assessment Scale (SUAS) har tidigare konstruerats för att användas vid upprepade tillfällen, för att exempelvis fortlöpande utvärdera patienter som eventuellt är suicidala. Tidigare studier har visat att denna intervju skala är behjälplig i bedömning av suicidrisk. Därför är nu en självskattningsskala konstruerad, SUAS-S.

Syftet med det första arbetet är att se om självskattningsskalan är lika användbar som den intervjubaserade varianten, där varje poäng är beskrivet. Båda skalorna är numeriska och innehåller 20 frågor som skattas från 0 till 4 poäng. Frågorna är grupperade utifrån fem områden: påverkan av kroppsliga symtom, problemlösningsförmåga, känslor, suicidtankar och planer. Vi undersökte 64 patienter, varav 42 (21 män och 21 kvinnor) som tidigare hade gjort ett suicidförsök och 22 (9 män och 13 kvinnor) som inte hade gjort ett suicidförsök, men som hade vårdats för samma diagnos och vid samma tidpunkt. Alla fyllde i SUAS självskattningsskala, och alla blev skattade av en erfaren psykiatriker utan att psykiatrikern fick kännedom om självskattningsresultatet. Vi fann att resultatet av SUAS och SUAS-S var jämförbara. Detta gör självskattningsskalan till en enkel och användbar metod i psykiatrin som ett hjälpmedel i bedömningen av suicidrisk för en patient. Fortsatt forskning behövs, och för tillfället håller vi på att utvärdera SUAS-S i en stor psykiatrisk population.

## Arbete II

För nästan hundra år sedan försökte Adolf Meyer ordna predisponerade och utlösande händelser kronologiskt i så kallade Life-charts (livsdiagram) för att kunna se helheten och strukturen under en patients liv. Vi har använt ett tidsgeografiskt livsdiagram, som ursprungligen introducerades av Torsten Hägerstrand. Metoden använder geografin som ankare för att samla information om individen från vitt skilda håll. Syftet med studie II är att beskriva och utvärdera livshistorien hos 11 tidigare vårdade psykiatriska patienter med hjälp av en tidsgeografisk anamnes. Informationen som vi fick från denna anamnes om alla livshändelser, analyserades enligt manifest innehållsanalys. Innehållet reducerades så småningom till fyra kategorier av intresse: flyttningar, social kapacitet, predisponerade händelser och/eller belastande och utlösande händelser. Resultatet visar att den tidsgeografiska anamnesen beskriver en omfattande och strukturerad bild av patientens livshistoria. Patienterna uttryckte sin uppskattning om metoden, som också visade sig vara användbar som kommunikationsverktyg.

### Arbete III

Olika riskfaktorer kan kopplas till suicidalt beteende. Förändrade nivåer av stressmarkörer har dels betraktats som tecken på biokemisk reaktion på stress, dels som riskfaktor för suicidalt beteende. En annan riskfaktor är belastande livshändelser. Syftet med studien är att se om det finns något samband mellan biologiska stressmarkörer och livshändelser hos suicidförsökspatienter. Vi undersökte ursprungligen 102 patienter som gjort suicidförsök genom att göra en lumbalpunktion och låta dem samla urin under tre dygn, innan de fick läkemedel för sin sjukdom. I ryggmärgsvätskan och i urinen mätte vi olika substanser, katekolaminer och kortisol, som utsöndras vid stress. Under en uppföljningsstudie 12 år senare träffade vi 42 av dem igen. Vi intervjuade dem angående belastande händelser som skett under hela livet. Resultatet av denna uppföljningsstudie visar att de som blivit utsatta för sexuella övergrepp under tidig ungdom har höga katekolaminer vid tidpunkten för suicidförsöket. De som upplevt att de har blivit försummade av sina föräldrar under barn och tonår har låga kortisolvärden.

### Arbete IV

Olika faktorer har identifierats som riskfaktorer för suicidalt beteende, och en av dem är hur en person hanterar en belastande händelse, coping. Carver och Scheiers (1989) skattningsskala COPE, som mäter hur man reagerar i svåra situationer, har delats ut till 36 patienter som nyligen gjort suicidförsök och till 38 patienter, som ingick i en uppföljningsstudie 12 år efter ett suicidförsök, samt 20 kontrollpatienter som ej gjort suicidförsök utan matchades för kön, ålder, diagnos och inläggningstillfälle, och dessutom 19 friska kontroller. COPE innehåller 56 olika påståenden, som skattas av individen enligt en Likert skala 0 (stämmer överhuvudtaget inte) till 5 (stämmer väldigt bra). Dessa påståenden kan delas in i fyra huvudgrupper: aktiv, emotionell, förnekande och kognitiv problemlösningsförmåga. Resultatet visar att de som gjort suicidförsök för c:a 12 år sedan och friska kontroller använder sig av mer aktiv problemlösande coping samt kognitiva strategier, jämfört med dem som nyligen gjort suicidförsök och de psykiatriska kontrollerna. De som

nyligen har gjort ett suicidförsök hade högre poäng på förnekande problemlösningsförmåga än de övriga. Det fanns också en könsskillnad i de olika grupperna, förutom hos dem som deltog i uppföljningsstudien 12 år efter ett suicidförsök. Det visade sig att män hade lägre poäng när det gäller att ta hjälp från sin omgivning än kvinnorna. I uppföljningsstudien 12 år efter ett suicidförsök var män och kvinnor lika bra på att be omgivningen om hjälp, vilket kan bero på att en del av behandlingen är att lära dem att ta och be om hjälp, när de mår dåligt.

