

Prenatal anticipatory stress: Baby preparation and worry scale-revised in the Dutch context

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ABSTRACT

Background: Prenatal distress encompasses a range of different emotions, worries, and experiences of stress. The Baby Preparation and Worry Scale (Baby-PAWS) was recently developed to target anticipatory worries during pregnancy about the postnatal period. However, the Baby-PAWS questionnaire was only examined in the United States of America, limiting the questionnaire's generalizability to different countries. To address this issue, we performed a psychometric evaluation of the questionnaire in a Dutch sample and examined associations between the Baby-PAWS questionnaire and established measures of maternal distress (i.e., EPDS, STAI, PRAQ-R) and infant temperament (i.e., IBQ-R).

Methods: Healthy pregnant women ($N = 521$) completed questionnaires during their third trimester and postnatally, including the Baby-PAWS and distress measures. A subsample of mothers ($N = 194$) also reported on infant temperament at 12 weeks postpartum.

Results: Exploratory factor analysis suggested a four-factor structure for the 16-item questionnaire in our Dutch sample, as compared to the expected three-factor structure found in the original psychometric evaluation with the American sample. The total Baby-PAWS score was related to pre-and postnatal depression, anxiety, stress, and specific scales of infant temperament. American women scored higher on the Baby-PAWS items than Dutch women.

Limitations: Our participants had higher-than-average socioeconomic status, limiting the generalizability of the findings.

Conclusion: The current analyses indicate good validity of the Baby-PAWS in a Dutch sample. Furthermore, our results highlight cross-cultural differences in perinatal mental health and show the importance of examining instrument structure of context-dependent constructs, such as prenatal worries.

1. Introduction

Pregnancy can be seen as a major life transition that includes unique physical and psychological changes, and often, anticipatory worries. During pregnancy, women commonly experience increased levels of stress and anxiety, with the prevalence of clinically significant forms of prenatal distress ranging between 20 and 30% [1–3]. The importance of assessing prenatal distress has been highlighted by studies repeatedly showing how maternal prenatal distress may negatively affect the developing fetus (for a review, see [4]). For example, heightened psychological stress levels during pregnancy have been linked to increased

risk for offspring, such as more difficult temperament [5,6] less advanced cognitive functioning [7,8], altered brain connectivity [9,10], and later mental health problems [11,12]. An increased understanding of prenatal stress can be expected to result in more effective preventive services and clinical interventions [13].

Prenatal distress encompasses a range of emotions, worries, and experiences of stress. Instruments used to capture prenatal distress assess depression, anxiety, or perceptions of stress, with some addressing pregnancy-specific distress, such as the Pregnancy Anxiety Questionnaire-Revised (PRAQ-R; [14]), Cambridge Worry Scale (CWS; [15]), and the Pregnancy Experience Scale (PES and PES-BRIEF;

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Table 1
Descriptive statistics for total and individual studies.

	Total (N = 521)		SKIPPY (N = 127)		SMILEY (N = 154)		Online (N = 240)	
	M (SD)/Mode/%	Range	M (SD) / Mode/%	Range	M (SD) / Mode/%	Range	M (SD) Mode/%	Range
Maternal age (years)	31.71 (3.83)	22–51	31.71 (3.56)	22–42	31.64 (3.62)	22–41	31.76 (4.09)	22–51
Gestational age (weeks)	33.41 (3.39)	27–44	36.46 (1.36)	32–41	31.32 (1.20)	29–35	33.14 (3.90)	27–44
Maternal Education ¹								
Low/Medium	22%		20%		14%		27%	
High	78%		80%		86%		72%	
Years of Education	18.56 (2.5)	9–25.5	– ²		–		18.56 (2.5)	9–25.5
Total family income	€60.000 - €80.000		–		–		€60.000 - €80.000	
Partner status								
Married/cohabiting	97.5%		100%		98%		95.8%	
Single	2.3%		0%		2%		3.8%	
Parity (primiparous)	56.2%		44.4%		50.6%		65.8%	
Baby-PAWS Total	30.72 (9.1)	12–64	30.74 (7.63)	13–49	28.18 (8.72)	12–59	32.38 (9.67)	13–64
Baby-PAWS Scale 1	5.41 (2.27)	2–14	5.96 (2.36)	2–14	4.84 (2.14)	2–13	5.50 (2.23)	2–14
Baby-PAWS Scale 2	8.46 (3.19)	18	8.13 (2.95)	3–18	8.13 (2.98)	3–19	8.85 (3.41)	3–21
Baby-PAWS Scale 3	13.03 (4.55)	3–21	13.59 (4.5)	5–24	11.92 (4.35)	5–28	13.45 (4.59)	5–29
Baby-PAWS Scale 4	4.06 (2.27)	5–14	3.52 (1.68)	2–9	3.42 (1.86)	2–12	4.74 (2.57)	2–14
Prenatal EPDS	8.64 (4.33)	3–24	7.74 (3.81)	3–20	8.25 (4.12)	3–24	13.91 (3.59)	8–20
Prenatal STAI	33.57 (9.42)	20–76	29.99 (7.31)	20–64	32.89 (8.71)	20–75	35.88 (10.19)	20–76
PRAQ Total	21.60 (6.5)	10–49	19.40 (5.44)	10–35	– ³	–	22.73 (6.72)	10–49
PRAQ Scale 1	9.43 (2.88)	4–20	8.57 (2.70)	4–17	–	–	9.88 (2.88)	4–20
PRAQ Scale 2	6.31 (2.26)	3–15	5.67 (1.95)	3–11	6.06 (2.14)	3–12	6.81 (2.38)	3–15
PRAQ Scale 3	5.74 (2.38)	3–14	5.17 (2.13)	3–11	–	–	6.04 (2.45)	3–14
Infant sex (% boys)	49.8%		57.1%		46.8%		– ⁴	
Infant age (weeks)	12.59 (0.97)	11.86–17.43	13.24 (1.36)	11.86–17.43	12.59 (0.97)	11.86–17.43	–	–
Postnatal EPDS	8.07 (4.78)	3–26	13.62 (4.07)	8–21	7.75 (4.63)	3–26	–	–
Postnatal STAI	31.40 (9.44)	20–79	30.43 (8.30)	20–54	31.78 (9.85)	20–79	–	–
IBQ-R negative affect	2.92 (0.77)	1.52–5.67	3.03 (0.78)	1.9–5.67	2.89 (0.77)	1.52–5.43	–	–
IBQ-R orienting/regulation	4.96 (0.69)	1.83–6.90	5.09 (0.59)	3.88–6.09	4.91 (0.72)	1.83–6.90	–	–

Note. Baby-PAWS scales: Scale 1 “*Separation from Infant Worry*”, Scale 2 “*Self and Partner Worry*”, Scale 3 “*Baby Caregiving Worry*”, Scale 4 “*Non-parental Childcare Worry*.” PRAQ scales: Scale 1 “*Fear of Giving Birth*”, Scale 2 “*Worries of Bearing a Handicapped Child*”, Scale 3 “*Concern about Own Appearance*.”

¹ Education = low/medium: secondary education or vocational education; high: bachelor's or master's degree or higher (i.e. PhD).

² Years of education and income were not obtained for the SKIPPY and SMILEY samples.

³ Not all items were administered; only Scale 2 “*Worries of Bearing a Handicapped Child*” was thus computed.

⁴ Postnatal variables were not measured in the Online sample.

[16,17]). Until recently, however, an instrument assessing specific pregnancy worries about the postnatal period was missing.

