Caesarean section on maternal request
Personality, fear of childbirth and signs of depression among first-time mothers

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“Medicine is the most scientific of the humanities and the most human of the sciences”

E.D. Pellegrino
Abstract

Aim
The overall aim of this thesis was to study healthy first-time mothers requesting and undergoing an elective caesarean section (CS) and to compare these to healthy first-time mothers planning a vaginal delivery. The focus was socio-demographic factors, personality, depression, expectations and experience of birth.

Sample
The cohort consisted in total of 558 healthy first-time mothers. Participants were recruited to the trial in late pregnancy and divided into three different groups; women requesting CS in the absence of medical or obstetrical indication, women having an elective CS on indication breech presentation and women planning a vaginal delivery. The focus in this thesis has mainly been to compare two of the groups, namely women requesting a CS and women planning a vaginal birth.

Method
The participants completed four different self-assessment questionnaires. At inclusion, they received the first questionnaires concerning socio-demographic background, self-estimated health and family planning, and a personality inventory, Karolinska Scales of Personality (KSP) and a questionnaire revealing their expectancies on the forthcoming delivery, Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ). At two days postpartum, they were given a questionnaire concerning initiation of breastfeeding, self-estimation of pain and experience of the delivery. At three months after birth, they received a posted questionnaire concerning breastfeeding, sexual life, experience of birth (W-DEQ) and a questionnaire measuring signs of depression, Edinburgh Postnatal Depression Scale (EPDS). At nine months after birth, they received the last questionnaires concerning breastfeeding, sexual life, birth experience, health and the personality inventory (KSP).

Results
A significant difference in age was found between the CS and the vaginal group (mean age 33.9 yrs vs. 30.8). Analysis of personality traits showed that the subscales Monotony Avoidance and Socialization differed between women requesting CS and women planning a vaginal delivery. It was found that both groups increased their Impulsivity scores and women in CS group lowered their Detachment scores from late pregnancy to nine months after birth. Women requesting CS experienced their health as poorer compared to women planning a vaginal birth and were more often planning for one child only. They often reported anxiety for lack of support during labour, for loss of control and concern for fetal injury/death. At three months after birth they were breastfeeding to a lesser extent than women planning a vaginal delivery. There were no differences in signs of postpartum depression between the groups three months after birth. Mothers requesting a CS had more negative expectancies of a vaginal delivery and 43% in this group showed a clinically significant fear of delivery.

Conclusion
Women requesting a CS in the absence of obstetric/medical indication differ in several aspects from those who plan a vaginal delivery. This finding highlights the need for an individual response to a request for CS where obstetricians very carefully weigh and balance outcomes in different ways. For any decision, factors such as age, family plans for the future, psychological factors and medical risks both in CS and in planned vaginal delivery must be considered.

Keywords: Caesarean section on maternal request, personality, childbirth anxiety, depression.
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II. Wiklund I, Edman G, Larsson C, Andolf E. Changes in personality from late pregnancy to three months after birth. Submitted.


LIST OF ABBREVIATIONS

Abbreviations

BMI	Body Mass Index
CS	Caesarean Section
Cohort study	An observational study that takes a group (cohort) of patients and follows their progress over time in order to measure outcomes such as disease or, mortality rates or lifestyle
DSM-III-R	Diagnostic and Statistical Manual of Mental Disorders
EMC	Emergency Caesarean Section
EPDS	Edinburgh Postnatal Depression Scale
gws	Completed gestational weeks
IVF	In-vitro fertilisation
KSP	Karolinska Scales of Personality
W-DEQ	Wijma Delivery Expectancy/Experience Scale

 Definitions

“Maternal request”, “caesarean section on demand”, “patient choice” and “caesarean section without obstetric or medical indication” is in the thesis used synonymous as an expression for women requesting an elective caesarean section in the absence of obstetric/medical indication.

A personality profile is a set up of different personality traits that determine a person’s characteristic behaviour, temperament, attitudes and ways of reacting. Trait is a stable part of the personality in contrast to state which is more temporary condition.
INTRODUCTION

Giving birth is a significant event in people’s lives. Women and men often refer to the births of their children both in their thoughts and in discussions for many years after. For many women about to give birth for the first time, the event appears to be unfamiliar, uncontrollable and intimidating. The wish to avoid a vaginal delivery has during the last ten years resulted in an increased group of women approaching midwives and obstetricians to ask for an elective CS. Healthcare personnel, midwives and particularly obstetricians sometimes have difficulties meeting these demands. They might have medical concerns about the negative effects of CS, having previously experienced severe complications after multiple surgical entries into the abdomen. Traditionally CS has also been associated with a higher maternal mortality and morbidity rate, both short and long term, and with neonatal respiratory distress [1] [2].

Lately attitudes among healthcare personnel have been changing. A growing awareness of consumer preferences amongst obstetricians and midwives could play an important role [3]. A significant proportion of obstetricians in the USA (46 percent) would favour a CS for themselves, or for their partners, in an uncomplicated pregnancy [4]. Advances in medical care have made CS delivery safer than it was 15 years ago [1]. At the same time vaginal birth has been linked to adverse outcomes such as pelvic floor injury and rising rates of emergency CS. The situation is complicated by the lack of relevant studies on short- and long term adverse effects after elective caesarean section on healthy women in comparison with vaginal delivery. The elements for evidence based decision making about the most appropriate way of delivery and support for women requesting an elective CS are lacking.

During the last 30 years the rate of CS in Sweden has risen from 6 percent in 1974 to 17 percent in 2004 [5]. Women requesting CS without a specific medical indication have been a particular group of interest. CS performed on maternal request in the absence of a medical indication is a focus of considerable attention both for clinical and ethical reasons and specific reasons for the request should be evaluated [6]. Concerns about the increasing rates of CS have led to discussions about possible causes behind this phenomenon. However, evaluation of factors associated with the increased CS rates has been carried out in several countries. These studies have demonstrated that some of the differences in CS rates observed can be explained by changes in demographic characteristics of the childbearing population. When women are delaying childbirth and having fewer children the average age of women giving birth will increase and also the proportion of primiparae, thus increasing the caesarean section rate [1]. Limited evidence suggests that caesarean delivery on maternal request is increasing [1, 7].

The present thesis contributes to the field of knowledge concerning first-time mothers requesting a CS, in that it aims to describe reasons/factors behind a request for CS in the absence of an obstetrical indication.
Caesarean delivery in history

“It has been three days and three nights now since the labour begun, and I am at the end of my feeble strength. Nothing in my life has prepared me for this agony. Not all the prayers, processions and intercessions can help me, for I am beyond help. There is just me and the pain. I have forgotten why I am here. I know only that if I scream loudly enough, someone will have to take the pain away. Once I heard the hastily summoned physicians whispering asking the king if they should save mother or child. Even then, I was beyond caring for all I had heard one of them suggesting that the infant should be cut from my body.” The year is 1537 and Jean Seymour the third wife of Henry VIII is about to give birth to her first child. Edward VI was safely delivered but his mother died 12 days after birth due to puerperal infection [8].

The caesarean delivery, a rescue and sometimes a shortcut to life has a short history. Not long ago women died during obstructed labour and complicated births with the unborn child left in the uterus. One of the earliest stories of performance of CS is from 1411 when a German midwife is claimed to have performed seven CS where both the mother and child survived [9]. The first reported CS in Sweden was performed in 1758 by an obstetrician, Schützer. The mother, a woman described as a dwarf died three days after birth in puerperal infection. The child, a girl survived [10]. In total there are reports of 13 CS performed in Sweden 1758-1875, all women died [11]. Other methods than CS were developed in obstructed labour such as forceps delivery, embryotomy, craniotomy and symfysiotomy. In a Swedish textbook for midwifery education published in 1873, the possibilities to perform a CS were not mentioned. The author Professor Cederschiöld, states that “if there has been no progress in labour for 10-12 hours the midwife has to call the doctor and the woman in labour has to be delivered with forceps or other appropriate method” [12].

One of the reasons for the high mortality in history was that the surgery was performed on exhausted women who had been in labour for many days. They died due to puerperal infection, bleeding, postoperative ileus as well as eclampsia [11]. When knowledge about aseptic technique came during the middle of 1800, this reduced septic maternal mortality by 25-fold in lying-in hospitals and by 2.7-fold in rural home deliveries [13].

During the time 1926-1930 the CS rate in Sweden was 0.25 % and the mortality rate 9.5 %. Mortality rate decreased during the beginning of 1950 to 0.5 % [14]. From 1951-1980 CS rates increased from 1.7 % to 11 %. In connection with this 103 maternal deaths were reported. Half of the deaths were attributed to the surgical procedure [14]. Still during the 1970’s the mortality rate was 9-12 times higher than a vaginal delivery [15] [16].
Caesarean delivery today

CS rates are progressively rising in many parts of the world. The CS rate in Sweden has increased 60 % from 1990-2001 and the CS rate in Stockholm was 19 % of all deliveries in 2003 (Fig 1). Increased age among childbearing women and increased BMI is one of the explanations for this as well as fetal indication and previous CS [17]. Breech presentation has become an indication for CS. CS performed on maternal request in the absence of an obstetric indication also probably contributes to this increase. Since serious complications during childbirth cannot always be predicted, many CS are unanticipated. In Sweden about 60 % of the abdominal deliveries are carried out as emergency CS. [5] Emergency CS is associated with a greater risk of complications both during surgery and postpartum period compared to elective CS.

Still today the morbidity of caesarean delivery is higher than during a planned vaginal delivery. In a recently published big population-based cohort study carried out in Canada researchers found that healthy women undergoing a primary caesarean delivery for breech presentation had a higher risk for severe maternal morbidity compared to women with planned vaginal delivery. Overall rates of severe morbidity were 27.3 and 9.0 respectively, per 1000 deliveries. The planned CS group had increased risk for cardiac arrest, hysterectomy, major puerperal infection, anaesthetic complications, venous thromboembolism and haemorrhage requiring hysterectomy [18].

In Sweden there are nearly 100 000 deliveries annually. Today maternal mortality during delivery in Sweden is very low. The register of causes of deaths in Sweden 1989-2004 report 1-7 deaths per year in complications during pregnancy, birth and postpartum period [19]. During the last 30 years the focus therefore has changed towards perinatal mortality which in Sweden 2003 was 5.0 per 1000 birth in 2003 [5].

From a psychological perspective emergency CS is found to have significant adverse psychological effects. Fisher and co-workers found that significant adverse psychological effects were associated with the mode of delivery and those who had spontaneous vaginal deliveries were most likely to experience a marked improvement in mood and an elevation in self-esteem across the late pregnancy to early postpartum interval. In contrast, women submitted to CS were significantly more likely to experience deterioration in mood and self-esteem [20].

Fig. 1. Caesarean Section rate in Sweden and Stockholm
Caesarean delivery on maternal request

“Patient choice caesarean”, “maternal request of CS”, and “caesarean on demand” all refer to primary elective CS in the absence of an obstetric or medical indication. International estimates of caesarean delivery on maternal request range from 4 – 18 percent of all caesarean deliveries; however there is little confidence in the validity of this estimate [1].

Known reasons for requesting CS and factors contributing to the request are; age above 35 years, a history of elective or emergency CS, a previous negative birth experience, a complicated pregnancy and fear of giving birth. A relationship has also been seen between socioeconomic factors such as unemployment, smoking and immigrant status [21] [22] [23]. Low education and low income has also been connected with a high rate of request for CS [21]. This group of women has also been shown to have more antenatal depressive symptoms [23]. Nevertheless there is insufficient understanding as to why women may request a CS in the absence of obstetric indication. If these women have different life styles, expectations of pregnancy and birth and personality need to be explored.

