The significance of supportive and undermining elements in the maternal representations of an unborn baby

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Abstract

Objective. The maternal representations of an unborn baby begin to develop already during pregnancy. However, the factors that moderate them are not well identified. The objective of this study was expressly to jointly explore supportive and undermining factors in the maternal representations of an unborn baby and motherhood.

Methods. The article is based on cross-sectional data comprising 1,646 women studied during the third trimester of pregnancy. Maternal expectations were measured using a 12-item self-report questionnaire, Mother's Representations about an Unborn Baby. Depression, anxiety, family atmosphere and adult attachment were measured using standardized questionnaires. Statistical analysis is based on multivariate Linear Regression analysis.

Results. The most powerful predictors of a mother's prenatal expectations were the mother's educational status, age, closeness in adult relationships, depressiveness and family atmosphere. In accordance with our hypothesis, depressiveness was related to the mother's more negative expectations on their relationship with the unborn baby and on regularity in the baby's sleeping and eating patterns. A positive family atmosphere and the mother's ability to closeness and dependence (i.e. confidence) in adult relationships were related to more positive expectations of the mother-unborn baby relationship. On the other hand, stress, anxiety and adverse life events were not related to the mother's expectations of her unborn baby.

Conclusions. The results may be helpful in identifying families who need early professional support and call for studies where the prenatal phase is explored as a proactive phase for the development child parent relationship.

Keywords: Prenatal attachment, representation, expectation, pregnancy, motherhood, depression

Introduction

A meaningful relationship between a mother and her child begins to develop during pregnancy. Becoming a mother is seen as a transformation process during which a woman anticipates her future role, cognitively prepares herself and practices the tasks which will be needed after the baby has been born (Alhusen, Hayat, & Gross, 2013).

Different concepts such as *maternal-fetal or maternal-infant prenatal attachment* (Barone, Lionetti, & Dellagiulia, 2014; Schwerdtfeger & Goff, 2007), *prenatal expectations* (Gress-Smith, Roubinov, Tanaka, Cirnic, Gonzales, Enders & Luecken, 2013) and *maternal prenatal representations* (Huth-Bocks, Theran, Levendosky & Bogat, 2011) have been used to refer to the mother's expectations, thoughts and emotions about her unborn baby, about motherhood and about pregnancy.

Maternal prenatal representations have been operationalized differently by different authors. For example, Condon's (1993) prenatal attachment measure with 19 items of the mother's scale focuses on the quality of prenatal attachment (positive, negative, delightful, sad, ambivalent feelings to the fetus) and the quantity of time the parents spend "in attachment mode" (p. 180). Cranley's (1981) Maternal-Fetal Attachment Scale (MFA) with 24 items, comprises emotional and affectional factors related to pregnancy, to future motherhood and to the unborn baby. Muller's (1993) 21-item questionnaire of Prenatal Attachment Inventory (PAI) had similar elements to Cranley, but the factors were named differently (Barone et al., 2014). Consequently these measures are conceptually overlapping.

In our study, we have explored prenatal expectations concerning mother-child relationship using a 12 item questionnaire (Kangaspunta, Kilkku, Kaltiala-Heino and Punamäki 2005). This study is conducted in the framework of Stern's (1995) theory. In his view, the concept of representations or "schemas-of-being-with" refers to the perceived images of self in relation to others. These mental representations, expectations and dreams concerning a baby, called an **"imaginary baby"** by Stern

(1995), are both real and imaginary pictures of interaction with a baby, with a baby's father, with a mother's parents and with other significant people.

Prenatal representations have been found to evolve during pregnancy due to baby's movements, which the mother experiences in the weeks after mid-pregnancy (Vedova, Dabrassi & Imbasciati, 2008; Laxton-Kane & Slade, 2002; Canella, 2005). Moreover, Vreeswijk, Rijk, Maas and Bakel (2015) found that while representations are stable (from 26 weeks), they become more disengaged before the birth than after it. They assumed (p. 608) that, by avoiding psychologically accession to the baby during pregnancy, the mother protects herself from disappointments that may arise during childbirth.