The Baby Preparation and Worry Scale (Baby-PAWS; [18]) was developed to address this gap, specifically targeting anticipatory worries during pregnancy about the transition to parenthood. This questionnaire includes items related to common anticipatory pregnancy worries, including those concerning the future balance of adequate infant and self-care, the partner's participation, non-parental care arrangements, and the mother's own postpartum wellbeing. Erickson et al.'s [18] validation of the original 16-item Baby-PAWS questionnaire with a sample of 276 mothers in the US resulted in an 11-item questionnaire, with factor analyses supporting a three-factor structure: Self and Partner Worry, Nonparental Childcare Worry, and Baby Caregiving Worry. The importance of measuring these anticipatory worries was highlighted by the three factors, as well as the total score, being associated with higher pre- and postnatal general anxiety and depression. At the same time, associations were modest, indicating that the Baby-PAWS taps into worries and distress that are not addressed in general anxiety and depression questionnaires. Moreover, higher prenatal concerns, as measured by the Baby-PAWS, were also associated with infants displaying more distress, sadness, and difficulties being soothed, demonstrating the questionnaire's predictive value. To date, the Baby-PAWS factor structure has only been examined in the United States of America (US), limiting the questionnaire's generalizability. To address this limitation, the current study investigated the psychometric properties and predictive validity of the Dutch version of the Baby-PAWS in a population of pregnant women in the Netherlands. The findings serve to broaden our knowledge regarding prenatal worries in different countries, as well as help evaluate the cultural generalizability of the Baby-PAWS.

The latter is particularly important given that prenatal worries are

potentially culturally-dependent, due to contextual factors such as differences in health-care availability and parental leave arrangements. For example, a previous study shows that compared to a Dutch sample, US women report higher prenatal distress [19]. Moreover, US infants display more negative affectivity compared to Dutch infants [20]. With awareness for differences noted in cultural contexts, the current study aims to validate the Dutch version of the Baby-PAWS in a healthy sample of expectant mothers in their third trimester of pregnancy. Furthermore, we examined a revised version of the questionnaire by assessing the possible psychometric and predictive improvement resulting from inclusion of four additional items to the original 16-item Baby-PAWS questionnaire. These items were added to expand the content of the original version, and thus they were hypothesized to improve the questionnaire's psychometric and predictive properties.

In this preregistered study, we have four sets of goals and hypotheses. First, we performed a psychometric evaluation of the original 16-item questionnaire in a Dutch sample to assess the factor structure of the Baby-PAWS. We expected to observe a similar factor structure to that of the US Baby-PAWS. Moreover, we tested the psychometric properties of the 20-item revised questionnaire, hypothesizing that the 20 items would yield a more definitive factor structure with stronger loadings compared to the original 16 items. Second, we assessed the association between the Baby-PAWS scores (i.e., total and subscales) and established measures of prenatal depression, anxiety, and pregnancy-specific stress to provide evidence of concurrent validity. In line with the US validation results [18], we hypothesized positive associations between the Baby-PAWS and the other prenatal distress instruments. Third, we evaluated the predictive value of the Baby-PAWS by assessing associations between the Baby-PAWS questionnaire and postnatal depression, anxiety, and infant temperament. Specifically, based on Erickson et al. [18], we expected the Baby-PAWS (total and subscale scores) to be

positively associated with maternal postnatal depression and anxiety, as well as with specific infant temperament factors as follows: higher negative affectivity and lower orienting/regulation. Fourth, we compared US and Dutch Baby-PAWS scores. Based on our earlier work [19], we expected the Baby-PAWS scores to be higher for US pregnant women compared to Dutch women. We achieved these aims, addressing hypotheses of this preregistered study by utilizing merged data from four different investigations: one cross-sectional and two longitudinal studies of healthy Dutch pregnant women, and one longitudinal study of healthy US pregnant women [18].

2. Methods

2.1. Participants and procedure

The total Dutch sample ($N = 572$) includes data from three studies approved by The Ethics Committee of the Faculty of Social Sciences from the Radboud University (SKIPPY study: ECSW2015–2311-358; SMILEY study: SW2017–1303-497; online study: ECSW2022–1303-497). This study was preregistered on the Open Science Framework (<https://osf.io/gqk8j>). Participants were recruited via our participant database (<https://babyandchild.nl/en/>), midwifery practices, and social media (Table 1).

2.1.1. SKIPPY study

A randomized controlled trial (SKIPPY) of a skin-to-skin postnatal intervention for full-term infants was conducted ($N = 127$; [21]). At 34–36 weeks of gestation, prior to randomization, participants completed questionnaires addressing demographics and prenatal distress. At 12-weeks postpartum, participants were asked to respond to an online questionnaire, including surveys with items inquiring about maternal mental health and infant temperament. Data collection took place between April 2016 and February 2018.

Inclusion criteria for this cohort were: singleton pregnancy, no substance use, fluent in Dutch, ≥ 18 years of age, no severe physical/mental health issues, and no concurrent participation in other studies. Infant inclusion criteria included: full-term status (≥ 37 weeks); birthweight ≥ 2500 g; no congenital anomalies; and a 5-min Apgar score of ≥ 7 . Due to the intervention, only control group ($N = 63$) participants contributed to postnatal analyses, with a total of 55 meeting inclusion criteria and completing the questionnaire. Exclusion was due to birth complications ($n = 4$), personal circumstances ($n = 2$), or missing the 12-weeks postpartum questionnaire ($n = 2$).

2.1.2. SMILEY study

Women in the second Dutch sample were part of the ongoing SMILEY study (Study of Microbiota and Lifestyle in the Early Years), following 160 mothers and their infants from pregnancy onward. Participants responded to online questionnaires addressing prenatal distress at 18-weeks (not used in the current study) and 32-weeks of pregnancy. Questionnaires at 12-weeks postpartum addressed maternal distress and infant temperament. Data were collected from December 2019 to February 2022.

Inclusion criteria were: singleton pregnancy, mastery of the Dutch language, ≥ 18 years of age, no severe physical/mental health issues, enrollment at <21 weeks of gestation, and a pre-pregnancy BMI < 30 . The final sample included 154 participants for prenatal analyses at 32-weeks of pregnancy. Exclusion was due to obstetric complications ($n = 2$), stillbirth ($n = 1$), medication use ($n = 1$), and being unable to contact participants ($n = 2$). Infant inclusion criteria at birth were the same as for the SKIPPY study. Data from 139 participants were available for the predictive postpartum analyses. Exclusion was due to birthweight <2500 ($n = 1$), delivery <37 weeks gestation ($n = 3$), Apgar 5 min < 7 ($n = 2$), infant health issues ($n = 1$), maternal medication use ($n = 2$), obstetric complications in late pregnancy ($n = 2$), personal reasons ($n = 2$), or missing the 12-week postpartum questionnaire ($n = 2$).

2.1.3. Online study

The third Dutch sample of pregnant women ($N = 285$) was recruited specifically for the current validation study. Online questionnaires were administered in the third trimester (27–41+ weeks) between April and June 2022. From 285 completed responses, 240 participants met inclusion criteria. Exclusions were due to serious health complaints ($n = 41$): (gestational) diabetes $n = 26$; (gestational) hypertension $n = 7$; fibromyalgia $n = 3$; rheumatoid arthritis $n = 2$; miscellaneous $n = 3$; or gestational age <27 -weeks ($n = 4$).

Three samples of pregnant women ($N = 521$) were included in prenatal analyses. For the postnatal/predictive analyses, SKIPPY and SMILEY samples ($N = 194$) were used.

US Sample. The US sample included expectant mothers in their third trimester (i.e., 27–40 weeks gestation). Women ($N = 276$) were recruited through community flyers, social media, birthing classes, and hospitals in Eastern Washington/Northern Idaho. Women were mostly in their late 20s or early 30s and primarily White. Although the average income was relatively high, the range was also considerable, with most women reporting working and living with a spouse/partner [18].