Fear of childbirth

To experience anxiety and fear in certain situations are normal reactions and can save our lives. Fear of snakes, heights and darkness could even be innate and have a protective function from an evolutionary perspective. A natural selection might have favoured those of our ancestors who learned to fear dangerous objects or situations and to start mechanisms such as fight, flight, freeze or faint [24]. Childbirth fear however, can hardly be considered as a fear benefiting evolution. The delivery itself may be associated with other types of fear such as fear of pain, of losing control and dying and the protective mechanisms could be the same [25]. It is also reasonable to believe that fear of childbirth can have its origin in the cultural or social transmission over generations. Thus the fear is more a product of cultural heritage and socialization [26].

Fear and anxiety are a natural part of life but for some people anxiety is so strong that it interferes with their everyday life. A pregnant woman’s expectation of the forthcoming delivery might be relevant for both her experience and behaviour during the delivery.

Fear of childbirth is a continuous variable since a person is more or less afraid of the event. Some researchers have however tried to estimate the percentage of women suffering from childbirth fear. In a recently published study from Sweden, approximately 10 percent of the pregnant women were found to suffer from fear of childbirth [23]. In the same study fear of childbirth in combination with counselling were shown to increase the rate of elective CS three to six times, but not with higher rates of emergency caesarean, nor with a negative birth experience. Fear without treatment has been shown to have a negative impact on the subsequent birth experience [23]. In earlier studies an association between fear of childbirth and a risk of subsequent emergency CS has been reported [27]. The discrepancy in results between studies may
be related to the definition of “fear of childbirth”, different research design and
different use of measures or research instruments.

A woman’s ability to cope and adjust to motherhood responsibilities and bond with
a newborn child could be affected by the mode of delivery (whether vaginal or CS) and
also by unrealistic expectations. Faced with the challenges of birth some women may
feel a loss of control. It has been documented that the expectation of being in control
during the delivery (both self-control and control over what was done) is positively
associated with a higher satisfaction with the delivery [28].

It is natural/normal to be afraid of giving birth, but if fear of childbirth is enough as
an explanation for abstaining from vaginal delivery needs to be studied. Whether there
is a difference in the perceived fear of childbirth between first-time mothers undergoing
elective CS on request and other mothers needs to be explored. Also whether the
delivery itself influences the development of fear of childbirth is of interest to study.

Personality and mode of delivery

A personality profile is a set up of different personality traits that determine a person’s
characteristic behaviour, temperament, attitudes and ways of reacting. Trait is a stable
part of the personality in contrast to state which is more a temporary condition.

The role of the individual, important others (i.e. parents, teachers, siblings), and the
larger environment (family norms, cultural and social norms) most certainly play a part
in the development of self and identity. It has been suggested that personality
dispositions are strong predictors for subjective well-being [29] For example
specifically individuals high in extraversion and low in neuroticism tend to see events
and situations in a more positive light, are less responsive to negative feedback, and
tend to discount opportunities that are no longer available to them [29]. Whether
personality is consistent over time and context or if there are certain events in life that
could change personality traits has been discussed. Expecting the first child may be
described as a transition. Transition implies process and change of fundamental life
patterns [30] Factors that affect positive transitions are subjective well-being, role-
mastery, and the well-being of relationships [31]. From this perspective it would be of
interest also to study if personality changes from pregnancy to motherhood.

Several factors such as depression, anxiety, perceived and desired support of family
members, friends and medical staff probably affect self determination, thoughts about
giving birth and request for an elective CS. It has been described that personality traits
appear to influence not only well-being but also occupational interests and choices in
life [32]. Whether a difference in personality influences a woman’s wishes for an
elective CS, expectations of childbirth and motherhood has to our knowledge not been
studied. Since personality may affect how counselling and support should be
performed, this lack of evidence-based knowledge on women requesting CS is a
substantial problem.
Depression during pregnancy and postpartum is an important health problem, affecting mother and child interaction. Important risk factors for postnatal depression have been reported to be a history of psychopathology, psychological disturbance during pregnancy, poor marital relationship, poor social support and stressful life events [33]. Other risk factors found are low self-esteem, child-care stress, single marital status, unplanned or unwanted pregnancy and infant temperament [34]. In a Swedish study it was found that unemployment, lack of support and physical health problems were risk factors for postpartum depressive symptoms [35]. Several researchers have found that antenatal depression is as common as postnatal depression [36] [37]. Prevalence rates of depressive symptoms in early pregnancy of 14 percent have been reported from a Swedish study [37]. However, the observed prevalence of depression during the third trimester of pregnancy varies among studies ranging from 6 - 24 percent according to Research Diagnostic Criteria (RCD) and 29 percent according to DSM-III-R. With self-screening questionnaires there is a range between 4 -38 percent in different studies [38].

Research of postnatal depression shows a prevalence rate of approximately 10-15 percent [38] [39]. The exact prevalence depends on the criteria used for detection [40]. The first symptom usually appears between the fourth and sixth week postpartum [39]. In a Swedish study the point prevalence of depression using a threshold of 11/12 on the Edinburgh Postnatal Depression Scale (EPDS), was 12 percent at 8 weeks and 8 percent at 12 weeks postpartum [41].

It has been described that traumatic experiences during birth can be associated with postnatal depression and post traumatic stress [42]. Addressing trauma may improve patients’ confidence in staff, self-rated health and trauma-related symptoms [43]. An association between complications during pregnancy and depression has been described [44, 45]. No differences concerning outcome of delivery, puerperium and neonatal health were seen in the group of depressed mothers, but they were found to have a high risk for postpartum depressive symptoms.

In a metaanalysis examining the link between CS and postpartum depression no connection between CS and postpartum depression was found [46]. Although there is a broad range of studies where CS has been found to be both a significant risk factor for postpartum depression and to be protective against it[46] and a number of possible explanations exist for these diverse findings. Methodological weakness in different studies, cultural differences in the study population and organization of the care provided during pregnancy, labour and postpartum as well as the indication for CS could affect the results.

If women requesting elective CS are depressed and/or have a greater risk for postpartum depression compared to other women has not, to our knowledge, been studied.

The rationale for the study

Several studies have been published recently where delivery with CS has been in focus. In spite of the medical societies’ negative approach to the increasing CS rates in general
and elective CS on maternal request in particular, the understanding for the reason of the development is lacking. Few studies have focused on psychological aspects of the request for CS and to our knowledge no study has investigated the relation between personality and a wish for elective CS. Whether there is a difference in the perceived fear of childbirth between first-time mothers undergoing elective CS on request and other mothers also needs to be explored.

Since psychological aspects may affect how counselling and support should be performed, this lack of evidence-based knowledge on women requesting CS is a substantial problem.
**AIM**

The overall aim of this thesis was to study healthy first-time mothers with normal pregnancies requesting elective caesarean section in the absence of obstetrical indication. The focus of the project was personality, self-estimated health, breastfeeding, fear of delivery and postpartum depression. Comparisons are made with healthy primiparae planning a vaginal birth. The specific aims of the studies were:

- to compare personality traits in women requesting CS with those who plan a vaginal delivery. The aim was also to study differences between the groups in age, perceived health, and place of birth, IVF-treatment and family size planning. 
  (Paper I).

- to describe changes in personality traits from late pregnancy to motherhood in healthy first-time mothers and to investigate if changes in personality differ between mothers requesting a CS and other women. The aim was also to investigate if personality traits differ amongst women who plan a vaginal delivery but end up needing an emergency caesarean section 
  (Paper II).

- to investigate first-time mothers undergoing caesarean section in the absence of medical indication, their reason for the request, self-estimated health, experience of delivery and duration of breastfeeding. We also aimed to study if signs of depression postpartum are more common in this group 
  (Paper III).

- to study expectancies and experiences of delivery in women undergoing a caesarean section (CS) on maternal request and compare these to women undergoing CS on indication breech presentation and women who intended vaginal delivery (control group). A second aim was to study if assisted delivery and emergency CS in the control group affected birth experience. 
  (Paper IV).
STUDY DESIGN AND METHODS

The Caesarean Section trial was designed as a cohort study where both physiological and psychological aspects, as well as women’s experience of care provided during birth, were studied (Fig. 1). The study was carried out between January 2003 and June 2005. In total, five hundred and forty five healthy women with normal pregnancies were enrolled in the trial. Women who agreed to participate in the study answered questionnaires in late pregnancy, two days after delivery, three and nine months after birth. In a protocol their medical records were studied and medical outcomes were documented. In this thesis psychological results from this trial will be presented.

<table>
<thead>
<tr>
<th>Time</th>
<th>CS group</th>
<th>Vaginal group</th>
<th>Response rate n</th>
<th>Drop out</th>
</tr>
</thead>
<tbody>
<tr>
<td>At inclusion</td>
<td>CS on request n=105</td>
<td>Planned vaginal delivery n=292</td>
<td>n=545</td>
<td></td>
</tr>
<tr>
<td>37-39 gws</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Late pregnancy</td>
<td>Questionnaire • Predelivery questionnaire • W-DEQ • KSP (n=207)</td>
<td>Questionnaire • Predelivery questionnaire • W-DEQ • KSP (n=242)</td>
<td>n=447</td>
<td>82%</td>
</tr>
<tr>
<td>(gws 37-39)</td>
<td></td>
<td></td>
<td>n=98</td>
<td>18%</td>
</tr>
<tr>
<td>Birth</td>
<td>Study group (n=232)</td>
<td>Control group Vaginal delivery (n=204)</td>
<td>n=474</td>
<td>87%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control group EMC* (n=36)</td>
<td>n=71</td>
<td>13%</td>
</tr>
<tr>
<td>Day 2</td>
<td>Delivery questionnaire Medical outcome (n=224)</td>
<td>Delivery questionnaire Medical outcome (n=204)</td>
<td>n=496</td>
<td>91%</td>
</tr>
<tr>
<td>Three months</td>
<td>Postpartum questionnaire EPDS W-DEQ (n=232)</td>
<td>Postpartum questionnaire EPDS W-DEQ (n=32)</td>
<td>n=467</td>
<td>85%</td>
</tr>
<tr>
<td>Nine months</td>
<td>Postpartum questionnaire KPS (n=209)</td>
<td>Postpartum questionnaire KPS (n=32)</td>
<td>n=78</td>
<td>15%</td>
</tr>
</tbody>
</table>

*EMC=Emergency Caesarean Section

Fig. 1 Design of the trial
Samples

The hospital where this study was conducted is situated in the northern part of Stockholm and has two labour wards with a total of 8,500 deliveries per year. During the study period there were a total of 20,082 births. CS rate in the hospital including both primiparae and multiparae was 19%. Elective CS was conducted in 10% of all deliveries. The total numbers of CS at the hospital during the study period on indication “maternal request” were 204.

Pregnant women scheduled for elective CS were recruited. Indications for CS were breech positions and maternal request. Women were included in the study from gestational week 37-39. For every woman scheduled for an elective CS one to two controls from the same antenatal clinic, planning a vaginal birth were consecutively invited to participate. Exclusion criteria were a BMI over 30, psychiatric illness and complications during pregnancy. The aim was to recruit a representative sample of women. However, non-Swedish speaking women had to be excluded since questionnaires were only available in Swedish.

Data were assessed under naturalistic conditions. Drop outs are presented in Fig 1. There is a considerable drop out from inclusion to completion of the first questionnaire. Reasons for not completing the questionnaires in late pregnancy were: lack of time before birth, giving birth earlier than planned or giving birth at another hospital. In one third of the cases reasons for drop out are not known.

Data collection

Data were collected by means of four different questionnaires: in late pregnancy, two days after delivery, three and nine months after delivery.

In late pregnancy the respondents received one questionnaire concerning socio-demographic background such as age, place of birth, native language, education and a global question regarding perceived health and infertility, a questionnaire screening for childbirth anxiety, Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ A) and a personality trait questionnaire, Karolinska Scales of Personality (KSP). The questionnaires were posted to the participants after the research team had received the woman’s consent. The women were instructed to fill it in at home as soon as possible (Fig 1).