Previous studies have shown how different psychosocial factors relate to prenatal attachment. Mother's serious trauma-history (Schwerdtfeger & Goff, 2007), stress (Feldman, 2007; Maas, Vreeswijk, Braeken, Vingerhoets & van Bakel, 2014; Cranley, 1981), anxiety (Gaffney, 1986) and depression (Rubertsson, Pallant, Sydsjö & Haines, 2015; Seimyr, Sjögren, Welles-Nyström & Nissen, 2009) relate to poorer prenatal attachment. On the other hand, there are positive factors, such as social support (Condon & Corkindale, 1997; Granley, 1981), support from partner or from own parent (Rubertsson, 2015), relationships with significant others (Wayland & Tate 1993) or attachment to partner or mother's own parents (Bouchard, 2011) that have been related to more positive prenatal representations. However, many findings have been inconsistent or not replicated (Canella, 2004; Laxton-Kane & Slade, 2002). In addition, studies (such as Bouchard, 2001 and Rubertsson, 2015) where both supportive and risk factors are explored jointly are rare. Our study will contribute to completion of the previous studies in this respect.

In conclusion, in this study we explore how different risk and protective factors (attachment in adult relationships, family atmosphere, anxiety, stress, depression, adverse life events) are associated with the expectations of the mother concerning her unborn child. Based on earlier studies (Walsh, Hepper, Bagge, Wadephul & Jomeen, 2013), our hypothesis was that lower levels of stress, anxiety,

depression and adverse life events, more secure attachment scores in adult relationships and a positive family atmosphere jointly relate to more positive prenatal expectations.

Methods

Sample

The study is based on the CHILD-SLEEP birth cohort, which is a longitudinal birth cohort to study child sleep quality, its development and health. The cohort was described in detail in Paavonen et al. (2017). Briefly, it is a randomly recruited birth cohort, with data collections during the 32nd week of pregnancy and when the child is 3, 8, 18 and 24 months. Except for language, there were no exclusion criteria. This study is based on cross-sectional data, the maternal reports during pregnancy. The cohort comprises 1,673 families with 1,667 women with returned prenatal questionnaires. A small number of mothers had filled out the questionnaires after the infant was born (1.2%, n=21), and thus this study comprises 1,646 women. The study protocol has been accepted by the local ethical committee (R11032/9.3.2011). All participants gave an informed consent and signed an agreement form. Families were informed of their rights to terminate their participation in the study at any time during data collection.

Questionnaires

The prenatal questionnaires were given to the mothers at the maternity clinics and included questions on socio-demographic factors, pregnancy and health (e.g. somatic and psychiatric illnesses, height, weight, medication, smoking) as well as standardized questionnaires to evaluate psychiatric symptoms (e.g. depression, anxiety, stress, alcohol usage).

Mothersø expectations of an unborn baby were measured by a 12-item self-report questionnaire ***(Representations of Unborn Baby, RUB-M)*** based on a 5-point Likert scale (ranging from 1 to 5)

(Kangaspunta et al., 2005). The items are reported in Table 1. In order to determine the latent structure of the scale, maximum likelihood factor analysis was performed. The analyses were first conducted with all 12 variables, and then including only the eight variables with communalities over 0.25 (after extraction). Three factors with Eigenvalues >1, explaining 49.61% of the total variance, were extracted. The first factor was called Positive expectations of the relationship with the baby (Posit-Expt-Relation, SD=0.91, n=1626), the second Negative expectations of taking care of the baby (Negat-Expt-TakingCare, SD=0.83, n=1626), and the third Positive expectations of the baby's regularity (Posit-Expt-Regularity, SD=0.75, n=1626). Factor-scores were used in further statistical analyses. [1]

RUB-M has an affective base as in Condon's (1993) quality part of prenatal attachment measure but with different questions. The items of RUB-M refer both to mother's expectations about the unborn, future baby and to mother's expectations of the relationship with the unborn baby and to motherhood. The items of RUB-M are simple and are formulated so that they can be easily understood, which increases the content validity of the measure (Hammond, 1995).

Absence of expectations of the baby (ABS-Expt) were calculated based on the RUB-M original 12-item scale (Table 1), recoding option –I cannot say– as 1 and other options as 0 (Kangaspunta et al., 2005). Sums were calculated (α=0.73, M=1.84, SD=2.11, range 0.00-12.00). The higher the score, the fewer expectations of the baby that the mother reported.