2.2. Measures

2.2.1. Baby preparation and worry scale (Baby-PAWS)

The Baby Preparation and Worry Scale (Baby-PAWS; [18]) displayed acceptable internal consistency for both the subscales and the total score in the US (Self and Partner Worry $\alpha = 0.90$, $\omega = 0.91$; Non-parental Childcare Worry $\alpha = 0.77$, $\omega = 0.79$; Baby Caregiving Worry $\alpha = 0.74$, $\omega = 0.75$; sum score of the 11 items that loaded onto subscales $\alpha = 0.89$, $\omega = 0.90$). The questionnaire administered to participants in the original study consisted of 16 items. All items loading <0.40 or presenting with substantive loading (i.e., >0.40) on more than one factor were excluded from the scales, resulting in 11 items considered in subsequent analyses.

In the current study we used the revised questionnaire, which consisted of the original 16-item questionnaire, with four additional items, resulting in the final 20 items. These four additional items were: 17. Not being able to sooth the baby when he/she is crying; 18. Having a baby who doesn't sleep well at night; 19. Not loving the baby enough; and 20. Not having enough time to maintain relationships with others because you're busy with the baby. Analyses for the revised 20-item questionnaire were carried out with the SMILEY and Online study Dutch samples ($N = 394$). These four items were introduced based on discussions with prenatal stress researchers and Baby-PAWS developers [18]. Participants were instructed: "When you think about your life after the baby is born, how often do you worry, feel nervous or uneasy about the following?" A 7-point Likert scale (Never, Very rarely, Less than half the time, Half the time, More than half the time, Almost always, Always) was used with corresponding scores ranging from 1 to 7. "Does not apply" was an answer option and higher scores indicated greater worries. The questionnaire was translated to Dutch by two research assistants. These translations were back-translated to English by an English native speaker; incongruities were discussed and resolved by the Baby-PAWS researchers.

2.2.2. Edinburgh postnatal depression scale (EPDS)

The Edinburgh Postnatal Depression Scale (EPDS; [22]) is widely used to measure perinatal depression. The questionnaire consists of 10 items, with a 4-point scale ranging from 0 to 3. A total score is a sum ranging from 0 to 30, with higher scores indicating greater depression. Internal consistency in the current study was good ($\alpha = 0.81$, $\omega = 0.71$).

2.2.3. The state trait anxiety inventory (STAI)

Anxiety was measured by the State subscale of the State Trait Anxiety Inventory (STAI; [23]), with 20 items on a 4-point scale ranging from 1 to 4. Scores are based on a sum of all items range from 20 to 80, with higher scores reflecting greater anxiety. Internal consistency in the present sample was excellent ($\alpha = 0.93$, $\omega = 0.93$).

2.2.4. *Pregnancy-related anxieties questionnaire – Revised (PRAQ-R/PRAQ-R2)*

In the SKIPPY study, the original PRAQ-R was administered, while the newer version of the questionnaire (PRAQ-R2) was administered in the SMILEY and online studies [14]. The PRAQ-R2 differs in rephrasing of one item, making the questionnaire applicable for multiparous women [14]. Both questionnaires include 10 items forming three subscales: 1) Fear of giving birth, 2) Worries of bearing a handicapped child, and 3) Concern about one's own appearance. Only 7 of the 10 items were administered in the SMILEY study, thus only the “Worries of Bearing a Handicapped Child” scale was computed. Internal consistency in the current study was as follows: (1) Fear of giving birth ($\alpha = 0.59$, $\omega = 0.66$); (2) Worries of bearing a handicapped child ($\alpha = 0.56$, $\omega = 0.58$); and (3) Concern about own appearance ($\alpha = 0.62$, $\omega = 0.68$); Total score ($\alpha = 0.81$, $\omega = 0.75$).

2.2.5. *Infant behavior questionnaire-revised, short form (IBQ-R)*

Infant temperament was measured with the Dutch version of the Infant Behavior Questionnaire-Revised Short (IBQ-R Short; [24]). The IBQ-R Short Form has 91 items rated on a 7-point scale, which yield 14 scales and 3 factors serving as valid and reliable indicators of infant temperament [25]. For this study, we were particularly interested in the factors of Negative Emotionality, Orienting/Regulation, and their subscales. The Negative Emotionality factor consists of the subscales Distress to Limitations, Fear, Sadness, and Falling Reactivity/Rate of Recovery from Distress (reversed). Infant Orienting/Regulation consists of the subscales Low Intensity Pleasure, Cuddliness, Duration of Orienting, and Soothability. Internal consistency in the current study were as follows: (1) Distress to Limitations ($\alpha = 0.79$, $\omega = 0.54$); (2) Fear ($\alpha = 0.67$, $\omega = 0.80$); (3) Sadness ($\alpha = 0.76$, $\omega = 0.73$); (4) Falling Reactivity/Rate of Recovery from Distress ($\alpha = 0.83$, $\omega = 0.84$); (5) Low Intensity Pleasure ($\alpha = 0.75$, $\omega = 0.72$); Cuddliness ($\alpha = 0.68$, $\omega = 0.74$); Duration of Orienting ($\alpha = 0.78$, $\omega = 0.73$); and Soothability ($\alpha = 0.87$, $\omega = 0.84$).

2.3. *Statistical analyses*

We first assessed mean differences among the three data sets using independent group *t*-tests. Descriptive statistics (means, SDs) for the original 16-item and revised 20-item questionnaire were also considered.

Exploratory Factor Analyses (EFA)/Exploratory Structural Equation Modeling (ESEM) using maximum likelihood estimation with robust corrections for potential nonnormality and goemin oblique rotation within Mplus Version 8.6 [26] were performed. Results were also used to compute model-based estimates of omega reliability (see, e.g., [27]).

To establish concurrent validity of the Dutch Baby-PAWS, bivariate correlations were computed between subscales and the total score, identified as optimal on the basis of EFA/ESEM results, with prenatal anxiety and depression indicators: EPDS, STAI (state), PRAQ-R Fear of giving birth, Fear of bearing a handicapped child, Appearance concerns and PRAQ-R total score. Subsequently, multiple regression models were examined to determine the contribution of Baby-PAWS subscales and total scores to postpartum maternal distress (EPDS, STAI), fine-grained negative emotionality and regulation dimensions (IBQ-R Negative Emotionality and Orienting/Regulation scales). When predicting postpartum depression and anxiety, prenatal anxiety and depression scores were considered as covariates, along with maternal age, weeks of gestation, and parity. A total of 8 regression equations was considered for infant temperament, with Distress to Limitations, Fear, Sadness, and Falling Reactivity (Negative Emotionality) and Low Intensity Pleasure, Cuddliness, Duration of Orienting, and Soothability (Orienting/Regulation) as dependent variables, controlling for maternal age, weeks of gestation, and parity.

Table 2
Primary loadings for the 4-Factor Baby-PAWS.