On day two the participants were given a postpartum questionnaire where they estimated their pain during delivery, their birth experience and breastfeeding initiation. Data concerning medical outcome were collected from the records.

At three months after birth the participants received a posted questionnaire concerning breastfeeding, sexual life after birth and a new estimation of birth experience as well as a screening instrument for postnatal depression (EPDS) and an instrument measuring childbirth experience (W-DEQ B). If the questionnaires were not returned within three weeks, a reminder was sent.

Nine months after birth they received the same questionnaire concerning personality traits as in late pregnancy and a global questionnaire regarding
breastfeeding, sexual life and family planning. The same procedure concerning reminders was used for all questionnaires at three and nine months.

Instruments

KSP
The Karolinska Scales of Personality (KSP) consist of 135 items with 4-point Likert response scale [47, 48]. The items are sorted into 15 personality variables: Somatic Anxiety (bodily signs of heightened anxiety such as restlessness and tachycardia); Muscular Tension (muscular tenseness and aches, difficulties in relaxing); Psychic Anxiety (worrying and low self-confidence); Psychasthenia (low degree of mental energy and stress susceptible); Inhibition of Aggression (low assertiveness); Impulsivity (tendency to act on impulse); Monotony Avoidance (experience-seeking behaviour); Detachment (no need for close relationships); Socialisation (relation with the respondent and his/her parents and other significant others during childhood); Social Desirability (conforming to social rules); Indirect Aggression (e.g. slamming doors); Irritability (being easily annoyed, quick to anger); Verbal Aggression (e.g. shouting, quarrelling, cursing); Suspicion (distrustfulness, projecting hostility to others); and Guilt (feeling of remorse and shame). The scales can be classified into three main groups:

1. The Anxiety proneness scales, which consists of five different subscales: the Somatic Anxiety scale, the Muscular tension scale, the Psychic Anxiety scale, the Psychasthenia scale and the Inhibition of Aggression scale.
2. The Extraversion scales, which consists of: the Impulsiveness scale, Monotony avoidance scale, Detachment scale, Socialization scale and the Social Desirability scale.
3. Aggression-Hostility scales, which consists of: Indirect Aggression scale, Irritability scale, Verbal Aggression scale, Suspicion scale, and Guilt scale.

The subscales are transformed into T scores (mean 50 and SD 10) and are standardised with regard to age and sex on the basis of a normal control group. The scales measure personality traits which have shown high test-rest stability over a period of 9-10 years [49, 50]. It has been used in a study of personality changes during pregnancy [51].

W-DEQ
At inclusion in the study the respondents received the first questionnaire with the instruction to rate their personal feelings and cognitions when thinking about a vaginal delivery on a six point Lickert scale with the end points “not at all… and extremely…”. The instrument used for this purpose was Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ A) an instrument measuring degree of fear of childbirth or negative expectations of delivery. At three months after birth they received W-DEQ B which measures degree of negative childbirth experience [52]. W-DEQ has been found to have a high reliability as an instrument measuring childbirth fear [52]Version W-DEQ A and B used before and after childbirth has 33
items each with a scoring range of 0-5. The minimum score is 0 and the maximum score is 165. The questionnaires are developed to measure construct of fear related to childbirth during pregnancy and after delivery by asking the woman about her expectations before (version A) and experience after delivery (version B). In questionnaire B measuring experience after birth, we used a modified version with 20 items suitable even for women who had a CS [53]. The minimum score on the 20 items version is 0, and the maximum is 100. The higher the score, the greater the fear of childbirth manifested. A cut of score above 85, indicates clinically significant fear of childbirth.

**EPDS**
The Edinburgh Postnatal Depression Scale (EPDS) is a 10-item self-rating scale that was designed to screen a broad population for postnatal depression [54, 55]. The scale covers common symptoms during depression; it excludes somatic dimensions such as fatigue and appetite variations, which are normal during ante- and postnatal periods. Each item is scored on a 4-point scale (0 to 3), with a minimum total score of 0 and maximum of 30. A cut-off point of 12.5 screened accurate for major postpartum depression in the original paper. EPDS has been validated postnatally and the recommended cut off score for major depression (DSM-III-R) is 11 or 12[56]. The scale has previously been used in a Swedish study on postpartum depression [37]

**The different papers**

In **Paper I** personality, related to the mode of delivery among healthy primiparae was studied. Three hundred and twenty-eight pregnant women from two different groups, “CS on maternal request” (n 84), and “vaginal delivery group” (n=242) completed the self report inventory KSP at 37-39 gestational weeks in pregnancy. The main outcome measures were scores from KSP in late pregnancy.  

In **Paper II** differences over time in personality among healthy primiparae (n=314), within and between different groups were scrutinised; personality trait data both from late pregnancy and nine months after birth are reported. Three hundred and fourteen pregnant women from two different groups, “CS on maternal request” (n=74) and “vaginal delivery group” (n=240) completed the self report inventory KSP at 37-39 gestational weeks in pregnancy and nine months after delivery. The main outcome measures were scores from the KSP. Differences between women due to the mode of delivery were also studied.

In **Paper III** reasons for the request of caesarean section, self-estimated health, expectations, experience of birth and signs of depression among 357 first-time mothers from two different groups, “caesarean section on maternal request” (n= 91) and “controls planning a vaginal delivery” (n= 266) were studied. Symptom scores from Edinburgh postnatal depression scale (EPDS) at three months after birth were also investigated.
In Paper IV fear of childbirth in first time mothers were studied (n=496). Comparisons were made between; “CS on maternal request” “CS due to breech presentation” and “controls planning a vaginal delivery”.

The instrument used was the W-DEQ A and B. The participants completed the W-DEQ revealing their expectations prior to delivery (A) and experiences at three months after birth (B).

Statistics

Overviews of statistical tests used in the thesis are presented in table one (Table 1, page 20).

In Papers I and II standard descriptive statistics (e.g. mean, standard deviation, and range) were used to summarize the variables. The distributions of the personality variables were checked for severe deviations from normality. No skewed distributions were found. Group differences in age were analyzed with a Student’s t-test. Since there was a significant difference in age, covariance analyses were conducted with age as covariate. For categorical data the $\chi^2$-test was used. A significance level of five percent was applied (two-tailed). The number of subjects included (n= 326 or n=2*127 as the group sizes were unbalanced) allowed us to detect a small to medium effect size (ES= 0.38) [57] between the groups at the 5 % level (two-tailed) with a power of 0.85 (Paper II).

In Paper III continuous data, differences between the groups were tested by z-test. For nominal and categorical variables, the $\chi^2$-test (Fisher’s exact test when the expected frequency in one cell was less than 5) was used. The mean score on the EPDS three months post partum was calculated for each group. The samples were split according to a criterion of 12. These subgroups were compared.

In Paper IV W-DEQ before the delivery (“expectancies”), the groups were compared in the 33 items version, namely mothers who expected a vaginal delivery; mothers with an elective CS on request, and mothers with an elective CS due to breech presentation. In the analysis of experiences after delivery, the groups were compared in the 20 items version. Five groups were compared: mothers who had a spontaneous vaginal delivery; mothers who expected a vaginal delivery but had an emergency CS; mothers who expected a vaginal delivery but had an assisted vaginal delivery; mothers with an elective CS on request, and mothers with an elective CS due to breech presentation. All variables were summarized using standard descriptive statistics, e.g. frequencies, means and standard deviations. Differences between groups in expectancies on and experiences of the delivery were analyzed by one-way analysis of variance with post-hoc test using Tukey HSD correction. Relationships between expectancies and experiences were expressed as Pearson’s product-moment correlation coefficients. The significance level was 5 percent (two-tailed) in all analyses.

A principal component analysis with Varimax rotation of the 33 items version of W-DEQ was performed. In accordance with Johnson and Slade [58], a four factor solution was chosen. Four items with the highest factor loadings (i.e. correlations) in each factor were entered into an item analysis. Thus, the latent variables derived from the factor analysis were replaced by a manifest item, representing the factor. In the item
analyses, differences in the scores were analysed with non-parametric Kruskal-Wallis (five groups) or Mann-Whitney U test (two groups).

Table 1. Statistical tests used in the four papers.

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Statistical test</th>
<th>Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive statistic</td>
<td>Frequency, mean, standard deviation, range</td>
<td>I, II, III &amp; IV</td>
</tr>
<tr>
<td>Test the difference in proportions in 2+ independent groups</td>
<td>Chi-square-test and Fisher’s exact test</td>
<td>I, II, III</td>
</tr>
<tr>
<td>Test the difference between two independent groups mean</td>
<td>Student’s t-test</td>
<td>I, II, III</td>
</tr>
<tr>
<td>Test the difference among the means of 3+ independent groups</td>
<td>ANOVA Post-hoc test Tukey HSD correction</td>
<td>IV</td>
</tr>
<tr>
<td>Test the relationship between two variables</td>
<td>Pearson’s product moment correlation</td>
<td>IV</td>
</tr>
<tr>
<td>Determine the dimensionality and the structure of a set of variables</td>
<td>A principal component analysis with Varimax rotation</td>
<td>IV</td>
</tr>
<tr>
<td>Test differences in ranks of scores of two independent groups</td>
<td>Mann-Whitney U-test</td>
<td>IV</td>
</tr>
<tr>
<td>Test the difference in ranks of scores of 3+ independent groups</td>
<td>Kruskal-Wallis test</td>
<td>IV</td>
</tr>
<tr>
<td>Covariance</td>
<td>ANCOVA Analysis of covariance</td>
<td>I, III</td>
</tr>
</tbody>
</table>

Ethical consideration

The studies were approved by the Regional Research and Ethics Committee at Karolinska Institutet, Sweden (Dnr 02-301, 03-408). Informed consent was obtained from all participants.
RESULTS

Characteristics of the participants

A significant difference in age was found between the caesarean and the vaginal group (mean age 33.9 yrs vs. 30.8, p< 0.001; Table 2). Forty-one percent of the caesarean group was older than 35 years as compared to 11 percent in the vaginal group. Significantly fewer women in the CS group planned to have more than one child (34 % vs. 74 %, p<0.001). When women older than 35 years were excluded from calculations, differences between the groups still remained (p<0.001).

The number of women born outside Sweden was significantly higher in the CS group (19.7 % vs. 9.3 % of the vaginal group, p<0.0135). Fewer women in the CS group perceived that they were healthy (84.8 % vs. 98.3 %, p<0.001) reporting depression, agony, anorexia, back pain, rheumatoid arthritis and asthma.

Table 2. Socioeconomic and obstetric characteristics of the respondents in paper I.

<table>
<thead>
<tr>
<th></th>
<th>Caesarean (%=86)</th>
<th>Vaginal (%=242)</th>
<th>t-test/ X²</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean)</td>
<td>33.9</td>
<td>30.8</td>
<td>6.22</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Weight (mean)</td>
<td>65.7</td>
<td>64.3</td>
<td>1.045</td>
<td>0.307</td>
</tr>
<tr>
<td>Native Swedes</td>
<td>69</td>
<td>220</td>
<td>6.09</td>
<td>0.013</td>
</tr>
<tr>
<td>Planning another child</td>
<td>29</td>
<td>179</td>
<td>47.745</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>IVF</td>
<td>9</td>
<td>8</td>
<td>5.456</td>
<td>0.019</td>
</tr>
<tr>
<td>Perceived good health</td>
<td>73</td>
<td>238</td>
<td>21.663</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Smoking</td>
<td>8/81</td>
<td>15/222</td>
<td>0.783</td>
<td>0.376</td>
</tr>
<tr>
<td>University education</td>
<td>62</td>
<td>176</td>
<td>0.001</td>
<td>0.972</td>
</tr>
</tbody>
</table>

Personality and mode of delivery
(Paper I and II)

All means of the personality variables were within normal range (Table 3, page 22). Women in the CS group scored significantly higher in Monotony Avoidance (avoiding monotony situations) [p= 0.003] and lower in Socialization (relations to important others) [p= 0.002]. Thirty-seven percent of the women in the caesarean group scored above 1 SD of the mean of the norm group, i.e. they belonged to the 16 percent of the population most sensitive for monotony, as compared to 17 percent in the vaginal group. In the Socialization scale, 18 percent of the women in the caesarean group scored lower than 40, i.e. less than 1 SD outside the normal range. The corresponding proportion of the vaginal group was seven percent.
Table 3. Mean T scores corrected for the effect of age in the personality variables of Karolinska Scales of Personality in healthy primiparas with vaginal or caesarean delivery.

