

BENEFIT-FINDING AND POSITIVE PSYCHOLOGICAL ADJUSTMENT IN MOTHERS
OF VERY LOW BIRTHWEIGHT INFANTS

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ABSTRACT

MAURIN ELANA: Benefit-Finding and Positive Psychological Adjustment in Mothers of Very Low Birthweight Infants
(Under the direction of Karen M. Gil)

Numerous studies have indicated that a woman who delivers a very low birthweight (VLBW; < 1500g at birth) infant is at increased risk for symptoms of psychological distress, both during the post-partum period and beyond. Benefit finding (BF), or the ability to extract positive value from negative circumstances, has been shown to be negatively associated with psychological distress in a variety of populations, but has rarely been examined among mothers of VLBW infants. Furthermore, few studies have addressed the relationship between BF and positive psychological adjustment (e.g., quality of life; QOL). The present study sought to test the hypothesis that BF would be positively associated with psychological well-being, and negatively associated with psychological distress. Participants ($N = 68$) were enrolled 3-5 weeks post-partum and completed measures of BF, QOL, positive and negative affect, and symptoms of depression and anxiety. As expected, there was a statistically significant omnibus multivariate effect of BF on quality of life and positive affect taken together. Contrary to hypothesized findings, BF was not significantly associated symptoms of depression, anxiety, and negative affect taken together. Univariate analyses confirmed these results; mothers with higher levels of BF reported significantly higher positive affect and marginally significantly higher QOL. Moreover, BF accounted for a significant proportion of the variability in positive affect over and above the contribution of other

covariates. Finally, infant health moderated the association between BF and QOL; there was a significant association between BF and QOL among mothers whose infants were most severely ill at birth. The findings indicate that BF may play an important role in promoting positive psychological outcomes among mother of VLBW infants.

Additionally, the results add to the increasing evidence that positive and negative psychological adjustment are orthogonal constructs and should be investigated as such.

Further research, particularly longitudinal in design, is needed to help clarify the relationship between BF and psychological adjustment. If BF proves to be causally related to positive psychological adjustment, interventions aimed at increasing BF may improve outcomes for both mothers and VLBW infants.

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Chapter 1: Background

The birth of a very low birthweight (VLBW) infant is an unexpected and traumatic event that routinely throws the lives of parents into upheaval. Research has shown mothers to be particularly affected, as they are faced with unanticipated medical concerns, increased financial burdens, disruption of normal routines, and uncertainty about their infants' survival (e. g. Benson & Gross, 1989; Cronin, Shapiro, Casiro, & Cheang, 1995; McCormick, Stemmler, Bernbaum, & Farran, 1986; Miles, Burchinal, Holditch-Davis, Brunssen, & Wilson, 2002; Scheiner, Sexton, Rockwood, Sullivan, & Davis, 1985). These changes in lifestyle can be extremely stressful and have been found to have an impact on a variety of domains. Among these is a mother's psychological adjustment, which can be seriously compromised as she tries to cope with and adapt to the changes brought about by her infant's prematurity. Mothers who do not adapt successfully appear to be at an increased risk for the development of various forms of psychopathology, such as anxiety and depression (e. g. Miles, Holditch-Davis, Burchinal, & Nelson, 1999; Pederson, Bento, Chance, Evans, & Fox, 1987; Singer, Davillier, Bruening, Hawkins, & Yamashita, 1996; Thompson, Oehler, Catlett, & Johndrow, 1993).

Although there have been a number of studies documenting this increase in risk, there has been surprisingly little focus on identifying which mothers are most at risk. This is an issue that merits receiving more attention, given the steadily increasing rate of VLBW births over recent years (Hoyert, Mathews, Menacker, Strobino, & Guyer, 2006). In addition, there has been virtually no attention paid to discovering which factors help to promote positive

psychological adjustment among mothers of VLBW infants. The dearth of literature in this domain is surprising, given that mothers who adapt successfully to the birth of a VLBW infant are more likely to be better equipped to face the numerous challenges associated with such an event. Moreover, psychologically healthy women are better able to meet the demands of motherhood and to promote good psychological outcomes for their children (e.g. Civic & Holt, 2000; Cox, Puckering, Pound, & Mills, 1987; Field, 1995; Lefkowitz & Tesiny, 1984). Thus, recognition of the factors that facilitate positive psychological adjustment in these mothers can assist health professionals in developing interventions that can be quickly and efficiently targeted toward those women least likely to adapt successfully, thereby promoting positive outcomes in both mothers and their children.

Benefit-finding, or the ability to extract positive value from negative circumstances, is a construct that has been gaining attention in recent years among researchers who study the process of psychological adaptation in populations affected by a negative event. It is believed that the perception that a trauma has had positive implications in one's life can protect that individual against feelings of loss and can preserve and, possibly, promote a sense of purpose and meaning in life (Nolen-Hoeksema & Davis, 2002; Taylor, 1983). Although this may sound paradoxical, studies have shown benefit-finding to be associated with psychological adjustment among disaster survivors (McMillen, Smith, & Fisher, 1997), victims of sexual assault (Frazier, Conlon, & Glaser, 2001), bereaved individuals (Davis, Nolen-Hoeksema, & Larson, 1998), and a number of populations affected by medical illness (e.g. Carver & Antoni, 2004; Pakenham, 2005; Thompson, 1991). Moreover, benefit-finding has been associated with physical adaptation in various medical populations (e.g. Bower, Kemeny, Taylor, & Fahey, 1998; Danoff-Burg & Revenson, 2005; Katz, Flasher,

Cacciapaglia, & Nelson, 2001). Thus, benefit-finding is thought by many to be indispensable in helping to promote positive adaptation among these populations. However, in spite these seemingly encouraging results, benefit-finding is a construct that is still in the early stages of exploration, with much about it remaining to be discovered. Moreover, benefit-finding has never been explicitly examined among mothers of VLBW infants. Thus the purpose of the current research is twofold: to investigate benefit-finding in greater depth and to determine its role, if any, in promoting psychological adaptation within this vulnerable population.

Very Low Birthweight Birth

Epidemiology

Although VLBW infants, those born weighing less than 1500 grams, account for only 1.47% of yearly births in the United States, they are a group worthy of scrutiny as this rate translates to approximately 60,500 births per year (Hoyert et al., 2006). Moreover, VLBW infants account for about 52% of all infant deaths (MacDorman, Minino, Strobino, & Guyer, 2002), and the risk of early mortality for VLBW infants is over 100 times that of infants born weighing ≥ 2500 grams (Hoyert et al.). Advances in neonatal intensive care unit (NICU) technology over recent years have led to a dramatic decline in the mortality rates of VLBW infants. VLBW infants have especially benefited from these technological improvements, which include exogenous surfactant therapy, high frequency ventilation, and corticosteroid treatment of chronic lung injury (Richardson et al., 1998). Currently, about 76% of all VLBW infants are expected to survive the neonatal period (MacDorman et al.; Richardson et al.), although the rate becomes significantly lower as birthweight decreases. Infants born weighing 1250-1499g have a 95% survival rate whereas those born weighing less than 500g only have a 15% chance of survival (MacDorman et al.). The overall declines in mortality

over recent years have unfortunately not been accompanied by a decrease in the rate of preterm births; in fact, over the past several years, there has been a slow but steady increase in the rate of VLBW births (Hoyert et al.).

Consequences

While increased rates of survival among these infants are clearly desirable, they have had the unwelcome effect of simultaneously increasing rates of morbidity, as VLBW infants are more likely to experience adverse health and developmental outcomes than are their full-term and heavier pre-term counterparts (Ichord, 1993; Johnston, 1998). Common short-term health sequelae observed in VLBW infants include difficulty with temperature regulation, increased risk of bruising and hemorrhage due to fragile vessel walls, gastro-intestinal tract immaturity, hyperbilirubinemia, impaired renal function, decreased immune response leading to a higher risk of sepsis, and difficulty breathing (Johnston). Long-term consequences can also be severe. It is estimated that 17-21% of VLBW infants suffer neurological sequelae, including cerebral palsy, mental retardation, seizures, and epilepsy (Ichord; McCormick, Brooks-Gunn, Workman-Daniels, Turner, & Peckham, 1992). Sensorineural problems, such as blindness, deafness, or difficulties with vision or hearing, affect 23-41% of VLBW infants. In addition, VLBW infants have been shown to exhibit more behavioral difficulties than full-term infants (Halpern, Brand, & Malone, 2001). When reaching school age, a large number of children who were VLBW are found to have learning disabilities or behavior disorders; the need for special education in this population is as high as 48% (Allen, Amiel-Tyson, & Alexander, 1998; Hack et al., 1994; Johnston). VLBW children are also more likely to have problems in more than one dimension; up to 5% of these children have multiple disabilities (Allen et al.; McCormick et al.; Vohr & Msall, 1997). Finally, children who were born

VLBW continue to struggle with chronic health problems; as many as 18% suffer from asthma and other related respiratory difficulties (McCormick et al.).

Impact on Maternal Psychological Distress

Rationale. It is generally acknowledged that the birth of any infant is stressful for mothers (Blumberg, 1980; Goldberg, Morris, Simmons, Fowler, & Levison, 1989). In fact, it is estimated that about 13% of all women experience a non-psychotic post-partum depression in the weeks following delivery (O'Hara & Swain, 1996). Mothers of VLBW infants may experience even higher levels of stress as they are required to devote substantial time, energy, and emotional resources to coping with an unforeseen situation and its associated demands (e.g. Stein, 1989).

The birth of a VLBW infant has been associated with tremendous emotional strain and difficulty with post-partum adjustment. Mothers of these infants often report feelings of guilt surrounding the early delivery and disappointment for not having produced a healthy baby (Blumberg, 1980). In addition, mothers experience great uncertainty and anxiety concerning their baby's survival and future health status. This distress, combined with potential limitations on the amount of time mothers can spend with their babies while they are still in the NICU, can result in difficulty forming a normal attachment with the infant (Pederson et al., 1987). Not surprisingly, mothers of VLBW infants report more crying, greater feelings of helplessness, and more worry about future pregnancies than do mothers of full-term infants (Pederson et al.). Mothers also experience high levels of stress related to a lack of control over their infant's care and the communication of medical information (Pederson et al; Rivers, Caron, & Hack, 1987). Specifically, they indicate feeling as though doctors look down on them, inadequately explain medical terms and communicate important

information, and do not give sufficient information about their infant's outcome and prognosis (Rivers et al.).

Mothers of VLBW infants typically report a significant increase in disruption of their lives. Trips to the hospital, while the infant is still in the NICU, and doctors' appointments, once the infant has been discharged, are time-consuming and interfere with a family's established routines. Not only do mothers have less time and energy to devote to their marital and familial relationships, but their opportunities for maintaining a social life and associated interpersonal relationships decrease (Benson & Gross, 1989). In addition, the level, knowledge, and complication of care may render it difficult, if not impossible, to cede caretaking responsibilities to a relative or babysitter. Thus, mothers are rarely relieved of such responsibilities and have little or no time for personal or social activities (Quittner, DiGirolamo, Michel, & Eigen, 1992).

Considerable economic cost is associated with the birth of a VLBW infant. Initial hospitalizations are lengthy and result in large hospital bills that are not always covered by health insurance. In addition, VLBW infants are more likely than full-term infants to be sick and to require re-hospitalization both in infancy and throughout early childhood. By the time they reach pre-school, approximately 20% of VLBW children have been hospitalized at least once, and 50% have incurred other health-related expenses (McCormick et al., 1986). Overall, it is estimated that the expenses, both medical and non-medical, associated with raising a VLBW infant are ten times higher than those associated with raising a full-term infant (Cronin et al., 1995). Maternal participation in the workforce can also be affected. Mothers may be required to give up employment because of the physical and time demands associated with providing care to an ill child. Other mothers report feeling pressured to quit

their jobs in order to be eligible for Medicaid benefits (Stein, 1989), particularly if their current jobs provide them with little or no health care coverage. Mothers who are obliged to give up their position in the workforce often feel a loss of financial independence, autonomy, self-esteem, and job satisfaction (Stein).

Finally, certain characteristics of mothers of VLBW infants may make them more susceptible to stress. Mothers of VLBW infants are more likely to live in the inner-city, to be of low socioeconomic status, and to have lower levels of education (Lieberman, Ryan, Monson, & Schoenbaum, 1987), characteristics that have been found to place women at an increased risk for stress, depression, and anxiety in a number of studies (e.g. Heneghan, Silver, Bauman, Westbrook, & Stein, 1998; Jessop, Riessman, & Stein, 1988). In addition, adolescents are more likely to give birth to a VLBW baby than are older mothers (Fraser, Brockert, & Ward, 1995). There is evidence to suggest that young mothers may be at increased risk for negative psychological outcomes due to less highly-developed coping skills, fewer psychosocial resources, and lower levels of social support. A study of new mothers who were primarily low-income, low-education, and non-white, found that 67% of young adolescent mothers and 53% of older adolescent mothers reported high levels of depressive symptoms, as compared to 35% of adult mothers (Reis, 1988). In another study of mothers of medically high-risk neonates, younger mothers had significantly higher levels of anxiety than older mothers (Blumberg, 1980). Thus mothers of VLBW infants may be in “double jeopardy;” not only are they at high risk for poor psychological outcomes by virtue of having given birth to a VLBW infant, but they may also more likely to have this risk exacerbated by demographic and economic factors.