## Arbete V

Det kan vara svårt att bedöma hur suicid-benägen en person är. I detta arbete försökte vi, i en explorativ studie, undersöka om en tidsgeografisk anamnes i kombination med en översikt av personens coping-mönster och poängen på SUAS-S skalan efter ett suicidförsök kan illustrera vägen till suicidalt beteende, så att vi kan förutspå suicidrisk. I arbetet ingick 23 patienter som nyligen gjort ett suicidförsök. Patienterna fyllde i COPE och SUAS-S, och tidsgeografisk anamnes gjordes. COPE analyserades och därefter gick vi igenom de belastande livshändelserna, som var och en registrerades tillsammans med patienten för att kunna analysera vilken coping-strategi som individen då kan ha använt sig av, och för att på så vis urskilja personens coping-mönster. Enligt dessa mönster, fann vi tre olika grupper: en grupp med låga SUAS-S poäng och som huvudsakligen använde problemlösande-coping strategier, medan den andra gruppen hade medelhöga poäng på SUAS-S och använde både problemlösande och undvikande coping-strategier. Den tredje gruppen hade höga SUAS-S poäng och föredrog undvikande coping-strategier. Den första gruppen avspeglar låg suicidrisk, den andra innebär svårbedömd suicidrisk, och den tredje innebär hög suicidrisk.

Den tidsgeografiska anamnesen (med t.ex. livshändelser och avspeglade sociala förmågor) kombinerad med coping-mönster och poäng på SUAS-S ger en tydlig beskrivning av en persons livshistoria och utgör ett nytt sätt att bedöma en persons risk för suicidalt beteende.

## Slutsats

Avhandlingens syfte är att öka förståelsen för suicidalt beteende genom att finna nya kliniska metoder som kan användas i bedömningen av suicidnära individer. Arbetet har inneburit att få fram en innehållsrik bild av en persons liv och utveckling mot suicidalt beteende genom att använda multidisciplinära metoder som visar alltifrån biokemiska parametrar till psykosociala faktorer och miljöpåverkan.

Det verkar som om biologiska stressmarkörer spelar en stor roll för suicidalt beteende, eftersom avvikande nivåer kunde relateras till belastande händelser. Detta gör sannolikt individen mer sårbar inför framtida påfrestningar. En persons problemlösningsförmåga, coping, har också betydelse för suicidalt beteende dvs. om personen har förmåga att lösa sina problem, eller om personen väljer att undvika att lösa dem. Även skyddande faktorer som socialt nätverk och social förmåga har betydelse. Det verkar som om balansen mellan dessa tre komponenter, dvs biologi, coping och social förmåga är avgörande för om ett suicidförsök kommer att inträffa i anslutning till en belastande händelse. Vi fann tre olika vägar som kunde leda till ett suicidförsök, och där sårbara personer på dessa vägar beskrivs på följande vis:

Den första vägen: Vägen till suicidförsöket har föranletts av en relativ trygg barndom med få belastande händelser genom livet, och där problemlösande coping-strategier har dominerat. En god social förmåga (utbildning, arbete och familj) finns att tillgå och suicidförsöket var utlöst av en svår händelse. En genetisk sårbarhet för psykisk sjukdom kan förekomma hos dessa individer.

Andra vägen: Vägen till suicidförsöket har föranletts av belastande händelser tidigt i livet, där både problemlösande och undvikande coping-förmåga har påverkat besluten. En god social förmåga (utbildning, arbete och familj) finns att tillgå. Suicidförsöket blev utlöst av en besvärlig händelse. Tidigare suicidförsök kan ha förekommit, och dessutom har personen en psykiatrisk sjukdom.

Tredje vägen: Vägen till suicidförsöket har föranletts av svåra belastande händelser under barndom, tonår och vuxenlivet, där övervägande undvikande coping förmåga har använts. Tidigare suicidförsök finns

beskrivna, och det senaste var inte utlöst av någon specifik händelse. Det sociala livet har präglats av en brokig livsföring. Psykiatrisk sjukdom förekommer och dessutom sannolikt en personlighetsstörning, samt hereditet både för psykiatrisk sjukdom och eventuellt suicid.



## References

- American Psychiatric Association (1987) *Diagnostic and Statistic Manual of Mental Disorders*, 3<sup>rd</sup> ed. (Rev.). American Psychiatric Press. Washington, D.C
- American Psychiatric Association (1994) *Diagnostic and Statistic Manual of Mental Disorders*, 4<sup>th</sup> ed.. American Psychiatric Press. Washington, D.C
- Appleby, L. (2002) Prevention of Suicide in Psychiatric Patients. In *Understanding Suicidal Behaviour. The Suicidal Process Approach to Research, Treatment and Prevention*, (Ed. K. Van Heeringen), pp 617-630. JohnWiley & Sons, Chichester
- Apter, A., Plutchick, R., & Van Praag, H.M. ( 1993) Anxiety, impulsivity and depressed mood in relation to suicidal and violent behavior. *Acta Psychiatrica Scandinavica* 87: 1-5
- Arie, M., Apter, A., Orbach, I., Yefet, Y., & Zalzman, G. (2008) Autobiographical memory, interpersonal problem solving, and suicidal behavior in adolescent inpatients. *Comprehensive Psychiatry* 49: 22-9
- Bah, J., Lindström, M., Westberg, L., Mannerås, L., Ryding, E., Henningsson, S., Melke, J., Rosén, I., Träskman-Bendz, L., & Eriksson, E. (2008) Serotonin transporter gene in suicide attempters. *Psychiatry Research* 15: 221-9
- Beck, A T., Davis, J. H., Frederick, C. J., Perlin, S., Pokorny, A. D., Schulman, R. E., Seiden, R. H., & Wittlin, B. J. (1972) Classification and nomenclature. In. *Suicide Prevention in the Seventies*, (Eds H. L. P. Resnik & B. C. Hathorne ), pp 7-12. Government Printing Office, Washington, DC
- Beck, A.T., Weissman, A., Lester, D.,& Trexler, L. (1974a). The measurement of pessimism: The hopelessness Scale. *Journal of Consulting and. Clinical. Psychology*. 42: 861-865
- Beck, A.T., Herman, I., & Schuyler, D. (1974b). Development of suicidal intent scales. In *The Prediction of Suicide*, (Eds.A.T Beck , H.L.P Resnik, D Lettieri ), pp 45-56. Charles Press, Bowie, MD
- Beck AT, Steer RA, Ranieri WF (1988). Scale for Suicide Ideation: psychometric properties of a self-report version. *Journal of Clinical Psychology*, 44, 499-505.

