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POSTTRAUMATIC GROWTH AFTER CHILDBIRTH: A PROSPECTIVE STUDY

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Abstract

A growing body of research has examined the potential for positive change following challenging and traumatic events, this is known as posttraumatic growth. Childbirth is a valuable opportunity to extend previous work on posttraumatic growth as it allows the role of different variables to be considered prospectively. The aim of the current study was to prospectively examine correlates of posttraumatic growth after birth, including sociodemographic and obstetric variables, social support and psychological distress, using a prospective, longitudinal design. 125 women completed questionnaires during their third trimester of pregnancy and eight weeks after birth. At least a small degree of positive change following childbirth was reported by 47.9% of women; however average levels of growth were lower than generally reported in other studies. A regression model of age, type of delivery, posttraumatic stress symptoms during pregnancy and general distress after birth significantly predicted 32% of the variance in growth after childbirth. The strongest predictors of growth were operative delivery (β .23 - .30) and posttraumatic stress symptoms in pregnancy (β .32). These findings emphasise the importance of assessing pre-event characteristics when considering the development of posttraumatic growth after a challenging event.

Keywords: Posttraumatic growth; Posttraumatic stress disorder; Childbirth; Social support; Psychosocial

Introduction

A growing body of research suggests that positive changes can be experienced following traumatic experiences (see Calhoun & Tedeschi, 2006; Linley & Joseph 2004, for reviews). Posttraumatic growth (PTG) is defined as a positive change in one's belief or functioning as a result of the struggle with highly challenging life circumstances (Tedeschi, Park, & Calhoun, 1998). These positive changes are often reflected in personal relationships, self-perception and life philosophy (Tedeschi & Calhoun, 1995). Early research in this area focused on PTG following typically traumatic events, such as military combat (Fontana & Rosenheck, 1998), natural disasters (McMillen, Smith, & Fisher, 1997), and sexual assault (Frazier, Conlon, & Glaser, 2001). However, even highly stressful events, which are not necessarily traumatic, like some illnesses (Dirik & Karanci, 2008), work-related stress (Paton, 2005) and immigration (Berger & Weiss, 2002) have been shown to facilitate PTG. Therefore in this article we will refer to 'growth' rather than 'posttraumatic growth'.

The majority of research looking at psychological adjustment following childbirth has focused on negative outcomes such as depression, anxiety disorders, and more recently posttraumatic stress disorder (Brockington, 2004). In comparison, positive psychological outcomes following childbirth have been relatively ignored by research. Only one published study has explored psychological growth after childbirth (Sawyer & Ayers, 2009). This study found that half of the women reported at least a moderate degree of growth in response to childbirth. This finding provides initial support that growth can occur, not only following typically traumatic events, but also challenging developmental events. However, it should be noted that Sawyer and Ayers' (2009) results were based on a self-selected Internet sample,

which might over represent symptomatic women (Ayers, Harris, Sawyer, Parfitt, & Ford, 2009).

Various theoretical models have been proposed to conceptualise the process through which growth occurs (Christopher, 2004; Joseph & Linley, 2005; Tedeschi & Calhoun, 2004). Although with some variation, most models hypothesise that the experience of a stressful event violates an individual's basic belief system and that some type of meaning making or cognitive processing to rebuild these beliefs occurs, resulting in perceptions that one has grown through the process (Horowitz, 1986; Janoff-Bulman, 2004). Such models also provide a framework for understanding individual differences in reports of growth. Tedeschi and Calhoun's cognitive processing model of growth (1995, 2004) emphasises the importance of pre-trauma variables (e.g. personality, demographic variables), event-related variables (e.g. objective severity, perceived threat or stress), and post-event variables (e.g. social support, distress) in the development of growth.