Research and findings. A number of studies have examined the prevalence of psychopathology in mothers shortly after the birth of a premature infant. In general, these studies have documented an elevated number of psychological symptoms in mothers of medically fragile infants as compared to mothers of healthier infants. Pederson et al. (1987) interviewed 130 mothers of pre-term infants while the infants were still in the hospital. Mothers of ill infants reported significantly higher levels of emotional upset, crying, and disappointment than did mothers of well infants (Pederson et al.). A 1980 study by Blumberg reported that 3-5 days post-partum, mothers of infants at high risk for poor outcomes (as determined by a number of medical factors) reported significantly higher levels of depression and anxiety than did mothers of infants in the lower risk groups (Blumberg).

Studies have indicated that not only are mothers of medically fragile or VLBW infants more likely to experience symptoms of psychological distress than mothers of healthy or full-term infants, but such symptoms are also reported by a disconcertingly high percentage of mothers. One study reported that 48% of mothers of VLBW infants in their sample were experiencing high psychological distress, as measured by the Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1983) shortly after their infant's birth; as many as 33% were still reporting these symptoms 3-5 weeks post-partum (Thompson et al., 1993). Similar results were reported in a study that compared distress in mothers whose infants fell into one of three groups: a VLBW group in which the babies also had lung damage, a VLBW group in which the babies did not have lung damage, and a full-term, healthy group. Mothers in both of the VLBW groups reported significantly higher levels of distress, as measured by the Brief Symptom Inventory (BSI; Derogatis & Nelisaratos, 1983), than mothers in the full-term group. Moderate distress was found in 34% of mothers of infants who were VLBW and

had lung disease, 31% of mothers of infants who were VLBW and did not have lung disease, and 21% of mothers of full-term infants. Moreover, severe distress was reported by 13% of mothers of infants in both VLBW groups, as compared to only 2% of mothers of full-term infants (Singer et al., 1996). A third study found that 45% of mothers of VLBW infants had scores above the cutoff on the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1997) at the time of their infant's discharge from the hospital (Miles et al., 1999).

Studies that have examined psychological distress in this population in the months following a VLBW infant's discharge have yielded similarly concerning results. Thompson et al. (1993) measured psychological distress in 143 mothers of VLBW infants at three different points: birth, 3 to 5 weeks later, and 6 months corrected age (i.e. 6 months from the time the infant would have been born had he or she been full-term). There was a significant decrease in the percentage of mothers reporting high levels of distress between the 1st and 2nd assessments (48% and 33%, respectively), but no significant change between the 2nd and 3rd assessments (33% and 41%, respectively) (Thompson et al.). It is interesting to note how many mothers were still experiencing high levels of psychological distress at the third assessment point (41%) and that the percentage had actually increased, albeit not significantly, since measurement at the 2nd assessment.

Miles et al. (1999) examined depressive symptoms in 67 mothers of "medically fragile" infants; two-thirds of these infants were premature and the remaining infants had a variety of congenital defects or disorders. Mothers were initially assessed at the time of their infant's discharge from the hospital and again when their infants were 12 months old, corrected for prematurity when necessary. Forty-five percent of mothers had CES-D scores

above the cut-off at the first assessment, and 36% remained above the cut-off at the second assessment; this change was not statistically significant.

A longitudinal study conducted by Singer et al. (1999) compared the prevalence of psychological symptoms between 210 mothers of VLBW infants, who were divided into high risk and low risk categories as a function of lung damage, and 123 mothers of full-term infants. Mothers were assessed when their infants were 1, 8, 12, 24, and 36 months old, ages corrected for prematurity when necessary. At the one-month assessment, mothers of both high-risk and low-risk VLBW infants had significantly higher average levels of general psychological distress, anxiety, and depression, as measured by the BSI, than mothers of full-term infants. Thirteen percent of mothers of all VLBW infants reported severe symptoms of overall distress. Severe symptoms of depression were reported by 9% of VLBW mothers, as compared to 1% of mothers of full-term infants. Mothers of VLBW infants were also significantly more likely to be anxious; moderately high levels of anxiety were reported by 26% of mothers of VLBW infants in the high risk group and 23% of mothers of VLBW infants in the low risk group, as compared to 7% of mothers of infants in the full-term group. At the second and third assessments, when infants were 8 and 12 months old, there were no differences among groups and all were within normative ranges, with one exception; mothers of high-risk infants were still more likely to have clinically significant anxiety scores. Interestingly, at the 24-month assessment, mothers of the high-risk VLBW infants once again reported significantly higher symptoms of moderate depression and general distress than mothers of low-risk VLBW infants and mothers of full-term infants. When the infants were 36 months corrected age, no significant differences between the three groups were observed, and none of the groups reported symptoms that were in the clinically significant range.

Taken together, the results from these studies indicate that mothers of VLBW infants experience high levels of distress not only during the neonatal period, but also well into the first year of the infant's life. In addition, research indicates that the frequency and intensity of distress is significantly higher in mothers of VLBW infants than in mothers of full-term infants.

Importance of Maternal Psychological Adaptation

These elevated rates of psychological distress among mothers of VLBW infants are concerning for a number of reasons. First, families must make major changes, such as redistribution of resources and modification of customary familial roles, within a short time after the infant's birth. Mothers are considered instrumental in effecting these changes and in ensuring that they are maintained in such a way as to promote long-term health and stability of the family unit (Hauenstein, 1990). Mothers who are depressed or anxious may be less effective in helping to bring about such transitions.

Second, maternal psychological adjustment can also have a strong impact on mothers' interactions with their children. There is a great deal of evidence suggesting that depressed mothers have difficulty meeting the demands of mothering (Civic & Holt, 2000). In addition, depressed mothers appear to be less emotionally available for, and responsive to, their children (Civic & Holt; Cummings & Davies, 1994). Mothers who report elevated symptoms of depression or distress have been observed during interactions with their infants to be less active, engaged, and sensitive (Cohn, Campbell, Matias, & Hopkins, 1990; Field, 1995; Singer et al., 2003). Infants of these mothers, in turn, display lower activity levels, look away more, vocalize less, and protest more; in essence, the infants appeared to adopt the negative affect of their mothers (Cohn et al.). Studies also indicate that depressed mothers

are more negative, critical and restricting than nondepressed mothers (Civic & Holt; Cummings & Davies; Singer et al.).

Finally, there is considerable evidence suggesting that children of depressed mothers are at an increased risk for a wide variety of negative outcomes, including excessive crying in infancy, severe temper tantrums, eating problems, and social difficulties in early childhood (Civic & Holt, 2000; Cox et al., 1987; Field, 1995). Maternal depressed mood has been positively associated with depression (Lefkowitz & Tesiny, 1985; Seligman et al., 1984) and behavior problems (Schaughency & Lahey, 1985) in children. In addition, older children of depressed versus non-depressed mothers are more likely to experience problems with substance abuse and conduct disorder (Caspi, Moffitt, Newman, & Silva, 1993; Heneghan et al., 1998). Thus, VLBW children, who are already at increased risk for behavior disorders and learning problems, may be in particular danger if they also have a mother with depression.

Given the high rate of psychological distress among mothers of VLBW infants, as well as the considerable damage this distress can cause to both mother and infant, further clarification of the relationship between the birth of a VLBW infant and maternal psychological adjustment is imperative. It is clear that not all mothers experience high levels or prolonged periods of psychological distress when faced with the birth of a VLBW infant. Mothers react differently to the stress of having a VLBW infant; some may find the challenge seemingly insurmountable while others are less affected, or perhaps even personally strengthened, by the experience. Framing maternal psychological adaptation within a transactional stress and coping model may help in gaining a better understanding of

which women are likely to experience successful psychological adjustment, and the ways in which they are able to effect this.

Conceptual Model of Psychological Adaptation

The transactional stress and coping model proposed by Thompson and colleagues (Thompson, Jr. R. J., 1985; Thompson, Gustafson, Hamlett, & Spock, 1992) was originally developed to understand the way in which families and children adapt to childhood chronic illness. This model has since been modified, however, to also apply to families affected by the birth of a VLBW infant; in this case the birth, rather than the chronic illness, is conceived of as the stressor to which families must adapt (Thompson et al., 1993). Within this model, maternal psychological adaptation is viewed as a function of the interaction between demographic variables, such as the mother's age, IQ, marital status, and SES, and child parameters, including gender, birthweight, and neurobiological risk. Emphasis is also placed on the adaptational processes that predict outcomes, such as maternal cognitive processes and coping strategies, as well as family functioning (Thompson & Gustafson, 1996; Thompson et al.). Thompson and colleagues' research indicated that this model is useful in explaining maternal adaptation to the birth of a VLBW infant; in their study, variables in the model accounted for 30% and 70% of the variance in maternal distress at birth and 6 months corrected age, respectively (Thompson et al.).

Among the cognitive processes that are hypothesized to be influential in facilitating maternal adjustment to the birth of a VLBW infant are cognitive appraisals of daily stress related to VLBW tasks and maternal expectations of efficacy, also related to VLBW tasks (Thompson et al., 1993). Although these have both been found to be associated with mothers' psychological adjustment, little research has been conducted to investigate the

effect of other cognitive processes that may also play a role in adaptation. In particular, benefit-finding, or the ability to extract positive value from negative circumstances, has been found in the trauma literature to facilitate adaptation to a number of negative life events.

Benefit-Finding

Over the years, much attention has been focused on the ways in which humans adapt to traumatic or negative events. Humans possess a remarkable capacity to endure trauma and hardship. In fact, the majority of individuals who are faced with a negative life event are able to negotiate it so successfully as to eventually report a degree of satisfaction or quality of life equal to or greater than their pre-event functioning (Taylor, 1983). In her theory, Taylor maintains that cognitively adaptive efforts are what enable people to respond to negative life events or personal tragedies and return to, or even exceed, their prior level of psychological functioning.

One way in which such cognitive adaptation can occur is by finding benefit in the experience. According to Janoff-Bulman and Frantz (1997), benefit-finding represents an attempt to understand the value or significance that the trauma has held for one's life. Perceiving that a trauma has had positive implications can help to minimize feelings of loss and to preserve, or even augment, the sense that one's life has purpose, value, and meaning (Nolen-Hoeksema & Davis, 2002; Taylor, 1983). Although the idea that confronting a major loss or traumatic incident in life can result in enhanced meaning and positive change may sound paradoxical, numerous studies have documented that this is the case (Calhoun & Tedeschi, 2001). In fact, across studies of individuals who have experienced a variety of traumatic events, as many as 50 to 80% of respondents endorse some degree of positive change or growth as a result of the trauma (Tedeschi & Calhoun, 1995). Consequently,

benefit-finding has been theorized by many to be a process that is instrumental, and perhaps indispensable, in promoting successful adjustment to negative life events.

Conceptual Classification

There is some debate as to the most appropriate classification of benefit-finding; some theorists have conceived of benefit-finding as a selective evaluation, whereas others see it as a way of coping with trauma, and yet others view it as a reflection of personal growth and change.

Selective evaluation. Selective evaluations are considered to be cognitive processes that minimize feelings of victimization by focusing on beneficial qualities of the situation (Taylor, Wood, & Lichtman, 1983). In addition to benefit-finding, other selective evaluations include finding a sense of order and purpose in the event, imagining worse possibilities, and making downward comparisons, i.e., comparing oneself with less fortunate individuals (Tennen & Affleck, 2002). It is proposed that making these selective appraisals helps traumatized individuals to restore assumptions about both themselves, as being worthy and valuable, and their world, as being predictable, orderly, and meaningful (Taylor, 1983; Tennen & Affleck).

Coping strategy. Perhaps more than any other conceptualization of benefit-finding, this one provokes a great deal of disagreement among researchers and theorists. The debate hinges on whether or not perception of benefits should be considered as intentional and effortful. Coping has been defined by Lazarus and Folkman (1984) as “the cognitive and behavioral efforts made to master, tolerate, or reduce external and internal demands and conflicts among them” (p. 141). Those who see benefit-finding as a coping strategy conceive of it as a conscious reappraisal of a traumatic event as an opportunity for growth, rather than

purely a loss. This process of cognitively reappraising the event is considered by many to constitute an intentional attempt to manage the stressor, thereby implying that benefit-finding should be considered a coping strategy (Nolen-Hoeksema & Davis, 2002; Park, Cohen, & Murch, 1996). On the other hand, theorists who refute this view believe that benefit-finding is not an effortful or conscious process (Tennen & Affleck, 2002; Tennen, Affleck, Armeli, & Carney, 2000). According to this perspective, actively searching for benefits in a negative life event, or intentionally reminding oneself of perceived benefits, would both be considered coping strategies. However, simply recognizing and reporting that one has derived benefits from an adverse life experience is not effortful, and thus should not be considered an example of coping (Affleck & Tennen, 1996; Tennen & Affleck). Studies that have attempted to elucidate the relationship between benefit-finding and coping strategies, such as positive reappraisal, have not shed a great deal of light on this issue. In a study of patients with multiple sclerosis (MS), Mohr et al. (1999) compared benefit-finding and positive reappraisal coping, as measured by a subscale of the Ways of Coping Questionnaire (WAYS; Folkman & Lazarus, 1988). The subscale includes such items as “I changed or grew as a person in a good way,” “I discovered what is important in life,” and “I found new faith.” The authors found that benefit-finding and positive reappraisal coping were positively associated. However, in a study of women with early-stage breast cancer, Sears, Stanton, and Danoff-Burg (2003) found contradictory results. They compared benefit-finding with positive reappraisal coping, as measured by a subscale of the COPE (Carver, Scheier, & Weintraub, 1989), and found no significant association between the two. Thus, there remains a good deal of uncertainty as to whether or not benefit-finding constitutes a form of coping.

