

Factor Structure, Validity and Reliability of the Cambridge Worry Scale in a Pregnant Population

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Abstract

This article presents the Cambridge Worry Scale (CWS), a content-based measure for assessing worries, and discusses its psychometric properties based on a longitudinal study of 1207 pregnant women. Principal components analysis revealed a four-factor structure of women's concerns during pregnancy: socio-medical, own health, socio-economic and relational. The measure demonstrated good reliability and validity. Total CWS scores were strongly associated with state and trait anxiety (convergent validity) but also had significant and unique predictive value for mood outcomes (discriminant validity). The CWS discriminated better between women with different reproductive histories than measures of state and trait anxiety. We conclude that the CWS is a reliable and valid tool for assessing the extent and content of worries in specific situations.

Keywords

anxiety, assessment, pregnancy, validation, worry

Introduction

PREGNANCY is a transition period in a woman's life associated with heightened levels of emotion and anxiety. The monitoring of levels of positive and negative affect is particularly important since there is evidence suggesting that anxiety during pregnancy can influence biological changes which can in turn influence subsequent outcomes (Burstein, Kinch, & Stern, 1974; Chung, Lau, Yip, Chiu, & Lee, 2001; O'Connor, Heron, Golding, Beveridge, & Glover, 2002; Perkin, Bland, Peacock, & Anderson, 1993; Spielberger & Jacobs, 1979). The widespread introduction of prenatal screening as a major component of antenatal care has intensified this interest (Green, 1990, 1994; Green & Statham, 1996). However, the commonly used methods of assessing anxiety in pregnancy have their own limitations.

The most widely used measure of anxiety is the Spielberger State-Trait Anxiety Inventory (STAI) (Spielberger, Gorsuch, & Lushene, 1970). This consists of two, 20-item, self-report scales based on a conceptualization of anxiety as consisting of both a relatively stable personality characteristic (trait), and a more transient, situation-specific element (state). The STAI has many advantages: it is fairly short and easy to administer, is suitable for self-administration, stands up to repeated use and norms have been established for various stressed groups (e.g. patients awaiting surgery and psychiatric patients; Spielberger et al., 1970). However, there are concerns about how it has been used in practice (Green, 1990). In particular, the information from the state scores is given prominence and that yielded by the Trait scale is largely ignored. State anxiety is indicative of the extent of anxiety at a particular time point, but it does not indicate what a person is anxious about.

This is important since attempts to allay anxiety make assumptions about causes. Furthermore, there is some evidence that the state score does not always correspond with women's own reports of worry about the baby's health, or even with their own self-ratings of anxiety. For example, Tabor and Jonsson (1987) found that the STAI and a Visual Analogue Scale (marked 'extremely anxious' at one end and 'not at all anxious' at the other) showed

somewhat different patterns for different groups. Similarly, Marteau, Johnston, Shaw, Michie, Kidd and New (1989) found some discrepancies between the STAI and a bipolar rating scale (see Green, 1990, for further discussion). It has also recently been suggested that both the Trait and State scales of the STAI are unstable during pregnancy (Hundley, Gurney, Graham, & Rennie, 1998).

Our concerns about the utility of measures of anxiety in pregnancy contexts are also supported by an extensive literature over the last 15 years that distinguishes the worry and anxiety constructs. Research on worry has flourished ever since the identification of worry as a very important diagnostic criterion for generalized anxiety disorder (Barlow, 1988). Borkovec and Inz (1990, p. 153) describe worry as a 'central definitional feature of generalized anxiety disorder'. Since then the literature has looked at both pathological and non-pathological worry focusing on the significance of the content of worries (Boehnke, Schwartz, Stromberg, & Sagive, 1998) and the cognitive and self-regulatory processes (Tallis & Eysenck, 1994). However, the worry construct has been largely ignored in pregnancy research.