There is substantial empirical support for the role of these variables. For example pre-trauma variables such as being female (Milam, 2004), younger (Widows, Jacobsen, Booth-Jones, & Fields, 2005) and from an ethnic minority group (Tomich & Helgeson, 2004) are associated with higher levels of growth. Regarding event-related variables it is hypothesised that highly stressful events lead to more growth because such events are more likely to challenge fundamental assumptions, and therefore afford a greater potential for growth (Park, 1998; Stanton, Bower, & Low, 2006). However, it is important to distinguish between perceived stress and objective indicators of stress. For example in a group of breast cancer patients Cordova, Cunningham, Carlson, and Andrykowski (2001) found that growth was predicted by greater perceived life threat, but was unrelated to disease stage or treatment variables. These findings suggest that subjective appraisals of threat may be a more important determinant of growth than objective indices of severity. Indeed theoretical models argue that

perceived stress is more important than the objective characteristics of the event in determining growth (Joseph & Linley, 2005; Tedeschi and Calhoun, 2004).

Evidence on post-event factors has largely focused on support and distress. Social support systems are considered to influence the development of growth because the presence of supportive others may promote self-disclosure, stimulate cognitive processing and offer new perspectives, which can assist people to find positive meaning and to perceive growth (Schroevers, Helgeson, Sanderman, & Ranchor, 2010; Tedeschi & Calhoun, 2004). Similar to measures of stress, perceived support is thought to be a better indicator of whether someone's needs are being met rather than actual support (Lyons, 1991). In a sample of men with prostate cancer 6–18 months post treatment Kinsinger et al. (2006) found perceived social support was related to higher levels of growth. The importance of social support in the development of growth was confirmed by a recent meta-analysis of 46 studies which reported a moderate positive relationship between social support and growth following a range of stressful events (Prati & Pietrantoni, 2009). Although pre-event social support is thought to be important in the development of growth (Joseph & Linley, 2005) few studies have been able to test this relationship.

Finally, the role of post-event distress has been widely debated. A common question within the literature is the nature of the relationship between psychological distress and growth. According to Tedeschi and Calhoun's model (1995, 2004) psychological distress and growth are separate dimensions and a certain degree of distress is a prerequisite for growth. However, the current literature is inconclusive and inconsistent. For example some studies have found that higher levels of distress predicted higher levels of growth (e.g. Barakat, Alderfer, & Kazak, 2006), whilst some studies reported that lower levels of distress predicted more growth (e.g. Urcuyo, Boyers, Carver, & Antoni, 2005). Other studies have found no relationship between distress and growth (e.g. Cordova et al., 2001).

One possible explanation for these inconsistent findings is differences in how distress is operationalised. The concept of "distress" is very broad and can be operationalised as global distress (e.g. Danoff-Burg & Revenson, 2005; Pakenham, 2005), or in terms of symptoms of psychopathology (e.g. Kleim & Ehlers, 2009; Updegraff et al., 2002), or more specific symptoms of posttraumatic stress (e.g. Cordova et al., 2001; Harms & Talbot, 2007; Widows et al., 2005). These are likely to be related to growth in different ways. For example specific measures of mental health outcomes such as posttraumatic stress may be more likely to be related to growth in comparison to global measures of distress (Helgeson, Reynolds, & Tomich, 2004; Park, 2004). These inconsistent findings therefore underscore the importance of examining the relationship between different types of measures of distress and growth.

From a theoretical viewpoint, studying growth following childbirth is a valuable opportunity to further clarify the development of growth prospectively. Most studies in the growth literature begin after the event and few studies have pre-event measures of distress or support that may be important in the development of growth. Moreover, current models of growth do not explicitly discuss how such variables are likely to influence growth. Therefore it is still to be determined how distress and support before an event relate to growth after the event. Childbirth is a naturally occurring and predictable event, which allows the role of different variables in the development of growth to be considered prospectively. As such the current study aims to extend previous work by using a prospective, longitudinal design to examine the role of pre-event factors (demographics, distress, support), event factors (birth events and subjective appraisal of birth), and post-event factors (distress, support) in growth. The aims of this study are threefold. The first aim is to explore the relationship between pre-event distress (assessed by a general measure of distress and a specific measure of posttraumatic stress symptoms) and support during pregnancy and growth after childbirth. The second aim is to explore the relationship between post-event distress (assessed by a

general measure of distress and a measure of posttraumatic stress symptoms in response to childbirth) and postnatal support and growth after childbirth. It is hypothesised that greater levels of growth following childbirth would be predicted by greater support during pregnancy and following childbirth. As previous research has yielded mixed findings regarding the relationship between distress and growth no specific hypotheses will be offered. The third aim is to examine which pre-event, event and post-event factors best predict growth after childbirth.

