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Running Head: CHANGES IN THE PERCEPTION OF BODY IMAGE

How well do women adapt to changes in their body size and shape across the course of pregnancy?

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Abstract

This study examined body image across pregnancy. Pregnant women ($N=158$) completed measures of general attractiveness, feeling fat, fitness and strength, salience of weight and shape, and ideal and current body size at pre-pregnancy (retrospective), and in early, middle and late pregnancy. Body image was found to be fairly stable across pregnancy such that women who started with greater body concerns maintained them over time. Although women were least satisfied with their stomach size at late pregnancy, women's ideal body shape increased in parallel with increases in body size. Women with the most body concerns reported more depressive symptoms, tendency towards dieting, and smoking during pregnancy suggesting they were at greater risk in terms of health and well-being during pregnancy.

Pregnancy is a particularly important phase in a woman's life, in which health and well-being have important implications not only for the woman herself, but also for the unborn child (Franko & Walton, 1993). During pregnancy, women experience rapid changes in their body size and shape over a relatively short period of time. A typical pregnant woman will gain approximately 13 kilograms in weight during a 40 week pregnancy (Girandola, Khodiguian, Mittlemark, & Wiswell, 1991) and experience increases in breast size and thickening of the waist (Heinberg & Guarda, 2002). These changes might be expected to result in a significant reappraisal by women of their body image as their body shape changes and their weight increases (Lederman, 1984; Moore, 1978; Strang & Sullivan, 1985).

While these body changes are to be expected during pregnancy, the extent to which women adapt to them positively, or alternatively become dissatisfied and concerned about these body changes, is not yet clear in the literature. Understanding the extent of women's adaptation to body changes is important because body dissatisfaction has been shown to be associated with difficulties including depression, anxiety, and low self-esteem in various contexts (Kostanski & Gullone, 1998; Palladino-Green & Pritchard, 2003; Paxton, Schultz, Wertheim, & Muir, 1999; Skouteris, Carr, Wertheim, Paxton, & Duncombe, 2005; Stice & Whitenton, 2002), which would be particularly detrimental to the well-being of a pregnant woman. Body dissatisfaction is also associated with unhealthy dieting and eating behaviours (Conti, Abraham, & Taylor, 1998), as well as cigarette smoking to avoid weight gain (Dobmeyer, Peterson, Runyan, Hunter, & Blackman, 2005; Lampasso, 2004; Newman, Sontag, & Salvato, 2006; Stepnowski, 2003), which would have important implications for the health and well-being of the mother and foetal development over the perinatal period (Fairburn & Welch, 1990; Franko & Walton, 1993). Furthermore, negative attitudes to body size have been reported in late adolescence and adulthood (Kenardy, Brown, & Vogt, 2001;

Stevens & Tiggemann, 1998). Given that many young women have body image concerns, it is possible that pregnancy might trigger additional body image concerns. The aim of the current study was to examine how women adapt to the body changes that arise over the course of pregnancy and specifically whether these body changes give rise to increases in body concerns or whether body image stays relatively stable over this time period.

A large amount of research indicates that the idealised image of female beauty in Western societies involves having a slim body (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). However, over the course of pregnancy women's bodies increasingly depart from this ideal of beauty, as weight is gained and the body becomes larger. Women's assessments of their bodies when non-pregnant tend to be based at least partly on their current perceived physical appearance or body size in comparison to their idealised physical appearance or body size (Cash, 1996). Thus, it might be expected, that if women's ideals remain stable over time, their satisfaction with their bodies might decline during pregnancy as they perceive themselves moving away from the current Western ideals about body shape that indicate thin women are more beautiful (Franzoi & Herzog, 1987; Strang & Sullivan, 1985).

Consistent with this view, some researchers have reported a decline in body satisfaction during pregnancy. For example, a qualitative study of 19 women by Leifer (1977) found that some women reported that pregnancy triggered negative feelings no matter how satisfied they were with their bodies before pregnancy. Fairburn and Welch (1990) reported that 40% of a sample of 50 pregnant women were afraid of weight gain during pregnancy. In a sample of 63 women in the postpartum, body image retrospectively reported about the last three weeks of pregnancy was reported to be more negative than at pre-pregnancy (Strang & Sullivan, 1985).

In contrast to this view, several researchers have proposed that the normal societal pressure to conform to body shape ideals may be reduced during pregnancy (Davies & Wardle, 1994; Fairburn & Welch, 1990), since women see changes in body shape and weight as temporary and specific to child bearing (Richardson, 1990). From this point of view, pregnancy might provide a time of respite from body image concerns, as women's reproductive role is valued more than physical appearance (Usher, 1989). Indeed, Davies and Wardle (1994) reported that pregnant women were more satisfied with their bodies than nonpregnant women. Richardson (1990) found that women in late pregnancy saw changes in body shape and weight as temporary and specific to child bearing, and reported that they were able to adapt to the changes without distress. Fairburn, Stein and Jones (1992) found that women practised fewer dieting behaviours during pregnancy than before pregnancy. The weight concerns reported early in pregnancy were lower than retrospective pre-pregnancy reports with the concerns starting to increase again later in pregnancy, but not reaching pre-pregnancy levels. Thus, pregnant women do not necessarily become more dissatisfied with their body during pregnancy.