Measures of worries in the general population have been reported (Davey, Hampton, Farrell, & Davidson, 1992; Joormann & Stober, 1997; Meyer, Miller, Metzger, & Borkovec, 1990; Tallis, Eysenck, & Mathews, 1991) but none so far to assess pregnant women's affect. The scales constructed for the measurement of worry in the general population adopt two approaches. The Penn State Worries Questionnaire (PSWQ; Borkovec, Metzger, & Pruzinsky, 1986) was constructed as a measure of the degree of worry. It comprises items such as 'I worry all the time'. In response to concerns about the neglect of measurement of worries content, Tallis et al. (1991) have constructed the Worry Domains Questionnaire which addresses specific concerns in five areas: relationships, lack of confidence, aimless future, work incompetence and financial.

The Cambridge Worry Scale (CWS) which is presented in this article, was developed for use in the Cambridge Prenatal Screening study (Green & Kafetsios, 1997; Green, Snowdon, & Statham, 1993a; Green, Statham, & Snowdon, 1993b; Statham & Green, 1994; Statham, Green,

& Snowden, 1993; Statham, Green, & Kafetsios, 1997) to examine women's concerns (worries content) about the health of their baby within the context of other concurrent worries, both pregnancy related and more general. In order to do this, a measure was needed that would assess not only the *extent* of pregnant women's worries, but also what it was that they were worried about. This is also in keeping with arguments that it is certain aspects of worry that are related to psychological health outcomes (Boehnke et al., 1998).

Our interest was in worry as a normal everyday activity rather than in pathology. In the context of pregnancy and prenatal testing, the terms 'anxiety' and 'anxious' are, in fact, generally being used to refer to sub-clinical phenomena, i.e. what we are calling 'worry', and the STAI is a continuous measure appropriate for use with non-clinical populations. Our preference in the context of our study was to use the term 'worry' in order to avoid the ambiguities and the possible suggestion that we were only interested in the pathological. Also, evidence from general worry measurements has demonstrated a strong relationship with trait anxiety but also discriminant predictive value (Davey et al., 1992). There is further evidence pointing to specific areas of pregnant women's concerns, which correlate with anxiety but still have unique predictive value (Glazer, 1980 using the Taylor Manifest Anxiety Scale).

We have previously demonstrated the utility of the CWS when focusing on a single issue—worry about the health of the baby—and shown that the extent of women's worry has face validity in the context of previous pregnancy experiences and current concerns (Statham & Green, 1994; Statham et al., 1997). This article complements these earlier reports by considering the scale as a whole and we report here the factor structure, validity and reliability of the CWS using data from 1207 women who took part in the Cambridge Prenatal Screening study.

Methods

The Cambridge Prenatal Screening study

Women were recruited to the study between January and March 1990 from nine District hospitals, all within 60 miles of Cambridge

(UK). All women booking for antenatal care during the recruitment period were eligible. Women were recruited via a letter and questionnaire forwarded to them with notification of their first hospital appointment, which was generally before 16 weeks of pregnancy (time 1). Subsequent data were collected via postal questionnaires at 22 weeks (time 2) and at 35 weeks (time 3). (There was further postnatal data collection, but that is not included in this article.) The majority of questions in each of the antenatal questionnaires concerned women's expectations, attitudes, knowledge and experiences with regard to tests of fetal well-being, as well as questions about feelings and relationships (see Green & Kafetsios 1997; Green et al. 1993a, 1993b; Statham & Green 1994; Statham et al., 1997 for further information).

The CWS was included at all three time points. The Trait scale of the STAI (Spielberger et al., 1970) was also included at time 1 and the State scale at time 3. The Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987) was also included at time 3. Although, this scale was designed to be a postnatally administered screening tool for postnatal depression, it has also been shown to be a valid measure of general dysphoria both postnatally and antenatally (Green, 1998).

Participants

The study was approved by the Local Research Ethics Committees. A total of 3350 women were invited to join the study and 1824 women agreed. This represents a response rate of 54 per cent but it is probably an underestimate since there were reasons to believe that not all questionnaires reached appropriate targets. The sample was broadly representative of the population from which it was drawn with regard to age, parity, education and socio-economic group when compared with figures published by the Central Statistical Office (1991).