Method

Participants

Women were recruited if they were at least 28 weeks pregnant, spoke English well and were at least 18 years of age. Pregnant women were recruited from two hospital clinics and from a community antenatal class in South East England. There were no differences between these samples with respect to demographic (age, education, employment status, ethnic group, marital status, accommodation type), obstetric (obstetric history, gestation, parity, type of delivery, pain, length of labour) and the main study variables (growth, general distress, posttraumatic stress symptoms, and social support) therefore the samples were analysed together. Of the 230 eligible women approached 161 (70%) agreed to participate and took a questionnaire to complete whilst at the clinic or at home. Of these, 125 women completed the questionnaire at Time 1 (77.6% response rate) and at Time 2 96 (76.8% response rate) completed the postnatal assessment. Comparing women who completed the follow-up with those who dropped out on demographic, obstetric and psychological variables, women who did not complete the postnatal assessment had higher distress scores during

pregnancy (M = 7.06, SD = 3.60) than those who completed the postnatal assessment ((M = 4.94, SD = 3.64), $t(123) = 2.79$, $p < .01$, $r = 0.24$).

Design and Procedure

This was a prospective, self-report study that examined psychological well-being in women during pregnancy and after childbirth. Women completed questionnaires at two time points: Time 1, 28+ weeks gestation (M = 32.29, SD = 3.66) and Time 2, 8 weeks after childbirth (M = 8.72, SD = 2.72).

Ethical approval was obtained by the University Research Governance Committee and the NHS Local Research Ethics Committee. When women agreed to participate their contact details and expected date of delivery were recorded and they were given consent forms and the first set of questionnaires along with a prepaid envelope. Women completed the questionnaires at the clinic/class or at home if it was preferable. Expected dates of delivery were monitored and maternity ward registers checked to find out when women had their baby so the second set of questionnaires could be sent to the women approximately 8 weeks after delivery. At both time points if the women had not returned the questionnaire within 21 days they were followed-up a maximum of three times either by mail or by phone.

Measures

Demographic and obstetric information

Participants provided information on their age, education level, ethnic group, marital status, accommodation, number of children, employment status, pregnancy details and obstetric history. Birth details, including weeks since birth, type of delivery, length of labour, and pain during labour (using a 10-point visual analogue scale), were also collected at Time 2

along with one yes-no question that assessed whether childbirth was perceived as traumatic. Subjective appraisal of birth stress was also assessed at Time 2 by exploring whether childbirth met Criterion A for a traumatic event according to the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV; American Psychiatric Association, 1994). Criterion A was measured by items asking about perceived threat to life or physical integrity of self (2 items) or others (2 items) and response of helplessness and terror (2 items). Childbirth qualified as a traumatic stressor if it involved threat to life or physical integrity of self or other, and included a response of helplessness or terror.

Distress

Distress was measured both in terms of general symptoms of psychopathology and specific symptoms of posttraumatic stress. General distress was measured during pregnancy and after childbirth using the Self-Reporting Questionnaire-20 (SRQ-20) (Harding, De Arango, & Baltazar, 1980), which is a World Health Organization designed brief measure of common mental disorders. It consists of 20 questions with 'yes/no' answers exploring symptoms of depression, anxiety and somatic manifestations of distress. The questionnaire has been shown to have high reliability and validity in the UK (Beusenberg & Orley, 1994; Winston & Smith, 2000). In the current study, internal reliability for the SRQ-20 was 0.81 at Time 1 and 0.79 at Time 2.