Most of these studies have examined a relatively small sample of women (maximum N of 100) at only one or two points in pregnancy, some using retrospective reporting. Furthermore, the pregnancy time points examined have differed from one study to the next, making it difficult to discern whether women's concerns are stable throughout pregnancy or arise at particular phases. In one of the few multiple time point prospective studies that have been conducted, Skouteris et al. (2005) found that, although for the most part body image was relatively stable across pregnancy, women were generally less satisfied with their bodies in early pregnancy than in pre-pregnancy or in late pregnancy. Early pregnancy is a particularly important time in the development of the foetus, so that body concerns at this time point would be important to evaluate. However, given that only

one study to date has taken this extended prospective approach, it is difficult to draw conclusions about patterns of change in body image across the full course of pregnancy (Tiggemann, 1994; Wertheim, Paxton, & Blaney, 2004a). Further prospective research is needed that investigates this issue.

It is generally agreed by researchers that body image is a multi-dimensional concept (Cash, 2002; Thompson, et al., 1999; Wertheim et al., 2004a) that refers to many different perceptual, evaluative and investment aspects of body image including perception of one's current shape and size; ideas about what size and shape is 'ideal'; satisfaction with general appearance; subjective experience of body size satisfaction; the perception of being strong and fit; and the salience of weight and shape. During pregnancy, women's image of their body may change in relation to each of these dimensions.

Therefore, this prospective study, which followed women across pregnancy, examined (1) whether there were changes in how women perceived their body across pregnancy; and (2) whether ratings of current and ideal shape as measured by figural stimuli altered over the course of pregnancy, with particular reference to whether the two ratings diverged as time progressed. Body image changes were examined from pre-pregnancy through to the third trimester of pregnancy. It was expected that if pregnancy is *not* a time of positive adjustment to body changes, then later in pregnancy women would report more dissatisfaction in relation to general attractiveness, feeling fat, strength and fitness, and the salience of weight and shape. In addition, as the pregnancy progressed, women's current body size would be perceived as increasingly departing from their ideal size, which would remain stable. However, if women adapt to pregnancy, their ideal might be expected to shift to incorporate expected pregnancy body changes, thus maintaining their levels of body satisfaction. An alternative, but still adaptive response would be for women's ideal image of their body to remain

stable but for the ideals to have less impact on body satisfaction, since women see pregnancy as a 'special' time; in this latter case even if perceived current size and ideal body size diverged, the current-ideal discrepancy might not be associated with greater reports of body dissatisfaction (e.g., 'feeling fat' or experiencing weight and shape as increasingly salient).

A secondary aim of the study was to confirm whether women's body image during pregnancy is associated with well-being and health behaviours including depressive symptoms, attempts to restrain eating, and smoking cigarettes in early and late pregnancy. It was expected that feeling fat and salience of weight and shape would be associated with weight loss attempts and smoking, and that a more negative view of one's body would be associated with more depressive symptoms.

Method

Participants

A total of 158 women with a mean age of 31.7 years (range 21-42, SD=3.7) participated in the study. Women were recruited from Melbourne and regional Victoria, Australia, with a few participants from other states. On average, women were 18.5 weeks pregnant at time one (T1) (range 16-23, SD=1.79 weeks); 26.6 weeks at time two (T2) (range 24-30, SD=1.51), and 34.5 weeks at time three (T3) (range 32-38, SD=1.45). Women were primiparous (45.1%), or had one child (35.8%), or two children (9.3%) or three or more children (2.5%); 85% of the sample reported that the current pregnancy was planned. Of the participants 70.4% reported annual household incomes above \$70,000; 10.5% had incomes from \$50,000 to \$60,000; 14.8% had incomes between \$30,000 to \$49,000; and 2.5% had incomes under \$30,000. Most women were married (85.8%), with others in de facto (live together) relationships (13%) or single (1.2%). In total, 80.2% were university educated, 17.9% had a high school education and 1.9% a primary school education. Most were in paid employment (73.5%), 40.1% being full-time and 34% part-time. Participants were born

in Australia (87.2%), Europe (6.1%), USA (2%), New Zealand (1.4%), Asia (0.7%), Middle East (0.7%), South Africa (0.7%), Chile (0.7%) and Canada (0.7%).

Participant mean body mass index (BMI; weight (kg)/height (m.)²) was 24.0 at pre-pregnancy (range 16.8-52.2, SD = 5.5), 25.5 at T1 (SD=5.1), 26.9 at T2 (SD=4.9) and 28.5 at T3 (SD=5.0). At pre-pregnancy 12.7% reported smoking and 6.2% reported smoking at T1, 5.4% at T2 and 3.4% at T3.

Measures

Demographics. Participants reported their occupation, employment status, household income, ethnicity, age, weight, marital status, height, parity, number of weeks gestation and smoking habits.