For the purposes of the analyses to be reported in this article the sample was limited to the 1207 women who completed all three antenatal questionnaires and who were less than 18 weeks pregnant at the time of completing the first questionnaire. The average age was 27.07 years (SD 4.93), 13.5 per cent were 21 or younger and 5 per cent were 35 years or older. In terms of education, 13.2 per cent had had

higher education and a further 30.7 per cent had some education beyond the age of 16 (excluding higher education). The remaining 56 per cent had left school at age 16 or younger. Ninety-four per cent were married or living as married and 44.7 per cent had not given birth before, although only 34 per cent had never been pregnant before. These demographics were comparable to those of the 1824 women in the full sample (see Green & Kafetsios, 1997).

Construction of the scale

The rationale for developing the CWS was the need to assess both the content and the degree of pregnant women's worries. The starting point for the scale was a concurrent study of blood-pressure monitoring in pregnancy in which women were being asked which of a small number of potential worries such as money and housing were actual sources of concern (Cartwright, personal communication). Conversations with women in antenatal clinics and with researchers served as a source of items on possible sources of worry to women in early

pregnancy.¹ To increase the validity and sensitivity of the scale, responses were made on a six-point Likert-type scale (0 'not a worry' to 5 'extremely worried'; for full instructions for completion see Fig. 1). An open-ended question at the end allowed respondents to tell us of other worries not on the list.

The focus of the study for which the scale was developed was worry about something being wrong with the baby. One of our concerns when constructing the data collection instruments was that an undue emphasis on this topic would heighten women's awareness that something could be wrong with the baby and perhaps generate new worries. An additional advantage of the CWS format for us, therefore, was that worry about 'the possibility of something being wrong with the baby' could be embedded in a list of other items. The same advantage was felt when we came to add 'context-specific' items to the postnatal questionnaire: we felt able to insert items about sexual activity in a relatively low-key way because it was just one item on a list.

Worry! Worry! Worry! Worry! Worry! Worry! Worry!

Most of us worry about something. This list is not meant to give you more things to worry about, but we would just like to know if any of these things are worrying you at all. Please circle a number for each one to show how much of a worry it is to you at the moment, from 0 if it is not a worry to 5 if it is something that you are extremely worried about.

	Not a worry					Major worry
1 Your housing	0	1	2	3	4	5
2 Money problems	0	1	2	3	4	5
3 Problems with the law	0	1	2	3	4	5
4 Your relationship with your husband/partner	0	1	2	3	4	5
5 Your relationship with your family and friends	0	1	2	3	4	5
6 Your own health	0	1	2	3	4	5
7 The health of someone close to you	0	1	2	3	4	5
8 Employment problems	0	1	2	3	4	5
9 The possibility of something being wrong with the baby	0	1	2	3	4	5
10 Going to hospital	0	1	2	3	4	5
11 Internal examinations	0	1	2	3	4	5
12 Giving birth	0	1	2	3	4	5
13 Coping with the new baby	0	1	2	3	4	5
14 Giving up work (if applicable)	0	1	2	3	4	5
15 Whether your partner will be with you for the birth	0	1	2	3	4	5
16 The possibility of miscarriage	0	1	2	3	4	5

If there is anything else that is worrying you, or if you would like to say anything more about any of the above, please use this space to tell us about it:

Figure 1. The Cambridge Worry Scale (prenatal screening study time 1).

The initial scale was devised for use in early pregnancy, but it became evident that it was inappropriate for certain items to be on the list at certain times. For example, 'The possibility of miscarriage' is a prevalent worry in early pregnancy, but is no longer an issue by the third trimester. Conversely, piloting revealed that 'The possibility of going into labour too early' was a concern later in pregnancy but not at the beginning. Options for dealing with this included: restricting the scale to items that would be relevant on all occasions, or, conversely, including all items at all times, even if inappropriate for the timing. We felt that both of these options were likely to alienate women: the first by not representing their concerns and the second by appearing to be out of touch with their likely concerns at any time. We therefore chose a compromise route: the majority of items appeared on all occasions but additional context-specific items were added or subtracted as was judged to be appropriate. Another result of piloting was the decision to present a separate 'Birth worry' scale in the third antenatal questionnaire listing only items specific to labour and birth (e.g. waters breaking at an embarrassing moment; not getting to the hospital in time). Here, analysis has included items that appeared on at least two occasions: 16 items

at times 1 and 2, and 15 items at time 3. The time 1 version of the scale is given in Fig. 1. All these items were also included at time 2, but item 16 was not included at time 3.

