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POSTTRAUMATIC GROWTH AFTER CHILDBIRTH

Citation

Sawyer, A., & Ayers, S. (2009). Posttraumatic growth after childbirth. *Psychology & Health, 24*(4), 457-471.

Abstract

Childbirth is a complex event that leads to a variety of psychological outcomes. This cross-sectional study examined posttraumatic growth in women following childbirth ($N = 219$) using an online questionnaire, and explored associations between growth, support and control during birth, coping after birth, and symptoms of posttraumatic stress disorder (PTSD). At least moderate degrees of growth were reported by 50.2% of women and average levels of growth were similar to those found in following accidents and assaults. Growth was positively related to approach coping and the avoidant strategy of seeking alternative rewards, but was unrelated to support and control during birth, other avoidant coping strategies after birth, and PTSD symptoms. It is concluded that growth does occur following childbirth. Further research is needed to clarify factors associated with growth in women following childbirth and to determine if growth is associated with psychological benefits in this population.

Keywords: Childbirth, Resilience/Posttraumatic Growth, Coping

Research on the psychological sequelae of challenging and traumatic events has grown rapidly during the past decade. Labour and the birth of a child is a challenging life event with the potential for positive and negative experiences, and in recent years has been established as an event that can be perceived as traumatic. Adverse childbirth experiences such as unexpected medical intervention, severe pain, or threat of death may precipitate a posttraumatic stress reaction in some women. In the UK approximately 0.1% of births are classified as involving medically life-threatening 'near miss' episodes (Baskett & Sternadel, 1998; Murphy & Charlett, 2002). A further 0.86% births involve infant deaths (Confidential Enquiry into Maternal and Child Health, 2006). However, up to one third of women rate their subjective experience of birth as involving the perceived threat and responses that are specified in DSM-IV criterion A as necessary for an event to precipitate post-traumatic stress disorder (PTSD) (Olde, Kleber, Hart, & Pop, 2006). Cross-sectional and prospective research suggests between 1% and 2% of women develop clinically significant PTSD following childbirth (e.g. Ayers & Pickering, 2001; Wijma, Soderquist, & Wijma, 1997).

As with PTSD following other events, PTSD after birth is associated with psychiatric comorbidity (White, Matthey, Boyd & Barnett, 2006) and possibly with impairment in a number of psychosocial domains (Maggioni, 2006). However, a growing body of evidence reveals that traumatic experiences can also lead to positive outcomes (Linley, 2003). In addition, positive psychological outcomes following childbirth have been relatively ignored by research. This study therefore examines if psychological growth following childbirth might be a legitimate outcome.

The term posttraumatic growth is used to describe a positive change in one's beliefs or functioning as a result of the struggle with highly challenging life

circumstances (Tedeschi, Park, & Calhoun, 1998). Early research in this area focused on growth following typically traumatic events, such as terrorist attacks or assault (e.g. Frazier, Conlon & Glaser, 2001). However, as Tedeschi, Calhoun & Cann (2007) clarify, posttraumatic growth “follows a challenge to and re-examination of core beliefs, not every bad experience” (2007, p396). Aldwin and Levenson (2004) also argue that growth is not just restricted to traumatic experiences but life events, such as childbirth, also have the potential to promote growth. Research has therefore increasingly examined growth following events such as illness, bereavement, and work-related stress (e.g. Koenig, Pargament & Nielsen, 1998; Paton, 2005; Znoj, 2006), which are challenging but not necessarily traumatic. Therefore in this paper we will refer to ‘growth’ rather than ‘posttraumatic growth’.

Within this framework, a challenging or adverse experience is viewed as a potential catalyst for positive psychological change. In support of this view, studies have shown a positive association between the severity of the stressor and growth (Armeli, Gunthert, & Cohen, 2001). Growth involves incremental psychological change and should therefore be distinguished from coping and resilience, which are concerned with enduring stress or returning to previous levels of functioning (McGrath & Linley, 2006). Three broad areas of growth are generally reported following adversity reflecting interpersonal, psychological, and life orientation changes (Tedeschi & Calhoun, 1995). Firstly, individuals often report that their relationships are enhanced in some way (e.g. increased closeness to others); secondly, an individual’s self perception may change (e.g. increased resiliency and maturity); and finally, there are often reports of changes in life philosophy (e.g. changes in life priorities). These domains served as the basis for the development of the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996), which measures

perceived growth following trauma across five categories: new possibilities, relating to others, personal strength, spiritual change, and appreciation of life.

