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Validation of the Dutch version of the Pregnancy Experience Scale

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ABSTRACT

The Pregnancy Experience Scale – Brief version (PES-Brief) assesses the frequency and intensity of the hassles and uplifts of pregnancy. This study aimed to assess the psychometric properties of the Dutch PES-Brief—*Beleving van Zwangerschap Schaal – verkorte versie (BZS-K)*—in a sample of healthy Dutch pregnant women. Participants ($n=115$) completed questionnaires twice during pregnancy, within a three-week interval. Factor analyses resulted in the expected two factors, one positive and one negative. The *BZS-K* showed sufficient internal consistency ($\alpha=.76$ for Hassles, $.83$ for Uplifts) and reproducibility of subscales (Intraclass correlation coefficients (ICC) $=.72$ – $.84$). Concurrent validity with measures of pregnancy anxiety, general depression, anxiety and stress, and emotional well-being was established. We conclude that the *BZS-K* is a reliable, valid measure for assessment of women's perceptions of hassles and uplifts of pregnancy.

Introduction

Prenatal stress and anxiety can negatively affect birth outcomes and the developing child (van den Bergh et al., 2005; Dunkel Schetter and Tanner, 2012; Graignic-Philippe et al., 2014). Moreover, pregnancy itself can generate stressful experiences and specific anxieties that differ from general anxiety (Huizink et al., 2004). Yet, pregnancy also knows many uplifting experiences (DiPietro et al., 2004). In contrast to the wealth of knowledge about the effects of prenatal stress and anxiety on birth and child development, little is known about potentially protective influences of positive experiences or mood during pregnancy. Nonetheless, experiencing uplifts (e.g., laughing) seems to have a buffering effect on physiological stress responses to a psychosocial stressor in pregnant women, as evidenced by alpha-amylase and cortisol levels during a Trier Social Stress Test (Nierop et al., 2008). Additionally, studies found negative associations between optimism and distress (Lobel et al., 2002) or depression (Grote and Bledsoe, 2007), and positive associations between a positive attitude towards the pregnancy and the length of gestation (Voellmin et al., 2013). These studies thus suggest that a positive psychological state could act as a protective factor against stress and stress-related symptoms, and against negative pregnancy outcomes. In sum, both negative and positive pregnancy experiences may have a significant impact on pregnant women and their babies, hence, it is important to tap into both types of experiences for

research and practice purposes. In order to do this, however, valid and reliable instruments that measure these aspects need to be available.

Various questionnaires concerning pregnancy have been designed to measure negative aspects, for example the Pregnancy Related Anxiety Questionnaire – Revised 2 (Huizink et al., 2016). However, only a few questionnaires measure positive experiences, which are mostly not specific to pregnancy (e.g., the Life Orientation Test – Revised (Scheier et al., 1994), Positive And Negative Attitudes Scale (Watson et al., 1988)). To the authors' knowledge, the only questionnaires measuring both hassles and uplifts that are specific to pregnancy, are the Pregnancy Experience Scale (PES; DiPietro et al., 2004) and the Pregnancy Experience Scale – Brief version (PES-Brief; DiPietro et al., 2008). Of the two, the PES-Brief is easier to apply, because items are rated on either the negative or positive dimension instead of on both dimensions, and it is shorter (20 instead of 41 items). This makes the PES-Brief more preferable for research and practice purposes. To date, no validated Dutch version of the PES-Brief was available; therefore, the aim of the current study was to assess the psychometric properties of a Dutch version of the PES-Brief—*Beleving van Zwangerschap Schaal – verkorte versie (BZS-K; Veringa et al., 2013)*—in a sample of healthy Dutch pregnant women.

