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**Abstract**

*Objective:* To explore how childbirth self-efficacy, i.e. outcome expectancy and efficacy expectancy, was associated with fear of childbirth (FOC) and how efficacy expectancy and FOC respectively were related to socio-demographic characteristics, mental problems and preference for a caesarean section.

*Methods:* In this cross sectional study, a consecutive sample of 1000 pregnant nulliparous women was sent the Wijma Delivery Expectancy Questionnaire and Childbirth Self-Efficacy Inventory. Statistical analyses were performed on data from 423 women.

*Results:* Outcome expectancy and efficacy expectancy correlated significantly and positively, FOC correlated significantly and negatively with both outcome expectancy and efficacy expectancy. Women with severe FOC (20.8 %) had a significantly lower level of education (p= 0.001), and had more often sought help because of mental problems (p= 0.004). They were more likely to have low efficacy expectancy (p<0.001) and to prefer a caesarean section instead of a vaginal birth (p<0.001).

*Conclusions:* Lower efficacy expectancy was associated with higher FOC while preference for a caesarean section was not. Improvement of self-efficacy could be a part of care for women with FOC during pregnancy; however, it would not be enough for fearful women who wish to have a caesarean section.

Keywords: CBSEI, W-DEQ, Pregnancy

**Introduction:**

Women with severe fear of childbirth (FOC) make up a vulnerable group. In Western countries about 6-15 % [1-4] of pregnant women fulfil the criteria for severe FOC, i.e. that the fear affects their daily life negatively [5].

Pregnant women with severe FOC run an increased risk negative birth experiences [6], post-traumatic stress after childbirth [7, 8] dystocia [9] and emergency caesarean section [9-11]. FOC is significantly more common among women with mental health problems when compared with a control group [12], and anxiety [3, 13] and depression are risk factors for severe FOC [3]. FOC is even more common in younger women with low educational level and lack of social network [14].

FOC is often the reason for caesarean section on the woman's request [1, 15-17], which probably means that elective caesarean section is more common among these women [9, 11, 16]. This might reflect that these women doubt their own capacity to cope with the upcoming labour and birth.

Self-efficacy, i.e. the individual´s confidence in her own capability to cope with a specific situation [18], is suggested to affect women´s wish for a caesarean section [19]. Conceptually, self-efficacy has two different components; outcome expectancy, i.e. the belief in a certain behaviour being helpful in a specific situation, and efficacy expectancy, being the belief in one´s ability to perform such behaviour. In a person, outcome expectancy and efficacy expectancy are not always congruent, since a woman can know that behaviour has a certain outcome while she is unsure about her own capacity to carry it out. Persons with high self-efficacy beliefs visualize success, while those with low self-efficacy beliefs visualize failure

and focus on things that can go wrong [18]. Self-efficacy has four sources. The most powerful source is the outcome of past experiences of mastering a specific situation. The additional sources are vicarious experience provided by others, social persuasion and physiological and affective state [18] . Self-efficacy theory postulates that it is mainly perceived efficacy expectancy that affects how much stress and depression the individual experiences in threatening situations. Accordingly, doubt that they can cope with a potentially aversive situation makes people fearful [20].

Self-efficacy has been identified as a factor that influences satisfaction with childbirth [21, 22]. Women with high self-efficacy report higher satisfaction with their own performance and with the support of midwives and physicians [23]. Higher levels of anxiety [24] and FOC [25, 26] were associated with lower levels of efficacy expectancy in nulliparous women. In other words, pregnant women with anxiety or FOC identify behaviours that will help, but doubt their capability to apply such actions during labour. Low self-efficacy as well as severe FOC imply a risk factor for symptoms of post-traumatic stress disorder after giving birth [8].

Thus perceived self-efficacy might be an important factor for how women cope with labour and for their birth experience, whereas self-efficacy and FOC also seem to be interrelated. Therefore, in this study focusing on pregnant nulliparous women, we explored how childbirth self-efficacy (i.e. outcome expectancy and efficacy expectancy) was associated with FOC. Furthermore, we wanted to explore how efficacy expectancy and FOC were related to socio-demographic characteristics, mental problems and preference for a caesarean section.