Posttraumatic stress symptoms during pregnancy (Time 1) were assessed with the Impact of Event Scale - Revised (IES-R) (Weiss & Marmar, 1997). This is a 22-item questionnaire based on the original 15-item IES of Horowitz, Wilner, and Alvarez (1979). It provides an assessment of symptoms of posttraumatic stress focused on intrusive thoughts (8 items), avoidant behaviours (8 items), and symptoms of hyperaraousal (6 items). Respondents are asked to identify a specific stressful life event and then to rate the items on a 5-point scale

according to how much they were distressed or bothered during the past 7 days by each "difficulty listed", ranging from not at all (0) to extremely (4). The scale has high reliability of 0.88 in women who have recently given birth (Olde, Kleber, van der Hart, & Pop, 2006). In the current study internal reliability for the IES-R was 0.94.

Childbirth related PTSD symptoms at Time 2 were measured using an adapted version of the PTSD Symptom Scale – Self-Report (PSS-SR) **(**Foa, Riggs, Dancu, & Rothbaum, 1993). This includes 17 items which correspond to the DSM-IV symptom criteria for PTSD (5 intrusion, 7 avoidance, and 5 arousal items). Women are asked to rate the items on a 4-point scale according to how much they were bothered in a typical month after childbirth by each "difficulty listed", ranging from not at all/only one time (0) to 5 or more times a week/almost always (3). Total scores range from 0 to 51. Women were instructed to answer all questions in relation to childbirth. In the current study, internal reliability for the PDS was 0.87.

Posttraumatic growth

Growth was measured after childbirth using the Posttraumatic Growth Inventory (PTGI) (Tedeschi & Calhoun, 1996). The PTGI is a 21-item scale designed to assess positive change following challenging events. The scale measures five factors: New Possibilities (5 items), Relating to Others (7 items), Personal Strength (4 items), Spiritual Change (2 items), and Appreciation of Life (3 items). Ratings are made on a 6-point Likert scale from 0 to 5 and yield a potential range of 0 – 105, with a higher score indicating greater growth. The prompt and items can be keyed to a specific event and in this study instructions specified that women rate the degree to which change occurred in their life as a result of their recent experience of birth. In the current study, internal reliability for the PTGI was 0.95 and reliability for the subscales ranged from 0.66–0.84.

Social support

The Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet, Dahlem, Zimet, & Farley, 1988) was used to assess social support during pregnancy and after birth. The MSPSS is a 12-item scale designed to assess three domains of perceived social support – support from friends, from family, and from one's significant other. Each item is rated on a 1 to 7 Likert scale, with higher scores indicating greater support. The scale may be scored to give three subscales (Friends, Family, Significant Others) which can be summed to yield a Global support score. High internal consistency for each of the subscales (Friends = .93-.94, Family = .92, and Significant Others, =.93-.94) has been reported in student and psychiatric samples (Clara, Cox, Enns, Murray, & Torgrude, 2003). In the current study, internal reliability for the MSPSS was 0.94 at Time 1 and 0.93 at Time 2.

Statistical Analysis

Missing data was prorated by substituting the individual participant's average for each scale if less than 25% of data were missing. Data screening indicated the majority of variables (with the exception of the PTGI) were skewed therefore non-parametric tests were used where possible. The relationships between demographic, childbirth and psychosocial variables with growth were examined initially using mean differences and Pearson's or Spearman's correlations where appropriate. The strength and uniqueness of relationships were then examined in a hierarchical multiple regression analysis[1]. Variables were entered into the regression analyses using the forced entry method. For all analyses, a *p* value equal to

[1] According to Field (2009) the predictors do not need to be normally distributed to conduct a multiple regression analysis. The assumptions of multicollinearity, homoscedasticity, independent errors, and normally distributed errors were all met.

.05 was used as the limit of statistical significance. Where a direction in the hypotheses has been specified, analyses were one-tailed; otherwise analyses were two-tailed.