For the original PES-Brief, DiPietro et al. (2008) created the two subscales Uplifts and Hassles by selecting those items from the 41-item Pregnancy Experience Scale (DiPietro et al., 2004) that were endorsed most

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often as uplifts and hassles, respectively. No factor analysis was carried out in the study of DiPietro et al. (2008). In the current study, we examined whether the proposed subscales corresponded to the main factors of the *BZS-K*. With respect to validity, the *BZS-K* Hassle subscale was expected to correlate positively with pregnancy anxiety, general anxiety, stress and depressive symptoms, and negatively with positive emotional well-being. Correlations with the questionnaire on pregnancy anxiety were expected to be strongest, because its questions are related to pregnancy hassles. For the *BZS-K* Uplift subscale, correlations with the same questionnaires were expected in the opposite direction.

Methods

Translation of the Pregnancy Experience Scale – Brief version

Authorization allowing for translation of the Pregnancy Experience Scale – Brief version (DiPietro et al., 2008) from English to Dutch was obtained from the original authors. The recommendations made by Beaton et al. (2000) were applied for the translation. One midwife and one academic independently translated the questionnaires from English to Dutch. They then conducted a synthesis of these translations (T-12 version). Two academics independently conducted back-translations of T-12. An expert committee consisting of a midwife, two academics and all translators then compared the T-12 and original version on semantic, idiomatic, experiential, and conceptual equivalence. All committee members were fluent in both English and Dutch. A consensus was reached by the expert committee on all items of the Dutch questionnaire, called the 'Beleving van Zwangerschap Schaal – verkorte versie' (*BZS-K*; Veringa et al., 2013).

Field testing the BZS-K

Participants and recruitment

Currently, there is little theoretical basis for sample size calculation of exploratory factor analyses and no formula is yet available. We therefore aimed for a sample size of at least 100 participants, in accordance with two often used rules-of-thumb: 1) include at least 100 participants (Gorsuch, 1983) and 2) the subjects-to-variables ratio should not be lower than 5:1 (e.g., Bryant and Yarnold, 1995), which is 5 times 20 items for the *BZS-K*.

Participants were recruited via flyers and posters spread throughout various municipalities in the Netherlands in both rural and urban areas. Flyers and posters targeting pregnant women were placed in midwife practices, stores selling baby products, kindergartens/nurseries, and pregnancy course facilities. In response to the flyers and posters, 136 pregnant women requested additional information, which was sent to them via e-mail. A total of 115 pregnant women agreed to participate in the study. No descriptive information was available on the 21 women who did not want to participate.

No remuneration was provided for participation. Recruitment lasted from November 2013 till November 2014. Inclusion criteria were: age > 18 years, being pregnant, and having adequate command of the Dutch language. No exclusion criteria were used.

Procedure

Participants filled out a series of questionnaires online to assess demographics, pregnancy experience (*BZS-K*), pregnancy specific anxiety (PRAQ-R), general depression, anxiety and stress (DASS-21), and positive emotional well-being (WHO-5) (T1). A second series of questionnaires was sent three weeks later (T2) to assess reproducibility of the *BZS-K*, in accordance with the recommendations of Terwee et al. (2007). All participants gave online informed consent for participation and for data use. Ethical approval was obtained from the Scientific and Ethical Review Board of the Faculty of Behavior & Movement Sciences of Vrije Universiteit Amsterdam.

Materials

Pregnancy experience was measured using the *BZS-K* which measures maternal appraisal of exposures to daily, ongoing uplifts (10 items) and hassles (10 items) that are specific to pregnancy (for item content, see Table 3). Respondents indicated the extent to which specific experiences make them feel happy or unhappy at this moment, on a four-point Likert scale ranging from 0 (not at all) to 3 (a great deal). The original PES-Brief (DiPietro et al., 2008) yields six scores: (a) Frequency of Uplifts, (b) Frequency of Hassles, (c) Intensity of Uplifts, (d) Intensity of Hassles, (e) Frequency Ratio, and (f) Intensity Ratio. In this study, only the main scales (i.e., frequency and intensity of both uplifts and hassles) were used for validation.