Baby-PAWS Item	Factor 1 (SIW)	Factor 2 (SPW)	Factor 3 (BCW)	Factor 4 (NpCW)
2. Transitioning back to work, because it will be difficult to separate from the baby*.	0.99			
6. Leaving my baby with others*.	0.42			
4. Finding quality time to be with my partner once we have the baby. ¹		0.83		
5. Having “me time” to relax and enjoy hobbies after the baby is born. ¹		0.83		
7. Changes in the relationship with my romantic partner. ¹		0.57		
1. Not being able to figure out why the baby is crying. ³			0.48	
8. Breastfeeding and/or the baby's diet. ³			0.48	
9. Knowing what to do if the baby is sick or injured. ³			0.55	
15. Bonding with the baby.*			0.50	
16. Feeling exhausted/sleep-deprived and stressed-out after having the baby. ¹			0.55	
11. Not finding adequate childcare for my baby. ²				0.54
12. The costs of daycare and other financial needs of the child. ²				0.67

Note. SIW = Separation from Infant Worry; SPW = *Self and Partner Worry*; BCW = *Baby Caregiving*; NpCW = *Non-parental Childcare Worry*; * Item was not associated with a factor in the previously identified 3-Factor solution for a US sample (Erickson et al., 2020). ¹Item loaded onto Factor SPW in the US sample solution. ²Item loaded onto Factor NpCW in the US sample solution. ³Item loaded onto Factor BCW in the US sample solution. Confirmatory Factor Analysis (CFA) was conducted for the 3-factor solution obtained with the US sample, yielding indicators of poor fit. Cronbach's α could not be computed for Separation from Infant Worry scale, which contains two items.

3. Results

3.1. *Questionnaire structure and internal consistency*

EFA results conducted with the 16-item version of Baby-PAWS provided support for a 4-factor structure. Fit indices for solutions with one through four factors were considered; **1-factor**: AIC (Akaike Information Criterion) = 25,351.62, BIC (Bayesian Information Criterion) = 25,555.80, RMSEA (Root Mean Square Error Of Approximation) = 0.08, CFI (Comparative Fit Index) = 0.81, SRMR (Standardized Root Mean Square Residual) = 0.07; **2-factor**: AIC = 25,160.85, BIC = 25,428.84, RMSEA = 0.07, CFI = 0.87, SRMR = 0.05; **3-factor**: AIC = 25,044.34, BIC = 25,371.88, RMSEA = 0.06, CFI = 0.92, SRMR = 0.04; and **4-factor**: AIC = 24,973.54, BIC = 25,356.39, RMSEA = 0.06, CFI = 0.95, SRMR = 0.03.

Overall, superiority of fit indices (i.e., lowest AIC and BIC values, lowest RMSEA and SRMR values, and highest CFI values) supported the 4-factor structure in the Dutch sample, with the latter implemented in the remaining analyses. The obtained four factors were readily interpretable: Factor 1 reflected the theme of “*Separation from Infant Worry*”; Factor 2 was consistent with the previously reported “*Self and Partner Worry*” subscale; Factor 3 paralleled the original “*Baby Caregiving Worry*” factor, including an additional item addressing bonding; Factor 4 items were from the original “*Non-parental Childcare Worry*” subscale. These four factors were indicated by the totality of 12 items with clear primary loadings (Table 2).

Additional items included in the 20-item version of Baby-PAWS did not contribute to a more conclusive or interpretable factor structure.

Table 3

Concurrent associations between Baby-PAWS, prenatal anxiety/depression indicators.

	1	2	3	4	5	6	7	8	9	10	11
1. Baby-PAWS Factor 1	–										
2. Baby-PAWS Factor 2	0.33**	–									
3. Baby- PAWS Factor 3	0.44**	0.55**	–								
4. Baby- PAWS Factor 4	0.36**	0.36**	0.34**	–							
5. Baby-PAWS Total	0.67**	0.78**	0.86**	0.62**	–						
6. EPDS	0.18**	0.35**	0.37**	0.31**	0.40**	–					
7. STAI-State	0.10*	0.22**	0.24**	0.18**	0.25**	0.46**	–				
8. PRAQ-R/Fear of giving birth	0.21**	0.34**	0.42**	0.31**	0.48**	0.31**	0.28**	–			
9. PRAQ-R/Fear of bearing handicapped child	0.17**	0.37**	0.32**	0.31**	0.44**	0.42**	0.23**	0.74**	–		
10. PRAQ-R/ Appearance concerns	0.13*	0.30**	0.20**	0.23**	0.33**	0.43**	0.22**	0.60**	0.44**	–	
11. PRAQ-R Total	0.18**	0.39**	0.35**	0.33**	0.47**	0.52**	0.29**	0.93**	0.85**	0.79**	–

Note. ** $p < .01$; * $p < .05$; # $p < .10$. Factor 1: “Separation from Infant Worry”, Factor 2: “Self and Partner Worry”, Factor 3: “Baby Caregiving Worry”, Factor 4: “Non-parental Childcare Worry”.

That is, support for the 4-factor structure of Baby-PAWS was mixed, with RMSEA (3-Factor = 0.07; 4-Factor = 0.08) and CFI/TLI (3-Factor = 0.88/0.83; 4-Factor = 0.84/0.74) favoring the 3-factor solution, and SRMR (3-Factor = 0.05; 4-Factor = 0.04) supporting the 4-factor structure. The fourth factor was also associated with a single uniquely-loading item. Thus, evidence indicating additional four items benefit the Baby-PAWS factor structure was not obtained.

For the remaining analyses we hence proceeded with the 12 items for the total score and the 4 factors, obtaining the following internal consistency for each of the factors/scales as well as the total score: (1) Separation from Infant Worry ($\omega = 0.69$)¹; (2) Self and Partner Worry ($\alpha = 0.83$, $\omega = 0.81$); (3) Baby Caregiving Worry ($\alpha = 0.66$, $\omega = 0.74$); (4) Non-parental Childcare Worry ($\alpha = 0.66$, $\omega = 0.67$); and (5) Total score ($\alpha = 0.85$, $\omega = 0.83$).

3.2. Concurrent questionnaire associations

All bivariate correlations between four Baby-PAWS subscales, total score, and prenatal maternal anxiety/depression indicators were statistically significant (Table 3). These associations were in the predicted direction, with higher transition to parenthood worries captured by Baby-PAWS related to greater prenatal anxiety and depression.

3.3. Predictive analyses

Baby-PAWS total score reliably predicted postpartum anxiety and depression scores controlling for covariates, including prenatal symptom indicators (Table 4a). However, only Factor 3 (*Baby Caregiving Worry*) approached significance ($p = .07$) in relation to the STAI State subscale. All related regression coefficients indicated that, as expected, high Baby-PAWS scores were predictive of more pronounced postpartum anxiety and depression, after accounting for prenatal symptoms.

The Baby-PAWS total score as well as the score based on Factor 4 (*Nonparental Childcare Worry*) predicted higher Distress to Limitations (Table 4b). Factor 3 (*Baby Caregiving Worry*) was associated with higher Sadness. Fear and Falling Reactivity effects approached significance. Fear was marginally predicted by the Baby-PAWS total score ($p = .053$), as well as Factor 2 (*Self and Partner Worry*; $p = .09$), with greater worry related to higher infant fear. The Baby-PAWS total score was marginally associated ($p = .054$) with lower Falling Reactivity, or lower ability to recover from distress.

For the regulation-related dimensions, Factor 3 (*Baby Caregiving Worry*) predicted lower duration of orienting and less cuddling. Higher cuddling was marginally predicted ($p = .09$) by the newly identified Factor 1 (*Separation from Infant Worry*). Baby-PAWS scores corresponding to Factors 1, 3, and 4 made significant contributions to the

Soothability scale, wherein lower soothability was predicted by greater *Baby Caregiving Worry* and *Non-parental Childcare Worry*. However, greater *Separation from Infant Worry* was associated with having a more soothable infant. No significant effects were noted for Low Intensity pleasure.

3.4. Comparison of US and Dutch women

Because the 4-factor structure identified for the Dutch sample differed from the 3 factors obtained with the US sample, comparisons of US and Dutch Baby-PAWS scores were limited to item-level independent groups *t*-tests focused on the original 16 items (Table 5 and Fig. 1). Multiple statistically significant differences emerged, most indicating higher levels of worry about transition to parenthood in the US.