Results

Sample characteristics

Demographic and childbirth characteristics for participants are shown in Table 1. Women were aged between 18 and 42 (M = 31.86, SD = 5.61). The majority of women were white European and were either married or cohabiting. The sample was highly educated with 61.9% of the sample having a degree or professional qualification. Women generally reported no problems with their current pregnancy (64.4%) and most women were pregnant with either their first or second child (84%). Over half of the women had a normal vaginal delivery (55.2%).

- insert Table 1 about here -

Descriptive statistics

Means and standard deviations for the main variables are presented in Table 2. Growth scores ranged from 0 to 89 out of a possible range of 0 to 105. Women experienced a small amount of growth following childbirth (M = 39.81, SD = 24.06). 47.9% of the sample reported at least a small degree (> 41 on the PTGI) of positive change following childbirth. Using similar criterion for the five subscales of the PTGI, the most endorsed domain of growth was appreciation of life (68.1%, > 4 on this subscale), followed by personal strength (52.1% > 7 on this subscale), relating to others (51.1% > 13 on this subscale), new possibilities (44.7% > 9 on this subscale) and spiritual change (22.3% > 3 on this subscale).

- insert Table 2 about here -

Relationship between pre-event, event and post-event variables and growth

Analyses of demographic variables found no significant associations between these variables and growth, with the exception of age, which was negatively associated with growth (r = -.24, $p < .05$). Analyses of birth variables showed that growth was associated with type of delivery ($F(3, 89) = 3.32$, $p < .05$, $\omega^2 = .07$). Childbirth fulfilled PTSD stressor criterion A for 23.2% of women. However, there were no significant differences in growth between women who did and did not fulfill stressor criterion A ($t(91) = 0.17$, *ns*, $r = 0.02$).

Table 3 displays the relationships between measures of distress, support and growth. The first hypothesis was not supported, in that growth was not related to social support at Time 1 or Time 2. In comparison growth was related to posttraumatic stress symptoms in pregnancy and general distress after birth. However, it was not significantly related to general distress during pregnancy or posttraumatic stress symptoms related to birth. Therefore women who reported higher trauma symptoms during pregnancy reported higher levels of growth after childbirth and women who reported higher postnatal levels of general distress reported higher levels of growth after childbirth.

- insert Table 3 about here -

Regression model of the relationships between pre-event, event, and post-event variables and growth.

A hierarchical multiple regression was conducted to examine the contribution of the significant pre-event factors (age, PTSD symptoms), event factors (type of delivery) and post-event factors (general distress) to growth. The final model was significant and explained 32.3% of the variance in growth scores and is given in Table 4. The strongest predictors of growth in this model were PTSD symptoms during pregnancy (i.e. women with higher PTSD symptoms during pregnancy experienced higher levels of growth following childbirth) and type of delivery (i.e. women who have had a caesarean section (emergency or elective) were more likely to experience higher levels of growth after childbirth than women who had a normal vaginal delivery).

- insert Table 4 about here -

Discussion

The primary aim of this study was to prospectively explore how pre-event factors, event factors, and post-event factors relate to growth after childbirth. Women in this sample experienced lower levels of growth in comparison to another study which looked at growth after childbirth (Sawyer & Ayers, 2009). However, they reported similar levels of growth to the survivors of colorectal cancer (Salsman, Segerstrom, Brechting, Carlson, & Andrykowski, 2009) and former refugees (Powell, Rosner, Butollo, Tedeschi, & Calhoun, 2003). In general however, scores on the PTGI in this sample were lower than the majority of PTGI scores reported in other populations. All five domains of growth were endorsed, with the appreciation of life domain showing the most change. Women reported the least amount of growth in the spiritual change domain. This pattern is similar to the previous study of growth in postnatal women (Sawyer & Ayers, 2009).

Variables associated with growth

In general demographic variables were not related to growth. The only demographic variable related to growth was age, with younger participants reporting higher levels of growth. This is consistent with previous studies following a range of events (Helgeson et al., 2006; Kinsinger et al., 2006; Linley & Joseph, 2004; Powell et al., 2003). Tedeschi and Calhoun (2004) hypothesise that younger people might be more open to learning and changing, whereas older people might be less amenable to change. However, a relationship between age and growth has not been reported consistently across studies (Aldwin, Levenson, & Kelly, 2009).