**Methods**

*Sample and procedure*

The study, which had a cross-sectional design, recruited a consecutive sample of 1000 Swedish-speaking, pregnant nulliparous women aged ≥ 18. The participants had attended a routine ultrasound screening in gestation week 18-20 with the result 'Fetus at normal size without visible abnormalities'.

Names, addresses, and estimated date of delivery of potential participants were received from three ultrasound clinics, located in a region in the southeast of Sweden. Data collection by means of questionnaires took place over a period of one year (April 2010-April 2011). The questionnaires were the Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ version A) [27] and the Childbirth Self-efficacy Inventory (CBSEI) [28]. Questions regarding demographic variables, perceived health, preference for mode of delivery, and history of mental problems before pregnancy were included. Perceived health was evaluated on a four-point scale with the endpoints being 'very bad' and 'very good'. Preference for mode of delivery had two reply alternatives; 'vaginal delivery' and 'caesarean section'. The question addressing mental problems had six alternative answers; five specified mental problems i.e. anxiety, depression, phobia, psychosis, obsession and one unspecified 'others'. The participants were asked to mark the alternatives that had been the reason for contacting the health care service pre-pregnancy.

The coded questionnaires, together with an information sheet and a pre-paid return envelope, were mailed to potential respondents in gestation week 25-26. Two weeks after the first mailing, reminders were sent to non-respondents. Completing and returning the

questionnaires was considered as consent to participate in the study.  Of the 1000

questionnaires sent out, 446 were completed and sent back, while 26 were returned because of

unknown address. The inclusion criteria were not fulfilled by six of the women, and 17

women were excluded due to missing data. Eventually, 423 women made up the final sample.


The Regional Ethical Review Board in Linkoping approved the study, Record No. M 197/06.

The information given to potential respondents followed The Helsinki Declaration [29].


*Instruments*

The W-DEQ (version A) [27] was used for measuring FOC of the upcoming birth. This 33-

item instrument has a six-point Likert-type format with a summated score between zero and

165: a higher score meaning more fear. The W-DEQ (version A) comprises statements

concerning intensities of emotions and magnitude of cognitions. Examples of items on the W-

DEQ are 'Feeling lonely- not at all lonely and 'Feeling strong -not at all strong'. The W-DEQ

has shown good internal consistency, validity, specificity and sensibility [27]. The Cronbach´s

alpha coefficient in the present study was 0.92.


Childbirth self-efficacy was measured with the CBSEI.  In its original form the CBSEI is a

62-item instrument with four subscales measuring both outcome expectancy and efficacy

expectancy related to active labour and second stage of labour. Participants respond on a 10-

point probability scale graded from 1('not at all helpful'/'not at all sure') to10 ('very

helpful'/'very sure'). In the present study we used two subscales (16+16 items) measuring

outcome expectancy and efficacy expectancy for active labour only. The original CBSEI has

shown high internal consistency reliability in several studies (0.85-0.96) [23, 28, 30, 31]. A

short form of the CBSEI (32 items) has shown sound validity and reliability for a Chinese

sample [32]. In the present study, the Cronbach´s alpha coefficients for the subscales were 0.83 (outcome expectancy) and 0.92 (efficacy expectancy).

*Analysis*

For statistical analyses we used IBM SPSS Statistics 20.

Missing data on the W-DEQ were replaced by the mean of the individuals´ remaining items [33] if at least 28 items were completed. Missing data in the CBSEI were replaced in the same way if at least 14 items on each subscale were completed. This resulted in exclusion of a total of 17 participants with too much missing data, 12 related to the W-DEQ and five related to the CBSEI.

The respondents were divided into groups. First, based on the W-DEQ sum score the women were referred to one of two groups; mild to moderate FOC (<85) and severe FOC (≥85) [4, 34]. Second, since it is mainly the perceived efficacy expectancy that influences whether a situation is perceived as fearsome or not, three groups were constituted based on the quartile values of efficacy expectancy. The first quarter made up the 'low efficacy expectancy' group, the second and third quarters made up the 'moderate efficacy expectancy' group, and the fourth quarter constituted the 'high efficacy expectancy' group. The 'moderate efficacy expectancy' group was excluded in some analyses since we aimed to analyse the effects of low and high efficacy expectancy respectively.