4. Discussion

We aimed to validate the Dutch version of the newly developed Baby Preparation and Worry Scale (Baby-PAWS) designed to measure the worries regarding the anticipated transition to parenthood. Furthermore, we examined associations between the Baby-PAWS questionnaire and established measures of maternal distress and infant temperament, providing evidence of concurrent validity and predictive value. We identified a four-factor structure for the 16-item questionnaire in our Dutch sample, as compared to the expected three-factor structure found in the original psychometric evaluation with the US sample [18]. These factors were demonstrated as internally consistent, with three of the four factors consistent with the three-factor US solution: 1) Self and Partner Worry, 2) Baby Caregiving Worry, and 3) Non-parental Childcare Worry. However, in the Dutch sample an additional fourth factor characterized as Separation from Infant Worry emerged. Higher levels of prenatal worries, as captured by Baby-PAWS factors, were related to higher scores on established measures of prenatal anxiety, depression, and pregnancy-specific stress. These correlations were generally moderate in strength, indicating that Baby-PAWS scores did not substantially overlap with the established constructs. This is not surprising given the Baby-PAWS was designed to address distinct worries of pregnant women about the transition to parenthood, and is thus conceptually distinct from general depression and anxiety targeted by existing instruments. Ascertaining these specific worries is crucial for a deeper understanding of psychological challenges associated with becoming a parent. A more precise understanding of women's psychological challenges during this period can lead to the development of more effective (preventive) interventions in the future. The Baby-PAWS total score (sum of the original 12 items that loaded on factors in the Dutch sample) also predicted postnatal maternal depression, anxiety, and infant distress to limitations and sadness. Together, our findings provide evidence of good psychometric properties and validity for the Dutch Baby-PAWS and add to the existing literature indicating links between prenatal worries and postpartum psychological wellbeing, as well as infant temperament [4–6].

¹ Cronbach's α could not be computed for Separation from Infant Worry scale that contains only two items

Table 4
Predictive multiple hierarchical regression models.

4a. Outcome: postnatal maternal symptoms						
Variable	R	R ²	ΔR ²	β	B	95% CI
EPDS						
<i>Predictor: Baby-PAWS Total Score</i>						
Final Model	55	0.30	0.04**			
Maternal Age				0.12	0.16	[−0.05, 0.37]
Gestational Age				0.12	0.36	[−0.08, 0.79]
Parity				−0.19*	−1.85	[−3.35, −0.34]
Prenatal EPDS				0.39**	0.47	[0.28, 0.65]
Baby-PAWS Total				0.21**	0.12	[0.03, 0.20]
<i>Predictors: Baby-PAWS Subscale Scores</i>						
Final Model	0.55	0.31	0.05#			
Maternal Age				0.14	0.19	[−0.04, 0.41]
Gestational Age				0.11	0.32	[−0.12, 0.77]
Parity				−0.19*	−1.78	[−3.32, −0.25]
Prenatal EPDS				0.39**	0.46	[0.27, 0.65]
Baby-PAWS Factor 1				0.06	0.13	[−0.32, 0.57]
Baby-PAWS Factor 2				−0.01	−0.01	[−0.34, 0.32]
Baby-PAWS Factor 3				0.12	0.13	[−0.10, 0.37]
Baby-PAWS Factor 4				0.13	0.34	[−0.15, 0.83]
STAI-State						
<i>Predictor: Baby-PAWS Total Score</i>						
Final Model	0.47	0.22	0.11**			
Maternal Age				−0.03	−0.07	[−0.47, 0.33]
Gestational Age				−0.07	−0.25	[−0.78, 0.28]
Parity				0.00	0.03	[−2.72, 2.78]
Prenatal STAI-State				0.26**	3.58	[1.62, 5.54]
Baby-PAWS Total				0.34**	0.37	[0.22, 0.52]
<i>Predictors: Baby-PAWS Subscale Scores</i>						
Final Model	0.49	0.24	0.13**			
Maternal Age				−0.01	−0.03	[−0.44, 0.39]
Gestational Age				−0.08	−0.28	[−0.81, 0.25]
Parity				0.03	0.47	[−2.29, 3.23]
Prenatal STAI-State				0.24**	3.30	[1.30, 5.30]
Baby-PAWS Factor 1				−0.00	−0.00	[−0.68, 0.67]
Baby-PAWS Factor 2				−0.04	−0.15	[−0.75, 0.46]
Baby-PAWS Factor 3				0.33**	0.70	[0.31, 1.10]
Baby-PAWS Factor 4				0.19*	1.05	[0.20, 1.89]
4b. Outcome: infant temperament						
Variable	R	R ²	ΔR ²	β	B	95% CI

Table 4 (continued)

4a. Outcome: postnatal maternal symptoms						
Variable	R	R ²	ΔR ²	β	B	95% CI
Negative Emotionality						
IBQ-R Distress to Limitations						
<i>Predictor: Baby-PAWS Total Score</i>						
Final Model	0.28	0.08	0.04**			
Maternal Age				−0.19*	−0.06	[−0.10, −0.01]
Gestational Age				−0.02	−0.01	[−0.07, 0.05]
Parity				0.01	0.03	[−0.29, 0.35]
Baby-PAWS Total				0.21**	0.02	[0.01, 0.04]
<i>Predictors: Baby-PAWS Subscale Scores</i>						
Final Model	0.32	0.10	0.06*			
Maternal Age				−0.17*	−0.05	[−0.10, −0.00]
Gestational Age				−0.00	0.00	[−0.06, 0.06]
Parity				0.02	0.04	[−0.28, 0.36]
Baby-PAWS Factor 1				−0.05	−0.02	[−0.10, 0.06]
Baby-PAWS Factor 2				0.11	0.04	[−0.03, 0.11]
Baby-PAWS Factor 3				0.09	0.02	[−0.03, 0.06]
Baby-PAWS Factor 4				0.16*	0.10	[0.00, 0.20]
IBQ-R Fear						
<i>Predictor: Baby-PAWS Total Score</i>						
Final Model	0.20	0.04	0.02#			
Maternal Age				−0.07	−0.02	[−0.06, 0.03]
Gestational Age				0.07	0.03	[−0.03, 0.08]
Parity				0.10	0.18	[−0.12, 0.48]
Baby-PAWS Total				0.15#	0.02	[0.00, 0.03]
<i>Predictors: Baby-PAWS Subscale Scores</i>						
Final Model	0.27	0.07	0.06*			
Maternal Age				−0.03	−0.01	[−0.05, 0.04]
Gestational Age				0.09	0.03	[−0.02, 0.09]
Parity				0.08	0.15	[−0.15, 0.45]
Baby-PAWS Factor 1				0.08	0.03	[−0.04, 0.11]
Baby-PAWS Factor 2				0.17#	0.06	[−0.01, 0.12]
Baby-PAWS Factor 3				−0.12	−0.03	[−0.07, 0.02]
Baby-PAWS Factor 4				0.14	0.08	[−0.02, 0.17]
IBQ-R Sadness						
<i>Predictor: Baby-PAWS Total Score</i>						
Final Model	0.17	0.03	0.01			
Maternal Age				−0.13	−0.04	[−0.09, 0.01]
Gestational Age				−0.00	0.00	[−0.06, 0.06]
Parity				0.02	0.04	[−0.30, 0.37]

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Table 4 (continued)