<table>
<thead>
<tr>
<th>Anxietyproneness scales</th>
<th>Vaginal (n= 242)</th>
<th>Caesarean (n= 86)</th>
<th>Analysis of covariance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M*</td>
<td>SD</td>
<td>M*</td>
</tr>
<tr>
<td>Somatic anxiety</td>
<td>45.9</td>
<td>8.15</td>
<td>45.7</td>
</tr>
<tr>
<td>Muscular tension</td>
<td>47.6</td>
<td>9.68</td>
<td>48.2</td>
</tr>
<tr>
<td>Psychic anxiety</td>
<td>45.4</td>
<td>10.08</td>
<td>47.0</td>
</tr>
<tr>
<td>Psychasthenia</td>
<td>44.1</td>
<td>11.64</td>
<td>45.7</td>
</tr>
<tr>
<td>Inhibition of aggression</td>
<td>47.3</td>
<td>10.02</td>
<td>46.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extraversion scales</th>
<th>Vaginal (n= 242)</th>
<th>Caesarean (n= 86)</th>
<th>Analysis of covariance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M*</td>
<td>SD</td>
<td>M*</td>
</tr>
<tr>
<td>Impulsivity</td>
<td>47.6</td>
<td>9.02</td>
<td>48.9</td>
</tr>
<tr>
<td>Monotony avoidance</td>
<td>51.5</td>
<td>8.76</td>
<td>54.9</td>
</tr>
<tr>
<td>Detachment</td>
<td>45.0</td>
<td>9.21</td>
<td>46.6</td>
</tr>
<tr>
<td>Socialization</td>
<td>53.8</td>
<td>9.04</td>
<td>50.0</td>
</tr>
<tr>
<td>Social desirability</td>
<td>49.0</td>
<td>8.46</td>
<td>49.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Aggression-Hostility scales</th>
<th>Vaginal (n= 242)</th>
<th>Caesarean (n= 86)</th>
<th>Analysis of covariance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M*</td>
<td>SD</td>
<td>M*</td>
</tr>
<tr>
<td>Indirect aggression</td>
<td>50.4</td>
<td>10.28</td>
<td>49.9</td>
</tr>
<tr>
<td>Verbal aggression</td>
<td>46.7</td>
<td>8.91</td>
<td>46.4</td>
</tr>
<tr>
<td>Irritation</td>
<td>47.5</td>
<td>8.92</td>
<td>47.0</td>
</tr>
<tr>
<td>Suspicion</td>
<td>48.0</td>
<td>9.50</td>
<td>50.3</td>
</tr>
<tr>
<td>Guilt</td>
<td>45.1</td>
<td>9.41</td>
<td>46.4</td>
</tr>
</tbody>
</table>

* The subscales are transformed into T scores (mean 50 and SD 10) and are standardized with regard to age and sex on the basis of random selected group

There were no significant differences in any of the other personality variables. Thus, women in both the caesarean and the vaginal group scored lower in the anxiety-proneness variables, the detachment variable, and most of the aggression hostility scales (Fig. 2, page 23).
Fig. 2 Comparison in personality traits between the groups in late pregnancy

Changes in personality from late pregnancy to early motherhood (Paper II)

Comparison between women delivering their child vaginally or by caesarean section on maternal request

Descriptive statistics for all personality variables in two groups are presented in Table 4, page 27). All means were within normal range, i.e., a T-score between 40 and 60. Although women in both groups scored within normal range they scored low in Anxiety, Impulsivity, and Detachment and in Guilt compared to population mean. Nevertheless, there were some moderate significant changes over time and significant differences between the groups. Thus, two personality variables were significantly changed from late pregnancy to nine months after delivery. Both groups increased their Impulsivity scores (acting on impulse) \( p = 0.019 \); and lowered their Socialization scores (relation to important others) \( p = 0.047 \). Although there was no significant general change in the other scales, the changes over time were significantly different in the Psychic Anxiety scale \( p = 0.014 \) and the Guilt scale \( p = 0.011 \). The women in the
vaginal group increased their scores in both the *Psychic Anxiety* scale and the *Guilt* scale, while women of the CS group decreased their scores, i.e. became less anxious and had feelings of less guilt nine months after birth compared to late pregnancy (Fig 3a and b).

Generally, the women in the CS group had higher scores in the *Monotony Avoidance* scale [p= 0.037] and the *Suspicion* scale [p= 0.037], and lower scores in the *Socialization* scale [p= 0.001].

**Vaginal Delivery**

![Bar chart showing deviations from a normal T score of 50](chart.png)

**Fig. 3a** Comparisons in control group between late pregnancy and nine months after birth
Comparison between women in the vaginal group who had an emergency caesarean section and those who had a vaginal delivery according to their intention

Twenty-nine women (12%) in the vaginal group underwent an emergency caesarean section. The women in this group were approximately two years older than those with a vaginal delivery [p = 0.008]. Twenty-three percent of the women with an emergency CS were 35 years or older.

There were no significant differences in the changes over time in personality between the two groups. Their pattern followed what is described above. However, there were some significant differences in the personality profiles. Thus, although within normal range, the patients with an emergency CS were higher in Psychasthenia [p = 0.046] and higher in Monotony Avoidance [p = 0.017].
Table 4. Means (M) and standard deviations (SD) of personality variables from the KSP in two groups of first-time mothers delivered by a vaginal delivery or by caesarean section (CS) on demand. The Ms and SDs are correlated for differences in age.

<table>
<thead>
<tr>
<th>Personality scale</th>
<th>Vaginal Delivery</th>
<th>Caesarean Section On Demand</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre 9 m post</td>
<td>Pre 9 m post</td>
<td>Group Time</td>
</tr>
<tr>
<td></td>
<td>M    SD</td>
<td>M    SD</td>
<td>p  p</td>
</tr>
<tr>
<td>Somatic anxiety</td>
<td>45.6  8.09</td>
<td>47.4  8.42</td>
<td>0.151 0.443</td>
</tr>
<tr>
<td>Muscular tension</td>
<td>47.1  9.44</td>
<td>48.7  9.82</td>
<td>0.393 0.141</td>
</tr>
<tr>
<td>Psychic anxiety</td>
<td>45.2 10.15</td>
<td>47.6 10.49</td>
<td>0.316 0.225</td>
</tr>
<tr>
<td>Psychasthenia</td>
<td>43.3 11.58</td>
<td>46.6 12.06</td>
<td>0.117 0.244</td>
</tr>
<tr>
<td>Inhibition of aggression</td>
<td>46.9 10.19</td>
<td>46.8 10.59</td>
<td>0.875 0.794</td>
</tr>
<tr>
<td>Impulsivity</td>
<td>47.8  8.68</td>
<td>47.8  9.02</td>
<td>0.529 0.019</td>
</tr>
<tr>
<td>Monotony avoidance</td>
<td>51.9  8.60</td>
<td>54.5  8.95</td>
<td>0.037 0.507</td>
</tr>
<tr>
<td>Detachment</td>
<td>45.3  9.33</td>
<td>46.3  9.70</td>
<td>0.874 0.007</td>
</tr>
<tr>
<td>Socialization</td>
<td>54.3  9.10</td>
<td>49.5  9.47</td>
<td>0.001 0.047</td>
</tr>
<tr>
<td>Social desirability</td>
<td>49.3  8.26</td>
<td>49.1  8.59</td>
<td>0.594 0.646</td>
</tr>
<tr>
<td>Indirect aggression</td>
<td>50.1 10.12</td>
<td>49.6 10.54</td>
<td>0.498 0.370</td>
</tr>
<tr>
<td>Verbal aggression</td>
<td>46.4  8.80</td>
<td>46.2  9.16</td>
<td>0.817 0.559</td>
</tr>
<tr>
<td>Irritation</td>
<td>46.8  8.70</td>
<td>47.6  9.04</td>
<td>0.410 0.177</td>
</tr>
<tr>
<td>Suspicion</td>
<td>47.7  9.74</td>
<td>50.7 10.13</td>
<td>0.037 0.522</td>
</tr>
<tr>
<td>Guilt</td>
<td>44.6  9.38</td>
<td>46.0  9.74</td>
<td>0.908 0.638</td>
</tr>
</tbody>
</table>
Reasons for the request, self-estimated health, birth experience and signs of depression
(Paper III)

Socio-demographic background
Women requesting a CS were more often borne outside Sweden (p= 0.003) and they were both in late pregnancy and at three months after birth more often planning for having only one child (p< 0.001). Proportion of women with university education did not differ between the groups (p= 0.608). Fewer women in the CS group participated in parenthood education during pregnancy compared to women planning a vaginal birth (p< 0.001; Table 5).

Reasons for the request
In 70 of 91 medical records the motivation for the request of CS was noted. In some records more than one reason was registered. Tocophobia was common (n= 45, 64 %). In 20 cases (28 %) anxiety for the health of their unborn child and/or their own life was mentioned. Heredity for complicated births among female relatives was the reason in 14 cases (20 %). In 13 cases (18 %) fear of pain during a vaginal delivery and in eight records (11 %) a history of sexual violence was mentioned. Eight patients (11 %) considered themselves depressed. Seven patients (10 %) mentioned anxiety for emergency CS as a reason. In the questionnaires where all women in the cohort (both cases and controls) answered an open question about their anticipations thinking of a vaginal forthcoming delivery, 32 % mentioned pelvic floor injuries as a major concern. In 16 % of the answers concerns about lack of support from the staff were mentioned and 7 % expressed fear of an emergency CS.

Table 5
Socio-demographic background, reproductive health and parenthood education

<table>
<thead>
<tr>
<th></th>
<th>Vaginal (n=266)</th>
<th>Caesarean on request (n=91)</th>
<th>%</th>
<th>t-test/ X²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean)</td>
<td>30.4</td>
<td>33.0</td>
<td>22.125</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Native Swedes</td>
<td>240</td>
<td>89</td>
<td>66</td>
<td>78</td>
<td>8.691</td>
</tr>
<tr>
<td>University education</td>
<td>190</td>
<td>71</td>
<td>58</td>
<td>68</td>
<td>0.263</td>
</tr>
<tr>
<td>Smoking</td>
<td>16/224</td>
<td>7</td>
<td>12/81</td>
<td>9</td>
<td>7.835</td>
</tr>
<tr>
<td>IVF</td>
<td>9</td>
<td>3.3</td>
<td>11</td>
<td>13</td>
<td>8.691</td>
</tr>
<tr>
<td>Planned pregnancy</td>
<td>239</td>
<td>90</td>
<td>67</td>
<td>79</td>
<td>6.193</td>
</tr>
<tr>
<td>Parenthood education</td>
<td>251</td>
<td>85</td>
<td>57</td>
<td>67</td>
<td>38.072</td>
</tr>
<tr>
<td>Perceived good health</td>
<td>259</td>
<td>98</td>
<td>73</td>
<td>85</td>
<td>24.196</td>
</tr>
</tbody>
</table>
In the self assessment questionnaire women requesting a CS to a larger extent reported anxiety for pain during birth (p< 0.001), anxiety for lack of support from the staff during birth (p< 0.001), for loss of control (p< 0.001) and worries for gynaecological examinations (p< 0.001). They also reported concern for fetal injury/death (p< 0.001) and anxiety for their own life (p< 0.001; Table 6, page 30). The CS group considered their health as poorer compared to women planning a vaginal birth (p< 0.001; Table 5).