Body Attitudes Questionnaire (BAQ). Body image at pre-pregnancy (retrospectively reported three months before pregnancy at T1) and during pregnancy at T1, T2 and T3 were assessed using four sub-scales from the Body Attitudes Questionnaire (Ben Tovim & Walker, 1991): feeling fat (13 items); strength and fitness (6 items); salience of weight and shape (8 items) and attractiveness (5 items). Higher scores represent greater feeling fat, salience, strength and fitness and attractiveness. Test-retest reliability, factor structure, and construct validity have been demonstrated in a range of samples (Ben-Tovim & Walker, 1991; 1992). Cronbach's alphas in the current study were: feeling fat pre-pregnancy = .92, T1 = .92, T2 = .91, T3 = .91; strength and fitness pre-pregnancy = .80, T1 = .80, T2 = .71, T3 = .68; salience pre-pregnancy = .82, T1 = .82, T2 = .78, T3 = .76 and attractiveness pre-pregnancy = .52, T1 = .52, T2 = .72, T3 = .71, which were satisfactory given the number of items.

Contour Drawing Rating Scale (CDRS). The CDRS (Thompson & Gray, 1995) shows eight schematic drawings of non-pregnant female figures ranging from 1 (extremely underweight) to 17

(extremely overweight). Women rated their current body size and their ideal (i.e., preferred) body size retrospectively reported for three months before pregnancy at T1. Current perceived body size minus ideal body size was calculated as an index of body dissatisfaction, in which a larger discrepancy in scores indicated ideally wanting to be thinner. The scale has been reported to have test-retest reliability over one, two and six weeks between .71 and .84 (Thompson & Gray, 1995; Wertheim, Paxton, & Tilgner, 2004).

Pregnancy Figure Rating Scales (PFRS). The PFRS (Skouteris et al., 2005) assessed participants' satisfaction with specific body parts during pregnancy. The scales consist of three rows of five schematic drawings, each row representing a different body part. Women rated from 1 (very thin) to 10 (very large) the current size of their bust, stomach and buttocks, and then on an identical set of scales their ideal size of these three body parts. Difference scores between the current and ideal rating for that body part were calculated. A total Current PFRS included the sum of the three body part ratings; inter-item correlations (an alternative to alpha for small scales, Kline, 1986) ranged from .21 to .37 (T1 .29-.32, T2 .21-.37, T3 .24-.36) which was satisfactory. Inter-item *rs* for the total Ideal PFRS ranged from .21 to .42 (T1 .27-.42, T2 .24-.36, T3 .21-.33).

Beck Depression Inventory (BDI) Short Form. The short form of the BDI (Beck, 1974) has been found to correlate .96 with the BDI long form (Beck & Beck, 1972; Reynolds & Gould, 1981) and has been validated for use in an obstetric population (Holcomb, Stone, Lustman, Gavard, & Mostello, 1996). One of the 13 items was omitted (number 7, in relation to suicide) to address ethics committee concerns; given that only one of 13 items was omitted and the item was also omitted in Skouteris et al. (2005), use of the subset of 12 items was viewed as representative of the construct being measured. The test has demonstrated good test-retest reliability ($r = .60$ to $.83$) in non-psychiatric samples (Beck, Steer, & Garbin, 1988; Gould, 1982). In a sample of 105 pregnant

women the sensitivity of the BDI to detect current depression was .83 (Holcomb et al., 1996). Cronbach's alphas for the BDI in the current study were T1 BDI = .84 and T3 = .82.

Dutch Eating Behavior Questionnaire- Restraint (DEBQ): The widely used dietary restraint scale of the DEBQ (Van Strien, Frijters, Bergers, & Defares, 1986) was used to assess restriction of food intake for weight reasons at pre-pregnancy (retrospectively three months before pregnancy at T1) and at T2 and T3 during pregnancy. It has shown high internal and test-retest reliability and construct validity in various adolescent and adult samples (Banasiak, Wertheim, Koerner, & Voudouris, 2001; Van Strien et al., 1986). Cronbach's alphas in the current study were pre-pregnancy = .89, T2 = .91 and T3 = .91.

Procedure

After obtaining university ethics approval, participants were recruited through advertisements in suburban and daily newspapers; in waiting rooms of obstetricians and gynaecologists; and in sports organisations' or pregnancy exercise providers' newsletters, web-sites or offices. The advertisements invited women to participate in a study that was investigating 'a range of life style factors during pregnancy in order to explore how they are related to the health of the mother and her infant.' Active consent was obtained. Data were collected at seven to eight week intervals, including at 16-23 weeks (early/mid second trimester) which is referred to here as *early* pregnancy, at 24-31 weeks (late-second /early-third trimester) and termed *middle* pregnancy, and the latter part of the third trimester or late pregnancy (32-38 weeks), and termed *late* pregnancy. At T1 participants reported demographic information, weight, height, parity, number of weeks of gestation, and made pre-pregnancy ratings of the CDRS and BAQ. At each pregnancy time point women completed four sub-scales of the BAQ and the PFRS and detailed the amount and frequency of

cigarette use. Participants completed the DEBQ-R at pre-pregnancy, T2 and T3 and the BDI at T1 and T3.

A second sample of 48 pregnant women at various points in their pregnancy were administered the PFRS at two time points between 1 and 2 weeks apart in order to assess test-retest reliability of those scales.

Results

Assumptions of parametric statistics for the measures used in the study

Each variable with extreme outliers was trimmed (Tabachnick & Fidell, 1996) resulting in normal distributions, except for the DEBQ-R T3, for which a square root transformation was successfully applied. Assumptions of parametric statistics were met for all variables.