Mothers' attachment in adult relationships (AAS) was measured by an 18-item self-report questionnaire according to Collins and Reed (1990). There are three subscales that were calculated according to original references (scale 1–5, 1=not true or suitable at all, 5=true), except that one item

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[1] In addition, in order to confirm the findings, sum-means with original variables were also calculated according to the results of the factor-analysis. The results were the same as with factor-points.

in two sums was excluded in order to improve the reliability of the scale[2]. Example items for Closeness (M=4.05, SD=0.60, range 1.80-5.00) õI find it relatively easy to get close to othersö, for Dependence, i.e. Confidence (M=3.74, SD=0.78, range 1.00-5.00) õI am comfortable depending on othersö, for Anxiety (M=1.74, SD=0.70, range 1.00-4.60) õI often worry that my partner does not really love meö. Mean-sums were calculated. All subscale scores had good reliability (current data vs. Collins & Reed (1990): Closeness α=0.70 vs. α=0.69, Dependence α=0.86 vs. α=0.75, AAS-Anxiety α=0.76 vs. α=0.72).

Depressiveness was measured using the 10-item version of the Center for Epidemiological studies Depression Scale, CESD (Radloff, 1977; Irwin, Haydari & Oxman, 1999). Scale was 0-3, 0=rarely or not at all or less than once a week, 3=all the time or 5-7 days per week. A mean-sum was calculated (α=0.78, M=5.11, SD=3.50, range 0.00–23.00). The higher the sum, the more depressive was the mother.

STAI-Anxiety[3] was measured using a 6-item shortened version of the Spielberger Trait Anxiety Scale (Bieling, Antony, & Swinson, 1998). A scale was 1ó4, 1=almost never, 4= almost always. A mean-sum was calculated (α=0.78, M=8.96, SD=2.38, range 6.00-21.00). The higher the sum the more anxious was the mother.

Stressfulness was measured using the 5-item perceived stress scale by Cohen, Kamarck & Mermelstein (1983). A scale was 0ó4, 0=not even once, 4=very often. A mean-sum was calculated (α=0.69, M=5.69, SD=2.89, range 0.00–18.00). The higher the sum, the more stressed was the mother.

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[2] AAS-Anxiety with 5 items excluded variable õI want to merge completely with another personö, Closeness with 5 and Closeness-Dependence with 11 items, excluded variable õ I am comfortable having others depend on meö.

[3] The variable is called **STAI-Anxiety** in the text in order to distinguish the concept from **AAS-Anxiety** in adult relationships, measured by the Adult Attachment Scale (AAS).

Adverse life events during the last 6 months were measured using the Life Events Scale (LTE), which lists 11 potentially distressing life events (Brugha & Cragg, 1990). A scale was 1–2, 1=yes, 2=no. Dummy variables were recorded (no distressing events=0). A mean-sum was calculated (α=0.53, M=0.64, SD=1.05, range 0.00–11.00). The higher the sum, the greater the number of adverse life events a mother has had.

Family atmosphere was evaluated using a 7-item Likert–type scale (1–7). Example items õexciteó chattyö, õsafeóinsecureö (reversed scale). A mean-sum was calculated (α=0.86, M=42.52, SD=5.24, range 14.00–49.00). The higher the sum, the better was the family-atmosphere.

Educational status from lowest to highest (1–4), based on the length and grade of the mother's education, was created by combining the variables of ‑professional educationø and ‑basic educationø into a new variable. (Table 2)

Statistical analyses

Frequency analysis was performed first. Thereafter, Spearman correlation coefficients were calculated between the independent (i.e.explanatory) and the dependent variables (Table 3). Finally, linear regression analysis was performed (Table 4). Models were created to study factors that are related to the dependent variables. The main explanatory variables were defined according to previous literature, comprising both risk factors (stress, STAI-Anxiety, depression and adverse life events), supportive factors (family atmosphere and mother's security in adult relationships) and the background variables (the mother's educational status, age, number of pregnancies, gestational age and income). All these variables were included in the same linear regression model so as to evaluate their relative contribution to the outcome variable. According to the tests, there was no multicollinearity in the data (0.1< Tolerance <1 and VIF <10).

Results

Description of the sample

The socio-demographic factors of the sample are reported in Table 2. Concerning mothersø age (Vuori & Gissler, 2014) and income (OSF, 2013) they are similar to the general data of Finnish pregnant women but mothers in our sample are higher educated (OSF, 2016).

Correlation analyses

The results of the correlation analysis are presented in Table 3. Of the main explanatory variables, we found that the greater closeness-dependence (i.e. security) in adult relationships (also with the partner) and the better family atmosphere were related to the more positive expectations of the relationship with the baby (p<0.001) and less negative expectations of taking care of the baby (p<0.001). Stress, anxiety (measured by STAI) and depression were related to more negative expectations of taking care of the baby (p<0.001) and to fewer (p<0.01) expectations of the baby. In addition, the more depressed the mother was, the less she expected the babyøs regularity (p<0.001).