**Birth experience and confidence in the staff**
The CS group reported higher confidence in the obstetrician than the vaginal group [p= 0.031]. There were no significant differences between the groups considering confidence in the midwife (p= 0.069). Two days after delivery women requesting and undergoing an elective CS had a better birth experience than women in the vaginal group (means= 8.3 vs. 6.7; p< 0.001). Three months after birth this difference persisted (means= 8.1 vs. 6.6; p= 0.002; Table 7).

**Breastfeeding**
There were no significant differences in experience of initiation of breastfeeding between the groups two days postpartum. Three months after birth women in CS group were breastfeeding to a lesser extent compared to women planning a vaginal birth (79 % vs. 93 %; p< 0.001; Table 7).
Table 6.
Apprehensions *in late pregnancy* when thinking about vaginal delivery

<table>
<thead>
<tr>
<th></th>
<th>Vaginal (n=266)</th>
<th>%</th>
<th>Caesarean (n=91)</th>
<th>%</th>
<th>t-test/ $X^2$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety for pain during birth</td>
<td>107</td>
<td>40</td>
<td>61</td>
<td>68</td>
<td>20.484</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Anxiety for being referred from chosen hospital at onset of labour</td>
<td>20</td>
<td>7</td>
<td>22</td>
<td>24</td>
<td>18.638</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Anxiety for lack of support from the staff during birth</td>
<td>28</td>
<td>10</td>
<td>37</td>
<td>41</td>
<td>42.148</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Anxiety for loss of control</td>
<td>92</td>
<td>35</td>
<td>57</td>
<td>63</td>
<td>21.940</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Anxiety for gynaecologic examinations</td>
<td>22</td>
<td>8.3</td>
<td>24</td>
<td>26</td>
<td>19.662</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Anxiety for the health of the unborn child</td>
<td>109</td>
<td>41</td>
<td>64</td>
<td>71</td>
<td>24.444</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Fear of dying/being injured during labour</td>
<td>10</td>
<td>3.8</td>
<td>25</td>
<td>28</td>
<td>43.153</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

**Sexuality**
No differences between the groups in sexuality three months after birth were found (p= 0.106; Table 7, page 32).

**Family planning**
Both in late pregnancy and at three months after birth there was a significant difference between the groups regarding plans for having a sibling, 52 % in CS group vs. 81 % in vaginal group planned to have another child in the future (p< 0.001; Table 7, page 32).

**Postnatal depression**
Two hundred and forty-three women answered the EPDS questionnaire. No significant differences in signs of postnatal depression between the groups were found between women in CS group on request and women in the vaginal group (mean score 5.5 vs. 5.2) (p= 0.877). Twenty-one women (6 %) had scores higher than the criterion (=12). Women with high scores were found in both groups.
Table 7
Postnatal care and birth experience

<table>
<thead>
<tr>
<th></th>
<th>Vaginal (n=266)</th>
<th>%</th>
<th>Caesarean (n=91)</th>
<th>%</th>
<th>t-test/χ²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support during delivery from a relative</td>
<td>263</td>
<td>99</td>
<td>81</td>
<td>95</td>
<td>3.576</td>
<td>0.058</td>
</tr>
<tr>
<td>Care at NICU</td>
<td>12/237</td>
<td>5</td>
<td>5/99</td>
<td>5</td>
<td>0.996</td>
<td></td>
</tr>
<tr>
<td>In hospital stay (mothers) days (m)</td>
<td>2.8</td>
<td>3.6</td>
<td></td>
<td></td>
<td>34.398</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Uncomplicated breastfeeding two days pp</td>
<td>162/237</td>
<td>68</td>
<td>50/92</td>
<td>54</td>
<td>10.948</td>
<td>&lt;0.052</td>
</tr>
<tr>
<td>Still breastfeeding three months pp</td>
<td>248</td>
<td>93</td>
<td>66</td>
<td>79</td>
<td>22.648</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Confidence in the obstetrician</td>
<td>99/125</td>
<td>79</td>
<td>64/70</td>
<td>91</td>
<td>8.809</td>
<td>0.031</td>
</tr>
<tr>
<td>Confidence in the midwife</td>
<td>213/242</td>
<td>88</td>
<td>80/92</td>
<td>87</td>
<td>7.100</td>
<td>0.068</td>
</tr>
<tr>
<td>Coitus three months after birth (Yes/No)</td>
<td>178</td>
<td>67</td>
<td>48</td>
<td>57</td>
<td>2.608</td>
<td>0.106</td>
</tr>
<tr>
<td>Planning another child</td>
<td>215</td>
<td>81</td>
<td>44</td>
<td>52</td>
<td>28.129</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Birth experience estimated two days pp. Lickert scale 1-10* (mean)</td>
<td>6.7</td>
<td>8.3</td>
<td></td>
<td></td>
<td>31.246</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Birth experience estimated three months pp. Lickert scale 1-10* (mean)</td>
<td>6.6</td>
<td>8.1</td>
<td></td>
<td></td>
<td>14.664</td>
<td>0.002</td>
</tr>
</tbody>
</table>

*1=worst imaginable experience  10=best imaginable experience

Expectancies and experience of childbirth
(Paper IV)

Factor analysis of the W-DEQ

In paper IV expectancies and experience of delivery among first-time mothers from five groups were studied; women requesting an CS in the absence of
medical/obstetrical indication (n=104), women undergoing CS due to breech presentation (n=128), women planning and undergoing a vaginal delivery (n=159), women undergoing an emergency CS during vaginal delivery (n=23) and women having an assisted vaginal delivery (n=25).

The principal component analysis yielded a factor structure that was fairly invariant of the structure with the factor analysis by Johnson and Slade (Table 8, page 33) [58] explaining 57.4% of the total variance. The first factor represents items measuring fear of the childbirth, the second factor items measuring lack of positive anticipation of becoming a mother, the third factor losing control of oneself or behaving badly during the delivery, and the fourth factor fantasies of injuring the child. Four items, those with highest factor loadings (i.e. item 6 “I am very afraid of the delivery.”; item 18 “I don’t feel happy at all.”; item 25 “I am afraid of behaving badly.”; and item 32 “I am afraid of losing the child.”), were entered in the item analyses of expectances, while in the analysis of experiences item 25 was not included in the 20 items version of the W-DEQ.

**Expectancies of delivery**

There was a highly significant difference in negative expectancies of delivery \( [F(2, 282) = 21.71, p < 0.001] \). The post-hoc test revealed that women requesting a CS had a significantly higher total score than those of the other four groups (Figure 4, page 34). The rate of women with a W-DEQ score above 84, which has been used as a cut-off level for clinically significant fear of childbirth [53], was 13.2% in the vaginal group, 9.6% in the group with a CS due to breech present, and 43.4% in the CS on maternal request group. Few mothers both in the vaginal group (n= 8 or 5%) and in the group with a CS due to breech presentation (n= 2 or 3%), had total scores above 100, which is a cut-off level for very severe fear of child birth. The corresponding frequency in the group requesting CS was significantly higher (n= 15 or 28%; \( \chi^2 = 31.36, df= 2, p < 0.001 \)).
Table 8. Factor analysis

<table>
<thead>
<tr>
<th>Item no.</th>
<th>Item</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>I</td>
</tr>
<tr>
<td>6</td>
<td>Afraid</td>
<td>0.73</td>
</tr>
<tr>
<td>4</td>
<td>Not Strong</td>
<td>0.73</td>
</tr>
<tr>
<td>5</td>
<td>Not Confident</td>
<td>0.72</td>
</tr>
<tr>
<td>17</td>
<td>Not Relaxed</td>
<td>0.68</td>
</tr>
<tr>
<td>29</td>
<td>Not Natural</td>
<td>0.65</td>
</tr>
<tr>
<td>22</td>
<td>Not Self-confident</td>
<td>0.64</td>
</tr>
<tr>
<td>30</td>
<td>Not Obvious</td>
<td>0.63</td>
</tr>
<tr>
<td>8</td>
<td>Weak</td>
<td>0.61</td>
</tr>
<tr>
<td>12</td>
<td>Tense</td>
<td>0.60</td>
</tr>
<tr>
<td>9</td>
<td>Not Safe</td>
<td>0.60</td>
</tr>
<tr>
<td>26</td>
<td>Not Let happen</td>
<td>0.59</td>
</tr>
<tr>
<td>10</td>
<td>Dependent</td>
<td>0.58</td>
</tr>
<tr>
<td>19</td>
<td>Panic</td>
<td>0.57</td>
</tr>
<tr>
<td>16</td>
<td>Not Composed</td>
<td>0.57</td>
</tr>
<tr>
<td>2</td>
<td>Frightful</td>
<td>0.52</td>
</tr>
<tr>
<td>7</td>
<td>Deserted</td>
<td>0.51</td>
</tr>
<tr>
<td>31</td>
<td>Dangerous</td>
<td>0.49</td>
</tr>
<tr>
<td>18</td>
<td>Not Happy</td>
<td>0.20</td>
</tr>
<tr>
<td>14</td>
<td>Not Proud</td>
<td>0.13</td>
</tr>
<tr>
<td>13</td>
<td>Not Glad</td>
<td>0.19</td>
</tr>
<tr>
<td>21</td>
<td>Not Longing for Child</td>
<td>0.04</td>
</tr>
<tr>
<td>1</td>
<td>Not Fantastic</td>
<td>0.42</td>
</tr>
<tr>
<td>28</td>
<td>Not Funny</td>
<td>0.43</td>
</tr>
<tr>
<td>23</td>
<td>No Trust</td>
<td>0.38</td>
</tr>
<tr>
<td>15</td>
<td>Abandoned</td>
<td>0.37</td>
</tr>
<tr>
<td>3</td>
<td>Lonely</td>
<td>0.36</td>
</tr>
<tr>
<td>25</td>
<td>Behave Badly</td>
<td>-0.08</td>
</tr>
<tr>
<td>24</td>
<td>Pain</td>
<td>-0.08</td>
</tr>
<tr>
<td>27</td>
<td>Lose Control</td>
<td>-0.17</td>
</tr>
<tr>
<td>20</td>
<td>Hopelessness</td>
<td>-0.39</td>
</tr>
<tr>
<td>11</td>
<td>Desolate</td>
<td>-0.46</td>
</tr>
<tr>
<td>32</td>
<td>Child Die</td>
<td>0.16</td>
</tr>
<tr>
<td>33</td>
<td>Child Injured</td>
<td>0.23</td>
</tr>
</tbody>
</table>

Factor labels: I=Fear; II=Lack of positive anticipation; III=Isolation; IV=Riskiness

1 Highest factor loadings are in bold, and factor loadings above 0.35 are underlined.
In the item analysis (Figure 5, page 35), mothers of the CS group on maternal request were more afraid than the other groups ($\chi^2 = 34.45$, df= 2; p< 0.001). They also felt less happy before the delivery ($\chi^2 = 6.18$, df= 2; p= 0.046) and were more afraid that the child would die ($\chi^2 = 12.19$, df= 2; p= 0.002). Mothers with a CS due to breech presentation were more afraid of behaving badly during the delivery ($\chi^2 = 15.36$, df= 2; p< 0.0016).

**Experiences of delivery**

Mothers of the two groups that expected a vaginal delivery but had an emergency CS or assisted vaginal delivery had more negative experiences of the delivery (Figure 6). The difference was statistically significant [F (4, 367) = 6.24, p< 0.001].

In the item analysis (Figure 5, page 35), the vaginal group was less afraid than the other groups. Furthermore, the two vaginal groups with complications were less happy
during the delivery, and were also more afraid that the child would be injured. However, none of the post-hoc analyses were statistically significant.