Personal growth. Finally, others see benefit-finding as a true reflection of personal growth and change, rather than simply a cognitive adaptation or coping strategy. According to Tedeschi and Calhoun (1995), traumatic events can result in true developmental growth by forcing individuals to confront new situations and challenges, adopt new roles, and shift their perceptions of themselves. For example, consider a mother who reports that the birth of her VLBW infant has resulted in a greater appreciation of her friends and family and who displays positive adjustment to this event. One possibility is that her high level of adjustment is due to the perception of benefits in the realm of relationships. However, it is also possible that as a result of her increased appreciation for her friends and family, this mother is eliciting a substantive increase in the amount of social support she receives. Thus, this perspective views adjustment not as a direct result of perceiving benefits, but rather as stemming from actual changes stimulated by perceiving benefits (Tennen & Affleck, 2002).

Domains

Although researchers and theorists find it difficult to agree on benefit-finding's place in the conceptual literature, there is consensus as to its general presentation. Researchers who have studied the effects of a traumatic or stressful incident have typically found benefit-finding to occur in three primary domains: sense of self, relationships, and philosophy of life (Calhoun & Tedeschi, 2001).

Sense of Self. Individuals who have experienced a traumatic event often report positive changes in the way they perceive themselves. Compared to how they saw themselves before the incident, these individuals report positive changes in their personal strength and capability, their self-image, and their levels of self-reliance and self-efficacy

(Calhoun & Tedeschi, 2001). In addition, these individuals often report positive personality changes, including greater patience, tolerance, empathy, and courage (Affleck et al., 1991).

Relationships. Positive changes are also often reported within the realm of personal relationships. Many individuals who have undergone a major stressor report that they feel better able to connect emotionally with others, a deepened sense of empathy for others, and a greater ability to express their emotions and to engage in self-disclosure after the stressor than they did beforehand (Calhoun & Tedeschi, 2001). These changes, in turn, are associated with reports of strengthened relationships with both friends and family members (Affleck et al., 1991).

Philosophy of Life. Finally, those who have undergone adversity often report an enhanced sense of meaning and purpose in life (Calhoun & Tedeschi, 2001), and changes in priorities and their ability to see what is truly important in life (Affleck et al., 1991). In addition, some report that religion or spirituality has taken on a higher level of importance in their lives (Calhoun & Tedeschi).

It is hypothesized that finding benefits in the three categories described above may help to mitigate feelings of loss or helplessness that individuals encounter when faced with a traumatic event. Moreover, in finding positive implications of the event for one's life, negative ones may be minimized, thereby facilitating adaptation to the stressor (Davis et al., 1998).

Predictors

Aside from the finding that women generally appear to be more likely to find benefits than men (Calhoun & Tedeschi, 2001; Tedeschi & Calhoun, 1996), there has been considerable inconsistency in the literature as to the variables, including demographic,

personality-oriented, and trauma-specific, associated with benefit-finding. With regard to SES, higher levels of education (Davis et al., 1998; Sears et al., 2003; Updegraff, Taylor, Kemeny, & Wyatt, 2002) and higher income (Cordova, Cunningham, Carlson, & Andrykowski, 2001; Updegraff et al.) have both been associated with increased levels of benefit-finding in some studies. Other studies, however, have documented a negative association between measures of SES and benefit-finding (Carver & Antoni, 2004; Tomich & Helgeson, 2004), and yet others have found no association between the two (Lechner et al., 2003). Whereas some researchers have found evidence that older individuals are less likely to find benefits (Davis et al.; Lechner et al.; Manne et al., 2004; Thompson, S. C., 1985), others have found no association between age and benefit-finding (Danoff-Burg & Revenson, 2005; Katz et al., 2001; Mohr et al., 1999; Tomich & Helgeson, 2004) and at least one has documented a positive relationship between age and benefit-finding (Carver & Antoni, 2004). With respect to ethnicity and race, Tomich & Helgeson observed higher rates of benefit-finding among African-American and Hispanic women, whereas Updegraff and Marshall (2005) found no association between ethnicity and benefit-finding.

Similar debate has arisen concerning personality characteristics associated with benefit-finding. Specifically, a number of researchers have found dispositional optimism to be positively associated with benefit-finding (Curbow, Somerfield, Baker, Wingard, & Legro, 1993; Davis et al.; Rini et al., 2004; Tennen, Affleck, Urrows, Higgins, & Mendola, 1992; Thompson, S. C.; Updegraff & Marshall), whereas several others have found no association between benefit-finding and optimism (Antoni et al., 2001; Park & Fenster, 2004; Sears et al.; Updegraff et al., 2002). It appears that only one study has looked at the relationship between the “Big Five” dimensions of personality and benefit-finding; the

results indicated that Extraversion and Openness to Experience were positively associated with benefit-finding (Tedeschi & Calhoun).

The relationship between trauma characteristics and benefit-finding has been somewhat more difficult to assess as the majority of studies have recruited samples that are relatively homogeneous in their experiences (i.e. victims of the same disaster, people suffering from a particular medical problem, etc.). However, among samples that differ in the length of time since the trauma or diagnosis, several studies have found a positive association between time elapsed and benefit-finding (Cordova et al., 2001; Pakenham, 2005). Others, on the other hand, have failed to find any such relationship (Danoff-Burg & Revenson, 2005; Katz et al, 2001.; Lechner et al., 2003; Manne et al., 2004) and at least one found a negative association between the two (Fromm, Andrykowski, & Hunt, 1996). With regard to the impact of the severity of trauma or disease on benefit-finding, somewhat more consistency has been found, with several studies reporting a positive association between severity or risk and benefit-finding (Fromm et al.; McFarland & Alvaro, 2000; Rini et al., 2004). However, Lechner et al. found a U-shaped relationship between stage of disease and benefit-finding in their study of breast cancer patients, such that the highest levels of benefit-finding were among those women who had Stage 2 or Stage 3 breast cancer and women whose breast cancer was Stage 1 or 4 displayed the lowest levels of benefit-finding.

Impact on Psychological Adjustment: Research and Findings

As mentioned previously, research indicates that the majority of people who have experienced a negative life event report finding benefits in the experience. The question remains, however, whether perceiving benefits in a traumatic situation renders individuals

better able to adapt to the consequences and demands of the stressor, thereby reducing the incidence of psychological distress in this vulnerable population.

Benefit-finding and negative psychological outcomes. The relationship between benefit-finding and adaptation has been examined in individuals who have experienced a variety of traumatic life events, including disaster, sexual abuse, bereavement, various illnesses and medical conditions, and the birth of a medically fragile infant. Although there are some exceptions, these studies have generally documented fewer symptoms of psychological distress among individuals who report higher levels of benefit-finding. (Numerous terms have been coined by researchers over the years to refer to deriving benefits from trauma, including “positive changes,” “finding meaning,” “benefit-construal” or “benefit-finding,” and “post-traumatic growth.” For the purposes of clarity and simplification, the construct will generally be referred to as “benefit-finding” within this document.)

McMillen et al. (1997) studied survivors of three disasters: a tornado, a plane crash, and a mass shooting. One hundred sixteen individuals were interviewed 4-6 weeks after the incident and again after 3 years. Participants were asked whether they could identify anything positive that came about as a result of the traumatic incident. Symptoms of depression, anxiety, alcohol abuse, and post-traumatic stress disorder (PTSD) were assessed at the 3-year follow-up period using portions of the Diagnostic Interview Schedule Disaster Supplement (DIS/DS; Robins & Smith, 1983); however, the incidence rates of all but PTSD were too low for these to be used as dependent variables. As a result, the investigators focused on the change in the number of diagnoses between the 4-6 week and 3-year structured interviews, in addition to levels of PTSD symptomatology. Results indicated that

those individuals who perceived benefits from the trauma at 4-6 weeks post-disaster were significantly less likely to report symptoms of PTSD three years later.

A longitudinal study of 171 female survivors of sexual assault (Frazier et al., 2001) examined the association between posttraumatic distress and benefit-finding over a 12-month period. Survivors were assessed at 2 weeks and 12 months post-assault. Benefit-finding was assessed by a 17-item measure developed by the authors that categorized changes into 4 domains: self, relationships, life philosophy or spirituality, and empathy. Results indicated that, at 2-weeks post-assault, reports of benefit-finding were associated with significantly lower levels of depressive symptomatology, as measured by the BSI, and PTSD symptomatology. Moreover, respondents who reported higher than average levels of benefit-finding at 2 weeks and at 12 months had the lowest levels of distress at the 12-month follow-up.

Davis et al. (1998) conducted a longitudinal study of 205 individuals who had relatives in hospice care. The participants were assessed at 6 and 13 months after the family member's death. Benefit-finding was measured via a single closed-ended question asking relatives whether they had found anything positive in the experience of losing a family member. Those who reported at the 6-month post-loss assessment that they had found something positive were significantly less likely to report symptoms of depression, as measured by the Inventory to Diagnose Depression, both at that time and at 13-months post-loss.

A number of researchers have studied the relationship between benefit-finding and distress in individuals with a variety of medical conditions. A cross-sectional study by Mendola, Tennen, Affleck, McCann, and Fitzgerald (1990) examined benefit-finding and

psychological symptoms in a sample of 65 infertile women who had tried unsuccessfully to conceive for over a year. Women were asked whether or not they had derived some benefit or gain that they would not have derived had they not gone through this experience. These benefits were then grouped into one of three categories: increased strength of marriage, higher degree of personal growth, and greater appreciation of life. Those individuals who reported experiencing an increase in the strength of their marriage had significantly lower levels of global distress on the SCL-90-R.

Thompson (1991) recruited 40 elderly stroke patients to participate in a cross-sectional study on predictors of adjustment. She found that those patients who reported deriving at least one benefit from their stroke, as measured by a single open-ended question, were significantly more likely to report lower levels of depression, as measured by the Geriatric Depression Scale.

Katz et al. (2001) conducted a cross-sectional study of 56 cancer and 31 lupus patients. Participants completed a Profile of Mood States (POMS) and a 48-item item questionnaire developed by Mohr et al. (1999) to assess the psychosocial effects of chronic illness in three categories labeled Demoralization, Benefit-Finding, and Deterioration in Relationships. Results indicated that high levels of benefit-finding were associated with significantly lower levels of depression, anxiety, and hostility.

In a study of 189 HIV positive women (Updegraff et al., 2002), participants were asked whether, and in what ways, being HIV positive had changed their lives for better or worse in five domains: how they viewed themselves, how they viewed their bodies, their social relationships, their romantic relationships, and their life priorities. Women were divided into one of three groups: exclusively negative changes, exclusively positive changes,

and mixed changes. Controlling for health status and dispositional optimism, those women who reported exclusively positive changes reported significantly lower levels of depression and anxiety, as measured by the CES-D and the anxiety scale of the SCL-90-R, respectively, than women in the mixed group and those in the negative changes group.

Finally, Carver and Antoni (2004) examined the relationship between benefit-finding and adjustment in a sample of 96 breast cancer patients. Benefit-finding was assessed at baseline, within the first year after breast surgery, using a modified version of the scale utilized by Tomich & Helgeson (2004; described below). At follow-up, 4 to 7 years later, symptoms of depression were measured using the CES-D, and the Affects Balance Scale (ABS; Derogatis, 1975) was administered to assess positive and negative affect. Results indicated that higher levels of benefit-finding at baseline predicted significantly lower negative affect and symptoms of depression, and significantly higher positive affect, at follow-up. These results were maintained even after controlling for baseline levels of the relevant outcome variable.

Only two studies thus far have assessed the association between benefit-finding and adjustment among parents of pre-term or medically fragile infants; none have recruited samples comprised entirely of mothers of VLBW infants. Affleck et al. (1985) conducted a cross-sectional study of 45 mothers of infants who required NICU care, either because of medical problems or premature birth. Benefit-finding was assessed in mothers shortly after an infant's discharge with a single yes or no question. Those who reported experiencing benefits had significantly fewer symptoms of depression on the POMS, and significantly lower levels of intrusive symptoms of PTSD on the Impact of Event Scale (IES; Horowitz, Wilner & Alvarez, 1979).

In order to further study this phenomenon, Affleck et al. (1991) recruited a sample of 114 women, whose babies were hospitalized in the NICU for at least 10 days, to participate in a longitudinal study. Interviews were conducted before hospital discharge, and at 6 and 18 months post-discharge. Benefit-finding was again assessed via one categorical question. Those who did not report benefits at the time of the initial interview were significantly more likely to report a less positive mood, as measured by the POMS, and greater global distress on the SCL-90-R at 18 months. Interestingly, benefit-finding was unrelated to negative mood or global distress at the 6 month interview.

Benefit-finding and positive psychological outcomes. Far fewer studies have examined the relationship between benefit-finding and measures of positive psychological adjustment; however, those that have done so have generally found strong evidence of such a relationship. A study of 154 adult women who were victims of childhood sexual abuse (McMillen, Zuravin, & Rideout, 1995) found that 46.8% of them reported deriving some benefit from the abuse. Benefit-finding was assessed by asking the women whether they could think of anything positive that had come about as a result of the experience. Overall, women who reported finding benefits in their experiences of abuse had significantly higher levels of self esteem, an increased comfort with depending on others, and lower levels of relationship anxiety.