- Berg, B. L. (1998) *Qualitative Research Methods for the Social Sciences*, 3<sup>rd</sup> ed. Allyn & Bacon, Boston
- Berglund, M., & Öjehagen, A. (1998) The influence of alcohol drinking and alcohol use disorders on psychiatric disorders and suicidal behavior. *Alcoholism, Clinical and Experimental Research* 22: 333S-345S
- Bertolote, J.M., Fleischmann, A., De Leo, D., & Wassermann, D. (2003) Suicide and mental disorders. Do we know enough? *British Journal of Psychiatry* 183: 382-383
- Beskow, J. (1979) Suicide and Mental Disorder in Swedish men. *Acta Psychiatrica Scandinavica* suppl 277: 1-138
- Bille-Brahe, U., & Jessen, G. (1994). Repeated suicidal behavior: a two-year follow-up. *Crisis* 15: 77-82
- Björkenstam, C., Edberg, A., Ayoubi, S., & Rosén, M. (2005) Are cancer patients at higher suicide risk than the general population? *Scandinavian Journal of Public Health* 33: 208-14
- Brent, D.A., & Melhem, N. (2008) Familial transmission of suicidal behavior. *Psychiatric Clinics of North America* 31: 157-77
- Brodsky, B.S., Groves, S.A., Oquendo, M.A., Mann, J.J., & Stanley, B. (2006). Interpersonal precipitants and suicide attempts in borderline personality disorder. *Suicide and Life Threatening Behavior* 36: 313-22
- Brodsky, B.S., & Stanley, B. (2008) Adverse childhood experiences and suicidal behavior. *Psychiatric Clinics of North America* 31: 223-35
- Brown, G.K., Ten Have, T., Henriques, G.R., Xie, S.X., Hollander, J.E., & Beck, A.T. (2005) Cognitive therapy for the prevention of suicide attempts: a randomized controlled trial. *Journal of American Medical Association* 294: 563-70
- Brådvik, L., & Berglund, M. (2000) Treatment and suicide in severe depression: a case-control study of antidepressant therapy at last contact before suicide. *The Journal of ECT* 16: 399-408
- Burnard, P. (1996) Teaching the analysis of textual data: an experiential approach. *Nurse Education Today* 16: 278-281
- Bäckman, J., Alling, C., Alsén, M., Regnéll, G., & Träskman-Bendz, L. (2000) Changes of cerebrospinal fluid monoamine metabolites

- during long-term antidepressant treatment. *European Neuropsychopharmacology* 10: 341 – 349
- Carter, G. (2005) Repeated self-poisoning: increasing severity of self-harm as a predictor of subsequent suicide. *The British Journal of Psychiatry* 186: 253-257
- Carver, S., Scheier, M. & Weintraub, J. (1989). Assessing Coping Strategies: A Theoretically Based Approach. *Journal of Personality and Social Psychology*: 56: 267-283
- Carver, C. S. (1997). You want to measure coping but your protocol 's too long: Consider the Brief COPE. *International Journal of Behavioral Medicine*, 4: 92-100
- Caspi, A., Sugden, K., Moffitt, T.E., Taylor, A., Craig, I.E.W, Harrington, H., McClay, J., Mill, J., Martin, J., Braithwaite, A., & Poulton, R. (2003) Influence of life stress on depression: moderation by a polymorphism in the 5-HTT gene. *Science* 301: 386-9
- Cavanagh, J.T.O., Owens, D.G.C., & Johnstone, E.C. (1999) Life events in suicide and undetermined death in south-east Scotland: a case-control study using the method of psychological autopsy. *Social Psychiatry and Psychiatric Epidemiology* 34: 645-650
- Chioqueta, A.P., & Stiles, T.C. (2007) The relationship between psychological buffers, hopelessness, and suicidal ideation: identification of protective factors. *Crisis* 28: 67-73
- Conway, M. A., & Bekerian D. A. (1987) Organization in autobiographical memory. *Memory & Cognition* 15: 119-132
- Conway, M.A., & Pleydell-Pearce, C.W. (2000) The construction of autobiographical memories in the self-memory system. *Psychological Review* 107: 261-88
- Dervic, K., Brent, D.A., & Oquendo, M. (2008) Completed suicide in childhood. *Psychiatric Clinics of North America* 31: 271-91
- Diaconu, D., & Turecki, G. (2009) Family history of suicidal behavior predicts impulsive-aggressive behavior levels in psychiatric outpatients. *Journal of Affective Disorders* 113: 172-8
- Dieserud, G., Roysamb, E., Ekeberg, O. & Kraft, P. (2001) Toward an integrative model of suicide attempt: a cognitive psychological approach. *Suicide and Life Threatening Behavior* 31: 153-68