Scoring

The raw scores can be used in a variety of ways depending on the needs of the study. For many purposes researchers will wish to focus on single items. In this article we will present:

1. the frequency distribution of mean ratings given to individual items at times 1, 2 and 3;
2. mean scores for the whole scale at each of the three time points: CWS1, CWS2 and CWS3. CWS1 and CWS2 are based on 16 items, CWS3 on 15 items.

Results

Item scores

Figure 2 presents the mean responses to individual items at time 1, rank ordered from the item about which most people reported some degree of worry (The possibility that there might be something wrong with the baby: 90%) to that about which the smallest number were worried (Problems with the law: 3.6%).

There was considerable variation between the

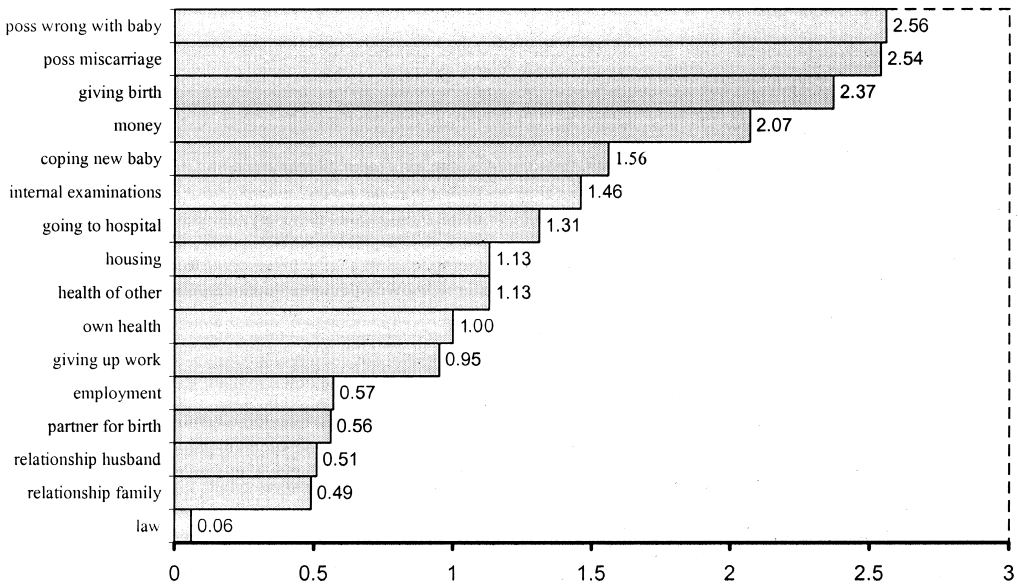


Figure 2. Ranking of women's worries (mean scores),

items. There was no item that was not a worry to anyone, although zero was the modal response for 10 of the 16 items. Analysis of variance across all items was highly significant for between-measure variation ($F_{(15,1041)} = 365, p < .000$). Thus, in spite of observed homogeneity at a general level (see internal consistency section), the CWS items differed enough to justify an analysis of item groupings within the set of 16 (see factor analysis section). See Table 1 for item means at the three times during pregnancy.

Mean scores

The unweighted mean scores across items and standard deviations for the three time points were CWS1 = 1.29 (.73); CWS2 = 1.06 (.70); CWS3 = 1.13 (.65) with average skewness of .07. The score was highest at time 1, dropped in the middle of pregnancy and rose at the end which is consistent with the commonly reported U-shaped distribution of anxiety over the course of pregnancy (e.g. Lubin, Gardener, & Roth, 1975).