Despite differences in assessment methods studies have found that between 30% and 90% of people report some positive changes following trauma (Tedeschi & Calhoun, 1995; Tedeschi et al., 1998). Growth has been reported following a range of health-related events including breast cancer (Bellizzi & Blank, 2006; Cordova, Cunningham, Carlson, & Andrykowski, 2001), heart disease (Sheikh, 2004), HIV infection (Updegraff, Taylor, Kemeny, & Wyatt, 2002), and brain injury (McGrath & Linley, 2006). Given the diversity of events that precipitate growth, it is suggested that rather than the type of event being important in the development of growth it is the subjective experience of the event (Linley & Joseph, 2004).

Growth is therefore a unique phenomenon that is believed to occur in some individuals after challenging life experiences. However, this is not true of all individuals (Schaefer & Moos, 1998) so research has endeavoured to identify potential determinants of positive adaptation following adversity (for reviews see Linley & Joseph, 2004; Tedeschi & Calhoun, 2004). Tedeschi and Calhoun's (1995, 2004) model of growth emphasises the importance of personal, event-related, cognitive, and social factors in the emergence of psychological growth. These variables are all thought to have an impact on the cognitive processing of the event, which according to these theorists is necessary for the development of growth. Empirical support for these variables can also be found in the literature. Evidence suggests that in general between 12% and 21% of the variance in growth can be accounted for by coping styles (Bellizzi & Blank, 2006); primarily that approach-oriented coping strategies are associated with positive growth following trauma (Aremeli, et al., 2001; Frazier, Tashiro, Berman, Steger, & Long, 2004; Schaefer &

Moos, 1998). For example, Bellizzi and Blank (2006) found coping strategies explained the largest amount of variance of growth in breast cancer survivors, with women who engaged in active coping reporting most growth. Results for avoidant coping have been more mixed, with some studies showing either a negative relationship (Aldwin, Sutton, & Lachman, 1996), or no relationship to growth (Ho, Chan, & Ho, 2003; Park, Cohen, & Murch, 1996).

The association between social support and growth has also been examined with mixed results. The social support and social resources available to an individual are thought to have a significant effect on an individual's ability to perceive benefits following an adverse event (Park et al., 1996; Tedeschi & Calhoun, 1995). For example, Kinsinger et al. (2006) found that perceived social support in men treated for prostate cancer was positively associated with growth.

Also recognised as important in the development of growth is cognitive appraisal of the event. In particular, studies have shown that perceived controllability of the event is associated with growth (Frazier et al., 2004; Sheikh, 2004). For example, in a longitudinal study of rheumatoid arthritis patients Tennen, Affleck, Urrows, Higgins, and Mendola (1992) found a positive relationship between high perceptions of control and levels of growth. Past research has focused on control as a unidimensional construct, but it is important to recognise a distinction between external forms of control such as control over the environment, and internal forms of control such as control over self (Walker, 2001), and their differential relationship with growth.

Finally, although reports of growth are common, the relationship between growth outcomes and psychological adjustment is not clear. Although it seems intuitive that the ability to derive benefits from a traumatic event might reduce

psychological distress, the evidence is mixed regardless of how distress is measured e.g. whether by PTSD symptoms, anxiety, stress or depression. In support of this some research documents an inverse relationship between growth and distress (Carver & Antoni, 2004; Davis, Nolen-Hoeksema, & Larson, 1998; Updegraff et al., 2002). For example, a longitudinal study of female sexual assault victims found that women who reported positive changes following the assault had fewer depressive symptoms than women who reported no positive changes (Frazier et al., 2001). However, other studies have reported no relationship between growth and distress (Cordova et al., 2001; Schulz & Mohamed, 2005), whilst others have found that distress and growth can co-exist (Tomich & Hegelson, 2004). For example, in HIV/AIDS caregivers, Cadell, Regehr, and Hemsworth (2003) found that the more stress experienced by an individual the more growth they perceived. The idea that growth and distress may not be mutually exclusive supports Tedeschi and Calhoun's (1995) assertion that the experience of growth is not the same as an absence of distress, and a certain degree of distress is a prerequisite for growth. Therefore, whether growth confers some psychological benefit remains ambiguous, and additional efforts are needed to clarify this relationship.