Pregnancy anxiety was measured with the 10-item version of the Pregnancy Related Anxieties Questionnaire-Revised (PRAQ-R; Huizink et al., 2004). The PRAQ-R includes three subscales: (a) Fear of childbirth, (b) Fear of a handicapped child, and (c) Concern about own appearance. Participants indicated to what extent each statement applied to them on a five-point Likert scale, ranging from 1 (absolutely not applicable) to 5 (very applicable). Internal consistencies in the present sample were sufficient to good (Cronbach's α at T1 for Fear of childbirth = .72; Far of handicapped child = .82; Concern about own appearance = .78; Total scale = .76).

Depression, anxiety and stress were measured with the well-validated Dutch Depression Anxiety Stress Scales (DASS-21; De Beurs et al., 2001). The DASS-21 consists of 21 statements divided into three subscales: (a) Depression, (b) Anxiety, and (c) Stress. Participants rated the extent to which statements applied to them over the previous week on a four-point Likert scale. Response options ranged from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). Internal consistencies in this study were sufficient to good (Cronbach's α at T1 for Depression = .73; Anxiety = .66; and Stress = .81).

Emotional well-being was measured with the well-validated World Health Organization Five Well-being Index (WHO-5; Bech et al., 2003; Hajos et al., 2013), which consists of five positively phrased items. Participants indicate to what extent stated feelings were present in the last two weeks on a six-point Likert scale ranging from 0 (never) to 5 (all of the time). Internal consistency Cronbach's α at T1 was .84.

Statistical analyses

Preliminary analyses

Differences between participants with and without retest data were analyzed using a Pearson's chi-square test (categorical data), a Student's *t*-test or a Mann-Whitney *U* test. To be sure that the different timing of assessments in our sample did not influence our findings, differences between trimesters were tested using a one-way ANOVA.

Internal structure

Internal structure of the *BZS-K* was determined by principal factor analysis with oblique rotation in two steps. To determine the number of factors, the first analysis showed all factors with an Eigenvalue over 1. For the second analysis, the number of retained factors was fixed to two, based on the results of the first step and in accordance with the proposed scales of the PES-Brief (DiPietro et al., 2008). Cronbach's alpha was calculated for the resulting scales.

Concurrent validity

Concurrent validity was assessed using Pearson product moment correlations. Correlations corrected for attenuation due to measurement error are also given.

Reproducibility

Reproducibility was determined by Intraclass Correlation Coefficients between two repeated measures using a two-way model for average scores with absolute agreement.

For the internal structure and concurrent validity, T1 data were

used. For reproducibility, both T1 and T2 data were included. All analyses were conducted in SPSS version 21.0 and α was .05.

Findings

Preliminary analyses

A total of 136 pregnant women requested additional information on this study, of whom 115 pregnant women agreed to participate and filled out the first set of questionnaires. Table 1 shows participant characteristics at T1. Participants were in their early thirties and the majority had received a high level of education. All but four women lived with their partner and just over half of the participants were expecting their first child (see Table 1). Table 2 shows the mean scores of the outcome variables at T1 for the total sample and for participants in each trimester. No significant differences were found in the outcome variables between trimesters, with the exception of the BZS-K Frequency of Hassles ($F(2)=5.47, p=.005$). A post hoc test revealed

Table 1
Demographic characteristics for participants at T1.

Age (years) (mean (SD))	30.9 (4.1)
Gestational age (weeks) (mean (SD))	25.8 (8.8)
Level of education (n (%))	
High school	6 (5.2)
Lower vocational school	20 (17.4)
Higher vocational school	46 (40.0)
University	43 (37.4)
Civil state (n (%))	
Single	2 (1.7)
Relationship, living apart	2 (1.7)
Relationship, living together	111 (96.5)
Parity (n (%))	
Primiparous	65 (56.5)
Multiparous	50 (43.5)

Table 2
Observed means for pregnancy experiences (BZS-K), general depression, anxiety and stress (DASS), positive emotional well-being (WHO-5) and pregnancy related anxiety (PRAQ-R) at T1 for the total sample and for participants in the first, second, or third trimester of their pregnancy.