Regarding background variables, the motherøs higher education was related to less positive expectations of the relationship with the baby (p<0.001) and to more negative expectations of taking care of the baby (p<0.01). Younger age was related to the more positive expectations of relationship with the baby (p<0.001), more negative expectations of taking care of the baby (p<0.001) and fewer expectations of the baby (p<0.001). (Table 3)

Regression analysis

Linear regression analyses were conducted in order to study factors that are related to the motherøs expectations in the end of a pregnancy. In these models, lower level of depressiveness was related to ***positive expectations of the relationship with the baby*** (β=-0.120, p= 0.003). Moreover, motherøs relationships were related to positive expectations: closeness in adult relationships (β=0.152,

p< 0.001), positive family atmosphere (β=0.095, p=0.003) and the mother's dependence i.e. confidence in adult relationship (β=0.075, p=0.04) were related to more positive expectations. Anxiety in adult relationship (measured by AAS) was related to positive expectations of her relationship with her baby (β=0.072, p=0.043). Of the background factors higher education (university education, β=-0.172, p< 0.001 and polytechnic education, β=-0.102, p< 0.001), and intermediate income were associated with less positive expectations (β=-0.059, p=0.044). (Table 4).

Negative expectations of taking care of the baby. Of the main explanatory variables, only more negative family atmosphere (β=-0.090, p=0.007), and the mother's weaker closeness in adult relationships (β=-0.080, p=0.015), were related to more negative expectations of taking care of the baby. The strongest variables explaining negative expectations taking care of the baby were the mother's university education (β=0.124, p=0.004) and younger age (β=-0.116, p< 0.001). Finally, the first pregnancy and pregnancy exceeding 32 weeks were related positively (β=0.060, p=0.0345; β=0.064, p=0.017, respectively) to negative expectations of taking care of the baby. (Table 4).

Positive expectations of the baby's regularity in eating and sleeping. A mother's depressiveness (β=-0.177, p< 0.001) and higher education (university education: β=-0.098, p=0.026) were associated with a mother's more negative expectations of her baby's regularity in sleeping and eating. (Table 4).

Expectations of the baby were *more often absent* when the mother reported less closeness in adult relationships (β=-0.092, p = 0.006). They were also related to younger age (β=-0. 065, p=0.034), first pregnancy (β=0.060, p=0.038) as well as a later stage of the pregnancy (i.e. exceeding 32 weeks) (β=0.076, p=0.006). (Table 4).

Discussion

Our aim was to jointly explore the supportive and risk factors for maternal representations of an unborn baby at the end of a pregnancy. While prenatal attachment mostly refers to the thoughts about the fetus, our measure refers to the mother's thoughts and feelings regarding the future baby. Based on earlier studies, we assumed that lower levels of different environmental risk factors jointly with higher levels of supportive factors are positively related to the mother's expectations of her unborn baby and of motherhood.

We found that **depressiveness** was one of the strongest risk factors, being related to the mother's negative expectations. The more depressive the mother was, the less she had positive expectations of the relationship with her baby and the less she expected regularity from the baby (i.e. less predictability concerning eating and sleeping). Our results support the findings by Rubertsson et al. (2015), according to which more depressive mothers had lower prenatal attachment scores. Also according to Seimyr et al. (2009) depressive mothers have more negative attitudes to their pregnancy and their body which, as we suppose, can also increase negative expectations concerning the future baby.

However, contrary to our assumptions, the other risk elements of mental health disorders (stress, STAI-Anxiety, adverse life events) were not related to maternal representations. Our results partly supported the findings of Schwerdtfeger and Goff (2007), according to which mother's total trauma-history (including serious and numerous traumas similar to those in our study, including unemployment and death of family members or friends) did not predict prenatal attachment, but that an inter-personal trauma history was a negative predictor.

Regarding **perceived stress**, our finding is partly in agreement with previous studies, because stress was not related to a mother's expectations of her baby, of the relationship or of motherhood. Our findings support Siddiqui and Hägglöf's (1999) results, according to which psychosomatic symptoms (including overall distress) do not relate to prenatal attachment. It has also been reported that

less stress on the part of the mother during pregnancy predicts a more positive prenatal attachment (Feldman, 2007; Maas et al., 2014). On the other hand, the pregnant woman's depression, stress and anxiety are often combined (Latva & Moilanen, 2016). Positive correlations between stress, depression and STAI-anxiety were also evidenced in our study (r=0.59-0.61, p< 0.001).