Labour and the birth of a child is a challenging and significant life event and numerous examples within the literature indicate that the birth of a child changes adults in a number of ways (Cowan & Cowan, 2000). To date, no systematic research has investigated whether growth occurs following childbirth. Investigation of growth after childbirth has important implications for both theory and clinical practice.

Examining positive psychological outcomes allows a more comprehensive account of psychological reactions following childbirth to be developed, which can inform postnatal screening and interventions. From a theoretical viewpoint, studying growth

following childbirth is a valuable opportunity to further clarify the development of growth prospectively. Childbirth is a naturally occurring and predictable event, which allows the role of different variables in the development of growth to be considered prospectively.

There is very little evidence pertaining to variables that might be associated with growth following childbirth. The aims of this research are therefore threefold. Firstly, as prior research indicates that growth occurs following challenging experiences, the primary aim is to establish if growth occurs following childbirth. The secondary aim is to explore the relationship between growth and distress following childbirth. In this study PTSD symptoms will be assessed as a measure of psychological distress. As previous research has yielded inconsistent findings no specific hypotheses will be offered. The final aim is to explore possible correlates of growth within this population. Following on from previous research, it is hypothesised that women who score highly on measures of growth will engage in more approach oriented coping strategies and fewer avoidant coping strategies, perceive greater levels of support during birth, and perceive higher levels of internal and external control during the birth. It is further hypothesised that women who engage in more avoidant styles of coping and fewer approach coping strategies, perceive low levels of support during birth, and perceive low levels of internal and external control during birth will score highly on measures of PTSD symptoms.

Method

Participants

A convenience sample of 219 women aged between 18 and 42 ($M = 28.14$, $SD = 5.39$) were recruited via the Internet. Women were eligible for the study if they were

at least 18 years of age, fluent in written English, and gave birth within the previous 36 months. The average time between birth and completing the questionnaire was 10.95 months ($SD = 7.20$, range 1-36 months). Completion rate of the questionnaire was very high with only three women not completing the questionnaire once they had begun.

Design and Procedure

This was a cross-sectional online questionnaire study. Ethical approval was obtained from the University of Sussex Psychology Ethics Committee. The URL was posted on relevant websites (e.g. www.motherandbabymagazine.com, www.netmums.com, www.ukparentslounge.com, www.birthtraumaassociation.org.uk, www.baby-greenhouse.co.uk). Participants read an information page about the study and indicated their consent before completing the questionnaire. Participants were ensured that their responses would be confidential and they could withdraw from the study at any time. Questionnaire responses were entered automatically into a password-protected database.

Measures

Demographic and obstetric information – A standard measure of demographic and obstetric information was used (Nicholls & Ayers, 2007) to collect data about age, education level, ethnic group, marital status, who they lived with and where, number of children, type of delivery, and pain in labour.

Growth – The Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996) is a 21-item scale designed to assess positive change following trauma and has often been used to assess growth following health events (Bellizzi & Blank, 2006; Thornton & Perez, 2006). The scale measures five factors: New Possibilities (5 items;

e.g. “Established a new path for my life”), Relating to Others (7 items; e.g. “A sense of closeness with others”), Personal Strength (4 items; e.g. “Knowing I can handle difficulties”), Spiritual Change (2 items; e.g. “I have a stronger religious faith”), and Appreciation of Life (3 items; e.g. “Appreciating each day”). Ratings are made on a 6-point Likert scale from 0 to 5 and yields 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 should rate the degree to which change occurred in their life as a result of their experience of birth. The PTGI has good reliability in undergraduate students with an alpha coefficient of .90 and test-retest reliability of .71 over two months (Tedeschi & Calhoun, 1996). In the current study internal reliability for the PTGI was .93 and reliability for the subscales ranged from .67 - .86.