The only birth event variable which predicted growth was type of delivery with women who had a caesarean section (elective or emergency) displaying higher levels of growth in comparison to women who had a normal vaginal delivery. This finding is consistent with the view that more severe events stimulate greater growth because they are more likely to challenge fundamental assumptions (Park, 1998; Stanton et al., 2006). An obstetric procedure such as a caesarean section may contribute to the stressfulness of the delivery experience, and therefore increase the traumatic nature of the event (Olde, Van Der Hart, Kleber, & Van Son, 2006). However, it should be noted that other subjective indicators of birth stress such as pain during labour, rating the birth as traumatic and childbirth meeting the criteria for a traumatic stressor, were not significantly related to growth.

Contrary to predictions pre- and postnatal assessments of social support were not associated with growth following childbirth. This finding is in contrast to current theoretical models which suggest that social support plays an important role in the development of growth (Joseph & Linley, 2005; Tedeschi & Calhoun, 1995, 2004). However, previous studies have also failed to find a significant relationship between social support and growth (Sears, Stanton, Danoff-Burg, 2003; Widows et al., 2005). One explanation for these

contradictory results is that different types of support may play a differing role in the development of growth. Schroevers et al. (2010) examined three different types of social support (perceived availability of social support, actual emotional support received and satisfaction with actual emotional support received) and their relationship to growth in cancer patients. They found that actual received emotional support from family and friends predicted higher levels of growth, and in comparison perceived availability of emotional support was not significantly related to positive outcomes. This finding is consistent with cognitive processing theories of growth as talking to others may facilitate cognitive processes and coping responses that may promote positive change, and merely just perceiving others to be available is not sufficient to stimulate these processes. Therefore this study points to the importance of assessing different types of support in future studies examining the relationship between growth and support.

The relationship between pre- and postnatal measures of distress and growth after childbirth was mixed. Growth was unrelated to concurrent measures of PTSD symptomatology in relation to childbirth, which is consistent with the observations of a number of other studies (Cordova et al., 2007; Sears et al., 2003; Widows et al., 2005). This finding initially supports the view that distress and growth are independent, as opposed to bipolar, constructs that can co-exist (Tedeschi & Calhoun, 1995, 2004). However, in comparison, a positive relationship was reported between general postnatal distress and growth (although it did not significantly predict growth in the regression model). This finding is in contrast to previous assertions that growth should be more closely linked to specific measures of mental health in comparison to global measures of distress (Helgeson et al., 2006). One explanation which might account for this discrepancy is the possibility of a curvilinear relationship between distress and growth. Recent studies have explored a curvilinear relationship between growth and PTSD symptoms and found the highest levels of

growth were reported by those who endorsed moderate levels of PTSD symptoms (Butler et al., 2005; Kleim & Ehlers, 2009). It is thought that low levels of distress may not be sufficient to induce growth whereas overwhelming levels of distress may inhibit growth (McCaslin et al., 2009). Women displayed low levels of postnatal PTSD symptoms compared to previous studies (Keogh, Ayers, & Francis, 2002; Parfitt & Ayers, 2009) and if a curvilinear relationship is assumed a limited level of PTSD symptoms could plausibly yield no relationship with growth (McCaslin et al., 2009). In comparison, moderate levels of general postnatal distress were reported, which should lead to higher levels of growth. Therefore, a curvilinear relationship could account for the lack of relationship between growth and PTSD symptoms, and a positive relationship between growth and general distress, as observed in this study.