A small handful of studies examining measures of both positive and negative adjustment have found an association between benefit-finding and positive outcomes even in the absence of a relationship between benefit-finding and negative outcomes; thus, it appears as though benefit-finding may exert a stronger impact on positive outcomes than it does on negative ones. In a study of 135 long-term survivors of bone marrow transplantation (BMT),

Curbow et al. (1993) examined the relationship between benefit-finding associated with their BMT and psychological adjustment, as measured by life satisfaction and negative mood. Benefit-finding was found to be unassociated with negative mood; however, there was a significant relationship between benefit-finding and life satisfaction

Park and Fenster (2004) collected data from a sample of 94 undergraduates in an introductory psychology class in order to examine the association between benefit-finding and adjustment in regards to having experienced general negative life events. Benefit-finding was assessed using the Stress-Related Growth Scale (SRGS; Park et al., 1996). Two domains of adjustment were examined: depressive symptoms, measured by the CES-D, and positive states of mind, assessed via the Positive States of Mind Scale (PSOM; Horowitz, Adler, & Kegeles, 1988). The authors found that benefit-finding was not associated with symptoms of depression, but was significantly associated with positive states of mind.

Finally, Pakenham (2005) examined the effect of benefit-finding on positive and negative outcomes in 502 individuals with multiple sclerosis (MS). Measures included the Mohr et al's (1999) benefit-finding scale, the Brief Symptom Inventory-18 (BSI-18; Derogatis, 2000) to measure symptoms of distress, Bradburn Affect Balance Scale (Bradburn, 1969) to assess positive and negative affect, and the Satisfaction with Life Scale (Pavot & Diener, 1993). Benefit-finding and positive and negative outcomes were assessed at a single time point. Results indicated that benefit-finding had no association with distress, and a very weak impact on negative affect (r^2 change = .02, $p < .05$). However, benefit-finding was found to have a significant and positive association with both life satisfaction and positive affect.

Taken together, the results from these studies appear to provide evidence that, among people who have undergone a variety of traumatic life events, those individuals who perceive benefits in their experiences are more likely to experience better psychological outcomes than those who do not.

Benefit-finding and physical health. Several studies have also reported an association between benefit-finding and physical adaptation. The first of these followed 287 male heart attack victims over an 8-year period (Affleck, Tennen, Croog, & Levine, 1987). Participants were interviewed at 7 weeks after their initial attack and then again at 8 years. Results indicated that respondents who reported finding benefits or gains in their experience at the 7-week interview not only had significantly lower levels of overall morbidity at the 8-year interview, but also were significantly less likely to have experienced another heart attack.

In a study of morbidity among bereaved HIV-positive men, Bower et al. (1998) followed a sample of 40 men over an extended period of time. Participants were initially interviewed an average of 8 months after losing a close friend or partner to AIDS. Benefit-finding was later assessed by coding transcripts of these interviews and thus was never specifically asked about. Participants were examined for signs and symptoms of HIV progression every 6 months for 2 to 3 years. Results indicated that participants who perceived benefits to their experience had a significantly slower progression of the disease. More importantly, benefit-finding was associated with a lower rate of AIDS-related mortality over the next 4- to 9-year follow-up period, controlling for potential confounders.

In the Katz et al. (2001) study of 87 cancer and lupus patients described earlier, higher levels of benefit-finding were correlated with significantly lower ratings of pain over

the previous year. It should be noted, however, that the researchers did not control for any potential confounders when examining this association.

Finally, in a longitudinal study of 124 patients with rheumatoid arthritis (RA), Danoff-Burg and Revenson (2005) tested the relationship between interpersonal benefit-finding and physical adjustment, as measured by pain and functional disability. Benefit-finding was assessed at baseline via a single open-ended question concerning the positive effects that having RA had exerted on their relationships with others. Functional disability and pain were measured both at baseline and one year later using the Stanford Health Assessment Questionnaire (HAQ; Pincus, Summey, Soraci, Wallston, & Hummon, 1983) and a 100-mm visual analog scale, respectively. Analyses indicated that interpersonal benefit-finding was significantly and negatively associated with functional disability and pain, both at baseline and follow-up.

Although the results of all of the studies described above indicate that there is an association between benefit-finding and psychological and physical adaptation in individuals who have experienced a negative event, there are a handful of studies that have not found such a relationship. Lehman et al. (1993) examined the relationship between benefit-finding and psychological symptoms in a cross-sectional study of 94 bereaved individuals 4 to 7 years after the sudden accidental death of a family member. Life changes were assessed via a series of open-ended questions, and responses were coded and divided into three broad domains: self-perceptions, social relations, and life orientation. The SCL-90-R and the Bradburn Affects Balance Scale were used to measure psychological symptoms. Results of the analyses indicated that neither report of positive changes, nor number of positive changes, were significantly associated with psychological symptoms. Moreover, positive

changes in social relations were, surprisingly, associated with reports of higher distress and lower psychological well-being.

Mohr et al. (1999) recruited 94 patients with MS to participate in a cross-sectional study on the psychosocial impact of the disease. As part of this study, the authors developed and validated a questionnaire containing 48 statements on the psychosocial effects of MS. Three factors were identified: Demoralization, Benefit-Finding, and Deterioration in Relationships. Results indicated that benefit-finding was significantly correlated with elevated levels of anxiety and hostility on the POMS. No relationship was found between benefit-finding and depression.

A cross-sectional study by Cordova et al. (2001) examined the relationship between benefit-finding and distress among 70 female survivors of breast cancer. Participants completed a modified version of the Post-Traumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996), to assess positive changes experienced after the trauma, and the CES-D and IES, to measure symptoms of depression and post-traumatic stress, respectively. Results indicated that, although survivors reported a high level of post-traumatic growth, there was no association between growth and measures of distress.

Sears et al. (2003) examined the relationship between benefit-finding and psychological adjustment in a sample of women who had been diagnosed with early-stage breast cancer. Sixty women were interviewed at the time they completed primary medical treatment, then again at 3 and 12 months. Benefit-finding was assessed at baseline by asking participants whether any benefits had resulted from their experience with breast cancer, and subsequently asking them to describe their experiences. Identification of any benefits, as well as total number of benefits cited, were both used as predictors. Psychological

adjustment was measured at the 3- and 12-month interviews by creating “distress” and “vigor” indices from the POMS. The authors reported that neither of the benefit-finding predictors was significantly correlated with the two measures of psychological adjustment at either of the follow-up interviews.

In a longitudinal study of 364 women with breast cancer, Tomich & Helgeson (2004) examined the impact of benefit-finding on mental functioning and negative affect. Benefit-finding was assessed at baseline using a modified version of Behr’s Positive Contributions Scale (Behr, Murphy, & Summers, 1992). Mental functioning (as measured by a particular composite index on the SF-36; Ware, Snow, Kosinski, & Gandek, 1993) and negative affect (as measured by the PANAS; Watson, Clark, & Tellegen, 1988) were assessed both at 3 and 6 months post-baseline. Findings indicated that women who reported higher levels of benefit-finding at baseline had higher levels of negative affect at the 3-month assessment. In addition, benefit-finding was found to interact with stage of disease, such that higher benefit-finding at baseline was associated with worse mental functioning at 3 months and more negative affect at 6 months for women with more severe stages of breast cancer. No association was found between benefit-finding and positive affect.

Critique of the existing literature. Although there are some exceptions, results from the majority of studies that have examined the relationship between benefit-finding and psychological adaptation in individuals who have experienced negative life events indicate that, overall, benefit-finding does appear to be positively associated with adjustment. Despite these generally consistent results, there is good reason for further research in this area; a good portion of the studies outlined above share methodological, statistical, and

conceptual problems that render it difficult to be sure that this relationship has been thoroughly explored and delineated.

A significant methodological problem pervading this literature is the lack of valid and reliable quantitative measures of benefit-finding. The preponderance of studies have used a single open-ended question to measure benefit-finding (Affleck et al., 1985; Affleck et al., 1991; Danoff-Burg & Revenson, 2005; Davis et al., 1998; Frazier et al., 2001; Lehman et al., 1993; McMillen et al., 1995; McMillen et al., 1997; Mendola et al., 1990; Sears et al., 2003; Thompson et al., 1991; Updegraff et al., 2002): e.g., has the individual experienced any gains, benefits, or advantages from their traumatic experience? Although it is possible that the construct of benefit-finding is so robust as to predict outcome with this single question, there now exist measures of benefit-finding, such as the Posttraumatic Growth Inventory (Tedeschi & Calhoun, 1996), that have been documented to have good psychometric properties. In addition, three sets of investigators (Katz et al., 2001; Mohr et al., 1999; Pakenham, 2005) used a benefit-finding subscale from a questionnaire developed by Mohr et al. without reporting detailed tests of validity; moreover, the subscale was derived solely via factor analysis, and was not theoretically driven. Using instruments that have demonstrated both high reliability and validity, and that are in large part derived from theory, is imperative in future studies of benefit-finding and will enable researchers to compare results between individuals and across studies so as to develop a more cohesive and integrated body of literature (Thornton, 2002). Moreover, the possible lack of validity and reliability in the means with which benefit-finding has been measured may be partially responsible for the lack of significant findings in the studies that have not documented a relationship between

benefit-finding and adjustment, as certain scales or methods of assessment may be less adept than others at capturing the construct of benefit-finding.

Related to this issue is the fact that many studies have used a dichotomous rating of benefit-finding, rather than a continuous one that would capture the number of benefits a person perceives. Although it is possible that benefit-finding is so influential that even one perceived benefit has a positive impact on adjustment, it seems more likely that a higher quantity of perceived benefits would be associated with a greater level of adjustment. Again, use of a quantitative measure of benefit-finding would permit researchers to measure this construct in continuous, rather than dichotomous terms, and to, in turn, utilize an aggregate measure of benefit-finding in predicting adjustment.

Several other flaws in methodology may also have limited much of the research thus far. First, a number of researchers have recruited relatively small samples. This is particularly problematic in interpreting the studies that found no association between benefit-finding and psychological distress (Cordova et al., 2001; Sears et al., 2003), as researchers may not have had sufficient power to detect such an association, if it did exist. Second, the majority of studies have been designed cross-sectionally, rather than longitudinally (e.g. Affleck et al., 1991; Katz et al., 2001; McMillen et al., 1995; Pakenham, 2005; Tennen et al., 1990; Thompson, 1991; Updegraff et al., 2002). This poses potential problems, primarily in the studies that documented a positive association between benefit-finding and psychological adaptation, as there is good reason to believe that people who are currently experiencing psychological distress may have a more difficult time perceiving benefits from their negative life experience. Finally, the vast majority of studies did not assess, and therefore control for, dispositional optimism (e.g. Affleck et al., 1985; Frazier et al., 2001; Katz et al., McMillen et

al.; Thompson). Not only has dispositional optimism found to be positively associated with benefit-finding (Davis et al., 1998; Sears et al., Tennen et al., 1992; Thompson, S. C., 1985), but it has also been negatively associated with distress in numerous studies (e.g. Carver et al., 1993; Cozzarelli, 1993; Curbow et al., 1993; Scheier et al., 1989; Taylor et al., 1992). Thus, it is possible that the relationship between benefit-finding and psychological adjustment is a spurious one that is actually accounted for by dispositional optimism. (See below for a more detailed discussion of this issue.)

Several researchers also used inadequate statistical methods in analyzing their data. For example, four of the studies that did not find a significant relationship between benefit-finding and distress (Cordova et al., 2001; Mohr et al., 1999; Park & Fenster, 2004; Sears et al., 2003) only performed simple correlations to assess this relationship. It is possible that, in these studies, the association between benefit-finding and distress was obscured by a potential confounder not accounted for in the analyses. For example, Mohr and colleagues found that employment status was related to degree of benefit-finding, in that people who were unemployed actually reported higher levels of perceived benefits. However, in analyzing the relationship between benefit-finding and distress, the authors failed to control for employment status, which may also have been associated with the dependent variable. Thus the positive association between benefit-finding and levels of anxiety and hostility reported by the authors may be a spurious one that is actually a function of underlying unemployment. A similar phenomenon may also have occurred in the other two studies. Sears et al. reported that benefit-finding was significantly associated with education, yet this relationship was not addressed in analyses on the relationship between benefit-finding and distress. Cordova et al. found that income and length of time since diagnosis were

significantly related to benefit-finding, but did not control for either of these variables in subsequent analyses.

Another shortcoming of the literature is that very few studies have examined whether particular domains of benefit-finding are more strongly associated with adjustment than are other domains or than is the construct as a whole. For example, it is possible that perception of benefits in the area of personal relationships may be more highly associated with lower levels of distress than a changed philosophy of life. Two of the studies that have broken benefit-finding down into domains have found that the area in which benefits are perceived may be associated with outcome, even when overall benefit-finding is not. McMillen et al. (1995) found that benefits in the area of sense of self were primarily associated with higher levels of self-esteem. Similarly, Mendola et al. (1990) reported that participants who perceived benefits in the strength of their marriage had significantly lower levels of psychological distress. Thus, independent examination of the association between adjustment and individual domains of benefit-finding may well be warranted.

Finally, these studies have primarily examined the impact of benefit-finding on negative outcomes, such as level of depressive or anxious symptomatology. Very few researchers have studied the association between benefit-finding and positive outcomes, such as well-being or quality of life. As mentioned previously, those researchers who have examined the impact of benefit-finding of both positive and negative adjustment (e.g. Curbow et al., 1993; Pakenham, 2005; Park & Fenster, 2004) have generally found a stronger association between benefit-finding and positive adjustment than between benefit-finding and negative adjustment. Thus, defining adjustment via the absence of negative symptoms,

as many researchers have traditionally done, may be failing to accurately capture the positive changes that benefit-finding might, in fact, be promoting (Thornton, 2002).