Posttraumatic Stress – Childbirth related PTSD was measured using the Posttraumatic Stress Diagnostic Scale (PDS; Foa, Cashman, Jaycox, & Perry, 1997) adapted to measure symptoms in relation to childbirth. This questionnaire consists of 17 items corresponding to the DSM-IV criteria of re-experiencing (5 items), avoidance and numbing (7 items), and arousal (5 items). The inventory yields a total score ranging from 0-51, with higher scores indicating more symptoms. The questionnaire also measures impairment of functioning, perceived threat to life, symptom duration, time of onset of symptoms, and a checklist of prior trauma history. A total score of previous trauma was calculated for each participant according to the number of traumas identified in the checklist. The PDS has high reliability of .92 (Foa et al., 1997) and when used as a diagnostic measure it demonstrates 82% agreement with structured clinical interviews. In the present study internal reliability was .94.

Coping Styles – The Coping Response Inventory (CRI; Moos, 1990) is a 48-item questionnaire that yields scores on 8 subscales. The first four scales reflect approach responses of logical analysis, positive reappraisal, seeking support and taking problem-solving action. The remaining four scales assess avoidant coping of cognitive avoidance, acceptance or resignation, seeking alternative rewards, and emotional discharge. Coping strategies were measured in relation to childbirth and participants responded using a 4-point scale ranging from 0 (*not at all*) to 3 (*fairly often*). In the present study internal reliability was .93 for the approach subscales and .90 for the avoidance subscales.

Support and Control During Childbirth – The Support and Control during Birth Questionnaire was used (SCBQ; Ford, Ayers, & Wright, submitted) to measure internal control which refers to control over reactions to pain, emotions and behavior (10 items), external control which refers to control over procedures, decisions and information (11 items), and support during birth which refers to different aspects of support from healthcare professionals (12 items). High scores indicate high levels of control or support. In the present study internal reliability was .84 for internal control, .92 for external control, and .93 for support.

Analyses

Data screening indicated that the following scales were negatively skewed: personal strength, appreciation of life, support, and pain; and the following scales were positively skewed: months since birth, spiritual change, intrusions, avoidance, arousal, PDS total, cognitive avoidance, acceptance/resignation, emotional disengagement, and seeking alternative rewards. Data were transformed where possible to normalise the distributions. Some variables could not be normalised using transformations therefore non-parametric tests were used for these variables (spiritual

change, intrusions and avoidance subscales). 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 examined in hierarchical multiple regression analyses, which allowed for control over possible confounding variables. For all analyses, a p value equal to .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

Sample characteristics for the main demographic and childbirth variables are shown in Table 1. It can be seen that the majority of women were married or cohabiting and there is a slightly higher proportion of White European women than found in the UK population (92.1%; National Office of Statistics, 2001).

- insert Table 1 about here -

Analyses of demographic and childbirth variables found no significant associations between these variables and growth, with the exception of age, which was negatively associated with growth ($r = -.21, p < .01$). Demographic characteristics were not associated with PTSD symptoms. However, PTSD symptoms were associated with pain during birth ($r = .19, p < .05$), and type of delivery ($F(2, 59.23) = 6.41, p < .05$). Post hoc comparisons using the Games-Howell test revealed that PTSD symptoms were significantly higher if women had a caesarean section compared to a normal or instrumental delivery ($p < .05$). In order to minimise any

confounding influences these variables were controlled for in subsequent analyses. Time since birth was also examined as a possible confounding variable and was found not to be associated with growth ($r = .03, p > .05$) or PTSD symptoms ($r = .06, p > .05$).