Test-retest reliabilities for PFRS

In the independent sample of 48 women, 1-2 week (mean = 9 days) correlations indicated high stability on the PFRS for current bust, $r = .83$; current stomach, $r = .81$; current buttocks, $r = .76$; ideal bust, $r = .72$; ideal stomach $r = .68$; and ideal buttocks, $r = .77$. Paired t-tests of changes in means across the two testing occasions were all non-significant ($t < 1.6, p > .13$) indicating no effect of repeated testing.

Discrepancy between current and ideal body size before pregnancy

In examining the difference between pre-pregnancy CDRS current body size and ideal size, 20.1% of the women were satisfied with their body size before pregnancy (i.e., did not want to be smaller or larger). Most women (74.2%) reported wanting to have a smaller body size and 5.7% reported wanting a larger body size. The difference between each CDRS figure was two points. Women estimated that they would like to be from one point (0.5 of a contour rating) to 10 points (5 contour ratings) smaller in size.

Body Image in Women across Pregnancy

Percentages of women with specific body concerns

On BAQ items, in replying to the item 'I usually feel attractive' at pre-pregnancy 67% agreed and 23% were neutral (with only 10% disagreeing), at T1 52% agreed and 29% were neutral, at T2 55% agreed and 26% were neutral, and 46% agreed and 33% were neutral at T3. In relation to 'I get so worried about my shape that I feel I ought to diet', 54% disagreed and 14% were neutral at pre-pregnancy 59% disagreed and 18% were neutral at T1, 60.0% disagreed and 15% were neutral at T2, and 69% disagreed and 18% were neutral at T3. For 'I have a strong body', at pre-pregnancy 57% agreed and 26% were neutral, at T1 49% agreed and 30% were neutral, at T2 59% agreed and 25% were neutral, and at T3 61% agreed and 25% were neutral. For 'I often felt fat', at pre-pregnancy 60% disagreed and 14% were neutral, at T1 56% disagreed and 14% were neutral, at T2 61% disagreed and 15% were neutral, and at T3 60% disagreed and 13% were neutral. Finally, for 'I spend a lot of time thinking about my weight', at pre-pregnancy 62% disagreed and 13% were neutral, at T1 61% disagreed and 17% were neutral, at T2 70% disagreed and 18% were neutral, and at T3 67% disagreed and 19% were neutral.

Changes in body attitudes relevant to dissatisfaction

Differences across time for BAQ sub-scale scores were explored using repeated measures one-way ANOVAs (see Table 1 for BAQ sub-scale mean scores.) Due to violations of the sphericity assumption, Huynh-Feldt Epsilon adjustments were implemented. A significant effect for Time was found for the feeling fat sub-scale, $F(2.45, 345.22) = 3.98, p = .03, \eta^2 = .02$. Least Significant Difference (LSD) post hoc comparisons (used in all subsequent analyses) revealed that women felt significantly fatter prior to pregnancy than they did at T3 ($p = .04, \eta^2 = .03$), T1 than at T2 ($p = .03, \eta^2 = .03$), T1 than at T3 ($p = .002, \eta^2 = .07$), and T2 than at T3 ($p < .04, \eta^2 = .03$). There was a

significant effect for Time on strength and fitness, $F(2.74, 386.45) = 12.48, p < .0005, \eta^2 = .08$; women felt significantly stronger and fitter prior to pregnancy than they did at T1 ($p < .0005, \eta^2 = .19$), at T2 ($p < .0005, \eta^2 = .08$) and at T3 ($p < .005, \eta^2 = .05$) and at T3 than at T1 ($p < .001, \eta^2 = .08$). A significant effect for Time was found for the salience sub-scale $F(2.63, 371.05) = 10.78, p < .0005, \eta^2 = .07$; in which women felt that weight and shape was more salient prior to pregnancy than at T2 ($p < .0005, \eta^2 = .09$), and at T3 ($p < .0005, \eta^2 = .12$). During pregnancy, weight and shape was reported to be more important at T1 than at T2 ($p < .005, \eta^2 = .05$); and at T1 than at T3 ($p = .001, \eta^2 = .08$). No effects for Time were found for the attractiveness sub-scale $F(2.85, 402.37) = 1.65, p = .18$.

(Insert Table 1 here)

Correlations conducted between the body image sub-scales at different time points showed relative stability over time (see Table 2). Correlations across time for salience ranged from .61 (PP-T3) to .76; for feeling fat .63 (PP-T3) to .87; for strength and fitness .61 (PP-T3) to .76; and for attractiveness .51 (PP-T2) to .70.