In conclusion, the existing literature in this domain, while certainly encouraging, suffers from a number of methodological and statistical limitations that make interpretations equivocal. Moreover, the conceptualization and assessment of benefit-finding has generally lacked depth. Research that pertains specifically to the relationship between benefit-finding and adjustment in mothers of VLBW infants is also warranted. First, as documented previously, this is a population that is highly susceptible to negative psychological outcomes. Thus, any research that may help to predict which mothers are most likely to adjust well is particularly essential. Although the two studies conducted among mothers of infants hospitalized in the NICU (Affleck et al., 1985; Affleck et al., 1991) indicate that benefit-finding may indeed play a role in this population's adaptation, for the reasons outlined above, there is certainly a need for more exploration of this association; moreover, no studies have examined psychological adjustment in a sample of comprised entirely of mothers of VLBW infants. Finally, there is some evidence that cognitive-behavioral interventions can serve to increase benefit-finding among vulnerable populations. Results from two studies of women being treated for early-stage breast cancer indicate that participation in a 10-week cognitive-behavioral stress management group significantly increased levels of benefit-finding (Crues et al., 2000; Antoni et al., 2001). Thus, assuming confirmation that benefit-finding does play an important role in the psychological adjustment of mothers of VLBW infants, it may be possible to develop interventions that might stimulate the use of benefit-finding among women who do not engage in it, and even augment it among women who do. Such an

intervention would, optimally, serve the dual purpose of improving psychological health and outcomes in mothers and their children.

Dispositional Optimism

Any study examining psychological adjustment to a negative life event would be remiss if it did not consider the role of optimism in this process. Optimism has been described by Scheier and Carver (1985) as the tendency to believe that good things, rather than bad ones, will happen. Two types of optimism have since been identified: situational and dispositional. Situational optimism refers to the expectations that a particular situation will turn out well, whereas dispositional optimism refers to more generalized outcome expectancies that overall, good things will happen (Scheier & Carver, 1992).

Optimism and Psychological Adjustment

It has been hypothesized that dispositional optimism, due to its generalized and stable nature, should be associated with a general tendency toward positive feelings, and thus may serve as a protective factor in times of stress or trauma (Carver & Scheier, 2002; Scheier & Carver, 1992). Numerous studies have examined the relationship between dispositional optimism and psychological distress in a variety of populations and have confirmed that, in general, optimistic individuals tend to experience more positive psychological outcomes than do pessimistic ones. Some of these populations include individuals with medical problems, caregivers, and women who have recently given birth. Two longitudinal studies of patients who underwent coronary artery bypass surgery (Fitzgerald, Tennen, Affleck, & Pransky, 1993; Scheier et al., 1989) found that dispositional optimism was associated with lower levels of pre-surgical depression and hostility, and higher levels of post-surgical happiness and satisfaction. Optimism also has been associated with lower levels of distress and higher

levels of adjustment among individuals coping with treatment for breast cancer (Carver et al., 1993; Johnson, 1996), unsuccessful in vitro fertilization procedures (Litt, Tennen, Affleck, & Klock, 1992), bone marrow transplantation (Curbow et al., 1993), HIV-positive health status (Taylor et al., 1992), and abortion (Cozzarelli, 1993).

Optimism has been associated with well-being not only among individuals with medical problems, but also among familial caregivers of people with health problems. Studies examining caregivers of individuals with cancer (Given et al., 1993) and Alzheimer's disease (Shifren & Hooker, 1995) found that dispositional optimism was associated with fewer symptoms of depression and higher levels of psychological well-being. Although no studies were found to have specifically examined the role of optimism in adjustment to caring for a VLBW infant, Carver & Gaines (1987) studied a sample of women who had recently gone through childbirth and found that dispositional optimism (measured before the birth of the infant) predicted significantly lower levels of depression during the post-partum period. In sum, there is substantial evidence to indicate that dispositional optimism plays an important role in promoting adjustment to a significant stressor. There is considerable less information, however, on the mechanism by which optimism confers protection against distress.

Optimism and Benefit-Finding

One hypothesis proposed by researchers is that benefit-finding mediates the relationship between optimism and adjustment. In other words, individuals who expect positive outcomes in their lives may be more likely to search for opportunities to turn seemingly negative events into positive ones (Carver & Scheier, 2002; Nolen-Hoeksema & Davis, 2002). Consistent with this hypothesis, optimists do appear to be more likely to use

coping strategies that resemble benefit-finding than do pessimists (Affleck & Tennen, 1996). For example, one study found that undergraduate students who were high in dispositional optimism were more likely to cope with life stressors by using positive reinterpretation strategies, such as looking for something good in the stressor or trying to see the stressor in a more positive light (Fontaine, Masteed, & Wagner, 1993). In their study on women undergoing breast cancer treatment, Carver et al. (1993) found similar results; women who reported a high degree of dispositional optimism at diagnosis were more likely to use positive reinterpretation as a coping strategy.

Several studies have examined the relationship between optimism and benefit-finding in predicting adjustment to a negative life event. Although many of these have documented a positive association between the two constructs (e.g. Curbow et al., 1993; Davis et al., 1998; Rini et al., 2004; Tennen et al., 1992), several have failed to find such a relationship (Park & Fenster, 2004; Sears et al., 2003; Updegraff et al., 2002). Only two studies have been found that went beyond correlational analyses and examined the relationship between optimism and benefit-finding in a more comprehensive fashion. In their longitudinal study on bereaved family members, Davis et al. tested benefit-finding as a mediator of the relationship between optimism and psychological distress. They found that higher levels of pre-loss optimism were significantly associated with fewer symptoms of distress at the 6-month interview, and that this relationship was mediated by finding benefits in the loss at 6 months. Rini et al. examined the interaction between benefit-finding and dispositional optimism in a sample of 144 mothers whose children were undergoing hematopoietic stem cell transplantation (HSCT). Results indicated that optimism moderated the relationship between benefit-finding and psychological adaptation, such that benefit-finding was only associated with

psychological adaptation among mothers who were in high in dispositional optimism. Thus, it appears as though the relationship between benefit-finding and dispositional optimism is a fairly complex one that merits more systematic and thorough exploration.

The Current Study

The current study analyzes benefit-finding and its relation to psychological adjustment among mothers of VLBW infants. The study sought to add support to the growing body of literature exploring the positive association between benefit-finding and psychological adjustment among individuals who have experienced a significant negative life event, while simultaneously adding depth to the manner in which benefit-finding has previously been explored.

The current study built on previous research in a number of important ways. First, rather than measuring benefit-finding using a single open-ended question, this study utilized a measure of benefit-finding that has been developed fairly recently and has been shown to have good psychometric properties (Tedeschi & Calhoun, 1996). Moreover, use of this measure permitted an aggregate rating of benefit-finding rather than a simple dichotomous (yes or no) rating. This study also examined whether specific aspects of benefit-finding are more highly associated with psychological adjustment than others or than the global construct. In addition, this study looked not only at the relationship between benefit-finding and psychological distress, but also at the association between benefit-finding and psychological well-being. In examining these relationships, this study controlled for a number of covariates, such as maternal education and income, that have been shown to be associated with benefit-finding but have not always been controlled for in prior research. Related to this, the study assessed the role of dispositional optimism, not only as a potential

confounder, but also in an attempt to clarify the relationship between benefit-finding, optimism, and psychological adjustment. Finally, this study sought to add information about factors associated with both positive and negative outcomes to the VLBW literature. Much work has been devoted to documenting the high level of psychological distress among mothers of VLBW infants, but very little research has focused on determining which factors predict distress or, conversely, promote successful adaptation to such a stressor.

The original aims and hypotheses that guided the current study are presented below.

Aim 1

The first aim of this study was to investigate the relationship between benefit-finding and psychological adjustment in mothers who have recently given birth to a VLBW infant.

Hypothesis 1a. It was hypothesized that benefit-finding would be positively associated with reports of psychological well-being, controlling for potential covariates such as mother's SES, education, race, social support, previous diagnoses of anxiety or depression, daily hassles, as well as infant's health status.

Hypothesis 1b. It was further hypothesized that benefit-finding would be negatively associated with reports of psychological distress, controlling for possible covariates, such as those mentioned in Hypothesis 1a.

Hypothesis 1c. It was hypothesized that, of the five subscales on the PTGI (assuming replication of a factor structure similar to the original), higher scores on the Relating to Others and Personal Strength scales would be more strongly associated with lower levels of psychological distress and higher levels of psychological well-being than would higher scores on the other subscales (New Possibilities, Spiritual Change, Appreciation for Life). This hypothesis was based both on theory and empirical findings. The protective role of

social support and self-efficacy in guarding against psychological distress has been widely documented. Moreover, this hypothesis was supported by the findings reported by the few researchers who have examined whether perceptions of benefits in a particular domain are more strongly associated with psychological adjustment. In their sample of survivors of sexual abuse, McMillen et al. (1995) reported that higher perceived benefits in the area of sense of self were associated with higher levels of self-esteem. With respect to the impact of finding interpersonal benefits, Mendola et al. (1990) found that respondents who reported benefits in the strength of their marriage had lower levels of psychological distress and Danoff-Burg and Revenson (2005) found that individuals who reported a high degree of interpersonal benefits had lower levels of distress.

Aim 2

The second aim of the proposed study was to explore the sociodemographic variables associated with benefit-finding in mothers of VLBW infants.

Hypothesis 2. It was hypothesized that benefit-finding would be positively associated with maternal education. This hypothesis was based on the idea that individuals with a higher levels of education would be better able to engage in the cognitive processing thought to be necessary to promote benefit-finding. Several studies have, in fact, documented higher levels of benefit-finding among people who have more years of education (Davis et al., 1998; Sears et al., 2003; Updegraff et al., 2002). Further hypotheses concerning the nature of the association between benefit-finding and other sociodemographic predictors were not proposed due to the general inconsistency in previous research findings and the resulting lack of an empirical foundation for any such hypotheses.

Aim 3

The third aim of this study was to investigate whether benefit-finding mediates the relationship between dispositional optimism and psychological adjustment among mothers of VLBW infants.

Hypothesis 3. It was hypothesized that benefit-finding would mediate the relationships between dispositional optimism and psychological well-being and between dispositional optimism and psychological distress. Although this has not been widely examined in previous studies, Davis et al. (1998) found that benefit-finding served as a mediator between dispositional optimism and distress in bereaved individuals. In addition, although they did not specifically examine benefit-finding as a mediator, Tennen et al. (1992) found that dispositional optimism was positively associated with benefit-finding and positive mood, and that benefit-finding was also positively associated with mood. Therefore, benefit-finding may also have mediated the relationship between optimism and mood in this study.

The following corollaries to this hypothesis, which must first have been demonstrated in order to test benefit-finding as a mediator, were also proposed. Dispositional optimism would be positively associated with measures of psychological well-being, controlling for possible covariates, such as those described in Hypothesis 1a. It was also hypothesized that dispositional optimism would be negatively associated with measures of psychological distress, again controlling for any potential covariates, such as those described in Hypothesis 1a. Finally, it was hypothesized that dispositional optimism would be positively associated with benefit-finding.

Aim 4

The final aim of the proposed study was to verify the presence of the five scales of the PTGI documented by the authors in their original research (Tedeschi & Calhoun, 1996).

Hypothesis 4a. It was hypothesized that confirmatory factor analysis of the PTGI (Tedeschi & Calhoun, 1996) among mothers of VLBW infants would corroborate the factor structure documented by the authors in the original analyses. Tedeschi and Calhoun found the presence of five scales, which they designated New Possibilities, Relating to Others, Personal Strength, Spiritual Change, and Appreciation of Life. Although the inventory as a whole has been found to show high internal consistency ($\alpha = .90$), the five factor-analytically derived subscales have documented somewhat lower internal consistency: Relating to Others ($\alpha = .85$), Spiritual Change ($\alpha = .85$), New Possibilities ($\alpha = .84$), Personal Strength ($\alpha = .71$), and Appreciation of Life ($\alpha = .67$). Test-retest reliability coefficients ranged from .65 to .74 for Relating to Others, Spiritual Change, and New Possibilities, but were only .47 for Appreciation of Life and .37 for Personal Strength. Moreover, original analysis of the factor structure of the PTGI was conducted assuming that these five factors were uncorrelated. From a conceptual perspective, this statistical procedure may not have been optimal in uncovering the true underlying factor structure. As a result, while the scale as a whole appears to have good psychometric properties, re-analysis of the factor scales is warranted. In case confirmatory factor analysis of the PTGI failed to corroborate the original factor structure, it was planned that these analyses would be followed up by an exploratory factor analysis aimed at identifying a new factor structure that would be more appropriate for use within the current population.

Chapter 2: Method

Participants

Participants were 68 biological mothers of VLBW (<1500 grams) survivors who were cared for in the UNC Hospital's Neonatal Critical Care Units (NCCU). Mothers were excluded if they were under 18 years of age, were not English-speaking, had given birth to higher order multiples (triplets or greater), or had an infant with multiple congenital anomalies. Out of 79 eligible individuals, 5 women never returned packets that were either left for or mailed to them (6%), 4 mothers declined to participate (5%), and 2 were not able to be reached (3%). Mothers in the sample ranged from 18 to 44 years, with a mean age of 29.15 years ($SD = 7.22$). The ethnic/racial distribution was 63.2% non-Hispanic white, 27.9% African-American or black, 4.4% Hispanic, and 4.4% Asian/Pacific Islander. Eighty-four percent of mothers were either married, engaged, or living with a partner. Regarding educational attainment, 14.7% of mothers had completed less than twelve years of education, 26.5% had obtained a high school degree or GED, 45.6% had completed college or vocational training beyond high school, and 13.2% had completed graduate training. The majority of women were not working at the time of the assessment (79.4%); those who were reported working an average of 30.89 hours ($SD = 13.07$; range = 10 to 55) per week. Most mothers in the sample were primiparous (64.7%); sixteen percent of the participants had given birth to twins, resulting in a total of 79 infants. At the time of the assessment, infants in the sample were, on average, 28.38 days old ($SD = 4.68$; range = 19 to 40). Infants' mean birthweight was 1018.59 grams ($SD = 283.49$; range = 420 to 1508) and average gestational

age was 28 weeks ($SD = 2.08$; range = 24 to 32). Fifty-three percent of the infants were female.

