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DOI

[10.1007/s11205-009-9503-0](https://doi.org/10.1007/s11205-009-9503-0)

Publication date

2010

Document Version

Final published version

Published in

Social Indicators Research

[Link to publication](#)

Citation for published version (APA):

Hoffenaar, P. J., van Balen, F., & Hermanns, J. (2010). The impact of having a baby on the level and content of women's well-being. *Social Indicators Research*, 97(2), 279-295. <https://doi.org/10.1007/s11205-009-9503-0>

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The Impact of Having a Baby on the Level and Content of Women's Well-Being

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Accepted: 21 June 2009 / Published online: 4 July 2009

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Abstract The primary objective of this study was to more fully understand the impact of having a baby on women's well-being by attending to both the level and the content of well-being. To cover the judgemental and affective aspects of well-being we included global measures of life satisfaction and well-being and affective experience measures derived from the day reconstruction method. In a sample of 19 first-time mothers no differences between pre and postnatal reports of general life satisfaction, depression, anxiety, and experienced positive and negative affect were found, suggesting that the arrival of the newborn baby does not universally impact on women's level of well-being. Changes in the content of well-being were studied by examining changes in the way women experience specific activities and interactions with various social partners. There appeared to be an upward shift in experienced positive affect during active leisure and a slight decrease in negative affect during time spent with relatives. The results are discussed in light of previously documented changes across the transition to motherhood in negative mood states, time use, women's evaluation of various aspects of daily life, and relational satisfaction.

Keywords Transition to motherhood · Well-being · Experienced affect · Structural change · Accentuation principle · Time use · Daily life · Diary recall · Episodic reports · Cross-method convergence

1 Introduction

Many first-time mothers are excited to be pregnant and expect their life to change for the better by giving birth. Becoming a mother may, however, not be such a positive experience for all women (Harwood et al. 2007). Women have to adapt to a number of physical, emotional and social changes during the transition to motherhood. Research indicates that a considerable group of women do not cope well with the many challenges associated with motherhood (Cowan and Cowan 1995). For some, the costs (e.g. sleep deprivation, worries

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about raising the child) weigh more heavily than the rewards (Nomaguchi and Milkie 2003). The burden of parenthood alone or in combination with low antenatal support and/or a young age may cause mothers to experience a range of negative feelings, including anxiety, sadness, and anger (Graham et al. 2002; Porter and Hsu 2003; Thorp et al. 2004).

There is no doubt that a substantial portion of new mothers experiences a high degree of stress and low or irritable mood, but the occurrence of postpartum depression does not tell us the extent to which the transition to motherhood is associated with changes in women's well-being. The impact of the transition to motherhood on women's well-being is not yet fully understood for the following reasons. First, studies examining women's postpartum well-being in comparison to prenatal levels have yielded mixed results. Some have shown a pattern of higher depressive scores following the birth of the child (Matthey et al. 2000), others have shown no change in the mean-level of depressive symptoms or prevalence rates of depression (Eberhard-Gran et al. 2004; Josefsson et al. 2001; Salmela-Aro et al. 2006), and again others have shown a decrease in depression scores (Harwood et al. 2007). In the study by Harwood et al. (2007) 71 first-time mothers completed questionnaires during pregnancy and at 4 months postpartum. Only a few of these mothers had scores on the EPDS indicative of depression. Furthermore, declining depression scores from pregnancy to 4 months postpartum also contrasted with the notion of postpartum depression. To complicate things further, it may also be that only particular indicators of psychological distress show an increase during the transition to motherhood. Dipietro et al. (2008) recently showed that first-time mothers experienced an increase in anxiety from the prenatal to the postnatal period, whereas no changes over time were found for self-reported stress and depressive symptoms. In sum, it can be concluded that the literature is inconclusive as to whether becoming a mother produces heightened psychological distress or improves women's well-being.

Second, most of the transition to motherhood research has focused on a single aspect of well-being, namely negative affect. The predominant attention to anxious and depressive feelings may not be without implications. Attending to all of the separable aspects of well-being (positive affect, negative affect, and life satisfaction) may alter conclusions substantially. For instance, Wilkinson (1999) studied changes in both positive and negative affect through pregnancy and the immediate postpartum period. In contrast to the widely held belief that most women are in a depressive state after giving birth, both positive affect and negative affect peaked in the immediate postpartum period for first-time mothers. Wilkinson concluded that women's mood state in the postpartum period is better characterized by a combination of positive and negative affect than a pure state of sadness and anxiety.

Third and finally, most previous research efforts have established change in well-being by comparing group averages at different time points, thereby largely ignoring individual differences in the adaptation process. Group averages tend to guide one away from the corresponding variance estimates that may also provide a window into the processes that are associated with transition. Graber and Brooks-Gunn (1996) describe how transitional periods can lead to increasing divergence by referring to the accentuation principle. The accentuation principle states that behavioural patterns become more extreme at times of challenge, because individuals respond to these challenges in accordance with their existing behavioural and coping repertoire. For some women, the challenges of motherhood may strengthen their coping skills and change their life for the better, while for others the same challenges may make that inadequate coping skills that otherwise would not present a problem now result in distress. If the challenges accompanied by the new maternal role magnify pre-existing differences between individual women we would expect to observe a pattern of increasing divergence in women's level of well-being.