Reliability

The scale exhibited satisfactory internal consistency at all three time points (time 1: $\alpha = .79, k = 16$ items; time 2: $\alpha = .79, k = 16$; time 3: $\alpha = .76, k = 15$). Individual item alphas did not differ

significantly. Squared multiple correlations (each variable as an explanatory variable and the rest as predictors) ranged from .29 (item 3) to .65 (item 10) (only items 3 and 15 had low loadings: .29 and .38 respectively). The Guttman lower-bound estimate of reliability for the total score was on average .70 (times 1, 2 and 3).

Test-retest correlations

The scores on the questionnaire at the three times were all highly correlated (CWS1 & CWS2, $r = .72$; CWS1 & CWS3, $r = .69$; CWS2 & CWS3, $r = .70$; all $p < .001$). The high correlation during the whole period of pregnancy indicates the high reliability of the scale.

Factor structure

A principal components analysis with oblique rotation at time 1 yielded four factors accounting for almost 57 per cent of the total variance. Three items ('problems with the law', 'giving up work' and 'whether partner will be at the birth') were excluded from the analyses as they did not apply equally to all respondents and hence had low communalities. Items were adequately correlated (Keiser Mayer Olkin adequacy = .87) and component loadings are shown in Table 2. Factor 1 (27.75%) had to do with *socio-medical* aspects of having a baby: giving birth; going to hospital; internal examinations; and coping with

Table 1. Item means at the three times during pregnancy

	Time 1		Time 2		Time 3	
	mean	sd	mean	sd	mean	sd
1 Your housing	1.13	1.66	.93	1.56	.94	1.53
2 Money problems	2.07	1.66	1.99	1.61	1.98	1.60
3 Problems with law	.06	.39	.07	.46	.07	.47
4 Relat. with husband/partner	.51	1.09	.49	1.07	.62	1.16
5 Relat. with friends/family	.49	.99	.34	.82	.42	.88
6 Own health	1.00	1.27	.91	1.18	.95	1.14
7 Health of someone close	1.13	1.50	.71	1.24	.78	1.32
8 Employment problems	.57	1.23	.47	1.09	.47	1.08
9 Possibility of smth. wrong with baby	2.56	1.56	2.01	1.47	2.13	1.45
10 Going to hospital	1.31	1.57	1.14	1.45	1.55	1.56
11 Internal examinations	1.46	1.67	1.04	1.46	1.23	1.51
12 Giving birth	2.37	1.73	2.24	1.64	2.55	1.60
13 Coping with new baby	1.56	1.45	1.60	1.42	1.90	1.50
14 Giving up work	.95	1.41	.63	1.20	.47	1.11
15 Whether partner at birth	.56	1.23	.53	1.15	.71	1.27
16 Possibility of miscarriage	2.54	1.76	1.36	1.55	-	-
17 Labour too early	-	-	1.41	1.51	1.09	1.36

the new baby. Factor 2 (12.22%) referred to *socio-economic* issues: money, employment problems, housing and the law. Factor 3 (9.28%) included those items concerned with the *health* of mother and baby: miscarriage, something being wrong with the baby and own health. Items loading on factor 4 (7.72%) concerned *relationships* with partner, family and friends.

Principal components analyses at times 2 and 3, revealed a factor structure very similar to that at time 1 (see Table 2). The first factor (socio-medical aspects) was consistently the larger in all three analyses (time 2, 25.06%, time 3, 26.56%). The socio-economic factor was consistently the second largest (time 2, 11.9% and time 3, 11.8%). Health concerns about

miscarriage and something being wrong with the baby constituted a consistent factor at both times 2 and 3 (8.60% and 7.27%) but the relationships factor was relatively more influential at times 2 and 3 than at time 1 (7.90 % and 7.83% respectively) attracting loadings from two further items to do with own and other health (concerns with own and partner's health).

The correlation of the four factors (at time 1) with trait, state anxiety, age and education are presented in Table 3. As can be seen all four factors correlated with both trait and state anxiety (range $r = .27-.44$), with the correlations being highest for trait anxiety with factor 2 (socio-economic) and factor 4 (relationships).