(Insert Table 2 here)

Changes in ideal and current figure ratings across pregnancy

Repeated measures one-way ANOVAs (see Table 1 for mean scores) examined changes in the PFRS current size ratings for bust, stomach and buttocks between T1, T2 and T3. Significant results (with Huynh-Feldt Epsilon adjustments) were obtained for current bust $F(1.90, 267.10) = 34.66, p < .0005, \eta^2 = .20$; stomach $F(1.92, 383.07) = 445.23, p < .0005, \eta^2 = .76$; and buttocks $F(1.80, 253.17) = 107.92, p < .0005, \eta^2 = .43$. Post hoc t-tests indicated that women's current bust size was significantly smaller at T1 than T2 $t(151) = -.448, p < .0005$, at T1 than T3, $t(142) = -7.62, p < .0005$ and at T2 than T3, $t(141) = -.440, p < .0005$. Women's current stomach size was

significantly smaller at T1 than T2 $t(151) = -19.39, p < .0005$, at T1 than T3 $t(142) = -26.97, p < .0005$, and at T2 than T3, $t(141) = -12.63, p < .0005$. Similarly, women's current buttock size was significantly smaller at T1 than T2, $t(151) = -9.03, p < .0005$, at T1 than T3, $t(142) = -12.80, p < .0005$, and at T2 than T3, $t(141) = -7.00, p < .0005$.

The ANOVAs were repeated for the PFRS ideal size ratings (see mean scores in Table 1). Significant results (Huynh-Feldt Epsilon adjustments implemented) were obtained for ideal bust $F(1.93, 272.69) = 42.82, p < .0005, \eta^2 = .23$; ideal stomach $F(1.96, 276.88) = 154.93, p < .0005, \eta^2 = .52$; and ideal buttocks $F(2.00, 282.00) = 57.34, p < .0005, \eta^2 = .29$. Women's ideal bust size was significantly smaller at T1 than T2, $t(151) = -4.72, p < .0005$, at T1 than T3, $t(142) = -8.68, p < .0005$ and at T2 than T3, $t(141) = -5.12, p < .0005$. Women's ideal stomach size was significantly smaller at T1 than T2 $t(151) = -13.44, p < .0005$, at T1 than T3 $t(142) = -16.24, p < .0005$, and at T2 than T3, $t(141) = -4.74, p < .0005$. Similarly, women's ideal buttock size was significantly smaller at T1 than T2, $t(151) = -7.57, p < .0005$, at T1 than T3, $t(142) = -10.49, p < .0005$, and at T2 than T3, $t(141) = -3.11, p < .0005$.

ANOVAs examined changes in the current-ideal discrepancy scores for bust, stomach and buttocks across pregnancy. A significant effect was found for stomach discrepancy scores $F(1.95, 274.22) = 6.10, p = .003, \eta^2 = .04$; while the scores did not differ significantly between T1 and T2, $p > .05$, women were less satisfied with their stomach size (wanting to be smaller) at T3 than at T1 ($p = .005, \eta^2 = .05$) or T2 ($p = .001, \eta^2 = .07$). Discrepancy scores for bust and buttocks were not significantly different across time points, $p > .05$.

Relationship between current-ideal figure discrepancies and feeling fat

To assess whether current-ideal discrepancies represented body dissatisfaction during pregnancy, correlations were performed between the current-ideal discrepancy scores on the figure

rating scales and the BAQ feeling fat subscale for the same time point. In relation to pre-pregnancy, feeling fat was strongly correlated with the CDRS discrepancy score, $r = .68, p < .0005$. Feeling fat T1 was significantly correlated with the sum discrepancy scores for the PFRS three body parts at T1 $r = .48, p < .0005$; T2 $r = .45, p < .0005$ and T3 $r = .27, p = .001$.

Relationships between body dissatisfaction and indicators of health and wellbeing

As shown in Table 2, all four BAQ body image subscales were associated (alpha level set at .01) concurrently and prospectively with depression scores across the pregnancy (Times 1 to 3): Feeling Fat and BDI r s ranged from .32 to .45; Salience and BDI r s = .31 to .38; Attractiveness and BDI r s = -.29 to -.46; Strength and Fitness and BDI r s = -.26 to -.34. Retrospective reports of pre-pregnancy Feeling fat also predicted early ($r = .31$) and late pregnancy BDI (.28), and Salience and Attractiveness at pre-pregnancy predicted BDI-T1 (r s = .24 and .20 respectively). Feeling fat and Salience concurrently and prospectively predicted greater dietary restraint; Feeling fat and DEBQ r s ranged from .20 (pre-pregnancy to T3; $p = .02$) and .36 (pre-pregnancy to T2) to .57 (concurrent T2); Salience and DEBQ r s = .36 to .60. BMI and Feeling fat ranged from .27 to .63 and BMI and DEBQ ranged from PP-T1 $r = .28$, PP-T2 $r = .31$. Partial correlations indicated that all significant findings from simple correlations remaining significant when BMI at each time point was controlled for.

In independent t -tests, women who reported feeling fat prior to pregnancy and at T1 were more likely to report smoking at those time points, $t(155) = 2.10, p = .037$ and $t(141) = 2.48, p = .01$, respectively. Women who reported that weight and shape was more salient at T1 and T3 were more likely to smoke then, $t(141) = 3.01, p = .003$; $t(142) = 2.92, p = .004$. Smokers reported feeling less fit and strong at T2 ($t(140) = -2.39, p = .018$) and T3 ($t(142) = -3.11, p = .002$), and also less attractive at T2 ($t(140) = -3.33, p = .001$). BMI was also associated with more smoking: PP BMI and T2 smoking $t(142) = 2.72, p = .007$; T1 BMI and T1 smoking, $t(132) = 4.62, p = .008$;

T1 BMI and T2 smoking $t(133) = 2.87, p = .005$; and T2 BMI and T2 smoking $t(126) = 4.40, p = .02$.