Fig 5. Item analysis in late pregnancy

Relationships between expectancies and experiences of delivery

In the total group there was a weak but significant relationship between the expectancies and the experiences of delivery ($r_{xy} = 0.31$, $p < 0.001$). However, when the relationships were calculated for the separate groups, there was a stronger positive correlation in all groups ($r_{xy} > 0.40$), i.e. mothers with a positive expectancy also had a more positive experience of the delivery except for the mothers with an elective CS on request where there was no significant relationship between expectancy and experience ($r_{xy} = 0.04$, $p = 0.781$).
Woman planning a vaginal delivery but experiencing an emergency CS or an assisted vaginal delivery had more negative birth experiences than the other groups. Women with a spontaneous vaginal delivery scored in a similar way on W-DEQ as the group undergoing CS on maternal request 35.2 vs. 34.9. The group of women who underwent an elective CS due to breech scored 32.7 (Fig. 6). The difference was statistically significant [F (4, 367) = 6.24, p< 0.001.

Fig. 6 Comparison between the groups on W-DEQ score three months after birth
DISCUSSION

The overall aim of this thesis is to describe healthy first-time mothers with normal pregnancies requesting elective caesarean section in the absence of obstetrical indication. The focuses of the project are personality, self-estimated health, breastfeeding, expectancies and experience of delivery and postpartum depression. Comparisons are made with healthy primiparae planning a vaginal birth.

A profile of women requesting an elective CS

We found that women requesting a CS in the absence of a medical/obstetrical indication differ in several aspects from those who plan a vaginal delivery. They wish to have one child only, they consider their health as poorer, they are older, they are more often born outside Sweden and they differ to some extent in their personality (Paper I & III). Their apprehensions in late pregnancy on the forthcoming delivery are more negative compared to women planning a vaginal delivery and 43 % of the women requesting a CS suffer from childbirth fear (Paper IV). They participate to a lesser extent in parenthood classes but after birth they had, compared to women planning a vaginal birth, a more positive birth experience. They weaned their babies earlier than women planning a vaginal birth but there were no differences between the groups in signs of depression measured with EPDS (Paper III).

Family planning

Planning for only one child in the family was significantly more often reported in the CS group (Paper III). It is possible that a combination of age, fertility problems, health and personality will lead to that they refrain from having more than one child (Paper I & III). The association between CS and infertility has been demonstrated in a number of epidemiologic studies [59] [60] [61]. The mechanisms for this association require further elucidation. Biologic explanations suggest that scarring, adhesions, and placental implantation might contribute to an impaired conception [61]. Others have suggested that negative psychosocial factors associated with CS contribute to the reluctance to become pregnant again [53, 62]. In a recently published study with the aim to ascertain the extent to which mode of delivery in first pregnancy affected women’s decision-making about having another child it was reported that among those who had no further pregnancies 71 % had deliberately limited their fertility. The factors which influenced the decision to have only one child included decision made before first pregnancy, experience of first birth, health, and lifestyle, influence of partner, age, first child character and fertility problems [63].

Health and childbirth

A higher proportion of women in our study considered their health as poor. It is well known that women in the socially less advantaged groups are at a greater risk of developing illness [64].

Pregnancy and delivery are associated with a great change in a woman’s body and even if these processes in most cases are normal they may be experienced as signs of ill
health. Women recruited to our trial were on the basis of medical records considered as healthy. In spite of this, women requesting a CS reported poorer health compared with women planning a vaginal birth. Women in our study were found to be homogenous in educational level and in smoking habits. They did not show signs of depression to a higher degree three months after delivery than the control group (Paper III). It has been reported that physical problems are common among Swedish women in early motherhood, but that they in spite of that assess their health as good [65]. The fact that women in our study requesting a CS experience their health as poorer indicates that this is a group different in more than one aspect.

One argument against a surgical delivery (CS) could always be that morbidity is higher after CS compared to vaginal delivery, especially if poor health is the reason for the request. However, first-time mothers have a greater risk for an emergency CS during labour compared to others and the scenario, to have an emergency CS during a vaginal delivery is probably worse than having a planned CS for these women. The evidence on the balanced risks and benefits of CS on maternal request versus planned vaginal delivery is still unclear.

Self-rated health may also capture normal changes both in the body and the affect this have on the daily life as sign of poor health among some women. If there is a connection between self-rated health and a wish for CS among pregnant women has not to our knowledge been studied.

The link between personality, health and childbirth
The link between personality and health may reflect three different though overlapping processes [66]. First, personality traits are associated with factors that cause disease. Second, personality may lead to behaviours that protect or diminish health. Last, personality traits are related to successful implementation of health-related coping behaviours [67].

Very little is known about normal changes in personality during pregnancy and motherhood but it has been described that the personalities of pregnant woman and her partner, and their relationship, influences the woman’s attitude to her pregnancy and for her forthcoming delivery. The more anxiety, neuroticism, vulnerability, depression, low self-esteem, dissatisfaction with the partnership, and lack of social support that the women reported the more they showed pregnancy-related fear of childbirth [68].

Personality profile among women requesting CS
We found than women requesting CS scored significantly lower than the group planning a vaginal birth on the scale measuring Socialization, which is a part of the personality reflecting attachment to significant adults (e.g. parents, teachers) during childhood and adolescence. Moreover, women planning a vaginal birth scored higher in Socialization than the population mean while women requesting CS scored as in the population mean. Pregnant women are not representative of the population, but assumingly a subgroup better socialized [51, 69]. A significant number of women requesting a CS had scores outside the normal range (±1 SD). Eighteen percent were below 40 as compared to seven percent in the vaginal group. Low scores in the Socialization scale have been found to be a marker for psychiatric disorders and maladaptiveness [70].
Furthermore, women of the CS group were found to be more monotony avoidant (Paper I). The scale describes a part of the personality measuring a need for change and action, sensation-seeking, susceptibility for boredom and low in endurance, a characteristic very important during pregnancy and the delivery process.

Surprisingly enough anxiety proneness did not differ significantly between the groups. This is interesting as high anxiety proneness has been associated with fear of childbirth. In a Swedish study it was found that women subsequently delivered by emergency CS reported a greater anxiety, poorer stress coping ability, and a greater fear of childbirth at 32 weeks gestation [53]. Since high scores in anxiety proneness scale could affect bonding to the newborn baby, it is important to notice that none of the women in the CS group, or the vaginal group scored high in this scale. Although personality is something rather stable in life, some areas within the personality seem to change during pregnancy and motherhood. It has been described that subscales such as Muscular tension, Somatic Anxiety and Monotony avoidance diminished significantly from pregnancy to test periods after delivery [51]. Changes in lifestyle were interpreted as more relaxed and tolerant towards monotony and the changes may be necessary for adjustment to motherhood. One explanation for our results could be that women planning a vaginal birth modify this part of their personality already during the pregnancy and that this does not occur to the same extent among women requesting CS.

It is possible that health care professionals today encourage women to express their emotions concerning birth more openly than they did 15 years ago. Personal control has been seen as a predictor of childbirth satisfaction, and having expectations for labour and delivery met is a significant predictor of satisfaction [28]. We have recently learned that participation and a feeling of control affect labour outcome [71]. It has therefore become accepted for patients to express their opinion and demands. Fear of childbirth during pregnancy may also increase the risk for emergency CS [27]. Vaginal delivery could be a situation where the labouring woman experiences that she has no or little control over the situation. She may not be prepared or ready to accept a long delivery. If sensation seeking is a part of ones lifestyle, a vaginal delivery may not be a desirable option. The common way to give birth is not by CS and therefore this mode of delivery could suit a person not afraid of challenges such as those of a CS.

Do first-time mothers modify their personality?
The main findings were that there were only moderate changes in personality from late pregnancy to nine months after birth. It is however important to remember that we do not know if the moderate changes in personality traits found among mothers in this study are due to motherhood or not, since there is no measurement before the decision to become pregnant. Pregnant women’s development towards an emotional attachment to the foetus and the future child probably starts early in, or even before, pregnancy.

Changes in personality traits over time during first pregnancy and lactation have previously been described [51]. We found in our study that certain personality traits differed already in late pregnancy between women requesting a CS and women planning a vaginal birth but changes in personality from late pregnancy to nine months after birth were moderate. However, scores on three personality traits in the KSP inventory changed significantly from late pregnancy to nine months after birth (Paper II).
In our study the personality trait of *Impulsivity*, a tendency to act on the spur of the moment impulse, *increased* from late pregnancy to nine months after birth. In above mentioned study Impulsivity *decreased* between pregnancy and six months after birth. At six months many women are still breastfeeding. Hormone influences mediated by oxytocin may explain the differences in results as oxytocin during breastfeeding stimulates maternal interaction and attachment between mother and her baby [72]. The calmness in the mother of a newborn baby could be an important trait necessary for bonding. When the child has become older and the mother is no longer breastfeeding, personality may be adjusted to a more habitual state adjusted to an ordinary life. This adaptation in *Impulsiveness*, seen among all women in our study may therefore be a normal adjustment to *motherhood* and the need to improvise when caring for small children in responding and reacting on what the child is doing.

*Detachment* which measures need for close relationships (i.e. higher attachment) decreased from late pregnancy to nine months after birth especially in the CS group (Paper II). This decrease is presumably explained by the relationship between the mother and the baby which is also generalised to other relationships. The CS group was more detached in late pregnancy than women planning a vaginal birth, whilst the vaginal group has a rather stabile score in this subscale from late pregnancy to nine months after birth, maybe depending on real/stabile differences in personality traits. Nine months after birth differences between the groups in detachment are no longer significant (Paper II).

An important factor for becoming a mother is the importance of own parents as role models in parenthood [73]. *Socialization*, which is a part of the personality reflecting attachment to significant adults (e.g. parents, teachers) during childhood and adolescence, decreases among women in the vaginal delivery group from late pregnancy to nine months after birth, but is stabile within the CS group. There is however still a significant difference between the groups in this subscale nine months after birth. It is reasonable to believe that women revalue their own childhood when they become a mother and bond more to their own child than to their parents and other significant adults. In spite of this, women in the vaginal group score significantly higher in socialization both in late pregnancy and nine months after birth, than women in the CS group (Paper II). Support from the woman’s mother has been described as the single most important factor in maintaining motherhood throughout the first nine months after birth [74].

*Psychic anxiety* scores seem to increase among women in the vaginal group from late pregnancy to nine months after birth and decreases in CS group. At nine months after birth there were no differences between the groups in this subscale. This could probably reflect that women in the CS group in general are more worried during late pregnancy than women in the vaginal group (Paper II). The finding that the difference in Psychic anxiety between the groups has diminished at nine months after birth could support this assumption.

Another subscale that changes over time but in a different direction between the groups is *Guilt*. Why the women in the vaginal group increase the scores in this subscale whilst CS women decrease their scores from late pregnancy to nine months after birth is difficult to explain. A possible explanation could be that women in the CS group have higher scores in late pregnancy depending on their feelings towards labour, birth and the planned CS. To request a CS in the absence of medical or obstetrical indication may be considered as an unusual/not normal request in the woman’s context.
and could therefore cause a feeling of guilt. After birth, with a positive experience a healthy baby and mother, the request may be justified and the feeling of guilt will decrease.

Generally, the women of the CS group had higher scores in Monotony Avoidance scale both in late pregnancy and at nine months after birth and changes in this subscale over time are very small (Paper I & II). The scale describes a part of the personality measuring a need for change and action, sensation-seeking, susceptibility for boredom and low in endurance. Though there are nearly no changes at all in Monotony Avoidance from late pregnancy to motherhood the differences between the groups in the subscale seen in late pregnancy still remain after birth. Changes in lifestyle interpreted as more relaxed and tolerant towards monotony may be an adjustment necessary for motherhood that occurs already during pregnancy. From this perspective transition to motherhood could be a greater challenge for the CS group than for the vaginal group. One explanation for our results could be that women planning a vaginal birth modify this part of their personality during the pregnancy and that this does not occur to the same extent among women requesting CS.