- Edwards, M.J., & Holden, R.R. (2001) Coping, meaning in life, and suicidal manifestations: examining gender differences. *Journal of Clinical Psychology* 57: 1517-34
- Ehnvall, A., & Ågren, H.(2002) Patterns of sensitisation in the course of affective illness. A life-charting study of treatment-refractory depressed patients. *Journal of Affective Disorders* 70: 67-75
- Epidemiologiskt Centrum, *Patientregistret*, Socialstyrelsen (2008) (Centre for Epidemiology) Stockholm, Sweden
- Epidemiologiskt Centrum, *Patientregistret*, Socialstyrelsen (2002) (Centre for Epidemiology) Stockholm, Sweden
- Eriksson, B.M., Gustafsson, S., Persson, B.A. (1983) Determination of catecholamines in urine by ion-exchange liquid chromatography with electrochemical detection. *Journal of Chromatography* 278: 255-63
- Evans, J., Williams, J.M.G., O'Loughlin, S., & Howells, K (1992) Autobiographical memory and problem-solving strategies of parasuicide patients. *Psychological Medicine* 22: 399-405
- Evans, J., Platts, H., & Liebenau, A. (1996) Impulsiveness and deliberate self-harm: a comparison of "first-timers" and "repeaters". *Acta Psychiatrica Scandinavica* 93: 378-380
- First, MB., Gibbon, M., Spitzer, R.L., Williams, J.B.W., & Benjamin, L.S. (1997) *Structured Clinical Interview for DSM IV Axis I and II Disorders*. APA. Washington, D.C
- Fortune, S., Stewart, A., Yadav, V., & Hawton, K. (2007) Suicide in adolescents: using life charts to understand the suicidal process. *Journal of Affective Disorders* 100: 199-210
- Foster, T., Gillespie, K., & McClelland, R. (1997) Mental disorders and suicide in Northern Ireland. *British Journal of Psychiatry* 170: 447-52
- Gibbons, J.S., Butler, J., Urwin, P., & Gibbons, J.L. (1978) Evaluation of a social work service for self-poisoning patients. *British Journal of Psychiatry* 133: 111-118
- Graneheim, U.H., & Lundman, B. (2004) Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today* 24: 105-112
- Goddard, G.V. (1967) Development of epileptic seizures through brain stimulation at low intensity. *Nature* 214: 1020-1021

- Gunnell, D., Harbord, R., Singleton, N., Jenkins, R., Lewis, G. (2004) Factors influencing the development and amelioration of suicidal thoughts in the general population. Cohort study. *British Journal of Psychiatry* 48: 1060-4
- Guthrie, E., Kapur, N., Mackway-Jones, K., Chew-Graham, C., Moorey, J., Mendel, E., Marino-Francis, F., Sanderson, S., Turpin, C., Boddy, G., & Tomenson, B. (2001) Randomised controlled trial of brief psychological intervention after deliberate self Poisoning. *British Medical Journal* 323: 135-8
- Hagnell, O., & Rorsman, B. (1980) Suicide in the Lundby study: a controlled prospective investigation of stressful life events. *Neuropsychobiology* 6: 319-332
- Handwerk, M.L., Larzelere, R.M., Friman, P.C., & Mitchell, A.M. (1998) The relationship between lethality of attempted suicide and prior suicidal communications in a sample of residential youth. *Journal of Adolescence* 21: 407-14
- Haw, C., Hawton, K., Houston, K., & Townsend, E. (2001) Psychiatric and personality disorders in deliberate self-harm patients. *British Journal of Psychiatry* 178: 48-54
- Hawton, K. (1982) Attempted suicide in children and adolescents. *Journal of Child Psychology and Psychiatry and Allied Disciplines*. 23: 497-503
- Hawton, K., McKeown, S., Day, A., Martin, P., O'Connor, M., & Yule, J. (1987) Evaluation of out-patient counselling compared with general practitioner care following overdoses. *Psychological Medicine* 17: 751-761
- Hawton, K., Fagg, J., Simkin, S., Bale, E., & Bond, A. (2000) Deliberate self-harm in adolescents in Oxford, 1985-1995. *Journal of Adolescence* 23: 47-55
- Hawton, K., & Van Heeringen, K. *The International Handbook of Suicide and Attempted Suicide* (2002). John Wiley & Sons, Chichester
- Hawton, K., Houston, K., Haw, C., Townsend, E., & Harriss, L. (2003) Comorbidity of axis I and axis II disorders in patients who attempted suicide. *The American Journal of Psychiatry* 160: 1494-500
- Hawton, K. *Prevention and Treatment of Suicidal Behaviour. From*

- Science to Practice* (2005) Oxford University Press, Oxford
- Hepple, J., & Quinton, C. (1997) One hundred cases of attempted suicide in the elderly. *British Journal of Psychiatry* 171: 42-46
- Herman, J.P., Prewitt, C.M., & Cullinan, W.E. (1996) Neuronal circuit regulation of the hypothalamo-pituitary-adrenocortical stress axis. *Critical Reviews in Neurobiology* 10: 371-94
- Holmstrand, C., Niméus, A., & Träskman-Bendz, L. (2006) Risk factors of future suicide in suicide attempters--a comparison between suicides and matched survivors. *Nordic Journal of Psychiatry* 60: 162-7
- Houle, J., Mishara, B. L., & Chaqnon, F. (2008) An empirical test of a mediation model of the impact of the traditional male gender role on suicidal behavior in men. *Journal of Affective Disorders* 107: 37-43
- Hägerstrand, T. (1985) *Time-Geography. Focus on the Corporeality of Man, Society and Environment. The Science and Praxis of Complexity.* The United Nations University, Tokyo, pp 193-216
- The International Classification of Diseases: ninth revision (ICD-9) *Annals of Internal Medicine* (1978), 88: 424-426
- Isometsä, E.T., & Lönnqvist, J.K. (1998) Suicide attempts preceding completed suicide. *The British Journal of Psychiatry* 173: 531-5
- Jacobs, D.G. (1999) Depression screening as an intervention against suicide. *Journal of Clinical Psychiatry* 60: 42-5
- Johnsson Fridell, E., Öjehagen, A. & Träskman-Bendz, L. (1996) A 5-year follow-up study of suicide attempts. *Acta Psychiatrica Scandinavica* 93: 151-7
- Joiner, Jr. T.E., & Rudd, D.M. (2000) Intensity and Duration of Suicidal Criss Vary as a Function of Previous Suicide Attempts and Negative Life Events. *Journal of Consulting and Clinical Psychology* 5: 909-916
- Kendler, K.S., Thornton, L.M., & Gardner, C.O. (2000) Stressful Life Events and Previous Episodes in the Etiology of Major Depression in Women: An Evaluation of the "Kindling" Hypothesis. *The American Journal of Psychiatry* 157: 1243-1251
- Kendler, K.S., Kuhn, J.W., Vittum, J., Carol, A.P., & Riley, B. (2005) The Interaction of Stressful Life Events and a Serotonin Transporter Polymorphism in the Prediction of Neuronal circuit regulation of the