Descriptive Statistics

Descriptive statistics for main variables are presented in Table 2. Mean growth scores were comparable to other samples using the PTGI. 50.23% of the sample reported at least a moderate degree of positive change (> 62 on the PTGI) following childbirth. The most endorsed domain of growth was appreciation of life (80.36%; > 8 on this subscale), followed by personal strength (62.56%; > 11 on this subscale), relating to others (52.51%; > 20 on this subscale), new possibilities (47.95%; > 14 on this subscale), and spiritual change (16.44%; > 5 on this subscale).

Childbirth fulfilled PTSD stressor criterion A for 37.2% of women and 12.4% of the sample met full criteria for PTSD related to childbirth, which is higher than found in previous research. There were no differences between women with PTSD and without PTSD for previous trauma history ($t(185) = -1.04, ns$) or levels of growth ($t(215) = .98, ns$).

- insert Table 2 about here -

Associations between growth, control & support in birth, coping, and PTSD symptoms

Table 3 shows correlations between the main variables. No significant relationships were found between growth and PTSD symptoms, or between growth and support and control during birth. Approach coping was significantly associated with levels of growth. Specifically, greater use of the approach-based strategies of

seeking guidance and support, and problem solving were associated with growth. Greater use of the avoidance strategy, seeking alternative rewards, was also significantly positively related to growth.

In contrast to growth, which was unrelated to birth variables, birth variables of control and support during birth were associated with both avoidant coping strategies and PTSD symptoms. Internal control during birth was also associated with approach coping strategies.

- insert Table 3 about here -

Following on from this, variables that were significantly associated with growth were entered into a hierarchical multiple regression, controlling for age, to determine which variables predicted growth following childbirth. The final model explained 10.9% of the variance in growth scores and is given in Table 4. Only age was a significant predictor of growth, indicating that younger women reported more growth.

- insert Table 4 about here -

Similar regression analysis was carried out to examine which variables predicted PTSD symptoms. Birth variables of pain during birth and type of delivery were entered on the first step and results are shown in Table 5. The model accounted for 46.4% of the variance in PTSD scores. Avoidant coping, external, and internal control significantly predicted PTSD symptoms.

- insert Table 5 about here -

Discussion

This study set out to examine if growth occurs in women following childbirth, and if so, to explore the possible correlates of growth. The results of this study contribute to a growing literature demonstrating that developmental events such as childbirth do result in growth, with half of women reporting at least a moderate degree of growth. Comparison with previous research suggests levels of growth are similar to those reported after accidents and assaults (Snape, 1997) and mixed traumatic events (Wild & Paivio, 2003), but lower than those reported by individuals following chronic illness or bereavement (Cordova et al., 2001; Polatinsky & Esprey, 2000).

In this study, growth was only associated with age and coping strategies. Contrary to hypotheses, growth was not associated with control and support during birth, or with PTSD symptoms. In contrast, PTSD symptoms were strongly associated with birth variables and moderately associated with coping strategies. These findings will be discussed in turn before looking at methodological issues and conclusions.

Growth following birth

Growth was reported in four of the five domains measured in this study, with greatest change in appreciation of life. The lowest change was in spiritual change, implying that after childbirth spiritual development is less likely to occur in comparison to other psychological and interpersonal changes. The main predictor of growth after birth was age, which is consistent with previous research looking at growth following breast cancer (Bellizzi & Blank, 2006; Manne et al., 2004), terrorist attacks (Butler et al., 2005), and bereavement (Polatinsky & Esprey, 2000). It is unclear why this is but possible explanations might be that older women report less

growth because they are in a stage of life where developmental change is less rapid, or they may be coping with other life events that prevent or hinder growth. However, this reasoning is only speculative at this stage.

In contrast, birth variables were strikingly unrelated to levels of growth following childbirth. Contrary to predictions, levels of support and control during birth did not affect growth. This is consistent with findings reported by Cordova et al. (2001) but inconsistent with studies that have reported a positive relationship between growth and support (Kinsinger et al., 2006) or control (Sheikh, 2004). One possible explanation for this is that it is support *after* the event rather than during the event that is important in facilitating growth. Divergent findings regarding control may be due to differences in measurement or the event. For example, the present study measured perceived control during birth whereas other studies have focused on control over the occurrence of the event.