Descriptive statistics were used for the presentation of absolute and relative frequencies, mean (±SD) and median (inter-quartile range). Comparisons between two groups were tested by Pearson's chi-square test and Fischer's exact test for small samples for categorical variables, Mann-Whitney U-test for ordinal variables and Student´s t-test for continuous variables. Pearson´s *r* was used to study relations between W-DEQ and the subscales of

CBSEI. Two binary logistic regressions using the Enter method were performed, with the aim of investigating how the variables contributed to the level of efficacy expectancy and FOC respectively. The results are presented as odds ratios and a 99% confidence interval. Correlations between all the variables were analysed with Spearman $r_s$, in order to control for collinearity. The level of significance was set to $p<0.01$, two-sided.

**Results:**

The mean age of the participants was 29 years, and most were cohabiting (98.1%). The majority of the women had an intermediate (34.8%) or a high educational level (62.5%). About one fifth of the women (21.7%) was unemployed or on sick leave. Of all the participants 28.6 % (n=121) had sought health care assistance because of psychological problems at least once before pregnancy. The criterion for severe FOC was fulfilled by 20.8% (n=88). These women with severe FOC had a significantly lower level of education (p= 0.001), and more often sought help because of their mental problems (p= 0.004). A small proportion (5%) preferred a caesarean section instead of a vaginal delivery if they were free to choose, but significantly more of these women (p<0.001) were found in the severe FOC group. The women with severe FOC had a lower score of efficacy expectancy (p<0.001) compared with the mild to moderate FOC group, while no significant difference for outcome expectancy was shown (Table I).

Table I. Socio-demographic, mental characteristics according to level of fear of childbirth (FOC)

|  | All women | Mild to moderate FOC | Severe FOC | p-value |
|---|---|---|---|---|
|  | n= 423 | n= 335 | n= 88 |  |
| Age, Mean (±SD)[1] | 29.0 ±4.5 | 29.1±4.4 | 28.6±5.1 | 0.332 |
| Min-max | 18-42 | 18-42 | 19-41 |  |
| Cohabitation, *n (%)* | 413(98.1) | 329(98.5) | 84(96.6) | 0.127 |
| Educational level, *n (%)* |  |  |  | 0.001 |
| *Elementary school* | 11(2.6) | 9(2.7) | 2(2.3) |  |
| *High school* | 146(34.8) | 102(30.5) | 44(51.8) |  |
| *University* | 262(62.5) | 223(66.8) | 39(45.9) |  |
| Occupational condition, *n (%)* |  |  |  | 0.008 |
| *Employed /student* | 328(78.3) | 229(81.0) | 5(67.8) |  |
| *Unemployed/sick leave* | 91(21.7) | 63(19.0) | 28(32.3) |  |
| Perceived health [2]Md(Q1;Q3) | 3.0(3.0;4.0) | 4.0(3.0;4.0) | 3.0(3.0;4.0) | 0.125 |
| Mental problem before pregnancy, *n (%)* | 121(28.6) | 85(25.4) | 36(40.9) | 0.004 |
| Preference for caesarean section, *n (%)* | 21(5.0) | 7(2.1) | 14(15.9) | <0.001 |
| Outcome expectancy, Mean (±SD) | 125.5(17.0) | 126.5(16.0) | 121.6(19.9) | 0.015 |
| Efficacy expectancy, Mean (±SD) | 94.7(25.8) | 98.5 (22.1) | 80.6(32.7) | <0.001 |
| W-DEQ, Mean (±SD) | 68.5(22.4) | 59.7(14.1) | 102.4(14.7) | <0.001 |

[1] Standard deviation
[2]Four-point scale 1= very bad, 4 = very good

The sample was divided into quarters based on the quartiles of efficacy expectancy. The first quarter represents the lowest efficacy expectancy whilst the fourth quarter represents the highest efficacy expectancy. Comparisons between those in quarters one and four showed no differences for age, co-habitation, educational level and occupational status. The women with the lowest efficacy expectancy reported lower perceived health (p=<0.001) and had more often sought help because of mental problems (p=0.007). They also had lower outcome expectancy (p<0.001) and higher FOC (p<0.001). More than half of the women (52%) in the low efficacy expectancy group fulfilled the criterion of severe FOC (p<0.001), compared with 19 % in the high efficacy expectancy-group (Table II).