Measures

The Post-Traumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996) is a self-report instrument designed to assess positive outcomes and benefit-finding in people who have experienced traumatic events. The PTGI has 21 items that load onto five factors: New Possibilities, Relating to Others, Personal Strength, Spiritual Change, and Appreciation of Life. The overall score on the PTGI has been shown to have adequate reliability in individuals who have recently experienced significant negative life events, with internal consistency alphas of .90 (Tedeschi & Calhoun) and .95 (Cordova et al., 2001) and a test-retest reliability coefficient over two months of .71 (Tedeschi & Calhoun). The authors also documented the scale's discriminant validity; relatively low correlations have been found between the PTGI and personality characteristics, such as optimism, extraversion, and openness to experience (Tedeschi & Calhoun). This scale has been used to assess benefit-finding in a number of studies of people who have experienced negative life events, such as women undergoing treatment for breast cancer (Cordova et al., 2001; Sears et al., 2003), parents who have lost a child (Polatinsky & Esprey, 2000), and individuals who have recently been in an accident or assaulted (Snape, 1997).

The Quality of Life Inventory (QOLI; Frisch, Cornell, Villanueva, and Retzlaff, 1992) is a 32-item self-report inventory that measures satisfaction in 16 domains, including self-esteem, goals and values, health, work, money, play, helping, love, creativity, relationship with family, friends, and children, and satisfaction with home, neighborhood, and community. Respondents rate each domain on two levels: the importance of the area and

their current satisfaction with the area. A weighted satisfaction rating is calculated for each domain by multiplying a satisfaction rating (-3 to +3, very dissatisfied to very satisfied) by the respondent's rating of the domain's importance (0 to 2, not important to extremely important). The total score on the measure is an average of all the weighted satisfaction scores for areas that had nonzero importance ratings. Total scores are then converted into T-Scores or percentiles in order to simplify interpretation. The following cut-offs have been suggested in interpreting QOLI T-Scores (Frisch et al.); 58-77, high quality of life; 43-57, average quality of life; 37-42, low quality of life; 0-36, very low quality of life. The authors have shown the QOLI to have adequate internal consistency coefficients, ranging from .77 to .89, and test-retest coefficients ranging from .80 to .91, after two weeks or more. In addition, the QOLI has good convergent validity, as its scores have shown to be highly correlated with a number of other measures of quality of life (Frisch et al.). The QOLI has been used in numerous studies of people who have experienced negative life events, including mothers of VLBW infants (Donohue, Maurin, Allen, & Strobino, 2005) and individuals who have suffered spinal cord injuries (Anson, Stanwyck, & Krause, 1993).

The Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) is a 20-item questionnaire that measures two primary dimensions of mood: positive and negative affect. The measure is comprised of twenty mood-related adjectives, ten positive and ten negative; respondents rate how often they have experienced each emotion over the past week on a 5-point Likert scale ranging from "very slightly/not at all" to "extremely." The PANAS has been demonstrated to have good internal consistency, with values ranging from .86 to .90 for Positive Affect and .84 to .87 for Negative Affect (Watson et al.). Eight-week test-retest reliability is adequate: $\alpha = .68$ and $.71$ for positive and negative affect,

respectively (Watson et al.). Finally, the PANAS has been shown to have good convergent and discriminant validity.

The Beck Depression Inventory – Second Edition (BDI-II; Beck, Steer, & Garbin, 1988) is a 21-item self-report measure that assesses symptoms of depression in adults and adolescents. Respondents describe the degree to which they have experienced symptoms of depression over the previous week; total scores can range from 0-63, with higher scores indicating a higher level of symptoms of depression. The following cutoffs have been recommended in interpreting BDI scores: 0-13, minimal symptoms of depression; 14-19, mild symptoms of depression; 20-28, moderate symptoms of depression; 29-63, extremely severe symptoms of depression.

The BDI has been shown to have excellent psychometric properties. Internal consistency values generally range from .89 to .94, and Beck, Steer, and Brown (1996) have documented test-retest reliability over a one-week interval to be .93. Favorable evaluations of the BDI-II's concurrent and discriminant validity have also been documented (Beck et al.). The BDI and BDI-II have been used in over 2000 empirical studies since the development of the BDI in 1961, including a number of studies of at-risk mothers who have recently given birth (e.g. Wilcox, Field, Prodromitis, & Scafidi, 1998), as well as mothers of medically fragile children (e.g. Manne et al., 2001).

The Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988) is a self-report questionnaire designed to measure respondents' current levels of anxious symptomatology. The BAI was developed in order to reliably discriminate anxiety from depression, as previous self-report measures of anxiety had been unable to adequately differentiate the two constructs. The BAI has 21 items, which yield two factors: somatic

symptoms and subjective anxiety symptoms. Respondents are asked to report the degree to which they have been bothered by symptoms of anxiety over the past week, on a 4-point Likert scale. The items are summed to obtain a score that can range from 0-63, with higher scores indicating higher levels of anxiety. The BAI has been shown to have high internal consistency ($\alpha = .92$) and adequate one-week test-retest reliability ($\alpha = .75$; Beck et al.). In addition, the authors have established good convergent and discriminant validity. The BAI has been used in postpartum populations (Stuart, Couser, Schilder, O'Hara, & Gorman, 1998) and in mothers of sick children (Manne et al., 2001).

The Life Orientation Test - Revised (LOT-R: Scheier, Carver, & Bridges, 1994) is a self-report measure of dispositional optimism. The LOT-R was developed in response to Scheier's criticism that the LOT (Scheier & Carver, 1985) contained 2 items ("I always look on the bright side of things" and "I'm a believer in the idea that 'every cloud has a silver lining'") that did not explicitly refer to the expectation of positive outcomes. Consequently, the authors dropped these two items in the revised scale. The LOT-R consists of six coded items plus four fillers. Three of the coded items are phrased positively ("Overall, I expect more good things to happen to me than bad") and three are phrased negatively ("If something can go wrong for me, it will"). Respondents rate the extent to which they agree with each item on a 5-point Likert scale, ranging from "I agree a lot" to "I disagree a lot." Internal consistency ratings are adequate, ranging from .78 (Scheier et al.) to .80 (Antoni et al., 2001), and test-retest reliability is strong: $r = .81$ over a 3-month and a 6-month period (Antoni et al.). The LOT-R has also been demonstrated to have good concurrent and discriminant validity (Scheier et al.). The LOT and LOT-R have been used in a number of studies of individuals who have experienced negative life events, including women with breast cancer

(Antoni et al.), patients with rheumatoid arthritis (Tennen et al., 1992), and bereaved family members (Davis et al., 1998).

The Medical Outcomes Study Social Support Survey (MOS-SSS; Sherbourne & Stewart, 1991) is a 19-item questionnaire that measures the availability of four types of social support: tangible support, emotional support, positive interactions, and affection.

Respondents are asked to describe the frequency with which support is available to them on a 5-point Likert scale ranging from “none of the time” to “all of the time.” The measure has been shown to have good internal consistency, with values ranging from .94 (Soet, Brack, & Delorio, 2003) to .97 (Sherbourne & Stewart) and adequate one-year test-retest reliability ($\alpha = .78$; Sherbourne & Stewart). The authors have also demonstrated high convergent and discriminant validity. Although this study was normed on 2987 patients with chronic conditions, its uses have been extended to caregivers of the chronically ill or medically fragile (Young et al., 2003) and to expectant mothers (Soet et al.).

A Participant Information Form was used in order to collect information on the respondent’s age, race/ethnicity, educational attainment, occupation, household income, marital status, living arrangement, number and ages of children, religious affiliation, spirituality, history of depression, history of anxiety, and history of treatment for depression and anxiety.

Information on history of depression and history of treatment for depression was ascertained according to the methods delineated by Coyne, Thompson, and Racioppo (2001). Participants were asked to respond “yes” or “no” to the question “Have you ever in your lifetime had 2 weeks or more when nearly every day you felt sad, blue, or depressed, or in which you lost all interest in things like work or hobbies or things you usually liked to do for

fun?” Respondents who responded “yes” to this question answered three follow-up questions that inquired whether: a) the respondent’s work, school, or relationships suffered; b) the respondent had taken medication for the condition; c) the respondent had received treatment from a doctor or mental health specialist. Participants who answered in the affirmative to the initial question and any one of the three probes were considered to have a history of depression, whereas participants who answered in the affirmative to the initial question and either of the treatment seeking probes were coded as having a history of treatment for depression. The authors documented sensitivity of 63% and specificity of 43% when coding for history of depression, as compared to sensitivity of 38% and specificity of 74% when coding for history of treatment for depression. Similar questions, derived from Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000), were developed in order to assess history of anxiety and history of treatment for anxiety. The initial question posed for history of anxiety was: “Have you ever in your lifetime had 6 months or more when on most days you worried or felt anxious about a number of events or activities (like work or school performance)?” The four follow-up probes inquired whether: a) the respondent found it difficult to control the worry; b) the respondent’s work, school or relationships suffered; c) the respondent had taken medication for the condition; d) the respondent received treatment from a doctor or mental health specialist. As with the series of questions on depression, respondents were considered to have a history of anxiety if they answered in the affirmative to the initial question and any of the probes. A history of treatment for anxiety was documented for respondent who answered affirmatively to the first question and either of the treatment-seeking probes.

The Score for Neonatal Acute Physiology - Version II (SNAP-II; Richardson, Corcoran, Escobar, & Lee, 2001) and the Score for Neonatal Acute Physiology, Perinatal Extension – Version II (SNAPPE-II; Richardson et al.) were calculated in order to provide quantitative measures of infant illness severity. The SNAP-II was developed as a predictor of mortality, morbidity, and resource use, and is frequently used in assessing neonatal risk in VLBW infants. Scores are based on six physiological risk factors collected over the first 12 hours of life; these include mean blood pressure, lowest temperature, PO₂/FIO₂ ratio, serum pH, the presence of multiple seizures, and urine output. SNAP-II scores are calculated by totaling point values associated with each event, and can range from 0 to 115. The SNAPPE-II adds points to the SNAP-II for three perinatal risk factors (low birthweight, being small for one's gestational age, and low Apgar score) that are independent from the physiological problems used to calculate the SNAP-II. Therefore, the SNAPPE-II represents combined physiological and perinatal mortality risks, and can range from 0 to 162 points. The SNAP-II has been found to be particularly useful as a measure of newborn illness severity, while the SNAPPE-II is a better predictor of mortality risk (Dorling, Field, & Manktelow, 2005). The SNAPPE-II has been shown to have both excellent discrimination ($A_z = 0.91$) and goodness of fit (Hosmer-Lemeshow = 0.90).

Procedure

Mothers of VLBW infants were identified through a log book updated daily of new admissions to the UNC NCCC. Mothers were approached 3 to 5 weeks post-delivery, and only once the infant had been stabilized and was not critically ill, as confirmed by a member of the infant's medical treatment team. Prior to the time of enrollment, the potential participant was left a letter in her NCCC mailbox that briefly described the study and

informed the caregiver that the study coordinator would be contacting her in a few days. Following receipt of the letter by the potential participant, the study coordinator followed up via a phone call or a face-to-face contact in the NCCC. At this point, mothers were provided with more detailed information about the study and were given the opportunity to ask any questions they had about the study. If the mother indicated that she was willing to participate, an appointment was set for a day and time convenient for her. At this subsequent meeting, the study coordinator provided the potential participant with the consent form detailing the procedures involved in the study, and reviewed the information contained therein. If the mother agreed to participate, the study coordinator obtained written informed consent. The participant was then asked to complete the study questionnaires. The assessment generally took approximately 30 to 40 minutes to complete. Once the measures were completed, there was a debriefing period, during which the participant was given detailed information as to the purpose and rationale of the study and invited to discuss any questions or concerns. Each mother was also offered a typed page of information on mental health resources in her area. In addition, it had been arranged that a designated member of the hospital staff would be notified if a participant appeared significantly distressed after the assessment, or indicated any thoughts about harming herself or anyone else, either verbally or on the BDI; the need for this never arose, however, as none of the participants became upset during the assessment nor revealed thoughts of harm. In cases where infants were transferred to another hospital within the first 3 weeks after birth, the above procedures were completed by phone and mail, rather than in person. Mothers were given the choice of hospital parking passes and/or food vouchers totaling \$8.00 (or a check equal to this value for those completing the measures by mail) as a small incentive for participating.

After completion of the assessment, SNAP-II and SNAPPE-II were calculated independently from information obtained from the infant's medical record. History of depression, history of anxiety, history of treatment for depression, and history of treatment for anxiety were calculated according to the methods described previously.

Chapter 3: Results

Descriptive Information and Bivariate Relationships Between Benefit-Finding and Measures of Positive and Negative Adjustment

Descriptive information on the mean, standard deviation, and range of mothers' scores on the Post-Traumatic Growth Inventory are presented in Table 1. As can be seen, participants in the present study had values on the PTGI that were comparable to those noted in other studies. Internal consistency of the PTGI was examined in order to justify its use as a unidimensional measure of benefit-finding within this population; good internal consistency was demonstrated ($\alpha = .95$).