Mother's positive expectations were supported by a positive family atmosphere, the mother's capacity for closeness and dependency in adult relationships, including a spouse. In this context, our results support the findings by Rubertsson et al. (2015), which showed that lack of a partner's support is connected to lower prenatal attachment scores (in terms of PAI-R[4]).

Closeness and dependence i.e. confidence in adult relationships were associated with positive expectations, and closeness was also inversely associated with negative expectations of taking care of the baby. In addition, the more closeness mother had in her adult relationships, the more representations of an unborn baby and of motherhood she generated. These findings corresponded with the results of Maas et al. (2014), according to which a secure attachment in adult relationships provides better conditions for mothers to develop an emotional relationship with their unborn baby.

Good family atmosphere related to positive expectations of the relationship with the baby and to less negative expectations of taking care of the baby. Previous studies indicate that the support of the spouse is positively related to the mother's ability to create a better emotional relationship with her unborn baby. For example, social support for the mother (Huth-Bocks et al., 2011; Laxton-Kane & Slade, 2002) protects the emotional bond between mother and child both before and after birth. Moreover, Feldman (2007) reported that the teenage mother's expectations of support by those close to her with a baby increased prenatal attachment. Similarly Huth-Bocks, Levendosky, Theran and Bogat (2004) reported that domestic violence (i.e. conflicts in marital relations) related to more

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[4] Prenatal Attachment Inventory – Revised (Rubertsson et al., 2015).

negative representations of an unborn baby, which can transmitted in the form of an insecure attachment after birth (Huth-Bocks et al., 2011).

Concerning **mothersø education**, higher education was related to more negative expectations, but not absence of expectations of the baby. Mothers with a university or polytechnic degree had less positive expectations of relationship with the baby, and mothers with a university degree had more negative expectations of taking care of the baby and expected less regularity (i.e. predictability[5]) in their babyøs sleeping and eating compared to the mothers with the lowest education. Previous findings have been contradictory according to an integrative study by Canella (2004). In the study by Barone et al. (2014) it appeared that the motherøs education did not relate to her emotional bond with the unborn baby (i.e. prenatal attachment). In our study, the motherøs education is one of the most powerful explanatory factors. This is in harmony with findings by Rubertsson et al. (2015) concerning Swedish mothers with university or college education who had lower prenatal attachment scores than mothers with elementary or high school education. The results of education could be explained by a stronger role-conflict between family-life and work. A role-conflict can be stronger by highly educated mothers, because in Finland their working weeks are longer[6] and more stressful than those of mothers with a shorter education (see Gallie & Russell, 2009; Matthews, Swody & Barnes-Farrell, 2012; Palmer, Rose, Sanders & Randle, 2012). Highly educated mothers might be aware that both work and baby need more time than is available.

Mothers whose pregnancy had proceeded **beyond 32 weeks had** more negative expectations of taking care of their baby and generally less expectations compared to mothers with a pregnancy of

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[5] Our interpretation of higher regularity as a positive factor is relevant based on the findings by Maas et al. (2014) and Zeanahøs, Carrøs and Wolkøs (1990) findings concerning positive association between predictability and mother-fetal-attachment.

[6] Lower employees worked less than 35 hours per week more often than higher in Finland in 2014 (OSF, 2014).

less than 32 weeks. This might be because, as Stern (1995) assumed, a woman protects herself against possible disappointments caused by the real baby.

The age of mothers related inversely to negative and absence of expectations. Younger mothers had more negative expectations of taking care of their baby, and they also had less expectations of the baby. Previous results vary concerning association between age and prenatal relationship. Siddiqui and Hägglöf (1999) and Lindgren (2001) found, contradictory to our results, that younger mothers had stronger attachment to their unborn baby compared to older mothers. According to Canella (2004), most studies have not found this kind of correlation. Nor did the findings by Barone et al. (2014) show differences between younger and older women's prenatal attachment. In the longitudinal sample, we will further study whether younger women are at a greater risk of creating a weaker emotional bond with their baby after birth.