4a. Outcome: postnatal maternal symptoms						
Variable	R^2		ΔR^2	β	B	95% CI
Baby-PAWS Total				0.10	0.01	[−0.01, 0.03]
<i>Predictors: Baby-PAWS Subscale Scores</i>						
Final Model	0.25	0.06	0.04#			
Maternal Age				−0.14	−0.04	[−0.09, 0.01]
Gestational Age				0.01	0.00	[−0.06, 0.07]
Parity				0.04	0.09	[−0.25, 0.43]
Baby-PAWS Factor 1				−0.16#	−0.07	[−0.15, 0.01]
Baby-PAWS Factor 2				−0.05	−0.02	[−0.09, 0.05]
Baby-PAWS Factor 3				0.23*	0.05	[0.01, 0.10]
Baby-PAWS Factor 4				0.13	0.08	[−0.03, 0.18]
IBQ-R Falling Reactivity						
<i>Predictor: Baby-PAWS Total Score</i>						
Final Model	0.29	0.09		0.02#		
Maternal Age				0.22**	0.07	[0.02, 0.11]
Gestational Age				0.14#	0.06	[−0.00, 0.12]
Parity				0.00	0.01	[−0.32, 0.33]
Baby-PAWS Total				−0.14#	−0.02	[−0.04, 0.00]
<i>Predictors: Baby-PAWS Subscale Scores</i>						
Final Model	0.29	0.09	0.02			
Maternal Age				0.23**	0.07	[0.02, 0.12]
Gestational Age				0.14#	0.06	[−0.00, 0.12]
Parity				0.00	0.00	[−0.33, 0.33]
Baby-PAWS Factor 1				−0.01	−0.00	[−0.08, 0.08]
Baby-PAWS Factor 2				−0.05	−0.02	[−0.09, 0.05]
Baby-PAWS Factor 3				−0.09	−0.02	[−0.07, 0.03]
Baby-PAWS Factor 4				−0.03	−0.02	[−0.12, 0.09]
<u>Orientation/Regulation</u>						
IBQ-R Low Intensity Pleasure						
<i>Predictor: Baby-PAWS Total Score</i>						
Final Model	0.25	0.06	0.00			
Maternal Age				0.13	0.04	[−0.01, 0.08]
Gestational Age				0.18*	0.07	[0.01, 0.13]
Parity				0.08	0.16	[−0.16, 0.49]
Baby-PAWS Total				0.01	0.00	[−0.02, 0.02]
<i>Predictors: Baby-PAWS Subscale Scores</i>						
Final Model	0.29	0.09	0.03			
Maternal Age				0.17*	0.05	[0.00, 0.10]

Table 4 (continued)

4a. Outcome: postnatal maternal symptoms						
Variable	R^2		ΔR^2	β	B	95% CI
Gestational Age				0.17*	0.07	[0.01, 0.13]
Parity				0.07	0.13	[−0.19, 0.46]
Baby-PAWS Factor 1				0.14	0.06	[−0.02, 0.14]
Baby-PAWS Factor 2				−0.01	−0.00	[−0.07, 0.07]
Baby-PAWS Factor 3				−0.14	−0.03	[−0.08, 0.01]
Baby-PAWS Factor 4				0.07	0.05	[−0.05, 0.15]
IBQ-R Cuddliness						
<i>Predictor: Baby-PAWS Total Score</i>						
Final Model	0.30	0.09	0.01			
Maternal Age				0.18*	0.03	[0.00, 0.07]
Gestational Age				0.08	0.02	[−0.02, 0.06]
Parity				0.15#	0.20	[−0.01, 0.41]
Baby-PAWS Total				−0.08	−0.01	[−0.02, 0.01]
<i>Predictors: Baby-PAWS Subscale Scores</i>						
Final Model	0.36	0.13	0.05#			
Maternal Age				0.19*	−0.04	[0.01, 0.07]
Gestational Age				0.08	0.02	[−0.02, 0.06]
Parity				0.12	0.16	[−0.05, 0.37]
Baby-PAWS Factor 1				0.15#	0.04	[−0.01, 0.09]
Baby-PAWS Factor 2				0.12	0.03	[−0.02, 0.07]
Baby-PAWS Factor 3				−0.28**	−0.04	[−0.07, −0.01]
Baby-PAWS Factor 4				−0.09	−0.04	[−0.10, 0.03]
IBQ-R Duration of Orientation						
<i>Predictor: Baby-PAWS Total Score</i>						
Final Model	0.18	0.03	0.00			
Maternal Age				0.08	0.03	[−0.03, 0.09]
Gestational Age				0.05	0.03	[−0.05, 0.10]
Parity				−0.18*	−0.46	[−0.87, −0.05]
Baby-PAWS Total				−0.06	−0.01	[−0.03, 0.01]
<i>Predictors: Baby-PAWS Subscale Scores</i>						
Final Model	0.28	0.08	0.05#			
Maternal Age				0.13	0.05	[−0.01, 0.11]
Gestational Age				0.07	0.03	[−0.04, 0.11]
Parity				−0.20*	−0.51	[−0.91, −0.10]
Baby-PAWS Factor 1				0.04	0.02	[−0.07, 0.12]
Baby-PAWS Factor 2				0.08	0.04	[−0.05, 0.12]
Baby-PAWS Factor 3				−0.25*	−0.07	[−0.13, −0.01]
Baby-PAWS Factor 4				0.13	0.10	[−0.03, 0.22]
IBQ-R Soothability						

(continued on next page)

Table 4 (continued)

4a. Outcome: postnatal maternal symptoms					
Variable	R ²	ΔR ²	β	B	95% CI
<i>Predictor: Baby-PAWS Total Score</i>					
Final Model	0.19	0.04	0.01		
Maternal Age				0.13	0.04 [−0.01, 0.09]
Gestational Age				0.07	0.03 [−0.03, 0.09]
Parity				0.02	0.05 [−0.29, 0.38]
Baby-PAWS Total				−0.11	−0.01 [−0.03, 0.00]
<i>Predictors: Baby-PAWS Subscale Scores</i>					
Final Model	0.31	0.10	0.07*		
Maternal Age				0.13	0.04 [−0.01, 0.09]
Gestational Age				0.04	0.02 [−0.04, 0.08]
Parity				−0.01	−0.01 [−0.34, 0.32]
Baby-PAWS Factor 1				0.23*	0.10 [0.02, 0.18]
Baby-PAWS Factor 2				0.01	0.01 [−0.07, 0.08]
Baby-PAWS Factor 3				−0.23*	−0.05 [−0.10, −0.01]
Baby-PAWS Factor 4				−0.18*	−0.11 [−0.21, −0.01]

Note. ***p* < .01; **p* < .05; #*p* < .10. Factor 1: “Separation from Infant Worry”; Factor 2: “Self and Partner Worry”; Factor 3: “Baby Caregiving Worry”; Factor 4: “Non-parental Childcare Worry”.

In contrast to the findings from the original Baby-PAWS validation study, we identified a factor structure consisting of four rather than three factors. This divergence in factor structure is likely a function of considerable differences in perinatal policies and access to care in the US and the Netherlands. Importantly, maternity leave policies differ greatly between the Netherlands and the US. The US lacks a national paid maternity leave policy, at best allowing for up to 12 weeks of unpaid leave for eligible employees [28]. Alternatively, the Netherlands has a minimum of 16 weeks of fully paid leave, with additional days available [29]. The anticipation of paid maternity leave decreases stress levels in families in the prenatal period [30]. In contrast, the absence of paid maternity leave leads to higher employment rates during pregnancy and earlier return to work after birth, linked to poorer maternal mental health and infant outcomes [31,32]. In the Netherlands, the mother's partner also receives one week of fully paid leave, with the possible addition of five weeks of 70% paid leave, shown to decrease maternal distress [33].