	Total n = 115 Mean (SD)	1st trimester n = 15 Mean (SD)	2nd trimester n = 40 Mean (SD)	3rd trimester n = 57 Mean (SD)
BZS-K Frequency	9.22 (0.94)	9.20 (1.01)	9.10 (1.06)	9.30 (0.87)
Uplifts				
BZS-K Frequency	5.75 (2.46)	6.07 (2.71)	4.82 (2.46)	6.40 (2.15)
Hassles				
BZS-K Intensity	2.30 (0.47)	2.36 (0.57)	2.28 (0.42)	2.30 (0.48)
Uplifts				
BZS-K Intensity	1.42 (0.43)	1.40 (0.42)	1.33 (0.41)	1.49 (0.44)
Hassles				
DASS Depression	2.89 (3.92)	2.40 (2.95)	2.60 (3.66)	3.33 (4.38)
DASS Anxiety	3.48 (3.98)	2.93 (4.65)	2.65 (3.02)	4.25 (4.39)
DASS Stress	8.77 (6.02)	9.07 (5.01)	7.50 (5.67)	9.72 (6.49)
WHO-5	60.70 (17.60)	65.60 (15.84)	63.30 (17.33)	57.54 (17.20)
PRAQ-R Total	19.80 (5.38)	20.80 (5.49)	18.97 (6.05)	20.00 (5.46)
PRAQ-R Birth	5.75 (2.33)	5.47 (2.53)	5.40 (2.64)	6.02 (2.55)
PRAQ-R Handicap	7.59 (2.71)	8.73 (2.87)	7.68 (2.94)	7.23 (2.80)
PRAQ-R Appearance	6.46 (2.59)	6.60 (2.53)	5.90 (2.70)	6.75 (2.85)

Note: Ranges for the subscales are: 0–10 for BZS-K Frequency Uplifts and Hassles, 1–3 for BZS-K Intensity Uplifts and Hassles, 0–42 for the subscales of the DASS, 0–100 for WHO-5, 10–50 for PRAQ-R Total, 3–15 for PRAQ-R Birth and Appearance, and 4–20 for PRAQ-R Handicap.

that participants in the second trimester experienced fewer hassles than participants in the third trimester ($p < .01$). In each trimester, all items of the BZS-K were endorsed by at least a few participants, indicating that all items were relevant during the whole pregnancy period (data available upon request). Note that the mean subscale scores of the DASS in the total sample ranged from 2.89 to 8.77, which is low given the possible range of 0 to 42 for each subscale. These mean scores are significantly lower than the cut-off scores for mild symptoms (Depression < 9 , Anxiety < 7 , Stress < 14 ; all p -values $< .001$) (Lovibond and Lovibond, 1995).

Twenty-two participants did not complete the second measurement for reproducibility testing. Women without T2 data reported a slightly more negative intensity of pregnancy hassles (means are 1.58 and 1.37, respectively; $U = 666.50, z = -2.41, p = .016, r = -.23$) and they were less anxious about having a handicapped child (means are 6.59 and 7.83, respectively; $T(42) = 2.24, p = .030$) than those who participated in both measurements. Furthermore, gestational age was higher in pregnant women without T2 data (means are 31.37 and 24.42 weeks for those without and with T2 data, respectively; $T(110) = -3.51, p = .001$), because participants who were close to term at T1 often gave birth before T2. No other differences were found between participants with and without missing data (all p -values $> .11$).