A second problem with comparing group averages at different time points is that this approach rests on the assumption that change is quantitative and linear. However, life-transforming events are likely to be accompanied by discontinuities and qualitative shifts. Major life transitions such as becoming a mother can “shake up a person’s worldview” (Hayes et al. 2007, p. 716). It is therefore rather surprising that structural changes in women’s attitudes, values, or evaluations of specific domains in their life have rarely been studied. A notable exception is a study by Ruble et al. (1990). They assessed the impact of the transition to motherhood by examining both mean-level and structural change in childbearing attitudes and perceptions. The results revealed that especially those instruments measuring social orientation and beliefs about pain tolerance showed a pattern of low correlations between pregnancy and postpartum measures and high correlations between 1 and 3 months postpartum. These apparent shifts in women’s responses between pregnancy and the postpartum period suggest a redefinition of the meaning of social relationships and pain. Ruble et al. (1990) speculate that the instability in pain tolerance indicates that women come to think very differently about how they can handle pain after the experience of labour pain. We assume that emotional reorganization and shifts in the way women experience specific activities and interactions with various social partners are equally likely to occur. Furthermore, we expect such transformations to translate into changes in the *content* of well-being.

People generally have a preference for specific activities and they also tend to value the company of specific persons more than that of others. Well-being depends on these evaluations of various aspects of daily life and is maximized if people can engage in the activities they like best and can spend their time together with beloved others (Schimmack 2008). Following Kahneman et al. (2006), the *content* of well-being refers to the association between the feelings that constitute people’s subjective social well-being and their daily activities or social interactions. In general, the *content* of well-being changes if the sources of positive and negative feelings change. Women may for example come to enjoy interactions with their spouse less, but may develop more positive feelings about the child (or foetus) across the transition to motherhood (Fleming et al. 1990). Research has provided important information about how pregnant women spend their time (Clarke et al. 2005) and on how women in general enjoy various daily activities (Kahneman et al. 2004), but it is unknown whether pregnant women enjoy the same activities and the same social partners as non-pregnant women and whether the transition to motherhood brings about changes in the relationship between time use and levels of subjective well-being.

To the best of our knowledge, only one longitudinal study has examined change in the association between time use and subjective well-being. Fave and Massimini (2004) followed a sample of five couples expecting their first child during the transition to parenthood by gathering data at eight time points in the pre and postpartum period. They used an experience sampling method, in which couples reported their affective experience after being signalled by an electronic pager. This method provided a multitude of responses on couples’ thoughts and feelings at times they were using media (e.g. watching TV) or at the very moment couples were involved in parenting, work, or leisure. The results revealed that couples generally enjoyed childcare related activities and leisure the most and work the least. No significant differences were found in this pattern before and after pregnancy, suggesting that the rank ordering of activities according to the pleasure they bring is stable across the transition to parenthood. However, it is not possible to draw generalizations on the basis of this single study of a limited number of couples. Furthermore, Fave and Massimini studied changes in the quality of experience during different types of activities,

but they did not consider the possibility that giving birth affects the quality of interactions with particular social partners.

1.1 The Present Study

The present study aims to more fully explore the impact of having a child on women's subjective well-being. We intend to contribute to the existing research literature by (a) examining changes in both the *level* and the *content* of well-being, and (b) using multiple indicators of well-being. To meet these aims, we conducted a two-wave longitudinal study spanning a total period of 8 weeks of 19 first-time time expectant mothers. We conceptualize well-being in terms of three separable components, i.e. positive affect, negative affect, and life satisfaction. Because of the mixed results in the existing literature, we did not formulate a specific hypothesis regarding the direction of change in the mean level of well-being at the group level. Based on the accentuation principle, changes that occur at the level of the individual were expected to give rise to a pattern of increasing divergence. To explore changes in the content of well-being, i.e. the relationship between what women do during the day and their overall sense of well-being, we ordered activities and social partners according to the affective state they generally produce. The affective experience (sometimes referred to as hedonic value) associated with specific time use patterns is thought to be revealed by average experienced positive and negative affect for episodes in which women engaged in specific activities or spent their time with specific social partners.

2 Method

2.1 Design

Women completed a set of questionnaires at two time points: approximately 4 weeks before estimated delivery and at 1 month postpartum. The 2-month window was not chosen with the intention to fully cover the adaptation process associated with becoming a mother. Instead, we chose to explore potential difficulties in coping with the transition to motherhood in the early postpartum weeks. Fleming et al. (1990) note that negative feelings commonly come to the fore in the first 2 weeks after giving birth and remain present for 6–12 weeks. The postpartum measurement was therefore conducted in a period in which women are most likely to experience a high degree of stress and low or irritable mood. In planning the exact timing of the measurement occasions care was taken to avoid confounding the impact of having a baby with changes related to taking up maternity leave or returning to work. Women in the Netherlands are not allowed to work from 4 weeks before the expected birth date and are entitled to at least 10 weeks maternity leave after giving birth. So, although at approximately 4 weeks postpartum women may still be adapting to their new role (Harwood et al. 2007), it is unlikely that they have made the transition to work yet.