Table II. Characteristics among 423 nulliparous pregnant women divided into quarters related to childbirth self-efficacy expectancy (EE)

| | 1st quarter Low EE | 2nd & 3rd quarter Moderate EE | 4th quarter High EE | p-value[2] |
|---|---|---|---|---|
| Efficacy expectancy sum score (min-max)[1] | 16-80 n=108 | 81-111 n=205 | 112-160 n=110 | |
| Perceived health [3], Md (Q1;Q3) | 3.0(3.0;4.0) | 4.0(3.0;4.0) | 4.0(3.0;4.0) | <0.001[4] |
| Mental problem before pregnancy, *n (%)* | 45(41.7) | 49(23.9) | 27(24.5) | 0.007[5] |
| Preference for caesarean section, *n (%)* | 11(10.5) | 7(3.4) | 3(2.8) | 0.023[6] |
| Outcome expectancy, Mean (±SD)[7] | 117.3(19.7) | 123.5(13.8) | 137.2(12.8) | <0.001[8] |
| W-DEQ, Mean (±SD) | 82.2(21.4) | 65.5(17.9) | 60.7(25.1) | <0.001[8] |

[1] Min-max of the whole scale: 10-160 points. [2] Comparision 1st and 4th quarters. [3] Four-point scale 1= very bad, 4 = very good. [4] Mann-Whitney U-test. [5] Pearson's Chi-square test. [6] Fischer´s exact test. [7] Standard deviation. [8] Student's t-test

Correlations between outcome expectancy, efficacy expectancy and FOC are presented in Table III. Outcome expectancy and efficacy expectancy correlated significantly and positively, while FOC correlated significantly and negatively with both outcome expectancy and efficacy expectancy.

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Table III. Correlations between childbirth self-efficacy (CBSE)
and fear of childbirth (FOC)

|  | EE | FOC |
|---|---|---|
| CBSE<br>Outcome expectancies (OE) | . 407** | -.191** |
| CBSE<br>Efficacy expectancy (EE) |  | -.417** |

**Correlation is significant at the 0.01 level (2 tailed)

Before running the logistic regression analysis all variables were tested for collinearity by

calculating correlations. All correlations were below absolute .418. Consequently, all

variables were used in the models. Two logistic regression models were built to calculate the

effect of the independent variables on efficacy expectancy and FOC respectively.

The result of the analysis with efficacy expectancy as the dependent variable showed that the

independent variables explained 50 % of the variance. A higher level of fear predicted a lower

level of efficacy expectancy ($p<0.001$), whereas higher outcome expectancy was associated

with higher efficacy expectancy ($p<0.001$) (Table IV).

Table IV. Logistic regression model of childbirth self-efficacy expectancy for the first and fourth quarters
(n=218)

|  | B | Odds ratio (99% CI) | p-value |
|---|---|---|---|
| Outcome expectancy | 0.075 | 1.078(1.043-1.113) | <0.001 |
| Fear of childbirth W-DEQ | -0.032 | 0.969 (0.948-0.990) | <0.001 |
| Mental problem before pregnancy | -0.837 | 0.433 (0.156-1.201) | 0.032 |
| Perceived health | 0.443 | 1.557 (0.777-3.119) | 0.101 |
| Cohabitation | -1.416 | 0.243 (0.008-6.989) | 0.278 |
| Age | -0.025 | 0.975 (0.873-1.089) | 0.558 |
| Preference for caesarean   section | 0.336 | 1.399 (0.125-15.611) | 0.720 |
| Educational level | -0.141 | 0.869 (0.314-2.401) | 0.722 |
| Occupational status | -0.070 | 0.933 (0.225-3.860) | 0.899 |

Nagelkerke R square for the model: 0.50

In the second logistic regression analysis, 21 % of the variance of FOC was explained by all

the variables. Women with severe FOC were more likely to have low efficacy expectancy

(p<0.001) and to prefer a caesarean section instead of a vaginal birth (p<0.001) (Table V).