Discussion

Findings from this study indicated that the body image of women in this sample remained relatively stable across pregnancy, and that women appeared to adapt to the rapid body changes that took place. High correlations between body image assessments and little difference in scores at different time-points across pregnancy, suggest that women who felt good about their body at the start continued to do so during pregnancy and those who did not tended to maintain that concern during pregnancy. In addition, women reported that in pre-pregnancy they felt fatter than in late pregnancy, they saw weight and shape as more important than in middle or late pregnancy and that they felt fitter and stronger than at times during the pregnancy. While the findings were statistically significant, the effect sizes (eta squared) were small ($> .01$) or moderate ($> .06$), suggesting there were only small changes in the aspects of body image assessed.

In relation to ratings of current and ideal figure sizes, women's reported ideal body size increased in parallel to their current body size ratings across pregnancy, which demonstrated that most women in the current sample adapted to rapid changes in body size and weight across a very short time period. These changes in current and ideal size were unlikely to be a result of repeated testing since there were no changes in means in a test-retest sample. By the end of pregnancy women were reporting a greater discrepancy between their current stomach size and ideal size (preferring to have a smaller stomach) than at earlier time points in pregnancy, possibly reflecting the inconvenience of a large belly, but this difference was small to moderate.

Overall, participants reported similar dissatisfaction with their pre-pregnant bodies to that which has been documented in previous body image research that used the BAQ. For example, in

this study 74.2% of women reported that they wanted to be smaller in size before pregnancy.

Wertheim et al. (2004b) found that 72% of 1056 adolescent girls wanted a smaller ideal figure and other studies have indicated as many as 80% of young women report wanting to be thinner (Heatherington et al., 2001; Kenardy et al., 2001; Stevens & Tiggemann, 1998).

In relation to feeling fat, the present study indicated that even though there was a preference for a smaller belly in late pregnancy for many women, women felt less 'fat' in late pregnancy than they felt prior to pregnancy and significantly fatter in early pregnancy than they felt in middle pregnancy or late pregnancy, consistent with findings of Skouteris et al. (2005). It can be surmised that women may compare their body changes in early pregnancy to those of a woman who has gained weight, instead of a woman who is pregnant. However, as the pregnancy becomes more apparent, women may adjust to the physical changes in later pregnancy because they understand that body changes are necessary for a successful pregnancy and they may see the large belly as simply a sign of a full pregnancy (Davies & Wardle, 1994; Fairburn & Welch, 1990; Richardson, 1990; Skouteris et al., 2005). Consistent with these speculations, participants in the present study reported that weight and shape was less important for them in middle pregnancy and late pregnancy than it was in early pregnancy. These findings support the idea that pregnancy represents a 'special' time in women's lives where they are 'allowed' to be large because their size and shape are signs of a successful pregnancy.

Women in the present study described feeling less fit and strong during pregnancy than they felt before pregnancy, and more fit and strong in late pregnancy than they felt in early pregnancy. This finding appears to be robust as it replicated previous findings of Skouteris et al. (2005). It is possible that pregnancy symptoms (e.g., nausea/vomiting, backache, body soreness, headaches, and fatigue) impacted on some women's perceptions of their strength and fitness, particularly in the

early stages of pregnancy. As many different pregnancy symptoms have been reported in past studies (Birmingham & Kirkby, 1995; Horns, Ratcliffe, Leggett, & Swanson, 1996; Kirkby & Birmingham, 1996; Wallace, Boyer, Dan, & Holm, 1986), further research is required that explores all the recorded pregnancy symptoms, and the severity of pregnancy symptoms and how they impact on body image across pregnancy.

In contrast to Skouteris, et al.'s (2005) findings that women reported being most dissatisfied with their appearance in late pregnancy, in the current study women reported no differences in their view of their own attractiveness across pregnancy. It is unlikely that age was a significant factor in this discrepancy as the mean ages of participants in the present study (mean = 31.7, SD = 3.7) and Skouteris, et al. (mean = 31.63, SD = 3.44) were similar. However, it is possible that participants in the current study experienced fewer pregnancy body changes (i.e., stretch marks, varicose veins and skin pigmentation), and/or pregnancy changes were less severe than experienced by those in Skouteris et al. However, as specific body changes related to attractiveness were not measured in either study, actual changes and their effect upon participants from pre-pregnancy to late pregnancy could not be compared. Future research could consider the factors that impact on specific, rather than global, pregnancy issues.

The current findings, that women selected increasingly large ideal body sizes over the course of pregnancy as their actual body size increased, support the notion that ideal body size is not fixed. This finding is important for models of the development of body image, as it suggests that body ideals vary with context and thus are malleable (Wertheim et al., 2004a). Consistent with this concept, in non-pregnant individuals perceived body size often correlates with ideal size (Dunkley, Wertheim, & Paxton, 2001) even in women with an eating disorder (Wertheim & Weiss, 1989), and increases in weight have been shown to be associated with increases in what individuals report they

would *ideally like* to weigh (Cooley & Toray, 2001). These findings may partly reflect an adaptive tendency for individuals to select ideals that appear achievable. Body ideals may also be altered through women selecting appropriate comparison targets (Skouteris et al., 2005), which in the context of pregnancy would be other women at a similar stage of pregnancy. The findings here demonstrate the ability for individuals to select healthy ideals that are adaptive in the current context.