2.2 Participants

Twenty-four women completed and returned the initial questionnaire packet. Five participants did not return the questionnaire the second time, leaving a final sample size of nineteen women who completed the questionnaires at both time points (age range 24–39; mean age = 32, SD = 3.37). The majority of the participants had college (36.8%) or post-graduate

degrees (47.4%). Except for one case, all women were married (52.6%) or cohabiting (42.1%). The sample was further characterized by a high percentage of women who were working full time or 4 days a week in the period before their maternity leave (84.2%). Some of the women reported that they were planning to continue the same working schedule after giving birth (31.6%), but most of them wanted to reduce their working time by 1 or 2 days per week (63.2%). Only one woman wanted to give up work. The participants were not asked to report on pregnancy complications, conception mode, or general health problems.

2.3 Measures

At both time points, the women completed several measures of subjective well-being, including measures capturing depression, life satisfaction, and global mood. These measures can be categorized as trait measures because they provide information on dispositional response tendencies to react with negative or positive emotions. Following suggestions by Dipietro et al. (2008) we included an additional measure to capture the episodic aspects of well-being. Measures that assess well-being as a state variable may be more sensitive to change than measures assessing psychological dispositions. Therefore, we asked participants to provide detailed information on the emotions they experienced across a single day at both time points. For this purpose, we used the day reconstruction method (DRM; Kahneman et al. 2004). Given that respondents generally need about an hour to complete the DRM it was deemed unfeasible to ask women to report their daily mood states for several days. The meaningful relations between aggregated momentary samples of positive and negative affect over a single day and protective and adverse psychosocial factors found in previous research (Stephoe et al. 2008) support our decision to limit response burden.

2.3.1 Day Reconstruction Method

The DRM is a relatively new method to quantify subjective well-being. The DRM depends on participants' recollections of their emotions during the previous day. In contrast, Experience Sampling (which is considered a 'gold standard' for the measurement of well-being) involves random signalling of participants during their daily lives to capture their feelings as they occur in real-time. Kahneman et al. (2004) examined the validity of the DRM by comparing the diurnal rhythm of negative affect and tiredness to established results from Experience Sampling studies. Using a convenience sample of 909 employed women from Texas, they found that the methods closely correspond. This suggests that feelings experienced during the previous day can be assessed with minimal recall bias and that both Experience Sampling and the DRM can be used to measure a person's level of positive and negative affect. Because the DRM is a diary recall method that provides data on women's time use in combination with their affective experience over time, it is possible to link women's reported subjective well-being to their daily activities and the social interactions they engaged in. The DRM therefore also enabled us to gain insight into the *content* of well-being.

Women reconstructed the previous day by putting the places they visited and the sequence of events that took place down in a diary. Next, they reported their activities, partners, and affective experience for each episode in their diary. The affective experience of each episode was derived from the reported intensity of three positive affect adjectives (happy, self-confident, satisfied) and three negative affect adjectives (tense/stressed, sad,

angry/hostile). Respondents rated the intensity of the six affective dimensions on a scale from 0 (not at all) to 6 (very much). Several indices were derived from the women's DRM ratings.

2.3.2 Positive and Negative Affect

We formed indices for positive and negative affect (the *level* of well-being) by calculating the duration-weighted average of the positive and negative affect ratings over all episodes reported. Aggregating episodic emotional reports across a single day has proven to provide reliable and valid indices of positive and negative affect. Krueger and Schkade (2008) showed that the two-week test-retest reliability of aggregated episodic reports over a single day was in the same range as those for general life satisfaction and satisfaction with specific life domains (e.g. health, home, or work). Support for the validity of DRM affect indices can be found in the strong effect of the level of time pressure experienced at work on positive and negative affect during time spent at the job site and the effect of sleep quality on positive and negative affect during episodes at home (Kahneman et al. 2004).

2.3.3 Content of Well-Being: Activity Experience Ratings

By aggregating affect ratings over activities instead of over individuals a measure reflecting how women experience each activity was obtained. In order to get reliable estimates of positive and negative affect across activities, we chose to restrict our analyses to four compound categories previously used in a comparison of subjective well-being across countries (Krueger et al. 2008): *compulsory activities* (combines shopping, housework, and preparing food), *active leisure* (combines exercise, socializing, and talking on the phone), *passive leisure* (combines watching TV, non-work computer use, relaxing, and napping), and *eating*. In addition, three time-specific activities were included: *preparing for the arrival of the baby* (specific to pregnancy), *childcare*, and *playing/walking with the baby* (both specific to the postpartum period).

2.3.4 Content of Well-Being: Social Interaction Experience Ratings

Social interaction experience ratings were created by combining the affect ratings with the data on the social context in which women experienced negative and/or positive affect. We aggregated positive and negative affect over four interaction partner categories: *spouse/partner*, *friends*, *parents/relatives*, and *alone*.

2.3.5 Single-Item Measures of General Life Satisfaction and Global Well-Being

Participants reported on their global life satisfaction and their global mood. The standard life satisfaction question was "How satisfied are you with your life as a whole these days?" Participants could indicate whether they were very satisfied (4), satisfied (3), not very satisfied (2), or not satisfied at all (1). The global mood question posed was "When you are at home, what percentage of the time are you in a bad mood, a little low or irritable, in a mildly pleasant mood, in a very good mood." To obtain the percentage of time generally spent in a good mood while at home (Net mood), the last two percentages were summed.