This study provides partial support for the role of coping styles in growth. The importance of approach coping is consistent with previous research (Frazier et al., 2004). With the exception of seeking alternative rewards, the lack of association with avoidant coping is also consistent with past research (Ho et al., 2003; Park et al., 1996). However, the association between seeking alternative rewards and growth is anomalous with previous literature. It is possible this strategy is specifically relevant to women after birth because it includes activities that recent mothers may be particularly likely to engage in (e.g. “*get involved in new activities*”, “*try to make new friends*”, “*spend more time in recreational activities*”), which are likely to be adaptive under these circumstances.

Despite these associations between age, coping and growth, just under 90% of the variance in growth scores remained unaccounted for. Therefore more research is

needed to identify other possible determinants of growth in women following childbirth. Individual differences such as personality variables and cognitive processing variables might be worth examining.

Growth and PTSD symptoms

To date, research has yielded mixed results regarding the relationship between growth outcomes and PTSD. In this study, growth was not associated with PTSD symptoms, which is consistent with some previous studies (Cordova et al., 2001; Park et al., 1996; Tedeschi & Calhoun, 1996). Therefore, it is possible for women to experience growth independently of posttraumatic stress symptoms following childbirth. This is further substantiated by the fact that women who met criteria for PTSD did not report lower levels of growth than women without PTSD. These findings support Tedeschi and Calhoun's (1995, 2004) contention that a certain amount of distress is a necessary precondition for growth.

The reason for the inconsistent findings between psychological adjustment and growth remains unclear in the trauma literature. Future research therefore needs to further clarify possible mediating and moderating factors in the relationship between growth and psychological adjustment. For example, a recent meta-analysis suggested that time since the event might moderate this relationship (Hegelson, Reynolds, & Tomich, 2006). Future research might also benefit from including a wider range of measures of positive and negative psychological adjustment, which may better explicate the growth–adjustment relationship (Park, 1998).

PTSD symptoms following birth

In contrast to growth, over half of the variance in PTSD symptoms was accounted for by internal and external control during birth and avoidant coping. This implies that women who feel they have little control over their self and their

environment during childbirth, and engage in avoidant coping strategies are likely to experience more PTSD symptoms following birth. This suggests PTSD symptoms are more affected by event characteristics and therefore that different factors are involved in the development of PTSD symptoms than growth, lending further support to the view that growth and distress may be independent.

Methodological issues

The results of this study must be interpreted with the following methodological issues in mind. Firstly, the cross-sectional design constrains causal inferences regarding the relationship between psychological growth, age and coping strategies. Whilst cross-sectional research is useful for research at this early stage, longitudinal studies are needed to establish the temporal course of these variables. Caution should be taken in generalising these results to the larger population because this study was based on a self-selected and highly educated Internet sample. The sample also differed slightly from the UK population in that White European women and women with PTSD were overrepresented. However, as PTSD was not associated with growth this is unlikely to affect main conclusions regarding the presence of growth. Finally, there are also likely to be other variables that influence growth and PTSD outcomes that were not measured in this study e.g. maternal physical and mental health, and peri-natal complications such as low birth weight and preterm delivery. Future research would benefit from examining how these factors may influence psychological growth and adjustment following childbirth.

Summary and conclusions

In sum, this research indicates that women report growth and PTSD symptoms after childbirth and that these appear to be largely independent of each other. Therefore growth can occur as a result of developmental life events, as suggested by

Aldwin and Levenson (2004), and it would be interesting to investigate the similarities and differences between this type of growth and growth following traumatic events. It is hoped that these results contribute to the literature focusing on the positive psychological sequelae following adversity, as well as the growing body of literature on the psychological effects of childbirth. On a practical level obstetric and gynaecological interventions should recognise the possibility of psychological growth in women following childbirth. Finally, investigating childbirth and growth provides a unique opportunity to explore growth and its correlates prospectively. With further study, it is hoped that such research will provide a valuable insight into growth.