Consistent with previous research in non-pregnant women, poorer body image in early pregnancy was associated with a number of indicators of lesser well-being, including greater depression scores in early/mid and late pregnancy. Feeling fatter and placing more importance on weight and shape was also associated with a proneness to restrain eating later in the pregnancy. These findings were not just due to the effects of having a larger body size, since they remained after controlling for body mass index. Furthermore, women who were larger and who had greater body image concerns were more likely to smoke cigarettes, both prior to the pregnancy and during the pregnancy.

These findings have possible clinical implications. The fact that body image, dietary restraint and depression were fairly stable across pregnancy suggests that women who show indications of lesser health and well-being early in their pregnancy need to be monitored more carefully, as they are likely to maintain these concerns and related behaviours into middle and later pregnancy. The associations among body concerns, depressed affect and dietary restraint suggest that they are often co-experienced in women and the combination is likely to be particularly concerning.

Several limitations of the current study and suggestions for further research are important to note. First, most participants in the sample were university educated and had stable partners. Previous research has indicated that body image and eating behaviours can vary across different

socioeconomic and cultural groups, although the relationships are not as clear as was originally thought, with eating issues and body concerns being reported in a wide variety of economic and cultural groups (Anderson-Fye & Becker, 2004). Therefore, replication in a more diverse sample is required to assess these variables as moderators in the specific context of pregnancy.

A second limitation is that, while body image data were collected at three prospective time points across pregnancy and can be viewed as strong data (albeit self-report), pre-pregnancy data should be viewed with more caution because it was reported retrospectively. A variety of factors may influence retrospective recall including memory and retrieval biases (Shiffman et al., 1997). Specific to pregnancy research, women may reconstruct their pre-pregnancy body image differently when they know that they are pregnant, e.g., either idealising their pre-pregnancy body or perceiving their body image as more negative than it was. This issue of retrospective recall of pre-pregnancy is a general problem in the literature because it is difficult and expensive to recruit large samples of non-pregnant women and follow them prospectively until they become pregnant. Furthermore repeated testing across time, while waiting for participants to conceive, can bias reports.

We are not aware of any studies on the reliability of retrospective recall of subjective experiences leading up to pregnancy; however, reliability studies of retrospective reports of pregnancy information have been conducted. In one study (Voldsgaard et al., 2002), maternal influenza episodes during mid-pregnancy (as obtained through mid-pregnancy interviews) were substantially underestimated when women reported about it retrospectively 1-2 days after childbirth. However another study of retrospective recall 22 years after pregnancy indicated that accuracy of recall depended on the type of information gathered (Buka, Goldstein, Spartos, & Tsuang, 2004). For example, while medical interventions such as cord or placental difficulties were not accurately reported, major medical events such as caesarean section or breech delivery and demographic

information like age at birth were very accurately recalled, and estimated birthweight and length of gestation were reasonably accurately recalled. In addition, in Buka et al.'s study, high school graduates were more accurate reporters, which increases the likelihood that the highly educated sample studied in our paper may have reported relatively accurately. Research is needed that examines the reliability of pre-pregnancy reports to better interpret findings such as those reported here.

Future research should also examine additional risk factors for body concerns during pregnancy, considering socioeconomic status, the effect of an unplanned pregnancy, parity, maternal age, and a range of theoretical variables such as social comparison tendencies, general psychopathology and eating and dieting patterns at pre-pregnancy. Research should also examine changes in body image specific to pregnancy such as the sense of feeling 'big' (rather than 'fat'), stretch marks, skin changes, general discomfort, and varicose veins (Johnson, 1994). Finally, women's body image during the postpartum period is important to examine next, since retention of weight gained during pregnancy is common and may be associated with dissatisfaction once the 'special time' of pregnancy is over, particularly if body size ideals return to pre-pregnancy standards.

In conclusion, the findings of the study strongly supported a stability model of body image across pregnancy such that women who felt positive about their body image prior to pregnancy were likely to maintain these feelings through the pregnancy. Furthermore, generally women modified their self-standards for their body over the course of pregnancy, shifting their body size ideals to a larger size as they experienced increases in their actual weight and shape. However, women who reported greater body concerns prior to pregnancy were likely to maintain body concerns during the pregnancy and to report concomitant depressed affect, tendencies towards dietary restraint, and

more cigarette use both prior to and during the pregnancy. Thus it was recommended that women who demonstrated greater body concerns and health risk factors prior to and in the early phases of pregnancy be monitored and supported more closely over the course of their pregnancy.

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Table 1.