2.3.6 *The Edinburgh Postnatal Depression Scale*

The Edinburgh Postnatal Depression Scale (EPDS) is a 10-item self-report questionnaire. Previous longitudinal studies using the EPDS have demonstrated its sensitivity to change and have shown that the internal consistencies as measured by Cronbach's alpha for the EPDS in the prenatal and postnatal phases exceed 0.80 (O'Connor et al. 2002). Furthermore, its validity has been demonstrated for use in pregnancy as well as in the postpartum period (Cox et al. 1987; Murray and Carothers 1990). Following up on previous factor analytic studies indicating that the EPDS may be measuring both anxiety and depression in late pregnancy and in the postpartum period (Brouwers et al. 2001), Tuohy and McVey (2008) recently investigated whether the EPDS can be used to identify clinically meaningful subcomponents. Factor analysis revealed three distinct subscales in the EPDS; one measuring depression (EPDS-DEP), one measuring anxiety (EPDS-ANX) and one measuring anhedonia (EPDS-ANH). Regression analysis supported the interpretation of the anhedonia scale as reflecting a diminished capacity to experience pleasure by showing that of the three subscales only the anhedonia scale was negatively related to positive affect as measured by the Positive and Negative Affect Scales (PANAS). Support for the distinctiveness of the depression and anxiety scales was found in strong relations of these two subscales with their corresponding subscales in the Hospital Anxiety and Depression Scale (HADS). In this study, we chose to analyse changes in well-being across the transition to motherhood by using the three EPDS subscales as identified by Tuohy and McVey (2008): depression (items 7, 8, 9, and 10), anxiety (items 3, 4, and 5), and anhedonia (items 1 and 2).

2.4 Procedure

Participants were recruited through prenatal classes. These classes consisted of information on various aspects of pregnancy and birth and specific childbirth-related exercises (e.g. breathing techniques for pain management in labour). Additional participants were recruited using advertising flyers posted at birth centres and midwifery practices. Women could express their interest at their prenatal classes or via e-mail. They received a questionnaire pack and a letter containing a more detailed description of the study. We requested them to fill out the questionnaires approximately 4 weeks before the expected date of delivery. We also asked them to inform us of the actual date of birth by sending a baby birth announcement or card so we could send a small gift and the second questionnaire pack at 1 month postpartum. Questionnaires could be returned in a postage-paid envelope.

The Day Reconstruction Method protocol by Kahneman et al. (2004) served as the basis for data collection in the present study. Following the DRM protocol, participants were given 4 questionnaire booklets numbered in the order in which they should be completed. The first questionnaire asked women about demographic characteristics (age, education, and marital status), the division of family tasks, and their current life circumstances (sleep pattern, general satisfaction). The second booklet is basically a structured form on which respondents summarize the episodes that occurred in the preceding day. The women were instructed to think of their day as a sequence of movie scenes and to give each scene or episode a brief name that could serve as a memory aid. This part of the DRM is similar to commonly used time diaries. The third booklet contains a series of questions concerning key features of the episodes entered in the diary, including (1) the beginning and ending, (2) the main activity, (3) the setting (home or elsewhere), (4) whom they were interacting

with, and (5) how they felt at the time (ratings of multiple affective adjectives). The fourth and final questionnaire booklet included a single global mood question and the Edinburgh Postnatal Depression Scale.

2.5 Analysis

Because our measures tap different aspects of well-being and are based on either a wide range of remembered experiences or a limited number of reconstructed episodes, our first research question centred on the cross-method convergence of our well-being measures. Next, we examined whether there was a difference between the *level* of well-being during pregnancy and in the postpartum. And finally, we consider change in the *content* of well-being. Due to the small sample size non-parametric tests were used. Changes in mean-level of well-being across the transition to motherhood were tested with Wilcoxon's signed rank test. Correlations were assessed with Spearman's rho. Change over time in the content of well-being was evaluated using *t*-tests. We set the significance level for all statistical tests at .05.

3 Results

We tested whether EPDS scores at T1 differed between the group of women who participated at both time points of the study and those who dropped out. No significant differences were found on the EPDS scores, but the women who dropped out were significantly younger ($M = 26.8$, $SD = 4.8$) compared to the women who completed both assessments ($M = 32.0$, $SD = 3.4$), $t(21) = 2.65$, $p < .05$.

3.1 Cross-Method Convergence

The interrelationships among global reports and experienced positive and negative affect over a single day are displayed in Table 1. As can be seen in these results, the pattern of correlations was not consistent across the two time points. At pregnancy, global reports of well-being appeared to be relatively independent from the experienced affect ratings. Only significant correlations were found between the depression subscale of the EPDS and experienced affect. As expected, depression was positively correlated with negative affect and negatively with positive affect. At the postpartum assessment, there were significant correlations in the expected directions between, on the one hand, positive and negative affect, and, on the other hand, life satisfaction and anhedonia. The generally moderate convergence indicates that global reports of well-being and affect ratings aggregated over a single day capture separate, but interrelated aspects of well-being.