Second, the Netherlands also provides free postpartum care for all families with daily visits 8–10 consecutive days after birth. Maternity care assistants guide families through the transition after birth by educating them about postnatal care and providing help with household chores [34], which are all domains of worries reflected in the Baby-PAWS questionnaire. Third, perinatal health care is covered entirely by government insurance in the Netherlands, unlike the US which lacks a universal healthcare system, often resulting in financial stress because of steadily increasing costs around pregnancy and birth [35]. Together, these differences in paid maternity leave, postnatal professional care, and health care costs between the Netherlands and the US may contribute to lower prenatal worries in the Netherlands, which our post-hoc item-level findings supported. Importantly, these policy differences may also be responsible for the observed discrepancy in the structure of anticipatory worries between Dutch and US mothers. For example, with the additional perinatal supports in the Netherlands, Dutch mothers expect to spend more time with their infants postpartum, and separating

from the infant becomes a more concentrated area of worry.

As predicted, experiences of anticipatory worries indexed by Baby-PAWS were associated with increased pre- and postnatal distress symptoms. These findings align with the existing understanding of associations between pregnancy-specific worries and perinatal depressive and anxiety symptoms [36–38]. In contrast with the Baby-PAWS total scores, the subscale scores were not related to either postnatal depression or anxiety. It may be that the combination of all four subscales, or the totality of anticipatory worries, is required to adequately predict postpartum anxiety or depression for Dutch mothers.

We expected positive associations between Baby-PAWS total/subscale scores and infant negative affectivity and inverse associations with orienting/regulation, and our findings supported some of these relationships (i.e., Baby-PAWS total and Factor 4 [Nonparental Childcare Worry] and Distress to Limitations; Factor 3 [Baby Caregiving Worry] and Sadness; Factor 3 and Cuddliness; Factor 3 and Duration of Orientation; and Factor 1 [Separation from Infant Worry], Factor 3, and Factor 4 each with Soothability). Similar to the relationship between concurrent and postnatal distress reported by mothers, Factor 3 (Baby Caregiving Worry) emerged as a significant predictor of infant temperament. One potential reason may be that mothers with heightened prenatal caregiving worries might also experience increased, or stable, parenting-related anxiety after the infant is born, which has been associated with a more difficult infant temperament [39,40].

Notably, in the US validation of Baby-PAWS [18], Factor 2 (Self and Partner Worry) instead of Factor 3 (Baby Caregiving Worry) emerged as the primary significant predictor of both maternal mental health and infant temperament. The present findings further highlight the need for cross-cultural examinations of parental psychology and maternal mental health, even for countries characterized as “European American”. Pregnancy and the first months of life are periods characterized by transition and heightened plasticity that provide a unique window of opportunity for interventions [13,41]. An improved understanding of prenatal worries across different cultures/countries can provide the foundation for designing tailored preventive interventions and clinical treatments. Moreover, related research can be expected to result in identification of contextual factors contributing to maternal prenatal worries, such as policies on parental leave and perinatal support. This will deepen our understanding of complexity that exists between (and within) cultural groups as a result of policies, support, and norms [42].

Our study has multiple strengths. We had a large sample size of >500 Dutch pregnant women, with adequate power for the factor analysis. Moreover, the longitudinal design in a subsample of pregnant women allowed us to discern that higher prenatal anticipatory worries, as measured by the Baby-PAWS, were indeed associated with higher postnatal levels of depression and anxiety. However, several limitations should also be noted. The participants had a higher socioeconomic status (SES) than average in the Netherlands, and we studied a relatively healthy community sample of pregnant women. Thus, our findings are not generalizable to all worries of Dutch pregnant women. Future research with a more diverse sample would allow for an examination of Baby-PAWS across socioeconomic strata and women experiencing perinatal health issues.

The fact that our large sample was obtained through different studies, with questionnaires completed at different time points between 2016 and 2022, represents another limitation. In particular, the SMILEY sample completed questionnaires during the peak of COVID-19, which may have resulted in some variability in the pattern of worries given the uncertainty and restrictions that occurred as a function of the pandemic. We accounted for differences between samples, controlling for the origin of data statistically in all analyses; however, the latter still warrants acknowledgement as a limitation. A further limitation is that no content validity checks were carried out for the translation of the questionnaire. In addition, our findings relied on self-report of one primary caregiver (i.e., mothers), and we did not obtain longitudinal data from all respondents. It should also be noted that although internal consistency

Table 5
Independent samples T-tests and factor loading for Baby-PAWS items for US and Dutch samples.

Items English	Items Dutch Translation	US <i>M SD</i>		Dutch <i>M SD</i>		<i>t</i> (df)	<i>p</i>	Factors US	Factors NL
1. Not being able to figure out why the baby is crying.	1. Er niet achter kunnen komen waarom de baby huult.	2.18	1.14	2.75	1.34	5.19 (286)	0.00**	BCW	BCW
2. Transitioning back to work, because it will be difficult to separate from the baby.	2. Weer aan het werk gaan omdat het moeilijk is om gescheiden te zijn van de baby.	2.97	2.19	2.75	1.30	1.16 (184)	0.25	x	SIW
3. Having a strong social support network I can rely on to help with childcare.	3. Het hebben van een sterk sociaal netwerk waar je op terug kan vallen met opvang van de baby.	2.67	1.82	2.28	1.48	2.48 (215)	0.01*	NpCW	x
4. Finding quality time to be with my partner once we have the baby.	4. Het vinden van quality time met mijn partner als de baby geboren is.	3.16	1.66	2.86	1.22	2.09 (202)	0.04*	SPW	SPW
5. Having “me time” to relax and enjoy hobbies after the baby is born.	5. Het vinden van quality time voor mijzelf om tot rust te komen en te genieten van hobby's als de baby is geboren.	3.10	1.62	2.98	1.32	0.83 (214)	0.41	SPW	SPW
6. Leaving my baby with others.	6. Het achterlaten van de baby bij anderen.	3.24	1.80	2.68	1.33	3.56 (203)	0.00**	x	SIW
7. Changes in the relationship with my romantic partner.	7. Veranderingen in de relatie met mijn partner.	2.80	1.64	2.61	1.23	1.33 (203)	0.18	SPW	SPW
8. Breastfeeding and/or the baby's diet.	8. (Borst)voeding van de baby.	3.34	1.82	2.62	1.32	4.58 (201)	0.00**	BCW	BCW
9. Knowing what to do if the baby is sick or injured.	9. Weten wat je moet doen als de baby ziek of gewond is.	2.40	1.33	2.57	1.20	1.48 (671)	0.14	BCW	BCW
10. Having friends whom I can talk to about parenting.	10. Het hebben van vrienden waarmee ik kan praten over het ouderschap.	2.08	1.32	1.88	1.11	1.73 (219)	0.09#	x	x
11. Not finding adequate childcare for my baby.	11. Het niet kunnen vinden van goede opvang voor mijn baby.	2.31	1.60	1.89	1.25	3.04 (210)	0.00**	NpCW	NpCW
12. The costs of daycare and other financial needs of the child.	12. De kosten van opvang en andere financiële behoeftes voor de baby.	3.03	2.09	2.18	1.42	4.75 (195)	0.00**	NpCW	NpCW
13. Having the time to complete household tasks (e.g., cooking, cleaning, laundry) once the baby is born.	13. Het hebben van tijd om huishoudelijke taken te doen (bijvoorbeeld, koken, schoonmaken, de was doen) als de baby geboren is.	3.52	1.59	2.65	1.34	6.13 (219)	0.00**	x	x
14. Sharing tasks like feeding and changing our child with my partner.	14. Het verdelen van taken zoals eten geven en het verschonen van de baby met mijn partner.	2.63	1.56	2.23	1.22	2.91 (210)	0.00**	SPW	x
15. Bonding with the baby.	15. Hechten aan de baby.	2.22	1.61	1.84	1.18	2.72 (201)	0.01**	x	BCW
16. Feeling exhausted/sleep-deprived and stressed-out after having the baby.	16. Uitgeput en gestrest voelen en het hebben van een slaapgebrek na het krijgen van de baby.	3.82	1.71	3.26	1.49	3.69 (225)	0.00**	SPW	BCW