The CS group also has significantly higher scores in the Suspicion scale. Although both groups increase their scores on this scale after birth the CS group still, nine months after the birth of their child, scores higher compared to the vaginal group (Paper II). Suspicion is a part of the personality reflecting distrustfulness and hostility to others. This may be in line with the clinical impression of the group requesting CS as a group of women who chooses their own path, not so easily trusting doctors and midwives advice. The increase in this score among all mothers could be a natural change in personality necessary for mothers caring for and protecting their newborn baby.

Apprehensions in late pregnancy and reasons for request of CS
A significant proportion of the women requesting a CS in Sweden are multiparae with a previous negative birth experience [23] Our sample consisted of first-time mothers and is therefore a group of special interest since they have no previous experience of childbirth. In our study the most commonly mentioned reason for request of an elective CS without medical reasons is tocophobia (Paper III). Surprisingly few, 43.4%, showed a clinically significant fear of delivery measured with W-DEQ (Paper IV). Other reasons behind the request can only be speculated on. Many, 32% mentioned pelvic floor injuries as a major concern. In our cohort women reported anxiety for the health of their unborn child and/or their own life. Heredity for complicated births among female relatives was another mentioned reason. It is not so difficult to understand that fear of childbirth can have its origin in the transmission over generations. Thus the fear is more a product of a cultural heritage and socialization [26]

In the medical record some of the patients mentioned fear of an emergency CS as a reason for their request. Having in mind that the cohort consisted of first-time mothers this argument against planning a vaginal delivery is not an unrealistic apprehension. The risk for emergency CS is higher among primiparae than among multiparae as 15% of the women in the control group planning a vaginal birth in our cohort had an emergency CS.

In the self assessment questionnaire women requesting a CS to a larger extent reported anxiety for pain during birth, anxiety for lack of support from the staff during
birth, and for loss of control (Paper III). Childbirth has been described as an unavoidable situation, demanding both control and loss of control [75] and reports have been published showing that women want to take an active part in the control of labour [76]

**Parenthood classes**

Parenthood classes are a part of the national child health promotion program in Sweden. In a national survey from Sweden it was found that 93% of the first-time mothers attended classes [77] Only 67% of the women in our study requesting a CS had participated in parenthood classes during pregnancy compared to 85% among women planning a vaginal birth (Paper III). In above mentioned study it was found than non-attendants were more disadvantaged in terms of socio-demographic background and feelings about the approaching birth [78] Parenthood antenatal education has historically been a preparation for labour. It is possible that parenthood classes also today are focused on normal vaginal childbirth, more than preparation for parenthood. This could be a reason not to participate in parenthood classes for women planning a CS. It may benefit pregnant women if parenthood education could adjust to the fact that nearly one out of five women in Sweden has a CS.

**Birth experience**

We found that the CS group experienced their birth more positively than women in the vaginal group both at two days and three months after delivery (Paper III). Labour and delivery is the climax of a long period of waiting ending in some kind of delivery of the child. The labour is predictable in that it will occur. For first-time mothers it is an unknown situation where it is very difficult for the individual to predict how they will experience/manage the pain and the situation being in labour. Possible explanations for our result could be that women in CS group have actively pronounced a wish for CS and had the delivery of their choice. They are relieved that they have delivered their child without going through a vaginal birth. Choosing a vaginal delivery, on the other hand is usually not a choice at all; it will occur. Women in the vaginal group have probably not defined their needs to the same extent and they may have experienced unexpected complications like an emergency CS. It is also possible that midwives and other health-care personnel to some extent have failed to give good support to women in labour. Previous research very strongly agree that a sense of control is a major contributing factor for women’s birth experience and subsequent well-being in childbirth [79] [80] [81] Being treated with respect and as an individual and perceiving the staff as considerate has been described as important as well as feeling in control of one’s behaviour. Antenatal expectations of control have also been found to be an important factor for satisfaction with childbirth [80]. In a study with the aim to investigate maternal satisfaction following vaginal delivery after CS and CS after previous vaginal delivery maternal satisfaction with vaginal delivery was high. Those that had experienced both modes of delivery would prefer vaginal births in future pregnancies [82].
Breastfeeding
The frequency of breastfeeding in Sweden is high. According to statistics from the National Board of Health and Welfare, more than 91 percent of the children born in 2004 were exclusively or partially breastfed at the age of two months. At the age of six months, 72 percent were breastfed [5].

Several risk factors have been associated with delayed onset of breastfeeding such as emergency CS, primiparity, high BMI, vaginal delivery with a prolonged second stage and exclusive formula-feeding before onset of lactation [83] [84]. Surgical deliveries have previously been described to have a negative impact on initiation and maintaining of breastfeeding [85] [86]. The stress associated with CS is explained as one factor behind the impaired breastfeeding in this group. The release of oxytocin and prolactin, which is of importance for milk ejection, is inhibited by stress [87].

On day two after delivery women requesting CS in our study reported that they had introduced breastfeeding to the same extent as women planning a vaginal birth (Paper III). It seems that mothers with an elective caesarean in our study generally overcame early breastfeeding problems although they choose to wean their babies earlier than women planning a vaginal birth. At three months after delivery 79 % in CS group and 93 % among the controls were still breastfeeding. An explanation to the conflicting result on early breastfeeding may bee that women in our study are justifying the surgical treatment they have requested by denying problems with breastfeeding.

It is also possible that the difference in breastfeeding outcome between the groups at three months may be related to personality traits and socio-demographic factors rather than to mode of delivery. If there is a connection between certain personality traits such as monotony avoidance and breastfeeding behaviours has not to our knowledge been studied.

Postnatal depression
There were no differences in postnatal depression between women in the CS group and women planning a vaginal delivery (mean score 5.5 vs. 5.2). In a large prospective cohort study from Scotland researchers found no evidence that elective CS altered the odds of postnatal depression, compared to vaginal delivery. Neither did they find evidence that women undergoing emergency CS or assisted vaginal delivery were at a higher risk for postnatal depression compared to those who had a vaginal delivery [88]. In a review examining the link between postpartum depression and CS no significant association between CS, and mode of delivery were found. Authors of the paper discuss possible reasons why some studies have obtained an association between CS and postpartum depression and suggests that different results could be dependent on methodological weaknesses such as instrument used for screening of postnatal depression or the power of the studies [46]. It is also possible that the impact of CS on maternal mood may depend on the context in which the CS occurs, the cultural norms, preparedness and support from professionals and relatives and close friends. From this perspective it is not a surprise to find that there were no differences in mood three months after birth between first-time mothers undergoing an elective CS and those planning a vaginal delivery.

Mean value of EPDS score in all three groups were 5.3. However, 6% of all the mothers in our study scored above the cut-off level (EPDS> 12). In another Swedish study where respondents answered the EPDS questionnaire in early pregnancy, at two
months and a year postpartum, the prevalence of recurrent or sustained depressive symptoms (EPDS $\geq$ 12) were found to be 3% on all three evaluations[37]. Participants in our study answered the EPDS only on one occasion, three months postpartum, which may be an explanation to why a higher percentage of the women in our study showed signs of depression.

**Sexuality after birth**
We found no difference between the groups in re-establishing sexual life, as many as 34-43% had not resumed coitus three months after birth. Sexuality has normal fluctuations during different times of life. One period in which this could occur is after childbirth [89]. The mother favours other basic needs such as sleep and pre-occupation with the baby [90].

**Obstetricians’ attitudes to CS on maternal request**

In a study conducted in the United States with the purpose to determine obstetrician’s attitudes and practices with respect to maternal request for CS it was found that 84.5% were willing to perform patient choice CS. Mentioned acceptable indications for maternal request were adverse previous birth experience, concern for fetal injury/death, fear of childbirth and fear of damage to the pelvic floor [91]. In a study performed among 1 031 members of the American College of Obstetricians and Gynaecologists Fellows a majority of the respondents believed women to have the right to demand a CS. Most of their practices did not have a policy regarding CS on maternal request but they believed that the risk of the procedure outweighed the benefits [92].

No scientific report of attitudes among Swedish obstetricians towards CS on maternal request has, to our knowledge, yet been published. However the weekly magazine for Swedish physicians (Läkartidningen) published in March 2007 a survey conducted at a meeting for obstetricians, gynaecologists and midwives. As many as 23% of the physicians were of the opinion that the pregnant woman could choose to have an elective CS. The majority of midwives and obstetricians regarded the CS rate in Sweden as too high. Women’s request, attitudes in the society, new medical indications for CS, changes in the population (older first-time mothers) and causes related to the health care organization (stress and lack of staff) were mentioned as reasons for the situation [93].

**Organisational factors and CS rate**

The CS rate of a clinical unit is affected by organizational factors. A review of Canadian hospitals with low CS rates suggested that achievement and attainment of a low CS rate was associated with a range of factors. Attitudinal factors such as a culture of birth as a normal physiological process and a commitment to one-to-one supportive care in labour was mentioned. Organization of care defined as a strong leadership, effective multidisciplinary teams and timely access to skilled professionals was another
factor. Clinical application of knowledge and information in the form of a strong commitment to evidence based practice and programs to ensure continuous quality improvement was also considered important [94].

**Ethical aspects of CS on request**

Can an elective CS in an uncomplicated pregnancy be justified from an ethical point of view? There are several aspects that have to be considered. The physicians should discuss medically reasonable alternatives to give the patient an opportunity to have an informed consent. Patients have a right to decline care, but not to demand treatment that the physician holds to be unnecessarily risky. In the case of elective CS on request the surgery must be consistent with the desired outcome. Within the conception of “outcome” lies not only outcome from a physical but also from a psychological perspective. However, decisions concerning route of delivery in pregnancy are different from decisions outside pregnancy for two reasons. One is the presence of the foetus. How and to what degree foetal interests are to be considered in decisions about CS is not a straightforward issue. Consent for delivery is also different from consent in other medical areas because labour and delivery are, unlike other medical events, inevitable physiological processes [95]. The obstetrician has autonomy and beneficence-based obligations to the mother, and the mother and the obstetrician have beneficence-based obligations to the foetus.

The possibility for the physician or the midwife to form an opinion on the basis of information given from the patient during a short consultation is limited. The decision whether to meet the patient’s request of CS positively or not will probably often be based on what we know in general about both the surgery and its risk for mother and child but also in what way it will affect the mother psychologically. The professions are aware that a normal vaginal delivery from many aspects would be the best for healthy women with a normal pregnancy. They also know that women will experience complications during delivery that may lead to an emergency CS, which is worse than an elective CS. The dilemma is how to counsel women suffering from childbirth fear so that they can feel comfort in a forthcoming delivery in spite of the risk for unexpected complications.

An emergency CS in labour is the worst mode of delivery in terms of maternal morbidity. To find women at risk for emergency CS during late pregnancy is of importance as well as to discuss this matter with the patients in a way that they feel are in their interests. Further, how to provide individual care in a system made for mass production is a fundamental dilemma within modern health care and we have to find a way to solve this problem. Working towards optimum safety in childbirth must imply an increased rate of uncomplicated vaginal deliveries. The quality of intrapartum care must be improved.
Methodological considerations

Methodological aspects of the studies which deserve particular attention.

Selection bias

All data were collected from the same cohort with an “intention to treat” design. The trial provided data from a hospital with two different labour wards situated in a middle and high income area of Stockholm. The participants in the case group (CS group) were recruited from the surgical schedule at the operating theatre one to two weeks before surgery. Controls were thereafter consecutively recruited from the same antenatal clinic by a midwife without connection to the trial.

The respondents are not representative of Swedish women in general in some of the socio-demographic background variables. For example, in our cohort younger women and smokers were underrepresented and the proportion of women with university education was high. The whole cohort is drawn from the same/similar population which is a way of reducing the risk of selection bias [96]. Excluded from the study were non-Swedish speaking women, women with a physical and psychological illness and BMI >30.