The pattern of intercorrelations among the global mood measures also differed across time. At pregnancy, depression was negatively related to life satisfaction and Net mood, and positively related to anhedonia, whereas at the postpartum assessment, only a positive correlation was found between depression and anhedonia. The anxiety subscale of the EPDS appeared to be relatively independent from the rest of the measures used in this study at both time points. Life satisfaction and Net mood did not correlate significantly in pregnancy or in the postpartum period. Significant negative correlations were found between positive and negative affect at both time points.

Table 1 also shows the stability from the prenatal to the postpartum period in each of the well-being measures. As can be seen, only Net mood and the anxiety subscale from the

Table 1 Spearman's rank correlations coefficients for the association between well-being measures during pregnancy and the postpartum period

Measures	1	2	3	4	5	6	7
Global reports							
1. Life satisfaction	.10	<i>.31</i>	<i>-.32</i>	<i>-.67**</i>	<i>-.12</i>	<i>.60**</i>	<i>-.68**</i>
2. Net mood	<i>.11</i>	.56**	<i>-.20</i>	<i>-.46*</i>	<i>-.23</i>	<i>.21</i>	<i>-.19</i>
3. EPDS-DEP	<i>-.79**</i>	<i>-.49*</i>	.22	<i>.46*</i>	<i>.27</i>	<i>-.20</i>	<i>.32</i>
4. EPDS-ANH	<i>-.78**</i>	<i>-.04</i>	<i>.54**</i>	.02	<i>.18</i>	<i>-.57**</i>	<i>.71**</i>
5. EPDS-ANX	<i>.28</i>	<i>-.15</i>	<i>-.30</i>	<i>-.17</i>	.42*	<i>-.33</i>	<i>.10</i>
Experienced affect							
6. Positive affect (PA)	<i>.30</i>	<i>.38</i>	<i>-.51**</i>	<i>-.12</i>	<i>-.03</i>	.32	<i>-.75**</i>
7. Negative affect (NA)	<i>-.26</i>	<i>-.36</i>	<i>.47**</i>	<i>.26</i>	<i>-.09</i>	<i>-.39*</i>	.36

Note: Prenatal correlations are presented below the diagonal; postnatal correlations above the diagonal and in italics. Values in bold represent the stability from the prenatal to postnatal period

* $p < .05$; ** $p < .01$

EPDS showed stability across the transition to motherhood. For none of the other measures, the rank ordering of individuals at pregnancy was comparable to that in the postpartum period.

Additional analyses were conducted to examine cross-method convergence on change. For this purpose, we computed change scores for each of the well-being measures by subtracting the postpartum score from the pregnancy score. Changes from pregnancy to postpartum in life satisfaction correlated with changes in the anhedonia subscale of the EPDS ($r = -.62$, $p < .01$) and changes in positive affect ($r = .71$, $p < .01$). Changes in life satisfaction did not appear to be accompanied by similar changes in negative affect ($r = -.14$, NS). Changes in Net mood were significantly correlated with change in the depression ($r = -.52$, $p < .05$) and anhedonia ($r = -.44$, $p < .05$) subscales of the EPDS only. Finally, change scores for positive and negative affect were related to the anhedonia and anxiety subscales of the EPDS (PA with EPDS-ANH: $r = -.61$, $p < .01$; NA with EPDS-ANH: $r = .43$, $p < .05$; PA with EPDS-ANX: $r = -.42$, $p < .05$; NA with EPDS-ANX: $r = .41$, $p < .05$), but neither changes in positive affect nor negative affect were related to changes in the depression subscale (PA with EPDS-DEP: $r = -.16$, NS; NA with EPDS-DEP: $r = -.26$, NS).

3.2 The Level of Well-Being

To examine change in the level of well-being, prenatal and postnatal means for the well-being measures were compared. Table 2 displays the results. Differences between prenatal and postnatal levels of well-being were not significant. The level of well-being was comparable at the two time points for this group of women. However, a non-significant trend of higher EPDS anxiety scores was found ($Z = 1.58$; $p = .06$). For comparison with previous studies that have used total EPDS score, we also examined change in this overall depression score. Depressive symptoms showed a non-significant increase across the transition to motherhood. The mean total EPDS score (data not shown in Table 2) was 5.74 (SD = 2.37; range 1–9) at pregnancy and 6.00 (SD = 3.62; range 0–13) at the postpartum time point. The overall mean EPDS score at 4 weeks postpartum in this sample is comparable to that the 4 weeks postpartum mean score of 5.89 in a sample of 293 Dutch

Table 2 Mean level of subjective well-being across the transition to motherhood

Measure	Pregnancy		Postpartum		Z
	M (SD)	Range	M (SD)	Range	
Life satisfaction	2.55 (.51)	2–3	2.52 (.51)	2–3	.00
Net mood	84.44 (8.38)	70–95	82.37 (8.06)	60–90	–.83
EPDS-DEP	1.36 (1.21)	0–4	.95 (1.03)	0–3	–1.20
EPDS-ANH	.79 (1.03)	0–3	.84 (1.07)	0–3	.23
EPDS-ANX	2.37 (1.30)	0–5	3.16 (2.17)	0–7	1.58*
Positive affect (PA)	3.97 (.75)	2.5–5.4	3.97 (1.01)	1.8–5.8	–.16
Negative affect (NA)	.48 (.46)	0–1.5	.49 (.67)	0–2.4	–.59

* $p < .10$

women of various educational levels as reported by Pop et al. (1992). Both prenatal and postnatal scores on the EPDS were within the “normal” range if we consider only scores above the commonly used cut-off point of 12/13 as indicative of probable postnatal depression.