Table 2. The CWS four factors and item loadings at times 1, 2 and 3

	T1	T2	T3
<i>Socio-medical</i>	3.61	3.58	3.45
12 Giving birth	.82	.82	.82
10 Going to hospital	.79	.79	.80
11 Internal examinations	.76	.71	.69
13 Coping with the new baby	.61	.67	.67
		Q9	.54
<i>Socio-economic</i>	1.59	1.55	1.63
2 Money problems	.83	.82	.78
1 Housing	.70	.70	.73
8 Employment problems	.67	.56	.65
<i>Health</i>	1.21	1.03	1.02
16 Possibility of miscarriage	.81	.82	.63
9 Possibility of something wrong with baby	.79	.76	.40
6 Own health	.58	-.12	.36
7 Health of someone else close	.57	.45	.77
<i>Relationships</i>	1.03	1.12	1.05
5 Relationships with friends & family	.77	.76	-.77
4 Relationships with husband/partner	.73	.48	-.76
	Q6	.59	-.56
	Q7	.54	

Note: Factor eigenvalues in bold.

Table 3. Correlation of the four factor scores (time 1) with state, trait anxiety, age and education

	1	2	3	4	5	6	7	8
1 CWS_F1 Socio-medical	-							
2 CWS_F2 Socio-economic	.25	-						
3 CWS_F3 Health	.31	.25	-					
4 CWS_F4 Relationships	.15	.32	.21	-				
5 Trait anxiety	.32	.40	.32	.44	-			
6 State anxiety	.31	.28	.27	.31	.50	-		
7 Age	-.13	-.24	-.04	-.03	-.20	-.07	-	
8 Education	.01	-.09	-.05	-.08	-.11	-.07	.25	-

Note: Ns range from 1118-1206. All correlations greater than +/- .07 are significant at the .01 level.

There were small but consistent negative correlations between age and each of the worry factors. This was also true for educational level, to a lesser extent.

Criterion/concurrent validity

Do women who have reasons to worry have higher scores? One would expect that concerns of certain sub-groups of women should be reflected on certain worry factors. This hypothesis was tested with regards to previous child-bearing experiences. The sample was divided into four groups:

1. Those who have never been pregnant before (*None*; $N = 383$).
2. Those who have had previous pregnancies all of which had successful outcomes (i.e. a live born healthy child) (*Only successful*; $N = 377$).
3. Those who have had both successful and unsuccessful previous pregnancies (*Mixed*; $N = 243$).
4. Those who have been pregnant before but have never given birth to a live healthy child at term (*Only unsuccessful*; $N = 123$).

Repeated measures ANOVAs were conducted with reproductive experience as the main between-subject factor and age and level of education as model covariates. As shown in Table 4, previous reproductive experiences had an impact on factor 1 (socio-medical) and factor 2 (health). Age was more predictive of differences in factors 3 (socio-economic) and 4 (relationships). Specifically, it was primigravidae who had the highest worry scores on socio-medical issues at times 1 and 2 but not at time 3. Women with previously unsuccessful pregnancy experiences had the second highest worry scores at times 1 and 2, being most worried at time 3, just before labour. Regarding health (factor 2), women with only unsuccessful experiences were most worried at all three times. Worries about socio-economic issues and relationships did not vary among women with different reproductive experiences. Conversely, it was age which was negatively related with both socio-economic and relationship worries. The relationship between age groups (coded as 1: < 21, 2: 21–34, 3: > 34) and these variables was negative and linear. This association is also shown in Table 4.