- hypothalamo-pituitary-adrenocortical stress axis. Episodes of Major Depression A Replication . *Archives of General Psychiatry* 62: 529-35
- Kjellman, C. (2003) *Ta plats eller få plats?* (Summary in English) Thesis. Lund Institutionen för kulturgeografi och ekonomisk geografi.(Department of Human Geography and Economic Geography). Rapport 92:7
- Knez, I. (2006) Autobiographical memories for places. *Memory* 14: 359-77
- Kraepelin, E. (1921). *Depressive Insanity and Paranoia*. (Eds. E. & S Livingstone), pp 280. Edinburgh.
- Langhinrichsen-Rohling, J., & Lamis, D.A. (2008) Current suicide proneness and past suicidal behavior in adjudicated adolescents. *Suicidal Life and Threatening Behavior* 38: 415-26
- Levenson , M., & Neuringer, C. (1971) Problem-solving behaviour in suicidal adolescents. *Journal of Consulting and Clinical Psychology* 37: 433-436
- Lenntorp, B. (1992) Biografier, diagnoser och prognoser. I *Självmod som existentiellt Problem*, pp 63-76 ( Biographies, diagnoses and prognoses. In: Suicide as an existential- problem). Folksam vetenskapliga råd, forskningsrådsnämnden. (The Scientific Board of Folksam, FRN)
- Lindström, M.B., Ryding, E., Bosson, P., Ahnlide, J.A., Rosén, I., & Träskman-Bendz., L. (2004) Impulsivity related to brain serotonin transporter binding capacity in suicide attempters. *European Neuropsychopharmacology* 14: 295-300
- Linehan, M.M., Camper, P., Chiles, J.A., Strohsahl, K., & Shearin, E. (1987) Interpersonal problem solving and parasuicide. *Cognitive Therapy and Research* 11: 1-12
- Linehan, M.M., Armstrong, H.E., Suarez, A., Allmon, D., Heard, H.L (1991) Cognitive-behavioral treatment of chronically parasuicidal borderline patients. *Archives of General Psychiatry* 48: 1060-4
- Linehan, M.M., Tutek, D.A., Heard, H.L., & Armstrong, H.E. (1994) Interpersonal outcome of cognitive behavioral treatment for chronically suicidal borderline patients. *The American Journal of Psychiatry* 151: 1771-6

- Livianos-Aldana, L., & Rojo-Moreno, L. (2006) Life-Chart Methodology: a long past and a short history. *Bipolar Disorders* 8: 200-2
- Mann, J.J. (1998) The neurobiology of suicide. *Nature Medicine* 4: 25-30
- Mann, J.J., Bortinger, J., Oquendo, M.A., Currier, D., Li, S., & Brent, D.A. (2005) Family disorders. *The American Journal of Psychiatry* 162: 1672-9
- Mann, J.J., Apte, A., Bertolote, J., Beautrais, A., Currier, D., Haas, A., Hegerl, U., Lonnqvist, J., Malone, K., Marusic, A., Mehlum, L., Patton, Phillips, M., Rutz, W., Rihmer, Z., Schmidtke, A., Shaffer, D., Silverman, M., Takahashi, Y., Varnik, A., Wasserman, D., Yip, P., & Hendin, H. (2005) Suicide prevention strategies: a systematic review. *Journal of American Medical Association* 294: 2064-74
- Magne-Ingvar, U., & Öjehagen. (1999b) Significant others of suicide attempters: their views at the time of the acute psychiatric consultation. *Social Psychiatry and Psychiatric Epidemiology* 34: 73-9
- Malone, K.M., Oquendo, M.A., Haas, G.L., Ellis, S.P., Li, S., & Mann, J.J. (2000) Protective factors against suicidal acts in major depression: reasons for living. *The American Journal of Psychiatry* 157: 1084-8
- Maris, R.W. (1992) The relationship of non-fatal suicide attempts to completed suicide. In *Assessment and Prediction of Suicide*. (Eds. R.W. Maris, A.L. Berman, J.T. Maltsberger & R.I. Yufit). Guilford, New York
- McEwen, B. (1995a) Adrenal steroid actions on brain. Dissecting the fine line between protection and damage In *Neurobiological and Clinical Consequences of Stress: From Normal Adaptation to PTSD*. (Eds. M. Friedman, D. Charney, A. Deutch) pp 140-143. Lippincott Raven, Philadelphia
- McEwen, B.S. (1995b): Stressful experience, brain, and emotions: Developmental, genetic, and hormonal influences. In *The Cognitive Neurosciences*. (Ed M.S. Gazzaniga), pp 117-135. The MIT Press. Cambridge, MA
- McEwen BS (2000) Allostasis and Allostatic Load: Implications for Neuropsychopharmacology. *Neuropsychopharmacology* 22: 109-124
- McLaughlin, C. (1999) An exploration of psychiatric nurses' and patients' opinions regarding in-patient care for suicidal patients. *Journal of*