Limitations

A few limitations of the findings must be noted. Firstly, although we were able to show several factors that are related to maternal expectations of an unborn baby, they explained the variance in the data only to small extent, and thus further studies are needed to fully understand the formulation of mother's expectations of an unborn baby. Secondly, we must also be cautious in our interpretation of our measure of maternal expectations (RUB-M), because it is different to other measures that have been used previously. Concerning the subject of prenatal attachment, there are several studies made in different countries but with varying measures. This reduces the comparability of different studies. For this reason, we suggest in the future studies to compare different scales which have been developed to measure prenatal attachment, representations, expectations and affectional bond to an unborn baby for evaluating predictive validity.

In this study, we have assessed the mother's expectations as if they were permanent factors, although according to Raphael-Leff's (2010) theory (of a healthy ambivalence) a pregnant woman's feelings can fluctuate significantly from negative to positive and vice versa. In further studies, it will be important to examine whether a single evaluation (once during pregnancy) could predict how the relationship between a mother and a baby might develop after birth.

Conclusions

Summarizing our results, mother's lower depressiveness and good relationships inside and outside the family (i.e. good family atmosphere, security) were the most important predictors of mother's positive expectations concerning the baby. On the other hand, mother's higher education, mother's younger age, pregnancy over 32 weeks and first pregnancy predicted more negative expectations. The results may be helpful in identifying families who need early professional support. As part of a longitudinal study, which contains data from the prenatal to postnatal phase, we are going to analyse how a mother's prenatal representations predict the development of the relationships between mother and child, and how they, together with the background factors, predict a child's socio-emotional development.

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Table 1. Distribution of original variables of maternal expectations and the factor loadings of the final factor solution.

I imagine that my baby¡	Not at all		Somewhat		Cannot say		Much		Very much		Posit-Expt-Relation	Negat-Expt-Taking-Care	Posit-Expt-Regularity
	f	%	f	%	f	%	f	%	f	%			
will sleep regularly	92	5.6	809	49.1	302	18.3	388	23.6	48	2.9	0.013	-0.238	**0.614**
will be difficult to breast-feed	600	36.5	549	33.4	429	26.1	55	3.3	10	0.6	--	--	--
will follow a precise eating rhythm	179	10.9	769	46.7	423	25.7	257	15.6	12	0.7	0.042	0.024	**0.580**
will be satisfied and happy	7	0.4	161	9.8	147	8.9	949	57.5	374	22.7	0.290	**-0.390**	0.367
will seem unfamiliar and strange	1349	82.0	161	9.8	124	7.5	6	0.4	1	0.1	--	--	--
will enjoy himself	232	14.1	960	58.3	360	21.9	81	4.9	9	0.5	--	--	--
will calm down easily on my lap	13	0.8	166	10.1	127	7.7	974	59.2	361	21.9	0.317	**-0.465**	0.265
will not be easy to calm down	453	27.5	763	46.4	395	24.0	26	1.6	5	0.3	-0.078	**0.720**	-0.056
will wake up continuously at night	123	7.5	937	56.9	309	18.8	220	13.4	50	3.0	--	--	--
will suffer and be restless	760	46.2	499	30.3	361	21.9	17	1.0	4	0.2	-0.091	**0.671**	-0.069
will be adorably cute	1	0.1	14	0.9	28	1.7	361	21.9	1238	75.2	**0.851**	-0.130	0.033
will cause me great joy	1	0.1	14	0.9	20	1.2	281	17.1	1326	80.6	**0.825**	-0.144	0.066

N¡s ranged from 1638-1643

Table 2. Description of the sample

	N	%
Age of the Mothers (years)		
17ó25	198	12.3
26ó35	1193	73.3
36ó48	236	14.5
Gestational age of the Mothers (weeks)		
32 or less	243	14.8
More than 32	1396	85.2
Order of pregnancy		
First	560	39.3
Second	418	29.4
Third	274	19.3
Fourth or more	170	12.0
Disposable income of the Mothers (euros)		
Less than 1,000	371	23.2
1,000ó2,000	816	50.7
2,000ó3000	357	22.2
3,000ó4,000	51	3.2
More than 4,000	13	0.8
Vocational degrees		
University (highest level)	550	33.4
Applied sciences (upper secondary level)	597	36.3
Secondary level (lower secondary level)	343	20.9
Vocational course(s)	22	1.3
No vocational education	96	5.8
Something else	37	2.2
Educational status (basic and vocational education)		
1.Comprehensive school + vocational education at a lower secondary level (maximum)	278	17.3
2.Comprehensive school + vocational education at an upper secondary level or degree from a university of applied sciences or high-school diploma + vocational education at a lower secondary level	303	18.9
3.High-school diploma + vocational education at an upper secondary level or degree from a university of applied sciences	476	29.6
4.Comprehensive school or High-school diploma + graduated from a science university	550	34.2

Nøs ranged from 1607-1645.