Internal structure

Based on the principal factor analyses with all factors shown that have an Eigenvalue over 1, the BZS-K showed a clear two-factor structure in the factor loadings, in line with the Uplifts and Hassles subscales of the original version (DiPietro et al., 2008). The factor structure of the BZS-K using a factor analysis with the two factors retained, is shown in Table 3. The factor loadings for the item 'Thinking about whether the baby is normal' (.24) was relatively low, i.e., slightly below .30. Both subscales of the BZS-K showed sufficient internal consistency reliability (Table 3). Leaving out the aforementioned item with a low factor loading did not considerably change internal reliability ($\Delta\alpha = .01$), therefore, the item was kept in the scale.

Table 3
Factor loadings based on principal factor analysis with oblique rotation and two fixed factors for the BZS-K at T1.

Item subject	Uplifts	Hassles
Movement of the baby	.45	-.18
Discussing baby names	.64	.02
Comments about pregnancy/appearance	.65	-.07
Nursery arrangements	.65	.07
Being pregnant at this time	.63	-.12
Visits to obstetrician/midwife	.57	.06
Spiritual feelings about pregnancy	.36	-.10
Courtesy/assistance from others	.58	.01
Thinking about the baby's appearance	.62	.07
Discussing pregnancy/childbirth issues	.76	.12
Getting enough sleep	.02	.52
Physical intimacy	-.03	.60
Pregnancy discomforts	.03	.66
Weight	-.04	.39
Body changes	-.21	.61
Thinking about whether the baby is normal	.10	.24
Thinking about labor and delivery	-.04	.40
Ability to do physical tasks/chores	-.09	.58
Physical symptoms	-.21	.42
Clothes/shoes don't fit	.09	.39
Eigenvalues	4.81	2.85
% variance explained	24.04	14.26
Cronbach's alpha	.83	.76

Note: factor loadings $> .30$ in bold.

Table 4
Correlations for the BZS-K and the PRAQ-R, DASS and WHO-5 at T1.

	DASS Depression	DASS Anxiety	DASS Stress	WHO-5	PRAQ-R Total	PRAQ-R Birth	PRAQ-R Handicap	PRAQ-R Appearance
Frequency Uplifts	-.21* (-.27)	.01 (.02)	-.25** (-.31)	.33** (.39)	.02 (.02)	.01 (.01)	.08 (.10)	-.06 (-.07)
Frequency Hassles	.32** (.43)	.17 (.25)	.34** (.43)	-.30** (-.37)	.49** (.64)	.25** (.33)	.29** (.37)	.47** (.61)
Intensity Uplifts	-.28** (-.36)	.01 (.01)	-.28** (-.34)	.41** (.48)	-.14 (-.17)	-.10 (-.13)	-.01 (-.02)	-.17 (-.22)
Intensity Hassles	.20* (.27)	.30** (.42)	.26** (.33)	-.52** (-.65)	.04 (.05)	.08 (.11)	-.13 (-.17)	.14 (.18)

Note: correlations corrected for attenuation due to measurement errors are shown in brackets.

* $p < 0.05$.

** $p < 0.01$.

Concurrent validity

Table 4 shows the correlations between the BZS-K and the DASS, the WHO-5, and the PRAQ-R. The correlations show significant relationships in the expected directions and corrected correlations range from |.27| to |.65|. Exceptions were the correlations between the subscales of the PRAQ-R and Intensity of Hassles, which were very low (corrected r 's range from -.17 to .18) and not significant, and the correlation between the DASS Anxiety and the Frequency of Hassles (corrected $r = .25$), which was not significant. As hypothesized, the Frequency of Hassles scale indeed correlated highest with the PRAQ-R Total score, followed by the DASS Depression and DASS Stress subscales, which did not differ from each other, and finally the DASS Anxiety subscale.

Reproducibility

Test-retest analyses showed sufficient intraclass correlations for Frequency of Uplifts ($ICC = .78$, 95% CI = .69 - .86), Frequency of Hassles ($ICC = .84$; 95% CI = .76 - .90), Intensity of Uplifts ($ICC = .83$, 95% CI = .75 - .89), and Intensity of Hassles ($ICC = .72$, 95% CI = .58 - .81). All values were significantly different from 0 (all p -values < .02).