Table V. Logistic regression model according to level of fear of childbirth
 (n=423)

|  | B | Odds ratio (99% CI) | p-value |
|---|---|---|---|
| Efficacy expectancy | -0.024 | 0.976 (0.962-0.990) | <0.001 |
| Preference for caesarean   section | 1.899 | 6.678 (1.717-25.974) | <0.001 |
| Educational level | -0.544 | 0.581 (0.293-1.151) | 0.041 |
| Occupational status | 0.364 | 1.439 (0.599-3.454) | 0.285 |
| Mental problem before pregnancy | 0.314 | 1.369 (0.635-2.949) | 0.293 |
| Cohabitation | -0.687 | 0.503 (0.088-2.891) | 0.312 |
| Perceived health | 0.137 | 1.147 (0.673-1.955) | 0.507 |
| Outcome expectancy | -0.002 | 0.998 (0.977-1.020) | 0.849 |
| Age | 0.006 | 1.006 (0.927-1.0791) | 0.855 |

Nagelkerke R square for the model: 0.21

**Discussion:**

The aim of this study was to investigate the relationship between self-efficacy, i.e. outcome expectancy and efficacy expectancy, and FOC. Outcome expectancy stands for the belief that a given behaviour will lead to a given outcome while efficacy expectancy refers to the belief in one´s ability to carry out this behaviour. In various ways our study showed that efficacy expectancy was related to outcome expectancy as well as to FOC in a notable way, while FOC and outcome expectancy were not.

According to self-efficacy theory, emotional arousal is one of the sources of perceived self-efficacy, e.g. high aversive emotional arousal caused by a threatening situation usually diminishes self-efficacy. Therefore, it was not surprising that more than half of the women with severe FOC, i.e. W-DEQ score $\geq$ 85, were found in the lowest efficacy expectancy group. However, it is not clear what comes first, FOC or low childbirth self-efficacy. The results demonstrate meanwhile that women with severe FOC were more likely to look for help for mental problems before pregnancy. Thus, these women comprise a group that was already vulnerable before they became pregnant. We also know that FOC has state and trait components [13], and therefore it is possible that trait FOC could facilitate the development for ideas of incapability, i.e. low efficacy expectancy for childbirth. From this perspective, a fairly high number of women with severe FOC are vulnerable and to some degree already fear childbirth before they become pregnant, which means that women who fear delivery are also predisposed to have low childbirth self-efficacy when they become pregnant. This fits with self-efficacy theory, which states that in potentially aversive situations, fears tend to increase and influence perceived self-efficacy negatively [35]. Accordingly, Beebe et al [24] found that higher prenatal anxiety was related to lower confidence in one´s ability to cope with labour and birth.

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FOC correlated significantly with both outcome expectancy and efficacy expectancy although in the logistic regression, outcome expectancy was not a main factor that explained fear. This means that pregnant women with severe FOC concentrate more on their perceived incapability to cope with their tasks than the tasks per se.

Unexpectedly, nearly one fifth of the women with severe FOC qualified for the high efficacy expectancy group. Despite their fear, these women were confident about performing coping behaviours.. It is possible that some of the women with severe FOC were influenced by their social surroundings, which in self-efficacy theory terms means that they were prompted by sources such as vicarious experiences, e.g. the labour histories of other women, and verbal persuasion, e.g. encouragement by the midwife at the antenatal care clinic. Knowing that others have performed successfully, and verbal persuasion, contribute to making people believe that they can cope successfully [35]. Moreover, we do not know what the participants fear most in concrete terms. They might have anxious feelings and thoughts regarding labour and delivery but have confidence in their capability to execute those strategies that make up the CBSEI. Additionally, we did not control for planned caesarean sections, which implies considerable different strategies for coping with labour. On the other hand, in women with severe FOC, a planned caesarean section reduces FOC considerably [13].

As well as stronger fear, the women with the lowest efficacy expectancy had more often sought help due to mental problems and had a lower self-reported health and had lower outcome expectancy, than those with the highest efficacy expectancy. In other words, these women comprised the most vulnerable section of the participants. Besides that, they doubted they would be able to cope with labour and birth and they also had higher FOC.