*Advance Nursing* 29: 1042-51

- McLeavey, B.C., Daly, R.J., Myrray, C.M., O'Riordan, J., & Talor, M. (1987) Interperonal problem-solving deficits in self-poisoning patients. *Suicide and Life Threatening Behavior* 17: 33-49
- Meyer, A. (1948). The life-chart. In: *The Commonsense Psychiatry of Dr Adolf Meyer*. McGraw-Hill, New York, pp.418-422
- Michel, K., & Valach, L. (2000) Suicide prevention and primary care. In *Understanding Suicidal Behaviour. The Suicidal Process Approach to Research, Treatment and Prevention*. (Ed K Van Heeringen). pp 230-254 Wiley & Sons, Chichester
- Michel, K., Maltsberger, J.T., Jobes, D.A., Leenaars, A.A., Orbach, I., Stadler, K., Dey, P., Young, R.A., & Valach, L. (2002) Discovering the truth in attempted suicide. *American Journal of Psychotherapeutic* 56: 424-37
- Montgomery, S.A., & Asberg, M. (1979) A new depression scale designed to be sensitive to change. *British Journal of Psychiatry* 134: 382-9
- Mortensen, P.B., Agerbo, E., Erikson, T., Qin, P., & Westergaard-Nielsen, N. (2000) Psychiatric illness and risk factors for suicide in Denmark. *Lancet* 1: 9-12
- The Swedish National Board of Health and Welfare (2003)
- Neuringer, C. (1976). Current developments in the study of suicidal thinking. In *Suicidology: Contemporary Developments*. (Ed. E.S. Schneidman), Grune & Stratton. New York
- Niméus, A., Träskman-Bendz, L., & Alsén, M. (1997) Hopelessness and suicidal behaviour. *Journal of Affective Disorders* 42: 137-144
- Niméus, A., Alsén, M., & Träskman-Bendz, L. (2000) The suicide assessment scale: an instrument assessing suicide risk of suicide attempters. *European Psychiatry* 15: 416-23
- Niméus, A. (2000) Suicide Attempters- Drug Overdose Patterns and Ratings of Sucidality. Thesis. Lund: Department of Clinical Neuroscience. Division of Psychiatry
- Niméus, A., Alsén, M., & Träskman-Bendz, L. (2002) Do high suicide intent scores indicate future suicide? *Archives of Suicide Research* 6: 211-220
- Niméus, A., Hjalmarsson Ståhlfors, F., Sunnqvist, C., Stanley, B., &

- Träskman-Bendz, L. (2006) Evaluation of a modified interview version and of a self-rating version of the Suicide Assessment Scale. *European Psychiatry* 21: 471-7
- Nordentoft, M., Breum, L., Munck, L.K., Nordestgaard, A.G., Hunding, A., Laursen., & Bjaeldager, P.A. (1993) High mortality by natural and unnatural causes: a 10 year follow-up of patients admitted to a poisoning treatment centre after suicide attempts. *British Medical Journal* 306: 1637-1641
- Nordström, P., Samuelsson, M., & Åsberg, M. (1995) Survival analysis of suicide risk after attempted suicide. *Acta Psychiatrica Scandinavica* 91: 336-40
- Nordentoft, M., Branner, J., Drejer, K., Mejsholm, B., Hansen, H., & Petersson, B. (2005) Effect of a Suicide Prevention Centre for young people with suicidal behaviour in Copenhagen. *European Psychiatry* 20: 121-128
- Orbach, I., Bar-Joseph, H., & Dror, N. (1990) Styles of problem solving in suicidal individuals. *Suicide and Life Threatening Behavior* 20: 56-64
- Pagura, J., Cox, B.J., Sareen, J., & Enns, M.W. (2008) Factors associated with multiple versus single episode suicide attempts in the 1990-1992 and 2001-2003 United States national comorbidity surveys. *Journal of Mental and Nervous Disease* 196: 806-13
- Paykel, E.S. (1983) Methodological aspects of life events research. *Journal of Psychosomatic Research* 27: 341-352
- Patterson, W.M., Dohn, H.H., Bird, J., & Patterson, G.A. (1983) Evaluation of suicidal patients: the SAD PERSONS scale. *Psychosomatics* 24: 348-9
- Pettit, J.W., Joiner, T.E. Jr., & Rudd, M.D. (2004) Kindling and behavioral sensitization: are they relevant to recurrent suicide attempts? *Journal of Affective Disorders* 83: 249-52
- Polit, D.F and Hungler, B.P (1995) *Nursing Research Principles and Methods*. 5<sup>th</sup> ed. Lippincott Company. Philadelphia/New York
- Pollock, L.R., & Williams, J.M.G. (1998) Problem solving and in suicidal behaviour. *Suicide and Life Threatening Behavior* 28: 375-387
- Pollock, L.R., & Williams, J.M.G. (2001) Effective problem solving in suicide attempters depends on specific autobiographical recall. *Suicide*

- and Life Threatening Behavior* 31: 386-96
- Pollock, L.R., & Williams, J.M.G. (2004) Problem-solving in suicide attempters. *Psychological Medicine* 34: 163-7
- Post, R.M. (1992) Transduction of psychosocial stress into the neurobiology of recurrent affective disorder. *The American Journal of Psychiatry* 149: 999-1010
- Pompili, M., Rihmer, Z., Akiskal, H.S., Innamorati, M., Iliceto, P., Akiskal, K.K., Lester, D., Narciso, V., Ferracuti, S., Tatarelli, R., De Pisa, E., & Girardi, P. (2008) Temperament and personality dimensions in suicidal and nonsuicidal psychiatric inpatients. *Psychopathology* 41: 313-21
- Qin, P., & Mortensen, P.B. (2003) The impact of parental status on the risk of completed suicide. *Archives of General Psychiatry* 60: 797-802
- Ramberg, I-R. (2003) *Promoting suicide prevention. An evaluation of a programme for training trainers in psychiatric clinical work.* Department of Public Health Sciences. Karolinska Institute. Stockholm, Sweden.
- Ringel, E. (1976) The presuicidal syndrome. *Suicidal Life and Threatening Behavior* 6: 131-149
- Roy, A., & Linnoila, M. (1988) Suicidal behavior, impulsiveness and serotonin *Acta Psychiatrica Scandinavica* 78: 539-35
- Roy, A. (2004) Family history of suicidal behavior and earlier onset of suicidal behavior. *Psychiatry Research* 15: 217-9
- Roy, A. (2006) Family history of suicide and impulsivity. *Archives of Suicide Research* 10: 347-52
- Roy-Byrne, P., Post, R., Uhde, T. et al., (1985) The longitudinal course of recurrent affective illness: life chart data from research patients at the NIMH. *Acta Psychiatrica Scandinavica* 71: 1-34
- Runeson, B.S., Beskow, J., & Waern, M. (1996) The suicidal process in suicides among young people. *Acta Psychiatrica Scandinavica* 93: 35-42
- Rudd, M.D., Rajab, M.H., & Dahm, P.F. (1994) Problem-solving appraisal in suicide ideators and attempters. *The American Journal of Orthopsychiatry* 64: 136-49
- Rygnestad, TK. (1982) Prospective study of social and psychiatric aspects