In comparison general psychological distress during pregnancy was not associated with growth. However, the main predictor of growth after childbirth was posttraumatic stress symptoms reported during pregnancy in response to a recent stressful event. Women who displayed higher levels of posttraumatic stress symptoms reported higher levels of growth after childbirth. A number of explanations could account for these findings. First, among such vulnerable women childbirth is more likely to be perceived as a crisis (Söderquist, Wijma, Thorbert, & Wijma, 2009), which according to the cognitive processing theories of growth is necessary for growth to develop. In comparison, those women who are not as vulnerable may not perceive childbirth as a crisis and therefore display less distress, and with no sense of crisis there is no reason to expect growth either. Alternatively, this finding can also be explained using Schaefer and Moos' (1998) model of growth. They specify that prior experience of life crises should be associated with more positive change following a subsequent traumatic event because prior crisis experience can enhance coping resources. Previous studies have failed to report a relationship between prior crisis experience and

growth following a later trauma (Frazier, Tashiro, Berman, Steger, & Long, 2004; Park, Cohen, & Murch, 1996). However, these studies only included a checklist of prior trauma experience as opposed to an assessment of current psychological distress in response to a trauma.

Therefore these findings indicate that the relationship between distress and growth varies depending on the type of measure used to assess distress (i.e. a global or specific measure) and when it is assessed (i.e. before or after the event). Nonetheless, in this study PTSD symptoms, specifically during pregnancy, were a strong predictor of growth following childbirth. This suggests that pre-event mental functioning is important in the development of growth and additional research is needed to explore this possibility further to inform current theories of growth.

Limitations

A number of limitations should be considered when interpreting the results from this study. First, analyses indicated that non-responders were significantly more likely to have higher levels of general psychological distress. Thus the prevalence of postnatal distress in this sample is likely to be an underestimate and this should be considered when interpreting the relationship between growth and distress. Second, the current sample was relatively small and was composed primarily of highly educated white European women; both are factors which limit the generalisability of these results. Third, the timing of assessment of growth needs to be considered. Growth was assessed at approximately eight weeks after childbirth. Research suggests that growth is unlikely to occur shortly after a critical event and is more likely to be reported in hindsight (Tedeschi & Calhoun, 2004; Joseph & Linley, 2005). Thus the short follow-up may also account for the relatively low levels of growth reported by the women in this study. Moreover, a meta-analysis reported that there were stronger links

between growth and adjustment measures when there were two or more years since the stressor (Helgeson et al., 2006). Therefore future studies of growth after childbirth need to be continued to also assess medium and long-term positive changes. Fourth, the mean PTSD score after birth was very low, thus introducing the possibility of a floor effect, which would make it difficult to document a relationship between posttraumatic stress and growth. There are also many other variables that may be associated with growth such as personality dispositions (e.g. optimism), coping strategies, and positive mental health outcomes (e.g. positive affect) that were not assessed in this study and should be incorporated in future studies. The MSPSS also appeared to have produced ceiling effects with most women scoring in the upper range, which may account for the lack of relationship reported between support and growth. Therefore future studies should use a scale which is more sensitive to differing levels of support. Finally, growth was measured in relation to childbirth, and therefore this study does not take into account the possibility of growth during pregnancy.

Despite these limitations, the results from this study make an important contribution to the literature. First, research on positive changes following childbirth is limited. Research suggests that many women experience high levels of distress during and after childbirth, and the consequences for growth have not been explored. Many women in this study reported at least a small amount of growth so whilst monitoring symptoms of distress following childbirth clinicians need also to be sensitive to the potential for positive change. Moreover, by using a prospective design pre-event measures of distress and social support were obtained. The current study extends the previous empirical literature by showing that pre-event distress is an important predictor of growth following childbirth. This research underscores the importance of taking into account pre-event characteristics of the individual when examining growth; and childbirth provides a valuable opportunity to prospectively explore these variables.