Table 2 shows patterns of increasing variability for the EPDS anxiety subscale and the DRM affect measures. For the EPDS anxiety score, the range of scores from 0 to 5 in pregnancy broadened to 0–7 in the postpartum period and the standard deviation significantly increased from 1.30 to 2.17. For the DRM, the postnatal standard deviations for positive affect and negative affect were larger than the same values for the prenatal means. Overall, there appears to be more variation in postnatal well-being scores than in prenatal well-being scores, suggesting that the transition to motherhood is characterized by increasing individual differences.

3.3 The Content of Well-Being

Our final research question pertains to changes in the content of well-being, i.e. the question whether a given activity or social interaction produces a different average experience at 1 month postpartum than before the arrival of the baby. The women in this study gave detailed descriptions of how they spend their time and how they felt for an average of 14.4 (range 9–22) episodes at the prenatal assessment and for an average of 16.6 (range 11–26) episodes at the postnatal assessment. These figures are similar to the average number of 14.1 episodes that Kahneman et al. (2004) reported for a sample of 909 employed women. For 126 of the total 589 DRM episodes (21.4%) the women in this study indicated that they were involved in more than one activity. In line with the strategy followed by Kahneman et al. (2004) episodes for which two activities were reported were included in the computation of average positive and negative affect for both of these activities. Thus, analyses were based on the two most salient activities.

Table 3 displays the mean positive and negative affect and the total number of episodes by activity and interaction partner for both time points. One-tailed t -tests were conducted to establish whether the transition to motherhood is accompanied by changes in the content of well-being. These t -tests revealed that compulsory activities elicited, on average, more negative feelings in the postpartum period ($M = .63$, $SD = .97$) than at pregnancy ($M = .38$, $SD = .54$), $t(121) = 1.82$, $p < .05$. In addition, there was a significant upward shift in experienced positive affect during active leisure from pregnancy ($M = 4.03$,

Table 3 Mean positive and negative affect by activity and by social partner at pregnancy and in the postpartum period

	Pregnancy			Postpartum		
	PA	NA	<i>N</i>	PA	NA	<i>N</i>
Activity categories						
Eating	4.06 (1.10)	.32 (.63)	47	4.15 (1.12)	.54 (.97)	61
Passive leisure	4.04 (1.04)	.35 (.75)	76	3.98 (1.32)	.25 (.52)	66
Active leisure	4.03 (1.18)	.51 (.12)	52	4.51 (.96)	.39 (.16)	30
Compulsory	3.83 (.88)	.38 (.54)	62	4.01 (1.08)	.63 (.97)	61
Preparing for baby	3.85 (.87)	.52 (.92)	25	–	–	–
Child care	–	–	–	3.96 (1.16)	.46 (.74)	121
Playing/walking with the baby	–	–	–	4.33 (1.01)	.28 (.41)	32
Social interactions						
Parents/relatives	4.50 (.87)	.60 (.87)	24	4.32 (1.23)	.27 (.41)	39
Friends	4.21 (.89)	.41 (.88)	21	4.03 (1.15)	.70 (.66)	10
Spouse	3.92 (1.17)	.44 (.81)	100	4.11 (1.24)	.40 (.77)	117
Alone	3.67 (.98)	.38 (.71)	112	3.90 (1.11)	.50 (.76)	147

Note: Activities and interaction partners are ranked from highest to lowest average positive affect at pregnancy

SD = 1.18) to the postpartum period ($M = 4.51$, SD = .96), $t(80) = 1.88$, $p < .05$, suggesting that women are able to more fully enjoy exercise, walking, and socializing after they have given birth.

The DRM data on women's emotional experiences at various times of the day grouped by interaction partner provides information on how much the company of various others is enjoyed across the transition to motherhood. Table 3 displays the results. The ranking of interaction partners according to positive affect in pregnancy did not differ in important respects from that during the postpartum period. At both periods, positive affect is lowest, on average, when women are alone and highest when women are engaged in social contact. With respect to negative affect, the two DRM assessments did produce different rankings of the social interaction partners. At pregnancy, parents and relatives appeared to be most likely to elicit negative feelings, whereas after giving birth the company of friends appeared to most frequently elicit negative feelings. The impression that giving birth only affects the quality of interactions with parents/relatives was confirmed by one-tailed t -tests. These t -tests showed no significant differences in the level of experienced positive and negative affect during time spent alone or interactions with one's spouse or friends. However, there was a significant decline in negative affect during interactions with parents/relatives from the prenatal ($M = .60$, SD = .87) to the postpartum period ($M = .27$, SD = .41), $t(61) = -1.75$, $p < .05$, indicating a positive change in how interactions with parents and other relatives were experienced.