Table 3. Spearman correlations of mothers' mental health attenuating variables (Stress, STAI-Anxiety, Depressiveness, Adverse life events), supporting variables (family atmosphere, attachment of mothers) and background variables with Mother's Representations of an Unborn Baby.

Variable (Number of items)	ABS-EXPT	POSIT EXPT RELATION	NEGAT-EXPT-TAKING-CARE	POSIT EXPT-REGULARITY
	r	r	r	r
Closeness*	-0.14***	0.13***	-0.16***	0.02 ns
Dependence (i.e. confidence)	-0.13***	0.10***	-0.15***	0.02 ns
AAS-Anxiety**	0.05*	-0.09***	0.09***	0.00 ns
Closeness-Dependence***	-0.15***	0.12***	-0.18***	0.02 ns
Family atmosphere	-0.04 ns	0.16***	-0.16***	0.04 ns
Adverse life events	0.06**	0.02 ns	0.01 ns	0.03 ns
Stress	0.07**	-0.06*	0.13***	-0.05*
STAI-Anxiety	0.07**	-0.07**	0.15***	-0.05+
Depressiveness	0.07**	-0.04+	0.10***	-0.09***
Monthly income	-0.01 ns	-0.2 ns	0.06*	0.01 ns
Educational status	-0.00 ns	-0.10***	0.07**	0.04 ns
Mother's age	-0.10***	-0.09***	-0.10***	-0.02 ns

*p<0.05, **p<0.01, ***p<0.001, + 0.05 Öp<0.10, N's ranged from 1589-1624

Closeness*: with excluded item 'I am comfortable having others depend on me'.

Anxiety**: with excluded item 'I want to merge completely with another person'.

Closeness-Dependence***: with excluded item I am comfortable having others depend on me'.

Table 4. Results of the multiple regression analysis for maternal representations about the unborn baby concerning 164 models.

Model 1. Positive Expectations of the relationship with the baby

Explanatory variables	B	SE B		t	p
Adverse life events	0.034	0.025	0.037	1.366	ns.
Depressiveness	-0.031	0.011	-0.120	-2.959	0.003
STAI- Anxiety	0.013	0.016	0.032	0.797	ns.
Stress	-0.010	0.013	-0.030	-0.760	ns.
Family atmosphere	0.017	0.006	0.095	2.929	0.003
Closeness*	0.234	0.050	0.152	4.680	<0.001
Dependence (i.e. confidence)	0.088	0.043	0.075	2.058	0.040
AAS- Anxiety**	0.096	0.047	0.072	2.026	0.043
Educational status (alternative 2 =1)***	-0.123	0.083	-0.051	-1.473	ns.
Educational status (alternative 3 =1)***	-0.205	0.077	-0.102	-2.652	0.008
Educational status (alternative 4 =1)***	-0.329	0.081	-.172	-4.068	<0.001
Maternal age	-0.002	0.006	-0.009	-0.300	ns.
Number of pregnancy (first =1)	-0.072	0.052	-0.038	-1.379	ns.
Gestational age (>32 weeks =1)	0.004	0.066	0.002	0.065	ns
Maternal income (>3,000þ =1)	0.076	0.122	0.017	0.621	ns.
Maternal income (2,000ó3,000þ =1)	-0.129	0.064	-0.059	-2.019	0.044

Model 2. Negative expectations of taking care of the baby

Explanatory variables	B	SE B		t	p
Adverse life events	-0.028	0.023	-0.033	-1.224	ns.
Depressiveness	-0.002	0.010	-0.009	-0.225	ns.
STAI-Anxiety	0.026	0.015	0.074	1.823	0.068
Stress	0.016	0.012	0.056	1.380	ns.
Family atmosphere	-0.014	0.005	-0.090	-2.719	0.007
Closeness*	-0.112	0.046	-0.080	-2.429	0.015
Dependence (i.e. confidence)	-0.046	0.039	-0.043	-1.157	ns.
AAS-Anxiety**	-0.036	0.044	-0.030	-0.832	ns.
Educational status (alternative 2=1)***	0.057	0.077	0.026	0.735	ns.
Educational status (alternative 3=1)***	0.065	0.071	0.036	0.912	ns.
Educational status (alternative 4=1)***	0.215	0.075	0.124	2.877	0.004
Maternal age	-0.021	0.005	-0.116	-3.900	<0.001