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Table 1

Sample Characteristics of Main Demographic and Childbirth Variables

		<i>N</i> (%)
Marital Status	Married	126 (57.8)
	Living with partner	82 (37.6)
	Separated	1 (.5)
	Single	9 (4.1)
Number of Children	One	142 (65.4)
	Two	49 (22.6)
	Three	16 (7.4)
	More	10 (4.6)
Ethnicity	White European	213 (97.3)
	Afro-Caribbean	1(.5)
	Indian	1 (.5)
	Pakistani	1 (.5)
	Other	3 (1.4)
Left education	Under 15	9 (4.2)
	16	57 (26.9)
	18	42 (19.8)
	18+	104 (49.1)
Birth	Normal	138 (63.0)
	Instrumental	25 (11.4)
	Caesarean section	56 (25.6)
Pain (Mean (<i>SD</i>))	Range 0 – 10	7.15 (2.51)

Table 2

Growth and Outcome Measures

	Norm (<i>SD</i>)	Mean (<i>SD</i>)	Median
Total Growth (PTGI)	57.38 (17.68) ^a	58.81 (21.61)	63.00
New possibilities	12.63 (5.78)	13.76 (5.99)	14.00
Relating to others	17.95 (6.52)	19.46 (8.45)	21.00
Personal strength	12.58 (4.45)	12.14 (5.15)	13.00
Spiritual change	4.57 (3.26)	2.54 (2.93)	1.00
Appreciation of life	9.82 (3.30)	10.91 (3.23)	11.00
Total PTSD (PDS)	23.41 (14.68) ^b	12.91 (12.99)	8.00
Re-experiencing	6.38 (4.35)	3.57 (4.51)	1.00
Avoidance & numbing	9.23 (6.60)	4.77 (5.50)	3.00
Arousal	7.80 (5.01)	4.58 (4.40)	3.00
Total Approach Coping		27.56 (15.17)	28.00
Logical analysis	5.01 (3.88) ^c	6.30 (3.94)	6.00
Positive reappraisal	6.84 (4.49)	8.26 (4.68)	9.00
Seeking guidance	4.92 (3.72)	6.27 (4.28)	6.00
Problem solving	5.61 (4.24)	6.75 (4.43)	7.00
Total Avoidant Coping		22.41 (13.70)	24.50
Cognitive avoidance	3.00 (3.65) ^c	5.57 (5.07)	4.00
Acceptance	3.55 (3.47)	5.85 (4.04)	6.00
Seeking alternative rewards	3.83 (3.38)	5.55 (4.25)	5.00
Emotional disengagement	3.13 (2.99)	5.54 (3.83)	5.50
Control during birth		3.11 (.93)	3.14
Internal control	3.29 (0.97) ^d	3.18 (1.00)	3.20
External control	3.27 (1.17)	3.04 (1.12)	3.09
Support during birth	3.69 (1.06) ^d	3.54 (1.09)	3.75

^a Wild and Paivio (2003)^b Foa, Cashman, Jaycox, and Perry (1997)^c Ayers (1999), as cited in Ayers (2001)^d Ford, Ayers, and Wright (submitted)

Table 3.