4 Discussion

Starting from the notion that life satisfaction, positive affect, and negative affect are different but interrelated aspects of well-being (Diener et al. 2003), we chose to assess well-being by means of several measures covering multiple aspects of well-being,

including women's global reports about their life circumstances and experienced affect assessed by means of the Day Reconstruction Method (DRM). The measures used in this study not only covered distinct aspects of well-being, but also differed in the time frame on which subjects reported. Global life satisfaction questions and the EPDS ask subjects to make an overall evaluation of their current life circumstances or to provide a retrospective report of their mood state over an extended time period. In contrast, the scope of the DRM is limited to the preceding day. The DRM and the global reports used in this study represent two distinct categories, i.e. state and trait measures. State measures such as the DRM define well-being as current levels of positive and negative emotions, whereas trait measures define distress as a woman's general tendency to evaluate life negatively, to feel depressed, tense, or worried.

Analyses of changes in the level of well-being across a 8-week period spanning late pregnancy and the early postpartum period revealed that the women in this study generally coped well with the transition to motherhood. The mean level of well-being did not change over time irrespective of which aspect of well-being was examined or whether state or trait measures were used. In addition, prenatal and postnatal well-being scores generally indicated positive mood states or mild mood disturbances. None of the women scored within the range suggestive of probable major depression on the EPDS.

The small sample size, the selective nature of the sample, and the relatively large percentage of dropouts prevent any firm conclusion on the impact of the transition to motherhood on women's well-being. Nevertheless, in this study the supposed negative impact of becoming a mother on women's individual adjustment was not found. This fits well with other empirical results providing evidence of stability (Eberhard-Gran et al. 2004; Josefsson et al. 2001; Salmela-Aro et al. 2006) or even increasing levels of well-being from late pregnancy to the postpartum period (Harwood et al. 2007). In addition, there is research showing that negative mood states are just as likely during pregnancy as in the period after giving birth (Richards 2000) and that postnatal depression frequently appears to be a continuation of pre-existing psychological and social problems (O'Connor et al. 2002).

Examination of changes in the content of well-being, i.e. the specific activities and social interactions that elicit more positive feelings than negative ones (Kahneman et al. 2006), revealed an upward shift in the level of positive affect during active leisure. A possible, although speculative, explanation may be that active leisure is enjoyed more in the postpartum period because the moments when women can engage in an activity simply for their own enjoyment are few at this point in time as a result of the time and energy taken up by the care for their newborn baby. This line of reasoning fits well with the observed decline in the frequency with which women engaged in active leisure and the substantial number of episodes spent on childcare. Although it seems reasonable to assume that active leisure activities may be more psychologically rewarding if they are balanced by productive activities such as childcare (Evans and Haworth 1991), an alternative explanation can also be given. At pregnancy, active leisure activities may not be as pleasurable as usual because women may not feel physically fit. Therefore, engaging in physical activities (such as shopping or exercise) can bring about feelings of discomfort or fatigue. Strenuous activities may even elicit anxiety or fear if women interpret the resulting pain or fatigue as labour signs or connect these feelings to potential harm for the foetus.

Analysis of changes in the content of well-being also revealed that women experienced less negative affect during interactions with relatives after the arrival of their first child. This may indicate that interest in the newborn, the provision of infant care, and social support by relatives all make that mothers are less sensitive to annoying or irritating

behaviours of their relatives. The absence of a decline in experienced positive affect or an increase in negative affect during interactions with one's spouse is also noteworthy because this appears to contradict the generally accepted notion that the quality of the couple relationship declines across the transition to parenthood (Glade et al. 2005). Experienced affect during spousal interactions provides a perspective on the couple relationship that differs from the one provided by standardized tests or interviews for marital satisfaction, but there is reason to believe that relational satisfaction is at least partly based on the quality of time spent together. Using daily reports in which participants recorded all their interactions with their partner, Emmers-Sommer (2004) showed that couples enjoying interactions with each other were more satisfied with their relationship.

4.1 Future Research

The most important contributions of this study are that it provides methodological and theoretical directions for future studies. It is of considerable theoretical interest that comparison of the variances in well-being scores during pregnancy and in the postpartum period revealed a trend towards increasing individual differences. This result confirms our expectation based on the accentuation principle (Graber and Brooks-Gunn 1996). The increasing divergence in women's level of well-being is interpreted here as reflecting a process of differentiation, i.e. pre-existing individual differences are magnified over the course of the transition to motherhood. An important topic for future research concerns the predictors of differences in adjustment. In other words, what makes that some women are able to cope with the challenges associated with motherhood and others not? One possible predictor may be women's implicit theories of emotion. In research on the social and emotional adjustment during the transition to college (Tamir et al. 2007), weekly reports of students' experienced affect over the course of the first quarter revealed that those who viewed emotions as fixed and believed emotions to be impossible to control experienced more negative emotions and fewer positive emotions. The same individuals reported more depressive symptoms at the end of the first year of college. This study indicates the potential importance of beliefs and typical patterns of responding to environmental demands that women have developed before pregnancy. However, factors related to pregnancy itself (e.g. excessive vomiting in early pregnancy), factors related to giving birth (e.g. obstetric complications) or childcare in the immediate postpartum period (e.g. father participation), and child characteristics (e.g. infant irritability) may also affect women's reaction to the challenges of motherhood (Köken et al. 2008; Perren et al. 2005).

The results further suggest that it may be worthwhile to assess changes in the content of well-being along with changes in relational satisfaction or pain experiences in future research efforts. Such work could help to shed more light on the influence of pain experiences on women's well-being and the complex interplay between changes in couples' time use (e.g. the sharing of leisure time) and changes in relational satisfaction (Claxton and Perry-Jenkins 2008).