Note. BCW = *Baby Caregiving Worry* (NL factor 3, US factor 3); SIW = *Separation from Infant Worry* (new NL factor 1); SPW = *Self and Partner Worry* (NL factor 2, US factor 1); NpCW = *Non-parental Childcare Worry* (NL factor 4, US factor 2); x = not loading on a factor. ***p* < .01; **p* < .05; #*p* < .10. Differences in degrees of freedom stem from missing item-level data on the Baby-PAWS questionnaire.

analyses for established measures (e.g., EPDS, PRAQ) provided satisfactory alpha and omega estimates, the examination of factor structure required to obtain the latter estimates indicated relatively poor fit and potential deviations from prescribed solutions, which require further evaluations. Finally, although we controlled for prenatal levels of depression and anxiety, additional factors might have played a role in shaping postpartum depressive and anxiety symptoms. As the present study does not allow for tests of causality, results speak to associations instead.

Despite these limitations, our results provide an initial validation of Baby-PAWS in a community sample of Dutch pregnant women. In the future, validation of the questionnaire could be expanded by considering other sources of information (e.g., observations of temperament) as well as inclusion of other, especially non-Western countries, to establish generalizability of Baby-PAWS. Moreover, our results indicate that factor structure of assessment tools widely considered to be established should nonetheless be examined when applied in different cultural contexts. We also recommend assessing associations between the Baby-PAWS scores and later maternal and infant outcomes. Before we can determine the clinical value of the Baby-PAWS, future research needs to address factors responsible for elevated Baby PAWS scores and greater worries about transition to parenthood. For example, research with clinical/“high-risk” samples (e.g., women with clinical diagnoses, such as Major Depressive Disorder, and those with trauma exposure) should be conducted to ascertain characteristics of women endorsing greater worry and obtaining higher Baby-PAWS scores. It will also be important to consider whether the Baby-PAWS scores are predictive of relevant postnatal function, such as impairments in mother-infant bonding, or

lower quality of care. Lastly, future research should explore the relation between the Baby-PAWS scores and maternity leave (i.e., fully or partly paid), as well as access to perinatal care, which could clarify the potential impact of these contextual factors on prenatal stress and child outcomes.

In conclusion, we found a four-factor structure of the Baby-PAWS to provide generally reliable and valid indicators of anticipatory worry regarding transition to parenthood in a Dutch population. Baby-PAWS scores were associated with pre- and postnatal depression/anxiety, and infant temperament. However, a different factor structure in our Dutch sample, relative to the US analyses, emerged. The current validation study contributes to a better understanding of anticipatory prenatal worries and general cross-cultural differences in perinatal mental health. A better understanding of prenatal anticipatory worries can aid policymakers in supporting expecting families. The awareness of anticipatory worries and their relation to postpartum mental health can guide future interventions to reduce maternal perinatal distress.

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CRediT authorship contribution statement

Nina Bruinhof: Conceptualization, Methodology, Investigation, Data curation, Writing – original draft. **Ela Sehic:** Formal analysis,

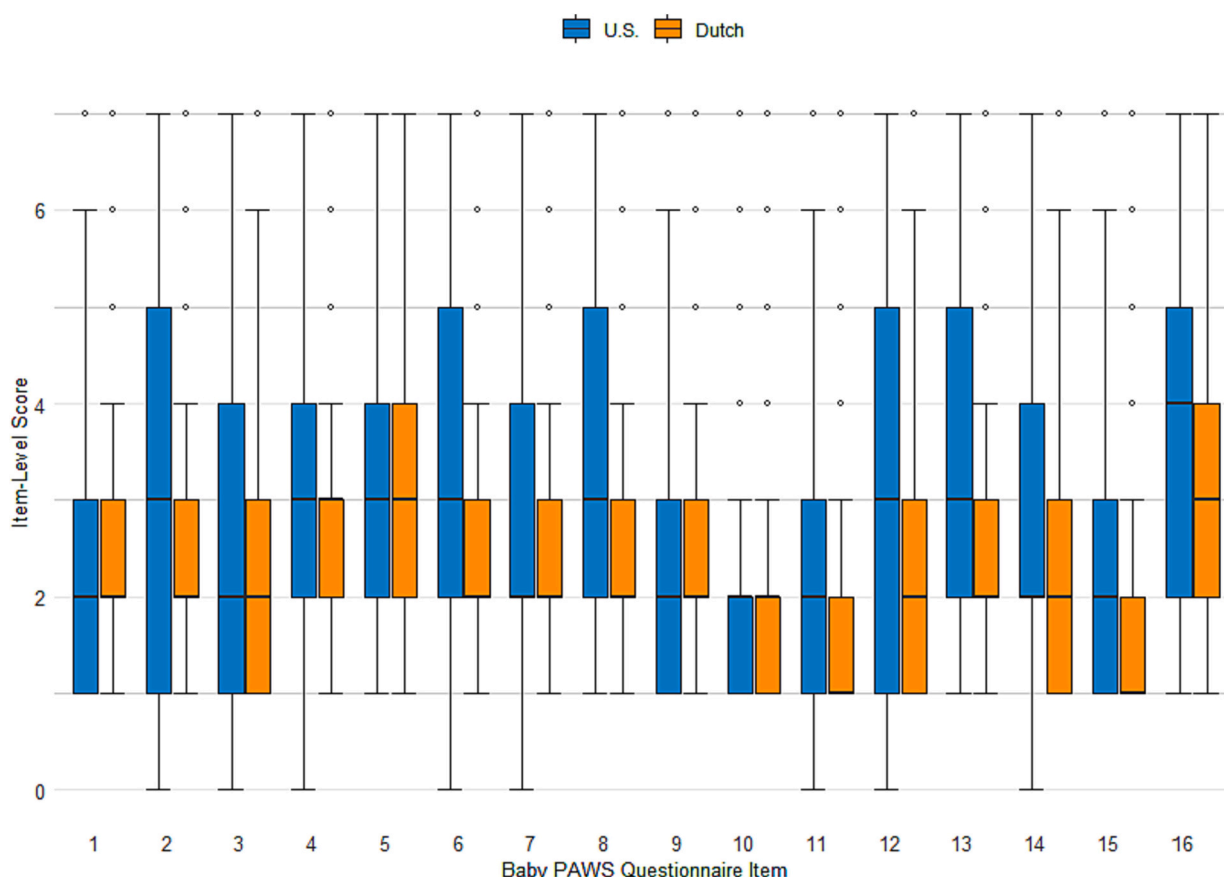


Fig. 1. US and Dutch comparison of Baby PAWS item-level means.

Writing – review & editing. **Gregory R. Hancock:** Software, Formal analysis, Visualization, Writing – review & editing. **Maria A. Gartstein:** Conceptualization, Methodology, Formal analysis, Visualization, Writing – review & editing, Supervision. **Carolina de Weerth:** Conceptualization, Methodology, Writing – review & editing, Supervision, Funding acquisition.

Declaration of Competing Interest

None.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.comppsy.2023.152437>.

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