Descriptive information on the means, standard deviations, and ranges of mothers' scores on the outcome measures and the LOT-R are presented in Table 2. According to the recommended cut-offs for categorizing quality of life (Frisch et al., 1992), 33.8% of mothers reported a high quality of life, 47.1% reported an average quality of life, 10.3% reported a low quality of life, and 8.8% reported a very low quality of life. Utilizing the cut-offs suggested by Beck, Steer, and Brown (1996) for categorizing levels of depressive symptomatology reported on the BDI, 65.2% of mothers reported minimal symptoms of depression, 19.7% reported mild symptoms, 13.6% reported moderate symptoms, and only 1 participant (1.5%) reported severe depressive symptomatology. Employing the same cut-offs for symptoms of anxiety, as measured by the BAI, 67.6% of mothers reported minimal symptoms of anxiety, 13.2% reported mild symptoms, 13.2% reported moderate symptoms, and 5.9% reported severe symptoms.

Bivariate correlations between scores on the PTGI and scores on the measures of positive and negative adjustment can be found in Table 3. These results indicated there was a significant positive association between benefit-finding and positive adjustment, as measured by quality of life and positive affect; however, the associations between benefit-finding and measures of negative adjustment were not significant.

Preliminary Analyses

Normality analyses of the outcome variables indicated that the distributions of both the BDI and BAI were positively skewed, whereas the distribution of the QOLI was negatively skewed. To address these non-normal distributions, all three were successfully transformed utilizing square-root transformations. Analyses were then carried out twice, once using the non-normally distributed variables, and once using the transformed variables. Comparison of results from both of these sets of analyses indicated no major differences, particularly as concerned benefit-finding, the predictor of interest; consequently, results from the analyses utilizing the non-transformed variables are reported to facilitate interpretation.

Correlations between measures of positive and negative adjustment are presented in Table 3. As can be seen, the correlations between symptoms of depression and symptoms of anxiety were quite high. In order to ensure that these were not isomorphic constructs, analyses of multicollinearity were conducted in all relevant analyses; no problems were detected. In examining the measures of positive adjustment, the correlation between positive affect and QOLI was significant, but moderate. Multicollinearity analyses also revealed no problems in analyses containing both variables.

Before proceeding with the analyses, a missing values analysis was conducted using the entire data set in order to determine the presence of any concerning patterns. Analyses

revealed a problem with maternal income, where 8 observations (11.8% of the entire data set) were missing. Separate variance t-tests indicated that there was a systematic relationship between missingness on income and maternal age ($t = 5.6$ (22), $p < .001$), number of biological children ($t = 2.7$ (22), $p < .05$), and frequency of worship ($t = 2.8$ (13), $p < .05$). Women who did not report income were younger, had fewer biological children, and attended worship services less often. Due to statistical concerns that can arise from having systematic missing data, income was left out of further analyses. No other systematic patterns of missing data were detected.

Relationship Between Benefit-finding and Adjustment: Testing Hypothesis 1

Univariate Relationships

In order to identify covariates that needed to be controlled for in multivariate analyses, bivariate correlations were run to analyze the relationships between benefit finding, measures of positive and negative adjustment, maternal demographic, psychosocial, and personality variables, as well as infant variables. Categories within two of the demographic variables were collapsed due to small numbers of participants within certain of the categories. In regards to maternal ethnicity, white and non-white categories were created. Maternal education was collapsed into three categories: high school and lower, which consisted of mothers who had completed a high school education or the equivalent, or less; college, which included mothers who had completed some college or technical school, or who had attained a college degree; and graduate school, which consisted of mothers who had completed post-college education. The correlations are presented in Table 4. In order to conserve power in the identification of covariates, variables demonstrating correlations with $p < .10$ were considered potential covariates and were thus included in the multivariate

analyses described below. Moreover, variables were considered covariates if they were significantly associated with any of the outcome variables or with benefit-finding.

Regression Strategy

Multivariate and univariate analyses of benefit-finding and covariates on measures of positive and negative adjustment. To preserve power in this moderately sized sample, regression analyses were initially conducted using multivariate techniques (specifically, MANOVA). Thus, the initial positive adjustment model included both quality of life and positive affect regressed on benefit-finding, dispositional optimism, and the relevant covariates identified in the bivariate correlations. The negative adjustment model included symptoms of depression, symptoms of anxiety, and negative affect regressed on benefit-finding, optimism and relevant covariates identified in the bivariate correlations. These results were then probed using univariate multiple regression analyses.

Multiple regression analyses. Probing of the multivariate results was conducted as follows. With the intent of continuing to be conservative in controlling for potential covariates, any covariates that demonstrated an omnibus multivariate effect at a significance level of $p < .10$ were retained in univariate analyses. As benefit-finding and dispositional optimism were the primary predictors of interest, they were included in all follow-up univariate analyses. Thus univariate multiple regression models were fit for each outcome variable independently, and included benefit-finding, dispositional optimism, and the covariates identified in the multivariate results. Finally, when benefit-finding was significantly associated with the outcome in question in the multivariate analyses, probing was conducted using hierarchical regression analyses in order to investigate the unique contribution of benefit-finding in promoting adjustment.¹

Hierarchical regression analyses. A model with three steps was created for each of the outcome variables being probed. Maternal demographic and child health variables were entered in Step 1, psychosocial and personality variables were entered in Step 2, and benefit-finding was entered in Step 3. This analytical strategy was designed to help clarify whether benefit-finding had a comparable impact on all measures of psychological adjustment, as well as to examine the unique contribution of benefit-finding after controlling for other potentially important influences on psychological adjustment.

Potential violations of linear regression. Given that non-normally distributed variables were utilized in the analyses, in combination with the general importance of ensuring that the assumptions of linear regression have not been violated, residuals were carefully inspected to ensure random and normal distribution after all of the analyses. No violations were detected. In addition, checks for multicollinearity and outliers also were conducted. Although no problems with multicollinearity were found, several potential outliers were detected by close inspection of measures of influence, leverage, and distance. Due to the concern that a small group of outliers might be driving any significant results, and in the interest of being conservative, all potential outliers were dropped (9 and 6 participants in the analyses looking at measures of positive and negative adjustment, respectively) and the analyses were run again without the inclusion of these observations. Comparison of both sets of results indicated that, when dropping outliers from the positive adjustment models, the results actually strengthened existing trends; specifically, the impact of benefit-finding was intensified. When dropping outliers in the negative adjustment models, no major differences were noted. These results were deemed sufficient justification for leaving the outliers in the

analyses, as this is generally a preferable strategy; thus, the results presented below are from the analyses that utilized the entire data set.

Effects of Benefit-Finding on Measures of Positive Adjustment

Multivariate results. The results of the regression of quality of life and positive affect on benefit-finding, dispositional optimism, and the other covariates identified in the bivariate correlations are shown in Table 5. Results indicated that there was a statistically significant omnibus effect of benefit-finding, dispositional optimism, maternal age, social support, and number of biological children on quality of life and positive affect, taken together. None of the other covariates included in the model were significant at the criterion $p < .10$ level.

Hierarchical regression results with positive affect as outcome. The results of the hierarchical regression of positive affect onto benefit-finding, dispositional optimism, maternal age, social support, and number of biological children can be found in Table 6. The omnibus test associated with the model that included all predictors was significant, $F(5, 61) = 15.94, p < .0001$, and revealed that the combination of variables accounted for 53.1% of the variance in positive affect. Benefit-finding and dispositional optimism were both significantly and positively related to positive affect, as was maternal age. Number of biological children trended towards significance, such that the fewer biological children a mother had, the greater her positive affect. Social support was not significantly associated with positive affect. In examining the unique contribution of benefit-finding in predicting positive affect, benefit-finding was shown to predict a significant proportion of the variance in positive affect, over and above the contribution of the covariates described above: R^2 change = .31, F change (1, 61) = 43.80, $p < .0001$.

Hierarchical regression results with quality of life as outcome. The results of the hierarchical regression of quality of life onto benefit-finding, dispositional optimism, maternal age, social support, and number of biological children are presented in Table 7. The omnibus test associated with the model that included benefit-finding and all the covariates indicated that the combination of predictors accounted for a significant proportion of the variance (32.5%) in quality of life: $F(3, 61) = 7.35, p < .0001$. Results indicated that dispositional optimism, social support, and maternal age were all positively and significantly associated with quality of life. Benefit-finding was marginally significantly associated with quality of life, in a positive direction. The relationship between number of biological children and quality of life was not significant. Examination of the unique contribution of benefit-finding in predicting quality of life indicated that higher levels of benefit-finding predicted a marginally significant proportion of the variance in quality of life, after controlling for the covariates described above (R^2 change = .04, F change (1, 61) = 3.70, $p = .06$).²

Effects of Benefit-Finding on Measures of Negative Adjustment

Multivariate results. The results of the regression of negative affect, symptoms of depression, and symptoms of anxiety on benefit-finding, dispositional optimism, and the other covariates identified in the bivariate correlations are shown in Table 8. Results indicated that there were statistically significant omnibus effects of maternal age, education, frequency of worship, history of treatment for anxiety, and infant birthweight on the measures of negative adjustment, taken together. Contrary to hypotheses, there was not a statistically significant effect of benefit-finding or dispositional optimism on the outcome measures.

However, due to reasons discussed previously, they were both retained in subsequent analyses.

Multiple regression results with negative affect as outcome. The results of the linear regression of negative affect onto benefit-finding, dispositional optimism, maternal age, education, frequency of worship, history of treatment for anxiety, and infant birthweight are presented in Table 9. The omnibus test associated with this model was only marginally significant, $F(8, 58) = 1.79, p < .10$, and indicated that the combination of predictors accounted for 8.8% of the variance in negative affect. In this model, maternal age and dispositional optimism were negatively and significantly associated with negative affect. Benefit-finding and all other covariates were not significantly associated with negative affect.

Multiple regression results with symptoms of anxiety as outcome. The results of the linear regression of symptoms of anxiety onto benefit-finding, dispositional optimism, maternal age, education, frequency of worship, history of treatment for anxiety, and infant birthweight are presented in Table 10. The omnibus test associated with this model indicated that the combination of predictors accounted for a significant proportion of the variance (25.2%) in symptoms of anxiety: $F(8, 58) = 3.78, p < .001$. Results indicated that maternal history of treatment for anxiety and frequency of worship were both significantly and positively associated with anxiety. Maternal age was significantly associated with symptoms of anxiety such that younger mothers reported higher symptoms of anxiety. Finally, benefit-finding, dispositional optimism, maternal education and infant birthweight did not show a significant association with symptoms of anxiety.

Multiple regression results with symptoms of depression as outcome. Table 11 displays the results of the linear regression of symptoms of depression onto benefit-finding,

dispositional optimism, maternal age, education, frequency of worship, history of treatment for anxiety, and infant birthweight. The omnibus test associated with this model was significant, $F(8, 56) = 3.08, p < .01$, and indicated that the combination of predictors accounted for 20.7% of the variance in depressive symptomatology. In this model, maternal age and infant birthweight were significantly and negatively associated with symptoms of depression, while history of treatment for anxiety was significantly and positively associated with depressive symptomatology. Neither benefit-finding nor any of the other covariates were found to be significantly related to symptoms of depression

Exploratory Analyses of Potential Interaction between Benefit-Finding and Infant Illness Severity in Predicting Maternal Adjustment

Rationale. Although the exploration of interactions between benefit-finding and other variables was not an original aim, and thus no a priori hypotheses were specified, one theoretically driven potential interaction was examined for exploratory purposes. Several researchers have documented that benefit-finding appears more likely to occur when the threat associated with a stressor is higher. For example, Rini et al. (2004) documented higher levels of benefit-finding among mothers whose children were most critically ill. A similar phenomenon was noted among stem cell transplant survivors; those who had a higher number of negative post-transplant sequelae reported significantly higher levels of benefit-finding (Fromm et al., 1996). Thus, it appears as though more severe events may offer the most potential for growth. Given these findings, it seems possible that the severity of the stressor may also moderate the impact of benefit-finding on adjustment, such that benefit-finding is most valuable in promoting good outcomes in people who experience more severe stressors. Although this relationship has not been widely examined, one study examined a

similar relationship. McMillen et al. (1997) looked at benefit-finding as a moderator of the impact of trauma severity on number mental health diagnoses and found that higher trauma severity predicted better mental health outcomes among those individuals who perceived benefits. The opposite, and perhaps more interesting, relationship (whether trauma severity moderated the impact of benefit-finding on mental health outcomes) was not examined by these authors, possibly because benefit-finding was measured dichotomously. In the current study, this post hoc hypothesis was tested by determining whether infant illness severity (as measured by the infant's SNAPPE-II score) moderated the impact of benefit-finding on maternal adjustment.

Data analysis strategy. The potential interaction described above was probed as follows. Variables were centered using Z-score transformations and an interaction term was calculated. This term was added into the initial multivariate equation of positive affect and quality of life onto benefit-finding and the additional covariates identified in the bivariate correlations. Assuming a significant omnibus multivariate effect of the interaction term on positive affect and quality of life, the interaction was then added to follow-up univariate multiple regression models for positive affect and quality of life that contained the same variables entered into the hierarchical regression models, in order to ensure that all important covariates were being controlled for. Interactions were probed in the manner recommended by Aiken & West (1991).