4.2 Methodological Considerations

The Day Reconstruction Method allows one to collect data on various ways of spending one's time in combination with experiences of positive emotions, negative emotions, and pain during the same time period. In comparison to standard methods, such as asking women to rank various daily activities and social partners in terms of enjoyment or asking women to evaluate how they experienced changes in various life domains (see e.g. Johnson

and Rodgers 2006), the DRM may provide an approach to women's subjective evaluations that is less susceptible to the influences of general beliefs and social desirability (Schwarz et al. 2007). For example, moments in which women struggle with breastfeeding or are unable to stop infant crying feature in women's episodic reports, whereas women's global judgments and evaluations are more likely to be affected by the belief that childcare is an intrinsically rewarding activity and should therefore be far more enjoyable than compulsory activities (e.g. housework). In addition, response tendencies may have a smaller impact on affective experiences as reported in the DRM, because it may not be troublesome to report momentary feelings of fear and sadness, but admitting feeling anxious and depressed for an extended period of time may be harder because it is closer to admitting that one is not fully responsive to the infant's needs.

Experience ratings derived from the DRM may also have the advantage of being less affected by measurement issues specific to longitudinal research. The pattern of correlations among the various well-being measures used in this study was not consistent across the transition to motherhood, suggesting instability in the meaning of some of the constructs. Previous studies have addressed the issue of construct comparability across the transition to parenthood (Ruble et al. 1990). For example, with regard to marital satisfaction, Guttman and Lazar (2004) showed that initial differences between first-time parents and childless couples are reduced if one takes into account differences in the importance that these two groups assign to various aspects of the marital relationship. They conclude that the transition to parenthood may have been mistakenly construed as challenging to the couple relationship because researchers have not systematically examined changes in marital satisfaction simultaneously with changes in the nature of the marital relationship. Measurement equivalence across phases (pregnant vs. postpartum) cannot be guaranteed for marital satisfaction scales, but seems less of an issue for repeated assessments of couples' feelings during actual interpersonal exchanges between couple dyad members. This is because it is hard to imagine that change can occur in the underlying meaning of affect adjectives.

The present study included a number of different measurement approaches such as a diary recall method, single-item measures, and standardized questionnaires. In addition, we did not focus on a single aspect of well-being, but used several measures that tap into different but interrelated aspects of well-being (positive affect, negative affect, and life satisfaction). In general, we found modest convergence between global reports of well-being and experienced positive and negative affect. This confirms the importance of separate assessment of the judgmental and affective aspects of well-being. In addition, some interesting results emerged from examination of the pattern of intercorrelations at pregnancy and in the postpartum period, which may warrant further investigation. First, life satisfaction appeared to be unrelated to experienced affect as measured by the DRM at pregnancy, whereas life satisfaction, positive affect, and negative affect were strongly correlated at 1 month postpartum. Kahneman et al. (2006) describe that life transitions can reduce the effect of the immediate situation. They note that during transitional phases "one can be deliriously joyous while stuck in traffic, or miserable at a feast" (p.10), because attention remains focused on one single aspect of the current life situation. Following this line of reasoning, the finding that women's judgments about their life circumstances and experienced affect during a range of episodes only converged in the postpartum period can possibly be explained by the contribution of the newborn child to women's well-being. This life-changing event may be so decisive that it 'colours' both global evaluations and episodic reports. Before childbirth such a universal and common focus may be lacking. Second, anxiety appeared to be relatively independent from depression, anhedonia and

experienced affect in this study. Furthermore, the non-significant trend towards an increase from the prenatal to postpartum period for anxiety represented a unique pattern of change. These findings are in line with other research showing that anxiety and depression are not so closely intertwined during the transition to motherhood and can best be treated as distinct negative emotional states (Miller et al. 2006).

4.3 Limitations

Several limitations of the present study should be noted. First, our sample was biased toward more highly educated and part-time or full-time employed women. Most likely related to this is the fact that most women were recruited through prenatal classes. Women living on low incomes and women with low educational attainment are more likely to perceive barriers in making use of prenatal education opportunities (Murphy Tighe 2009). In future research efforts, it seems imperative to maximize diversity among participants. Possible avenues would be to recruit women as they go shopping for baby supplies or to oversample birth centres located in neighbourhoods with high levels of social and economic disadvantage. The fact that the women in our sample attended prenatal classes also raises concerns because the preparation process may have helped women to cope with the challenges of early motherhood. There is some evidence that prenatal classes do not facilitate women's transition to motherhood (Nichols 1995), but the effects of antenatal education are largely unknown (Gagnon and Sandall 2007). It thus remains possible that the women in our study benefited from the information, advice, and social support they received in prenatal education. Finally, it is important to note that the experienced affect indices in this study were based on emotional recall of a single day. Although aggregated momentary samples of positive and negative affect over a single day (Stephoe et al. 2008) and the emotional reconstruction of a single day (Kahneman et al. 2004) can yield reliable and valid information on the level and the content of well-being, future studies could benefit from daily assessment of the DRM for several consecutive days. To limit response burden, one could consider randomly selecting a limited number of episodes from the previous day for emotional recall, such as recently introduced in a study by Krueger and Stone (2008) on pain assessment and pain-activity patterns.

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