Table 4. Reproductive history and estimated marginal mean scores on the four worry factors

Previous reproductive experiences	CWS_F1: Socio-medical			CWS_F2: Socio-economic			CWS_F3: Health			CWS_F4: Relationships		
	time 1	time 2	time 3	time 1	Time 2	time 3	time 1	time 2	time 3	time 1	time 2	time 3
None ($N = 383$)	2.13 ^a	1.83 ^a	2.14 ^a	.88	.81	.82	1.90 ^a	1.83 ^a	.99	.42	.55 ^a	.56 ^a
Only successful ($N = 377$)	1.33 ^b	1.20 ^b	1.63 ^b	.96	.81	.83	1.50 ^b	1.30 ^b	.82	.53	.57	.66
Mixed ($N = 243$)	1.26 ^b	1.19 ^b	1.94 ^b	.92	.82	.84	1.92 ^a	1.77 ^a	.99	.54	.69 ^b	.79 ^b
Only unsuccessful ($N = 123$)	1.91 ^a	1.76 ^a	2.13 ^c	1.06	1.07	.96	2.21 ^c	2.10 ^a	.99	.46	.60	.61
F (3,1145)	34.70 ***			2.12			19.41 **			3.21 *		
Covariates												
Age F (3,1145)	.71			68.05 ***			.58			7.86 **		
Education F (3,1145)	.11			.03			2.85			.01		

Notes: Numbers in each column that have different superscripts differ reliably. * $p < .05$ ** $p < .01$ *** $p < .001$

Table 5 shows that the CWS distinguishes clearly the worry levels of the four groups. Overall it is the protective effect of previous successful pregnancies that is noticeable with the two multiparous groups having lower scores than the groups that have not had previous successful pregnancies. This was consistently found at each time point ($F_{(3, 1190)} = 16.6, p < .001$; $F_{(3, 1190)} = 14, p < .001$; $F_{(3, 1190)} = 9.23, p < .001$). Interestingly however, primigravidae had the lowest scores on the state anxiety scale and quite low scores on trait anxiety. Women with mixed experiences had the highest level of state anxiety, but one of the lowest worry scores.

Convergent/discriminant validity

As expected, there was substantial covariation between trait anxiety and the total worry scores at each time (time 1 $r_{(1165)} = .54$; time 2 $r_{(1165)} = .44$; time 3 $r_{(1137)} = .46$ all significant $p < .000$). In order to assess further whether the CWS discriminated from anxiety as measured by the STAI, a multiple regression was carried out with state anxiety and worry scores at time 3 as predictors of concurrent EPDS score, a measure of antenatal dysphoria. State anxiety had the highest partial correlation ($r = .63$), but the worry score (CWS3) also had unique, significant predictive value ($r = .15, \Delta R^2 = .014, F_{(1,1181)} = 34.31, p < .001$).

Discussion

The CWS was devised in order to assess the extent and the content of women’s worries. The data presented in this article have shown the

measure capable of achieving both of these aims and we have presented a range of reliability and validity indicators. The longitudinal research design used in the Cambridge Prenatal Screening study has additionally allowed us to explore these issues over time.

One of our initial questions concerned the extent to which worries would be independent of each other. It could be the case that some women just worry because they are the worrying kind, and others, conversely, do not. If that were the case then one would expect a factor analysis of CWS items to reveal only one underlying factor. In fact we found four factors, indicating that scores are not just a reflection of disposition. We also examined the correlation between trait anxiety scores and the total CWS scores at each time point. These were between .45 and .56—highly significant but low enough to confirm that the CWS scores are not simply attributable to predisposition.

The relationships of worry scores with independent variables such as reproductive history, age and education also demonstrate the validity of the CWS. Reproductive history is important for factors 1 and 3 (socio-medical and health worries), but for factors 2 and 4 (socio-economic and relationship worries) it is age, and to a lesser extent, education that are significant. The higher trait anxiety scores of women who have only previously had unsuccessful pregnancies has been reported previously (Statham & Green, 1994) and adds to concerns about the stability of STAI scores (Hundley et al., 1998). The particularly low state anxiety scores at time 3 of women who have not been pregnant before

Table 5. Mean scores (and standard errors) for Trait anxiety, State anxiety and Worry at three times for sub-groups with different reproductive histories