According to the self-efficacy theory, a person may believe that certain behaviours can help with coping in an aversive situation, but may also feel dubious about her capability to perform the behaviours [18]. The results showed that irrespective of the level of FOC, the level of outcome expectancy was higher than the level of efficacy expectancy. This finding is in line with the results from other studies using the CBSEI [23-25, 30, 36]. Another explanation of the relation of outcome expectancy and efficacy expectancy may be linked to the items of the CBSEI. These are about behaviours for coping with labour and childbirth according to seven domains: concentration, thinking, support, motor/relaxation, self-encouragement, control and breathing [28]. These behaviours might be considered as common knowledge for non-medical coping with labour, and this might somewhat explain the strength of outcome efficacy beliefs. However, when judging one's own capability to cope with the upcoming birth it becomes more uncertain what is possible to perform.

Similar to Nieminen et al. [1] only 5% of the participants wanted a caesarean section if they had a free choice. Two thirds of these women had severe FOC. Although lower efficacy expectancy was associated with severe FOC, low efficacy expectancy did not relate to preference for caesarean section. This indicates that a preference for a caesarean section has more to do with severe FOC than with low efficacy expectancy. A consequence is that, for those women with severe FOC who have a preference for caesarean section, it is not sufficient to focus on coping with labour and delivery in antenatal health care.

Our finding that 20.8% of the women scored $\geq 85$ on W-DEQ (severe FOC) was considerably higher compared with previous Scandinavian studies using the same definition for severe FOC [1, 3, 37]. This finding must be treated with caution, since less than 50 % of the addressed women participated. On the other hand, our sample is representative for age for

nulliparous women in Sweden [38] . Furthermore, some characteristics of our sample of women with FOC agree with what others have shown, i.e. low education [14, 39].

A strength of our study is the use of reliable and valid instruments, W-DEQ and CBSEI. The cut-off score for severe FOC, i.e. W-DEQ score $\geq$ 85, has been applied in several studies [4, 10] and offers the advantage of comparing results from different publications. According to Bandura [35], previous experiences from a specific situation constitute the most powerful source of self-efficacy regarding that situation, since it is based on personal mastery experiences. Our aim was to collect data from a homogeneous sample; therefore all women were nulliparous and thus participants were equal in that none had experienced a delivery before, which could have influenced their reports on self-efficacy in a substantial way. Consequently our findings are limited to nulliparous women. Studies including multiparous women have to be done to offer greater generalization possibilities on the relations between FOC and self-efficacy. Furthermore, the result must be seen in the light of the low response rate. As we were not able to perform drop-out analysis, we do not know if the non-respondent women differ in levels of FOC or self-efficacy for childbirth compared with the respondents.

**Conclusions:**

Efficacy expectancy and FOC were associated. A lower efficacy expectancy, i.e. lower confidence in own capability to perform helpful behaviours during labour, was associated with higher FOC. Pregnant women with severe FOC and low efficacy expectancy run an increased risk of experiencing an even greater fear during the course of pregnancy. Additionally, managing labour and birth risks becomes a distressing task. Therefore, it is crucial to identity pregnant women with severe FOC, regardless of what the focus of their fear is. Encouraging the woman with severe FOC to verbalize her thoughts about the upcoming

birth could be one way to reveal individual needs and thus increase the probability of providing her with relevant care. In comparison, Saisto et al [40] showed that psycho-education and training relaxation during pregnancy were successful methods for helping women with FOC, even ending up in withdrawals of requests for a caesarean section.

Preference for a caesarean section was associated with severe FOC. Irrespective of the level of FOC, outcome expectancy was higher compared with efficacy expectancy. Since severe FOC is related to beliefs about incapacity to cope with labour and childbirth, it is crucial to direct the care to focus on various strategies for coping with labour and birth. However, for women with severe FOC who want to have a caesarean section this must be complemented with other antenatal care strategies.

**Declaration of Interest:**

The authors declare no conflict of interest

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**Current knowledge on this subject**

- Substantial FOC is rather common and for about 6-15% of pregnant women the fear is so severe that daily life activities are negatively influenced.

- Severe FOC is documented as a reason for requesting elective caesarean section.

- Self-efficacy has been identified as a factor that influences satisfaction with childbirth.

**What this study adds**

- Low efficacy expectancy is associated with a higher level of FOC.

- Preference for caesarean section instead of vaginal birth is related to severe FOC, not to efficacy expectancy beliefs.

- Outcome expectancy was higher than efficacy expectancy, irrespective of the level of FOC.