One main problem with cohort studies is related to the longitudinal design. Subsequent attrition of those who have initially agreed to participate could change the composition of comparison groups [97]. This was not the case in our cohort but the different instruments (KSP, W-DEQ and EPDS) had slightly different response rate. This is due to the fact that measuring changes over time requires response from the participants on at least two different occasions. However there were no differential selections in the loss of respondents.

Data collection bias

Known source of error in questionnaires is “faking good” or “faking bad”. We have probably reduced the risk in our trial since the respondents in the CS group already had a date for elective CS when they were enrolled in the study. The possibility that some of the respondents are not entirely honest when answering the questionnaires should always be considered. An advantage of all four studies was that the data were collected both prospectively, i.e., before the endpoint (CS/vaginal birth) and retrospectively after the CS/vaginal birth. Data concerning medical outcome were collected through medical records in a structured manner using a protocol. In paper four where the W-DEQ instrument was used we had to choose a 20 item version of W-DEQ B due to the fact that women undergoing CS could not answer some of the questions in the 33-item version. This version has been tested earlier and been found to correspond well with the 33-item version [53]

When reading about personality outcome it is important to remember that we do not know if changes in personality traits among mothers are due to the motherhood or not, since there is no measurement before the decision to become pregnant. Pregnant women’s development towards an emotional attachment to the foetus and the future child probably starts early in, or even before, pregnancy.

Most data in the thesis are based upon self-rated reports, not expert judgement. If
many different instruments are used during a long period of time it is possible that the respondents can become weary. The instruments we used were easy to fill in, and taking approximately 15 minutes in time. Since pregnancy and childbirth is a significant event in people’s lives, first-time mothers are a highly motivated group of respondents and to our experience often with an ability to recall previous feelings and experiences. Their written responses in the questionnaires were generally complete.

**Confounding bias**

An important distinction between confounding bias and other types of bias is that confounding is correctable at the analysis stage, whereas selection and information biases are usually difficult to correct at that stage [96].

In the design stage we aimed to eliminate or minimize confounding bias by restricting the study sample to participants with certain characteristics, i.e., healthy first time mothers from the same geographic area of Stockholm. As there was a significant difference in age, covariance analyses were conducted with age as covariate.

**Conclusion and practical implication**

In summary, this research highlights the complex nature of personality, expectancies on and experience of childbirth and how this may affect a request for a CS in healthy first-time mothers. Our findings make it clear that there is a need for an individual response to a request for CS where obstetricians very carefully weigh and balance outcomes in different way. For any decision, factors such as age, family plans for the future, psychological factors and medical risks both in CS and in planned vaginal delivery must be considered.

The group of women requesting a CS in the absence of medical or obstetrical indication seems to be a different group of women in several aspects. They are older, wish to have only one child in the family, they consider their health poorer and they differ to some extent in their personality. Their apprehensions in late pregnancy on the forthcoming delivery are more negative compare to women planning a vaginal delivery and 43 % of the women requesting a CS suffer from childbirth fear.

A form of mistrust in the ability of healthcares to reduce the risk of complications and also the inability to give support during a vaginal delivery could to some extent be suspected to explain the wish to abstain from a vaginal birth.
Kejsarsnitt på mammans begäran
Personlighet, förlossningsrädska och tecken på depression hos förstföderskor


Denna avhandling avser att bidra till ökad kunskap om förstföderskor som önskar genomgå planerat kejsarsnitt utan medicinsk/obstetrisk indikation.
Syfte
Det övergripande syftet med avhandlingen är att studera friska förstföderskor med normal graviditet som önskar föda barn med planerat kejsarsnitt. Fokus i projektet är personlighet, självskattad hälsa, amning, förlossningsrädska och depression.

Delarbete I
I delarbete I har vi studerat om förstföderskor som önskar föda barn med planerat kejsarsnitt skiljer sig i sin personlighet från dem som planerar vaginal förlossning. Syftet med delstudie I var också att undersöka skillnader i ålder, självskattad hälsa, födelseland, IVF behandling och familjeplanering. Vi fann att kvinnor som önskade föda barn med kejsarsnitt var äldre jämfört med dem som planerade vaginal förlossning. Vi fann också att de till vissa delar också skiljer sig i sin personlighet. De skiljer sig framförallt i två avseenden. De har sämre tolerans i monotona situationer (är mer otåliga) och befanns i mindre utsträckning vara beroende av andra betydelsefulla vuxna som föräldrar och lärare jämfört med kvinnor som planerar en vaginal förlossning.

Delarbete II
I delarbete II studerade vi förändringar i personlighet från sen graviditet till nio månader efter förlossningen. Syftet var också att undersöka om förändringar i personlighet skiljer sig beroende på hur mamman önskar föda barn. Vi avsåg också att undersöka om personliga egenskaper skiljer sig mellan kvinnor som genomgår spontan vaginal förlossning och de som drabbats av akut kejsarsnitt. I denna studie fann vi att både kvinnor som genomgick planerat kejsarsnitt på egen begäran och kvinnor i den vaginala gruppen (kontroller) ökade i impulsivitet. Detta kan möjligen vara så att möjlighet till improvisation krävs när man har små barn. Kejsarsnittgruppen minskade sitt ”avståndstagande” (detachement) från sen graviditet till nio månader efter förlossningen. Denna grupp ökade också generellt i misstänksamhet (suspicion) vilket kan vara en normal anpassning då man ska ta hand och skydda ett litet barn. Både kvinnor som planerar och genomgår vaginal förlossning och kvinnorna som genomgick kejsarsnitt på egen begäran minskade inom området socialisation (inflytandet av andra betydelsefulla vuxna). Detta kan möjligt tolkas som att andra betydelsefulla vuxna får ett minskat inflytande då kvinnan blivit mamma själv. Trots att båda grupperna minskade i socialisation nio månader efter förlossningen, var det fortfarande signifikant skillnad inom detta område mellan de båda grupperna. Det visade sig också att kvinnorna som genomgick akut kejsarsnitt var mer psykasteniska (dvs. ofta känner sig sjuka och trötta) och mer otåliga. Vi fann sammanfattningsvis, att endast små förändringar skedde i personlighetsdrag från sen graviditet till nio månader efter förlossningen.

Delarbete III
Skäl till önskan om kejsarsnitt, självskattad hälsa, förväntningar på och erfarenheter av barnafödande samt tecken på depression är undersökt i studie III. Vi fann att kvinnor som önskar föda barn med planerat kejsarsnitt skattar sin hälsa som sämre än de som planerar vaginal förlossning. De önskar också ofta bara ett barn. De är i större utsträckning rädda för att inte få stöd under en vaginal förlossning, för att de ska förlora kontrollen under födandet och för att något ska hända som skadar dem själva eller deras
barn. Efter genomgånet kejsarsnitt rapporterar de en bättre förlossningsupplevelse än kvinnorna som planerade vaginal förlossning. Trots att amning på andra dagen efter förlossningen/kejsarsnittet fungerade lika bra i båda de undersökta grupperna har kvinnor som genomgått kejsarsnitt på egen begäran i större utsträckning lagt ned amningen då barnet är tre månader. Tre månader efter förlossningen visade kvinnorna i CS grupp inte mer tecken på depression än andra.

**Delarbete IV**

I delarbete IV har vi undersökt förväntningar på vaginal förlossning och upplevelser av barnafödande. Vi har undersökt kvinnor från fyra grupper; kvinnor som önskar genomgå planerat kejsarsnitt utan obstetrisk eller medicinsk indikation, kvinnor som rekommenderas elektivt kejsarsnitt på grund av sätessändläge, kvinnor som planerar och föder barn vaginally samt kvinnor som genomgått akut kejsarsnitt men planerat vaginal förlossning. Vi fann att förstföderskor som önskade föda barn med planerat kejsarsnitt i signifikant högre utsträckning hade mer negativa tankar om en vaginal förlossning i sen graviditet jämfört med dem som planerade vaginal förlossning. Klinisk förlossningsrädsla före förlossningen fanns hos 13.2% i den vaginala gruppen, 9.6% i gruppen med sätessändläge och 43.4% i gruppen som önskar genomgå planerat kejsarsnitt utan medicinsk/obstetrisk indikation. Få mammor i den vaginala gruppen och i sätesgruppen, hade totalpoäng över 100, vilket anses vara en ”cut-off” nivå för mycket svår förlossningsrädsla (n= 8 or 5 % och n= 2 or 3 %). I gruppen som önskade planerat kejsarsnitt utan medicinsk/obstetrisk indikation hade 15 kvinnor (28 %) poäng över 100.

Kvinnor som planerade en vaginal förlossning men genomgick ett akut kejsarsnitt eller förlossning med sugklocka hade en signifikant sämre förlossningsupplevelse än de andra grupperna. Kvinnorna med en spontan vaginal förlossning uppvisade i stort samma resultat som de som genomgått kejsarsnitt på egen begäran liksom de kvinnor som genomgått elektivt kejsarsnitt på grund av sätessändläge.
ACKNOWLEDGEMENT

Many are those who have supported me in the process of writing this thesis, and I am sincerely grateful to all of you. In particular I would like to express my gratitude to:

Ellika Andolf, my supervisor and co-author, for excellent guidance, encouragement and discussions not only in subjects concerning research, but also other things important in life such as family, gender issues, literature and music.

Gunnar Edman, my second supervisor and co-author, for sharing your knowledge in both statistics and psychology with me.

Gudrun Abascal, the most important person in encouraging me to start doing research. You have always been supportive and generous. As a midwife you are a great model both for me and many other midwives.

Harald Almström, who employed me at BB Stockholm AB, and also financially arranged the clinic to support me and my research.

Josefin Wiklund, my oldest daughter, who in spite of her own medical studies and exam have checked all my English manuscripts. Good luck with your own research project on maternal mortality in Uganda.

Tim Conaglen, who did that little “extra” to the English text.

Anders Björklund, a good doctor, person and friend. It is great to be working with you.

Anna-Berit Ransjö-Arvidsson, who guided me through a Master degree in reproductive health and was one of the co-authors in my first scientific publication.

Wibke Jonas, who have been working with me in another research project where we both learned a lot about research and other things in the academic world.

Hilde Larsson, for help with data collection and excellent control over all questionnaires and files in the project.

Anne-Marie Boström, my friend since many years who during my PhD studies have been of great help both with reading manuscripts, discussing statistics and also helping my younger children with their homework while I’ve been focusing on my research.

Katarina Kolare, one of my closest friends, thank you for many hours in your house discussing literature and life while having nice meals and good wine.

Ulrika and Anders Rosenkilde, you have very generously during three pregnancies and births shared your experiences with me. I will always be at your service.
Jesper Wiklund, our oldest son, for your great interest in humanitarian assistance. Working with human security in South America and Africa you have taught us that there is another world outside the one we live in.

Johannes Wiklund, our second son, thank you for taking care of your little sister especially during the last year while I have been working a lot. You have encouraged her in many ways not least in how to become a skilled soccer player. No one could have a better brother.

Joel Wiklund, our youngest son, you have brought music and theatre to our home.

Julia Wiklund, our youngest daughter, you have grown up during my studies. Thank you for dragging me from the computer to your soccer games and other activities that a young girl at twelve likes to do.

Janne Wiklund, my husband and the father to our five kids, thank you for your patience with me focusing on research instead of other important issues in life.

Meta Tullgren, one of the colleagues that I’ve been working together with for a long time, I have learned a lot from you about how to support women in labour.

Thanks also to my other colleagues and work mates at BB Stockholm for daily sharing your professional experiences with me.

All women I have met in my work as a midwife deserve a special attention. You have helped me to understand the complexity of childbirth from many perspectives, sharing your thoughts, expectancies and experience of childbirth with me.

The studies were supported by BB Stockholm AB, grants from Praktikertjänst AB and the County Council in Stockholm.
REFERENCES