- in self poisoned patients. *Acta Psychiatrica Scandinavica* 66: 139-53
- Rygnestad, TK. (1997) Mortality after deliberate self-poisoning-a prospective follow-up study of 587 persons observed for 5, 279 person-years : risk factors and causes of death. *Social Psychiatry and Psychiatric Epidemiology* 32: 443-450
- Sakinofsky, I., Leenaars, A.A. (1997) Suicide in Canada with special reference to the difference between Canada and the United States. *Suicide and Life Threatening behaviour* 27: 112-26
- Salkovskis, P.M., Atha, C., & Storer, D. (1990) Cognitive-behavioural problem solving in the treatment of patients who repeatedly attempt suicide. A controlled trial. *British Journal of Psychiatry* 157: 871-6
- Schalling, D. (1978) Psychopathy-related personality variables and the psychophysiology of socialization.. In *Psychopathic Behavior. Approaches to Rresearch* (Eds. R.D Hare, R.D & D. Schalling) pp 85-106. John Wiley & Sons, Chichester
- Schalling, D., Asberg, M., Edman, G., & Oreland, L. (1987) Markers for vulnerability to psychopathology: Temperament traits associated with platelet MAO activity. *Acta Psychiatrica Scandinavica* 76: 172-182
- Schalling, D. (1993) Neurochemical correlates of personality, impulsivity and disinhibitory suicidality. In: *Mental disorder and crime*. (Ed. S. Hodgkins,) pp 208-226. Sage Publications. New York
- Schotte, D.E., & Clum, G.A. (1982) Suicide ideation in a college population. A test of a model. *Journal of Consulting and Clinical Psychology* 50: 690-696
- Schotte, D.E., & Clum, G.A. (1987) Problem-solving skills in suicidal psychiatric patients. *Journal of Consulting and Clinical Psychology* 55: 49-54
- Selye, H. *The physiology and pathology of exposure to stress*. (1950) Acta inc. Montreal.
- Skogman, K., Alsén, M., & Öjehagen, A. (2004) Sex differences in risk factors for suicide after attempted suicide-a follow-up study of 1052 suicide attempters. *Social Psychiatry and Psychiatric Epidemiology* 39: 113-20
- Soloff, P.H., Lis, J.A., Kelly, T., Cornelius, J., & Ulrich, R. (1994) Risk factors for suicidal behaviour in borderline personality disorder. *The*

- American journal of Psychiatry* 151: 1316-1323
- Stanley, B., Träskman-Bendz, L., Stanley, M. (1986) The Suicide Assessment Scale: a scale evaluating change in suicidal behaviour. *Psychopharmacology Bulletin* 22: 200-5
- Stenager, E., & Stenager, E. (2008) Suicidal behaviour and somatic disorders. *Ugeskrift for Laeger* 11: 517-22
- Sullivan, A.M., Barron, C.T., Bezmen, J., Rivera, J., & Zapata-Vega, M. (2005) The safe preventive approach. *The Psychiatric Quarterly* 76: 67-83
- Swahn, C.G., Sandgarde, B., Wiesel, F.A., & Sedvall, G. (1976) Simultaneous determination of three major monoamine metabolites in brain tissue and body fluids by a mass fragmentographic method. *Psychopharmacology* 48: 147-152
- Thompson, C. (1989) Descriptive dimensions of rating scales. In *Instruments of psychiatric research*. (Ed. C Thompson). John Wiley & Sons, Ltd. Chichester
- Träskman, L., Tybring, G., Åsberg, M., Bertilsson, L., Lantto, O., & Schalling, D. (1980) Cortisol in the CSF of Depressed and Suicidal Patients. *Archives of General Psychiatry* 37: 761-767
- Träskman, L., Åsberg, M., Bertilsson, L., & Sjöstrand, L. (1981) Monoamine metabolites in CSF and suicidal behavior. *Archives of General Psychiatry* 38: 631-6
- Träskman-Bendz, L., & Sunnqvist, C. (2009) Care of suicide attempters in a specialized inpatient unit. Advantages and disadvantages. *In press* In: Oxford handbook of Suicidology. Eds Wasserman D & Wasserman C. Oxford: University Press
- Van Heeringen, K. (2001) *Understanding Suicidal Behaviour. The Suicidal Process Approach to Research, Treatment and Prevention.*: John Wiley & Sons Ltd. Chichester
- Van Heeringen, C., Jannes, S., Buylaert, W., Henderick, H., De Bacquer, D., & Remoortel, J. (1995) The management of non-compliance with referral to out-patient after-care among attempted suicide patients: a controlled intervention study. *Psychological Medicine* 25: 963-70
- Waern, M., Rubenowitx, E., Runeson, B., Skoog, I., Wilhelmson, K., & Allebeck, P. (2002) Burden of illness and suicide in elderly people:

- case-control study. *British Medical Journal* 8: 324(7350), 1355
- Waern, M., Sjöström, N., Marlow, T., & Hetta, J. (2009) Does the Suicide Assessment Scale predict risk of repetition? A prospective study of suicide attempters at a hospital emergency department *In Manuscript*
- Wasserman, D., Tran Thi Thanh, H., Pham Thi Minh, D., Goldstein, M., Ward, M.F., Wender, P.M., & Reimherr, F.W (1993) The Wender Utah Rating Scale: An Aid in the Retrospective Diagnosis of Childhood Attention Deficit Hyperactivity Disorder. *The American Journal of Psychiatry* 150: 885-890
- Nordenskiöld, A., & Wasserman, C. (2008). Suicidal process, suicidal communication and psychosocial situation of young suicide attempters in a rural Vietnamese community. *World Psychiatry* 7: 47-53
- Westrin, Å., Ekman, R., & Träskman-Bendz, L. (1999) Alterations of corticotropin releasing hormone (CRH) and neuropeptide Y (NPY) plasma levels in mood disorder patients with a recent suicide attempt. *European Neuropsychopharmacology* 9: 205-11
- Williams, J.M.G. (1996) Depression and the specificity of autobiographical memory. In *Remembering Our Past-Studies in Autobiographical Memory* (Ed D-C: Rubin) Cambridge University Press. Cambridge
- Williams, J.M.G. (1997) *Cry of Pain: Understanding Suicide and Self-harm*. Harmondsworth: Penguin
- Williams, J.M.G., & Pollock, L.R. (2001) Psychological aspects of the suicidal process. In *Understanding Suicidal Behaviour. The Suicidal Process, Approach to Research, Treatment and Prevention*. (Ed K.Van Heeringen). Wiley & Sons, Ltd. Chichester
- Wilson, K.G., Stelzer, J., Bergman, J.N., Kral, M.J., Inayatullah, M., & Elliott, C.A. (1995) Problem solving, stress and coping in adolescent suicide attempts. *Suicide and Life Threatening Behavior* 25: 241-252
- World Health Organization (WHO). Available at:<http://www.who.int/en/>
- Wyder, M., & De Leo, D. (2007) Behind impulsive suicide attempts: indications from a community study. *Journal of Affective Disorder* 104: 167-73
- Ystgaard, M., Hestetun, I., Loeb, M., & Mehlum, L. (2004) Is there a specific relationship between childhood sexual and physical abuse and

- repeated suicidal behavior? *Child Abuse and Neglect* 28: 863-75
- Öjehagen, A., Regnéll, G., Träskman-Bendz, L. (1991) Deliberate self-poisoning: repeaters and nonrepeaters admitted to an intensive care unit. *Acta Psychiatrica Scandinavica* 84: 266-271
- Öjehagen, A., Danielsson, M., Träskman-Bendz, L. (1992) Deliberate self-poisoning: treatment follow-up of repeaters and nonrepeaters. *Acta Psychiatrica Scandinavica* 85: 370-375

## Acknowledgements

First, I wish to express my gratitude to all patients and healthy controls, who have participated in studies, resulting in this thesis.

During my work as a research nurse I got inspired by the scientific field, and thanks to my supervisor, Professor Lil Träskman Bendz, I had the opportunity to produce this thesis! I am so grateful for your excellent guidance, your patience, humour, knowledge in linguistic matters, and for endless support. I have had the honour to work with you for many years by now, and I am so fascinated of your enormous enthusiasm, warm personality, your great knowledge in suicidology. You have always encouraged me and lots of others in their work.

I am also grateful to my co-supervisor Professor Emeritus Bo Lenntorp for inspiring me in the work of time geography, as well as your excellent support, guidance and sometimes different, but clarifying advice. I also want to express me gratitude to Dr Åsa Westrin my co -supervisor for your enthusiasm, fun and warm personality, and endless support.

A very important person for me during my work has been Ulla Persson. Thank you for helping me with so many things, for example literature searching, linguistic matters, and support in reading manuscripts. You have always been there for me; now you have retired and I miss you so much!

Thanks also to Professor Agneta Öjehagen and her “gang”, for encouragement and support during the years. A special hug to Dr Anders Niméus, and to Dr Mats Lindström, both of you for support, encouragement and friendship.

I want to thank Dr med sci Lena Brundin and *Dr.med sci to become*, Sofie Westling. I have enjoyed being your research nurse, and I am looking forward to more exiting discoveries.



I want to thank all people at the research department for an enjoyable and inspiring environment; Margot Alsén, our former research nurse who was involved in many of our projects, and who introduced me to research nursing, my substitute Kristina Streijffert, HannaBritt Franzén, and PhD students; Gunnar Gustafsson, Daniel Lindqvist, Fredrik Vang and others.

Also, I want to put forward a special thanks to the staff of the Psychiatric ER for announcement of the research projects, as well as the staff members at the wards, especially ward 31, 1C and 32.

Finally, I would like to thank my friends and my family who have supported me in so many ways; my mother and father for love and compassion, my siblings Titti, Mia, Anders and Martin, and your families, for love and funny adventures. Bob and Lena for being there for my parents.

Thanks to my parents in law, Thord and Inga, for support and help with all our dogs when we are abroad.

Last but not least, my own lovely family! My lovely children Fredrika and John, as well as my stepchildren Michael and Jennifer, for always bringing me back to reality and making everything worthwhile, and to Lars for your love, support and patience with me for *all* our years together!

This thesis was supported by grants from the Swedish Research Council, ALF, Skåne county, the faculty of medicine, and the Ellen and Henrik Sjöbring foundation.

**Work procedure**

Geographic moves

Review of geographic moves.  
Have we received the right  
information?  
The reasons for moving?  
Something more to add or  
correct?

Social events

Review of social events.  
Have we received the right  
information?  
Something more to add or  
correct?

Stressful events

Review of stressful events.  
Have we received the right  
information?  
Something more to add or  
correct?

The life-chart with social–  
and stressful events

How does it feel now that we  
have discussed these events?  
A specific event of importance?  
What is your opinion of the  
time-geographic life chart and  
this procedure?  
Something more to add?