Number of pregnancy (first=1)	0.102	0.048	0.060	2.116	0.035
Gestational age (> 32 weeks =1)	0.147	0.061	0.064	2.385	0.017
Maternal income (>3000þ =1)	0.080	0.113	0.020	0.706	ns.
Maternal income (2000-3000þ =1)	0.086	0.059	0.043	1.452	ns

Model 3. Positive expectations of a babyøs regularity

Adverse life events	0.040	0.021	0.053	1.875	0.061
Depressiveness	-0.038	0.009	-0.177	-4.194	<0.001
STAI-Anxiety	0.007	0.013	0.020	0.487	ns.
Stress	0.004	0.011	0.016	0.391	ns.
Family atmosphere	0.004	0.005	0.031	0.900	ns.
Closeness*	0.027	0.043	0.021	0.623	ns.
Dependence (i.e. confidence)	-0.026	0.037	-0.026	-0.698	ns.
AAS-Anxiety**	0.057	0.040	0.052	1.398	ns.
Educational status (alternative 2 = 1)***	-0.094	0.071	-0.048	-1.318	ns.
Educational status (alternative 3 = 1)***	-0.096	0.066	-0.058	-1.338	ns.
Educational status (alternative 4 = 1)***	-0.154	0.069	-0.098	-2.228	0.026
Maternal age	0.003	0.005	0.018	0 .602	ns.
Number of pregnancy (first = 1)	0.077	0.045	0.050	1.738	0.082
Gestational age (>32 weeks =1)	-0.027	0.057	-0.013	-0.483	ns.
Maternal income (> 3000þ =1)	0.089	0.105	0.025	0.847	ns.
Maternal income (2000-3000þ =1)	0.015	0.055	0.009	0.281	ns.

Model 4. Absence of expectations of the baby

Adverse life events	0.019	0.056	0.009	0 .335	ns.
Depressiveness	-0.027	0.025	-0.046	-1.097	ns.
STAI-Anxiety	0.015	0.037	0.017	0.399	ns.
Stress	0.030	0.030	0.041	0.990	ns.
Family atmosphere	-0.020	0.013	-0.051	-1.507	ns.
Closeness*	-0.322	0.118	-0.092	-2.736	0.006
Dependence (i.e. confidence)	-0.148	0.100	-0.056	-1.480	ns.
AAS-Anxiety**	-0.151	0.111	-0.050	-1.365	ns.
Educational status (alternative 2=1)***	-0.013	0.195	-0.002	-0.067	ns.
Educational status (alternative 3=1)***	0.033	0.182	0.007	0.184	ns.
Educational status (alternative 4=1)***	0.191	0.190	0.044	1.006	ns.
Maternal age	-0.029	0.014	-0.065	-2.126	0.034

	B	SE B	β	t	p
Number of pregnancy (first=1)	0.254	0.122	0.060	2.079	0.038
Gestational age (> 32 weeks =1)	0.431	0.156	0.076	2.768	0.006
Maternal income (>3000þ =1)	0.048	0.289	0.005	0.165	ns.
Maternal income (2000-3000þ =1)	0.179	0.150	0.036	1.197	ns.

Closeness*: with excluded item õI am comfortable having others depend on meö.

Anxiety**: with excluded item õI want to merge completely with another personö.

Educational status***

Alternative 2: Comprehensive school + vocational education at an upper secondary level or degree from a university of applied sciences or high-school diploma + vocational education at a lower secondary level (Alternative 2=1 in dummy variable)

Alternative 3: High-school diploma + vocational education at an upper secondary level or degree from a university of applied sciences.

Alternative 4: Comprehensive school or High-school diploma + graduated from a science university.

Control group: Comprehensive school + vocational education at a lower secondary level (maximum)

B = unstandardized beta

SE B = standard error

  = standardized beta

Model 1. R^2=0.096, R=0.327, ANOVA F-ratio =9.697 (pÖ0.001); Model 2. R^2=0.066, R=0.279, ANOVA F-ratio =6.834 (pÖ0.001); Model 3. R^2=0.020, R=0.179, ANOVA F-ratio =2.679 (pÖ0.001); Model 4. R^2=0.024, R=0.189, ANOVA F-ratio =3.027 (pÖ0.001). F-value indicates that the model fits the data overall (Field 2013, 342).