Previous reproductive experiences	Trait anxiety	State anxiety	CWS1	CWS2	CWS3
None (N = 383)	38.04 (.42)	38.32 (.51) ^c	1.43 (.76) ^e	1.17 (.71) ^e	1.23 (.68) ^e
Only successful (N = 377)	38.47 (.51) ^b	40.62 (.51)	1.13 (.69) ^f	.92 (.65) ^f	1.02 (.66) ^f
Mixed (N = 243)	37.55 (.53)	42.77 (.64) ^d	1.18 (.70) ^f	1.02 (.72) ^f	1.05 (.58) ^f
Only unsuccessful (N = 123)	40.26 (.72) ^a	40.50 (.89)	1.50 (.73) ^e	1.28 (.68) ^e	1.25 (.60) ^e
$F_{(3,1190)}$	2.7*	9.4***	13.05***	11.44***	6.14**
<i>Covariates</i>					
Age	29.92***	11.4**	8.08**	3.20*	6.87**
Education	3.51*	1.3	4.25 *	1.62	.25

Notes: * $p < .05$ ** $p < .01$ *** $p < .001$

Numbers in each column that have different superscripts differ reliably (according to a Bonferroni post hoc) a,b $p = .05$; c,d $p < .01$; c,f $p < .001$.

was, however, unexpected. For these women, the pattern of time 3 worry scores, with women who have not given birth before being more worried than those who have, has greater face validity. This is consistent with recent evidence showing a discrimination of non-pathological worry and anxiety in the general population (Stober & Mujs, 2001). Evidence about the structure of worry suggests that it is important as it combines both cognitive and affective elements of anxiety. Namely, worry has a certain 'content'. For example, worries about the self and other have been shown to be negatively related to mental health (Boehnke et al., 1998).

The CWS is unusual in aiming to be relevant to the respondents, which in practice means being context specific. This potentially raises difficulties of comparability, even within the same study, when items are added and subtracted at different stages of pregnancy. However, comparison within and between studies on individual items should not present difficulties, and we know of a number of other studies, in the UK and elsewhere, which have now used both modified and unmodified versions of the CWS with childbearing women (e.g. Georgsson-Öhman, Grunewald, & Waldenström, 2003; Hilvingsson, Radestad, Rubertsson, & Waldenstrom, 2002; Homer, Farrell, Davis, & Brown, 2002; Sikorski, Wilson, Clement, Das, & Smeeton, 1996). Viewing the CWS as a flexible, context-specific tool has allowed us to adapt it for use in studies with other populations, such as parents of disabled children (Green & Murton, 1993) and women with a family history of cancer (Collins, Halliday, Warren, & Williamson, 2000; Statham, Green, Murton, Hollowell, & Richards, no date). In all of these studies, some of the core items such as money and housing were retained and pilot work established the other main areas of concern to the target group. This sometimes resulted in an item being expanded, e.g. 'own health' in the cancer study became a number of items assessing worries about specific cancers. Even using such data in a purely descriptive way can lead to insights. For example, in our cancer study we were able to distinguish sub-groups of women who had a very high degree of worry about all cancers from others, with different psychological characteristics, whose worry was much more focused (unpublished data). In

another study (Green & Murton, 1993), we were able to compare the worry profiles of mothers and of fathers.

We believe that the CWS has considerable scope to be used as a context-specific, user-friendly research tool. The nature of the scale lends itself to a range of methods of analysis, either at the level of individual items or using total or factor scores, depending on the needs of a given study. Our own use of it has been primarily at the item level (e.g. Statham et al., 1997) but we have demonstrated in this article the feasibility of using aggregate data. Users should, however, be aware of potential statistical difficulties when using mean scores from rating scales with a skewed distribution of responses. Other scoring methods, such as dichotomizing into high and low scorers may be statistically preferable.

In conclusion, the CWS is a reliable and valid tool for assessing the extent and content of worries in specific situations. It may be used descriptively to gain insights into the concerns of some defined group of people, or comparatively. The nature of its construction and the versatility of scoring allow it to be extended to a wide range of health psychology contexts where such information is sought.

Notes

1. At this stage we were unaware of work by Light and Fenster (1974) and Glazer (1980). These studies identified very similar concerns to those used in the CWS.

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