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Table 1

Sample Characteristics of Main Demographic and Childbirth Variables

		N (%)[2]
Marital Status	Married	69 (55.2)
	Living with partner	41 (32.8)
	Partner	6 (4.8)
	Separated	2 (1.6)
	Divorced	1 (0.8)
	Single	6 (4.8)
Ethnicity	White European	111 (88.8)
	Chinese	2 (1.6)
	African	1(0.8)
	Indian	1 (0.8)
	Pakistani	1 (0.8)
	Mixed race	3 (2.4)
	Other	6 (4.8)
Education level	None	6 (4.8)
	GCSE	20 (16.0)
	A Level	10 (8.0)
	Diploma	10 (8.0)
	Degree	28 (22.4)
	Higher degree	16 (12.8)
	Professional	31 (24.8)
Other Children	0	54 (43.2)
	1	51 (40.8)
	2	8 (6.4)
	3 or more	8 (6.4)
Delivery Type (T2)[3]	Normal	53 (55.2)
	Assisted	8 (8.3)
	Planned CS	15 (15.6)
	Emergency CS	19 (19.8)
Traumatic	Yes	26 (27.7)
Pain (Mean (*SD*))	Range 1 – 10	7.14 (2.86)

[2] Missing data means *n* ranges from 119-125
[3] Missing data means *n* = 95

Table 2

Posttraumatic Growth and Outcome Measures

	Mean (*SD*)	Median
PTG Total	39.81 (24.06)	41.00
New possibilities	8.36 (8.36)	8.5
Relating to others	13.67 (9.30)	14.5
Personal strength	8.22 (5.60)	8.00
Spiritual change	1.73. (2.36)	0.00
Appreciation of life	7.81 (4.54)	8.00
General Distress Time 1	5.45 (3.73)	5.00
General Distress Time 2[4]	4.06 (3.48)	3.17
PTSD Time 1 Total	1.08 (0.80)	0.93
Intrusions	1.33 (0.97)	1.13
Avoidance	0.97 (0.86)	0.75
Hyperarousal	0.89 (0.91)	0.67
PTSD Time 2 Total	4.86 (6.04)	3.00
Re-experiencing	1.32 (2.25)	0.00
Avoidance & numbing	1.42 (2.78)	0.00
Arousal	2.11 (2.52)	1.00
Support Total Time 1	6.02 (1.02)	6.08
Significant Other	6.38 (1.18)	7.00
Family	8.26 (4.68)	6.25
Friends	5.82 (1.1.0)	6.00
Support Time 2	5.98 (0.98)	6.25
Significant Other	6.34 (1.13)	7.00
Family	5.76 (1.31)	6.25
Friends	5.84 (1.19)	6.00

[4] SRQ-20 scores were significantly higher during pregnancy compared to after childbirth, $T = 1331.50$, $p < .05$, $r = -0.16$

Table 3.

Correlations Between Study Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1.PTG Total	1											
2. PTG NP	.92***	1										
3. PTG RO	.90***	.75***	1									
4. PTG PS	.88***	.80***	.69***	1								
5. PTG SC	.53***	.43***	.43***	.35**	1							
6. PTG AL	.80***	.74***	.58***	.68***	.35**	1						
7. Distress (T1)	.18	.20*	.18	.19	.02	.10	1					
8. PTSD (T1)	.42***	.41***	.37***	.40***	.08	.37***	.55***	1				
9. Support (T1)	-.04	-.07	.02	-.08	-.12	.05	-.28**	-.34***	1			
10. Distress (T2)	.30**	.22*	.24*	.33**	.11	.31**	.40***	.35**	-.18	1		
11. PTSD (T2)	.13	.05	.09	.19	.01	.20	.36***	.42***	-.15	.56***	1	
12.Support (T2)	.03	.02	.01	-.05	.05	.07	-.19	-.32**	.75***	-.19	-.22*	1

Note. PTG = posttraumatic growth, NP = new possibilities, RO = relationship with other, PS = personal strength, SC = spiritual change, AL = appreciation of life, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4.

Predictors of Total Growth Score

	Model 1 *β*	Model 2 *β*	Model 3 *β*
Age	-.17	-.09	-.08
PTSD symptoms (T1)	.35	.38***	.32**
Assisted Delivery		-.05	-.04
Emergency CS		.23*	.23*
Elective CS		29**	.30**
General distress (T2)			.15
R^2	.19	.31	.32
F	9.93***	7.18***	6.45***

Note. Delivery type was dummy coded with normal delivery as the baseline category as this was the most common form of delivery.
* $p < .05$, ** $p < .01$, *** $p < .001$