Correlations between Study Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.
1. Pg	1																							
2. Np	.90	1																						
3. Ro	.91	.74	1																					
4. Ps	.81	.72	.65	1																				
5. Sc	.60	.47	.45	.41	1																			
6. Al	.69	.58	.54	.60	.36	1																		
7. Pd	-.03	-.05	-.04	-.06	-.00	-.04	1																	
8. Re	-.03	-.06	-.03	-.05	-.04	.08	.79	1																
9. An	-.07	-.08	-.07	-.07	.02	.00	.92	.69	1															
10. Ar	-.03	-.05	-.03	-.05	.00	.03	.87	.51	.74	1														
11. Ap	.16	.12	.19	.07	.15	.03	.27	.22	.25	.31	1													
12. La	.10	.08	.12	.07	.10	.01	.29	.21	.30	.34	.90	1												
13. Pr	.08	.04	.12	.01	.09	-.02	.24	.20	.21	.24	.87	.73	1											
14. Sg	.20	.17	.21	.08	.20	.09	.31	.28	.28	.30	.84	.68	.60	1										
15. Ps	.17	.14	.20	.10	.14	.01	.12	.08	.12	.20	.89	.75	.69	.66	1									
16. Av	.06	.04	.07	.02	.07	-.01	.53	.38	.53	.57	.70	.70	.56	.63	.57	1								
17. Ca	-.08	-.08	-.08	-.07	.02	-.06	.51	.38	.56	.53	.54	.57	.46	.48	.40	.87	1							
18. Ar	.05	.01	.06	.02	.04	.01	.55	.41	.54	.57	.62	.59	.57	.54	.46	.86	.77	1						
19. Sa	.17	.19	.23	.01	.10	-.02	.14	.10	.09	.15	.71	.61	.58	.61	.69	.71	.39	.51	1					
20. Ed	.04	.02	.04	.02	.06	.01	.45	.29	.48	.53	.62	.61	.50	.55	.51	.83	.72	.71	.55	1				
21. Co	.04	.06	.05	.06	-.01	-.05	-.59	-.59	-.58	-.45	-.17	-.13	-.18	-.24	-.03	-.36	-.39	-.39	-.10	-.29	1			
22. In	-.00	.01	-.01	.06	-.01	-.07	-.51	-.53	-.47	-.38	-.16	-.12	-.20	-.17	-.08	-.32	-.32	-.35	-.17	-.26	.85	1		
23. Ex	.07	.08	.09	.05	-.02	-.02	-.53	-.52	-.53	-.41	-.13	-.11	-.12	-.25	.02	-.31	-.37	-.33	-.02	-.25	.90	.54	1	
24. Su	.02	.03	.04	.02	-.04	.01	-.44	-.36	-.46	-.39	.02	.00	.03	-.06	.10	-.24	-.31	-.26	.01	-.16	.63	.40	.67	1

Note. Pg = posttraumatic growth inventory, Np = new possibilities, Ro = relating to others, Ps = personal strength, Sc = spiritual change, Al = appreciation of life, Pd = posttraumatic diagnostic scale, Re = reexperiencing, An = avoidance/numbing, Ar = arousal, Ap = approach coping, La = logical analysis, Pr = positive reappraisal, Sg =

seeking guidance and support, Ps = problem solving, Av = avoidant coping, Ca = cognitive avoidance, Ar = acceptance/resignation, Sa = seeking alternative rewards, Ed = emotional discharge, Co = Control, In = internal control, Ex = external control, Su = support.

Italics $p < .05$, ***Bold and italics*** $p < .01$.

Table 4.

Predictors of Growth

	B	SE B	β
Step 1			
Constant	81.88	7.71	
Age	-.83	.28	-.21*
Step 2			
Constant	74.25	8.29	
Age	-.89	.27	-.22*
Problem solving	.86	.46	.18
Alternative rewards	5.07	5.53	.09
Step 3			
Constant	73.08	8.38	
Age	-.87	.27	-.22*
Problem solving	.66	.51	.14
Alternative rewards	3.66	5.72	.06
Seeking guidance	.44	.46	.09

Note $R^2 = .04$ for Step 1; $\Delta R^2 = .06$ for Step 2 ($ps < .01$); $\Delta R^2 = .00$ for step 3 ($p > .05$)

* $p < .01$

Table 5.

Predictors of Posttraumatic Stress Symptoms^a

	B	SE B	β
Step 1			
Constant	.92	.08	
Pain	.39	.11	.25**
Delivery type	.11	.04	.19**
Step 2			
Constant	1.00	.22	
Pain	.02	.10	.02
Delivery Type	.04	.03	.06
Approach	-.00	.00	-.09
Avoidant	.02	.00	.44**
External control	-.01	.00	-.17*
Internal control	-.01	.00	-.22**
Support	-.13	.08	-.12

Note $R^2 = .09$ for Step 1; $\Delta R^2 = .38$ for Step 2 ($ps < .001$). * $p < .05$, ** $p < .01$.

^a Results were replicated when mode of delivery was coded using two dummy variables