Discussion

The goal of this study was to assess the reliability and validity of the Dutch version of the Pregnancy Experience Scale - Brief (BZS-K) in a sample of Dutch pregnant women. Factor analysis showed two latent variables for the BZS-K, Uplifts and Hassles, similar to the findings of DiPietro et al. (2008). The item 'Thinking about whether the baby is normal', however, loaded relatively low on the Hassles factor (< .30). It is possible that participants did not consider the possibility of having a baby with mental or physical disabilities as a great concern. For instance, in the Netherlands, the uptake of Down syndrome screening is relatively low (25%) (Gitsels - van der Wal et al., 2014). One of the reasons for declining, is that parents would accept the child anyway (reported by 16% of decliners; Henrichs et al., 2010). Since the factor loading is not dramatically low or inverse, the authors decided to keep the item in the scale.

Based on the Cronbach's alphas, both the Uplifts and Hassles subscales of the BZS-K showed sufficient to good internal consistency. Both subscales showed sufficient reproducibility over a three-week interval. Furthermore, the findings of this study were in line with the expectation that the frequency of pregnancy related hassles would show highest correlation with the pregnancy-related anxieties questionnaire, which also includes pregnancy related items, and a somewhat lower correlation with the more general distress questionnaires. However, this only holds for the frequency of experienced hassles; the intensity of experienced hassles did not correlate with pregnancy-related anxiety. A possible explanation for this lack of correlation is that the items and responses of the PRAQ-R are a measure of frequency rather than intensity of pregnancy-related anxiety. Furthermore, the frequency of hassles did not correlate with general anxiety, which may be due to a

restriction in the range of scores on general anxiety. This restriction of range most likely also caused the relatively low internal consistency for that subscale. Pregnancy uplifts showed a positive correlation with positive emotional well-being as expected, and a weak negative correlation with stress and depression.

When interpreting the findings of this study, several limitations have to be considered. The fact that most participants were relatively well-educated, for instance, limits the generalizability of the results of this study to the general population. Furthermore, reported anxiety and depression levels were low in this sample. It is possible that results differ for more anxious and/or depressed women, because anxiety and depression could affect pregnancy experience. Therefore, future studies could examine whether the BZS-K is reliable and valid in a more at-risk sample. Furthermore, it is possible that the measures used in this study are affected by gestational age. Therefore, future studies could test the validity of the BZS-K in the three trimesters separately. Additionally, it would be worthwhile to examine whether the BZS-K could be used for screening purposes by clinicians to identify both extreme worries or negative experiences and potential sources of positive experiences associated with pregnancy. Identifying such worries and negative experiences is important because they could negatively affect women's health, while positive experiences could buffer women from adversity.

Currently, knowledge about the influence of positive experiences on prenatal stress and anxiety is scarce, even though some studies suggest that optimism and positive experiences could benefit both mother and child (e.g., Lobel et al., 2002; Nierop et al., 2008). This gap may partly be attributable to the lack of valid and easily-applicable instruments that include positive experiences. The BZS-K, which is short and apparently fun to fill in—several participants mentioned that they enjoyed thinking about the pregnancy experiences selected in the BZS-K—caters this need.

To summarize, the findings presented in this study support the reliability and validity of the Dutch version of the PES-Brief, the BZS-K, for assessment of maternal perception of both uplifts and hassles of pregnancy. Measuring both positive and negative aspects of pregnancy experiences in research and in practice, would increase our insight on how optimism and positive experiences could affect stress levels in pregnant women and the subsequent effects on the offspring's health. The BZS-K is a good and easy-to-apply measure that can be used for such purposes.

Declaration of interest

The authors report no conflict of interest. Sponsors were not involved in the conduct of the research or the preparation of the article.

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