Means and Standard Deviations in Brackets for BAQ Sub-scales, PFRS Subscales CDRS, BDI and DEBQ-R

Measures	Pre-pregnancy Retrospective	Time 1 16-23 weeks	Time 2 24-31 weeks	Time 3 32-38 weeks
<i>BAQ Subscales</i>				
Strength & Fitness	20.17 (4.24) ^a	18.51 (4.03) ^{bc}	19.08 (4.19) ^b	19.26 (3.98) ^{bd}
Feeling Fat	32.18(10.72) ^a	32.81(11.06) ^c	31.57(10.80) ^{de}	30.41(10.55) ^{bdf}
Salience	11.99 (4.12) ^a	11.49 (3.80) ^c	10.86 (3.66) ^{bd}	10.70 (3.49) ^{bd}

Attractiveness	17.67 (2.53)	17.27 (3.25)	17.33 (3.39)	17.33 (3.23)
<i>PFRS Current</i>				
Stomach		5.00 (1.31) ^a	6.97 (1.79) ^b	8.19 (1.09) ^{bc}
Bust		5.96 (1.78) ^a	6.39 (1.57) ^b	6.76 (1.65) ^{bc}
Buttocks		5.35 (1.62) ^a	6.23 (1.48) ^b	6.82 (1.47) ^{bc}
<i>PFRS Ideal</i>				
Stomach		4.64 (1.54) ^a	6.61 (1.33) ^b	7.39 (1.84) ^{bc}
Bust		5.43 (1.20) ^a	5.86 (1.21) ^b	6.28 (1.30) ^{bc}
Buttocks		4.22 (1.27) ^a	5.06 (1.29) ^b	5.44 (1.51) ^{bc}
<i>Other measures</i>				
CDRS - Current	9.77 (3.67)			
CDRS - Ideal	7.62 (2.64)			
BDI		3.42 (3.04)		3.71 (2.90)
DEBQ_R	25.14 (7.89)		19.72 (7.51)	18.06 (7.49)

Note: Significant differences were found between variables labelled ^a compared to ^b and ^c compared to ^d and ^e to ^f. T1 *n* = 158; T2 *n* = 152; T3 *n* = 144.

Table 2.

Pearson Correlations for Body Image Variables, Depression, Dietary Restraint, and Body Mass Index at Pre-pregnancy (Retrospective) and Three Time Points across Pregnancy

	Time 1 (16-23 weeks)						Time 2 (24-31 weeks)						Time 3 (32-38 weeks)						
	FF1	SAL1	SFIT1	ATT1	BDI1	BMI1	FF2	SAL2	SFIT2	ATT2	DEB2	BMI2	FF3	SAL3	SFIT3	ATT3	BDI3	DEB3	BMI3
Pre-preg																			
BAQ FF	.90**	.59**	-.13	-.25**	.31**	.56**	.69**	.48**	-.17	-.35**	.36**	.54**	.63**	.44**	-.14	-.24*	.28**	.20	.54**
BAQ SAL	.69**	.76**	-.07	-.25*	.24*	.26*	.58**	.63**	-.11	-.33	.47**	.24*	.56**	.61**	-.09	-.25*	.18	.36**	.22
BAQ SFIT	-.18	-.01	.66*	.09	-.10	-.10	-.07	.01	.63**	.12	.11	-.10	-.10	.03	.21	-.25*	-.09	.20	-.09
BAQ ATT	-.38**	-.21*	.12	.68**	-.20*	-.19	-.31**	-.14	.17	.50**	-.07	-.06	-.23*	-.11	-.11	.55**	-.20	-.07	-.10
DEB	.55**	.58**	.09	-.04	.06	.28**	.60**	.53**	-.03	-.24*	.65**	.31**	.56**	.59**	.02	-.19	.14	.63**	.14
BMI	.38**	.22*	.01	-.05	.21*	.96**	.27**	.08	-.06	-.09	.17	.93**	.31**	.13	-.04	-.06	.16	.06	.90**
Time 1																			
BAQ FF		.76**	-.17	-.35**	.37**	.45**	.80**	.66**	-.19	-.44**	.44**	.42**	.74**	.58**	-.18	-.38**	.32**	.29**	.41**
BAQ SAL			-.06	-.25*	.31**	.28*	.65**	.74**	-.11	-.32**	.54**	.24*	.68**	.77**	-.07	-.32**	.31**	.44**	.24*
BAQ SF				.29*	-.34**	.03	-.14	-.07	.72**	.26*	.01	-.02	-.20	-.07	.76**	.29**	-.30**	.15	-.01
BAQ ATT					-.39**	-.06	-.29**	-.18	.28*	.75**	-.08	.01	-.26*	-.25	.29**	.66**	-.29**	-.06	-.05
BDI						.20	.38**	.30**	-.20*	-.38**	.18	.18	.39**	.31**	-.24**	-.31**	.65**	.15	.24*
BMI							.35**	.18	-.07	-.15	.19	.96**	.38**	.20	-.03	-.08	.17	.10	.92**
Time 3																			
BAQ FF													.71**	-.18	-.42**	.45**	.45**	.43**	
BAQ SAL														-.08	-.40**	.38**	.51**	.19	
BAQ SF															.39**	-.26*	.09	-.03	
BAQ ATT																-.46**	-.18	-.12	

* $p < .01$. ** $p < .001$, two-tailed. BAQ = Body Attitudes Questionnaire, FF= Feeling fat, SAL = Salience, SFIT = Strength and Fitness, ATT= Attractiveness, BDI = Beck Depression Inventory, BMI= body mass index, DEB = Dutch Eating Behaviour Questionnaire - Dietary Restraint subscale