Results of interaction. When entered into the multivariate regression of positive affect and quality of life onto benefit-finding and the covariates identified in the bivariate correlations, there was a significant omnibus multivariate effect for the Benefit-Finding X Illness Severity term ($\Delta = .83$, $F(2, 43) = 4.36$, $p = .02$). Results from the multiple

regression models (one model for each of three levels of illness severity: high, medium, and low) of positive affect on benefit-finding, infant illness, the interaction term, and the other covariates are displayed in Tables 12 through 14. Although the interaction between benefit-finding and infant illness severity is significant, results indicate that benefit-finding is significantly and positively associated with positive affect across all levels of illness severity. Results from the linear regression models of quality of life on benefit-finding, infant illness, their interaction, and important covariates (Tables 15 – 17) indicate that illness severity plays a significant role moderating the effect of benefit-finding on quality of life. When infant illness severity was low or medium, the relationship between benefit-finding and quality of life was not significant, whereas when infant illness severity was high, benefit-finding and quality of life were significantly and positively associated. This relationship is depicted in Figure 1.

Variables Associated with Benefit-Finding: Testing Hypothesis 2

Multiple regression was used in order to explore which maternal demographic and psychosocial variables were associated with benefit-finding in this population, while simultaneously controlling for the effects of other covariates. In this model, benefit-finding was regressed on all of the variables found to be associated with benefit-finding at the $p < .10$ level in the bivariate correlations. Thus, benefit-finding was regressed on maternal age, ethnicity, education, number of biological children, spirituality, frequency of worship, and social support. The results of this model are presented in Table 18. The omnibus test of the model was significant, $F(8, 58) = 5.28, p < .0001$, and indicated that the combination of predictors accounted for 34.2% of the variance in benefit-finding. Social support was significantly and positively associated with benefit-finding. Ethnicity was also significantly

associated with benefit-finding, such that white mothers reported significantly lower levels of benefit-finding than non-white mothers. The association between benefit-finding and maternal age was marginally significant, with younger mothers reporting higher levels of benefit-finding, on average, than older mothers. Contrary to hypothesized findings, there was not a significant association between benefit-finding and maternal education. There was also not a significant association between benefit-finding and number of biological children, frequency of worship, and spirituality. The relationship between benefit-finding and income could not be examined due to the exclusion of income from the analyses.

Benefit-Finding as a Mediator of the Relationship between Optimism and Adjustment:

Testing Hypothesis 3

One of the primary aims of the present study was to test the hypothesis that benefit-finding would mediate the relationship between dispositional optimism and adjustment, both positive and negative. This hypothesis was predicated on the assumption that benefit-finding would be associated with dispositional optimism, as this is a prerequisite for benefit-finding serving as a mediator. However, the correlation between benefit-finding and dispositional optimism was negligible ($r = .04, p = .72$), thus eliminating the need to further test this hypothesis.

Exploratory Factor Analysis of the Post-Traumatic Growth Inventory: Testing Hypothesis 4

Because confirmatory factor analysis of the 5-factor structure initially identified by Tedeschi & Calhoun (1996) was not possible due to the relatively small sample size recruited in the present study, exploratory factor analysis (EFA) was conducted in order to identify alternative structures.

EFA strategy. Determination of the optimal number of factors to extract was accomplished through examination of a scree plot and eigenvalues. If more than one possible solution emerged, all models were tested so the results could be compared with regard to interpretability and consistency with theory. Principal components analysis (PCA) was utilized to determine the number of factors to extract; however, due to potential problems associated with PCA, which assumes no measurement error, principal factor analysis (PFA) was used thereafter. Each model was run using promax, which begins with an orthogonal rotation and proceeds to an oblique rotation; examination of results from both types of rotations were conducted to ensure that the most optimal solution, both from a theoretical and a mathematical perspective, would be identified. It was hypothesized that an oblique rotation would be preferable, as this allows for correlation among factors. Solutions were compared by examining communality estimates and cross-loadings.

EFA results. The scree plot and eigenvalues indicated that a one-factor solution might be optimal (see Table 19); however, two-, three-, and four-factor solutions also appeared to be possibilities and were thus extracted. Each of the orthogonal rotations was discarded in favor of the oblique rotations due to a large number of cross-loadings in excess of .40. The remaining models (two-, three-, and four-factor solutions using an oblique rotation) were then examined to identify the best solution. Of these, the four-factor solution was excluded due to several items with cross-loadings in excess of .40, as well as one factor being defined by only two items. The three-factor solution was also excluded; although fewer items had cross-loadings higher than .40, a large number had cross-loadings in excess of .30 and, again, one factor was defined solely by two items. The remaining two-factor solution was then examined. This solution, albeit better than the others examined, did not

appear to be preferable to a single-factor solution for several reasons. First, the two factors were highly correlated ($r = .76, p < .0001$). Second, the eigenvalue of the first factor was 10.65, which is quite large and implies a high inter-item correlations and the eigenvalue of the second factor was only 1.82. As mentioned previously, examination of the scree plot also suggests a single factor. Third, with a single exception (item 14 = .49), factor loadings for all items on the unrotated first factor ranged from .55 to .79, suggesting there is a common dimension. Finally, and perhaps most importantly, the items that loaded on the first and second factors were not conceptually distinguishable. Thus, all evidence from the EFA supported a single-factor solution.

*Relationship between Domains of Benefit-Finding and Adjustment: Addressing
Hypothesis 1c*

Strategy. Although the EF in this sample did not support individual factors within benefit-finding, several prior studies have investigated specific domains of this construct. Based on the findings within this literature, a priori hypotheses were made regarding two specific domains: Relating to Others and Personal Strength. Thus, despite the lack of evidence for individual factors, analyses were still conducted to test these a priori hypotheses. Methods utilized were similar to those described previously in analyses examining the association between total PTGI and measures of adjustment; in this case, the five subscales of the PTGI replaced the total PTGI score in both the MANOVA and follow-up multiple regressions. Results regarding the two domains of interest are reported below.

Results. In the MANOVA of positive affect and quality of life regressed on the PTGI subscales and relevant covariates specified in the previous multivariate analyses, there was a significant omnibus multivariate effect of Relating to Others ($\lambda = .74, F(2, 32) = 5.62, p =$

.01) on the outcomes, whereas Personal Strength was not significantly associated with the outcomes ($\lambda = .96$, $F(2, 32) = 0.73$, $p = .49$). Results from the follow-up multiple regressions, however, indicated that neither Relating to Others nor Personal Strength was significantly associated with positive affect ($\beta = -.03$, $p = .86$; $\beta = .13$, $p = .48$, respectively) or quality of life ($\beta = .34$, $p = .12$; $\beta = .12$, $p = .60$, respectively).

Results from the MANOVA of negative affect, symptoms of anxiety, and symptoms of depression regressed on the PTGI subscales and other previously identified covariates, revealed the reverse: there was a statistically significant omnibus multivariate effect of Personal Strength on the measures of negative adjustment ($\lambda = .75$, $F(3, 34) = 3.75$, $p = .02$), whereas Relating to Others was not significantly associated with the outcome variables ($\lambda = .88$, $F(3, 34) = 1.53$, $p = .23$). Probing of these results using multiple regression indicated the following. In the follow-up univariate regression of symptoms of depression on the PTGI categories, controlling for covariates, Relating to Others was marginally significantly associated with symptoms of depression ($\beta = .41$, $p = .06$), indicating that mothers who reported higher benefit-finding in this domain also reported more elevated symptoms of depression; this was in contrast to hypothesized findings. Personal Strength was significantly associated with symptoms of depression ($\beta = -.45$, $p = .05$), such that, as hypothesized, mothers who reported higher benefit-finding in this area reported lower symptoms of depression. In the regression of negative affect on PTGI categories, neither Relating to Others nor Personal Strength were significantly associated with negative affect ($\beta = .28$, $p = .14$; $\beta = .06$, $p = .74$, respectively). Similar results were found in the follow-up regression of symptoms of anxiety: Relating to Others ($\beta = .33$, $p = .12$) and Personal Strength ($\beta = -.12$, $p = .57$) were non-significant.

Footnotes

¹ In order to ensure that no potentially important covariates were being excluded from the follow-up multiple regression analyses due to the lack of an omnibus multivariate effect in the MANOVAs, a second set of multiple regression analyses was conducted. This set of analyses bypassed the multivariate regressions and proceeded directly to multiple univariate regression from the results of the bivariate correlations. The procedures followed for these analyses were identical to those described for the analyses driven by the MANOVA results. Comparison of the results from two sets of analyses indicated that the differences in the role of benefit-finding in predicting positive and negative adjustment was minimal; benefit-finding was important as a predictor of positive outcomes and unimportant in predicting negative outcomes in both sets of analyses.

² When dropping number of biological children, which was not significantly associated with quality of life in the hierarchical regression model, benefit-finding moved from being marginally significant to fully significant ($\beta = .22, p = .05$). In addition, once number of biological children was dropped from the model, benefit-finding was found to account for a significant proportion of the variance in quality of life, over and above the demographic, psychosocial, and personality variables initially entered into the model: R^2 change = .04, F change (1, 62) = 3.92, $p = .05$.

Chapter 4: Discussion

The present findings extend the study of benefit-finding and its impact on positive and negative adjustment to a sample of mothers of VLBW infants, a population that has not previously been examined in this context. This line of research was begun within medically ill and traumatized populations in an attempt to determine which factors promote successful psychological adaptation to a negative life event. The findings of this study indicate that benefit-finding may play an important role in facilitating psychological adaptation among mothers with VLBW infants. As predicted, benefit-finding was significantly associated with positive psychological outcomes, particularly positive affect. Interestingly, there was an interaction between benefit-finding and infant health, such that the relationship between benefit-finding and quality of life was strongest among women whose infants were more critically ill in the neonatal period. Contrary to hypotheses, there was no association between benefit-finding and measures of negative adjustment, nor between benefit-finding and dispositional optimism.

Previous studies that have examined the role of benefit-finding in facilitating adjustment to a traumatic event have documented somewhat mixed findings; a number of researchers have found a significant negative relationship between benefit-finding and distress (e.g. Carver & Antoni, 2004; Davis et al., 1998), whereas others have documented no significant association between the two (e.g. Mohr et al., 1999; Pakenham, 2005). The variability in findings may be related to methodological limitations, including not using a quantitative measure of benefit-finding that has good psychometric properties, and failure to

control for important demographic, psychosocial, and personality-related covariates. The present study addressed these methodological problems by using the PTGI, a well-validated measure of benefit-finding, and by controlling for a number of potential covariates in the analyses, while also extending the benefit-finding literature to a previously under-studied population. In addition, relatively little attention has been paid to the relationship between benefit-finding and positive adjustment. In studies that have looked at both positive and negative adjustment, there is some indication that benefit-finding may exert a more powerful impact on positive outcomes than negative ones (Curbow et al., 1993; Pakenham, 2005; Park & Fenster, 2004). The present findings clearly support this notion. Finally, there continues to be significant debate as to the nature of benefit-finding, and its conceptual distinction from other similar constructs, such as dispositional optimism. In the present sample, benefit-finding and dispositional optimism were found to be clearly distinct, and all effect of benefit-finding were above and beyond those of optimism. The implications of these findings are discussed below in more depth.

Benefit-Finding and Positive Adjustment

The findings from the present study add to the growing evidence of a relationship between benefit-finding and positive outcomes that is stronger and more consistent than that between benefit-finding and negative outcomes. Moreover, these results indicate that benefit-finding not only is present shortly after the occurrence of a traumatic stressor (3-5 weeks in the current sample), but also is strongly associated with positive adjustment. These are encouraging findings; although participants were continuing to experience negative affect and symptoms of distress, they were able to simultaneously experience positive outcomes as well. Individuals who are capable of experiencing positive outcomes in conjunction with

negative ones in the short-term may be more likely to continue experiencing positive outcomes in the longer-term, and also may be better equipped, psychologically, to manage their symptoms of distress.

In this sample, although benefit-finding was significantly associated with both positive outcomes when taken together, it was more strongly associated with positive affect than it was with quality of life when they were examined individually. Benefit-finding accounted for 31% of the variance in positive affect, over and above other covariates, as opposed to only 4% of the variance in quality of life. It is unclear what accounts for this finding; positive affect may be an outcome that is more easily and quickly affected than quality of life. Conversely, it is possible that those individuals higher in positive affect are more likely to report higher levels of benefit-finding. Only one other study has examined the association of benefit-finding with both positive affect and quality of life (more specifically, life satisfaction) (Pakenham, 2005); as in the current study, findings from this research indicated that benefit-finding was significantly associated with both outcomes, but was more strongly related to positive affect.

A stronger significant relationship between benefit-finding and quality of life was found for mothers whose infants were most severely ill at birth, whereas the relationship between benefit-finding and quality of life was not significant in mothers whose infants were moderately or not severely ill at birth. These findings are partially consistent with those of McMillen et al. (1997), who reported that severity of the disaster exposure was positively associated with degree of mental health recovery only among individual who perceived benefits. Although the authors did not report these analyses, careful inspection of results indicates a much clearer distinction between the impact of benefit-finding and lack thereof at

higher severity of trauma exposure. Thus, both of these sets of findings indicate that benefit-finding may be particularly important in the context of more traumatic events.

Benefit-Finding and Negative Adjustment

In this sample, no association was found between benefit-finding and negative adjustment. These results were not consistent with hypothesized findings, but are not completely unexpected, as a number of researchers have documented similar results (e.g. Mohr et al., 1999). There are a number of possible explanations for the lack of association between benefit-finding and measures of negative adjustment in the present study. First, the findings may be related to the proximity of the assessment to the stressor. In this sample, mothers completed study measures 3 to 5 weeks post-partum; the majority of the studies that have found an association between benefit-finding and symptoms of distress were conducted well after the occurrence of the stressor (e.g. 5-8 years, Carver & Antoni, 2004; 1 year, Frazier et al., 2001; 3 years, McMillen et al., 1997). In the present sample, it is understandable, even expected, that symptoms of distress would still be elevated; thus, perhaps benefit-finding initially has an impact on positive adjustment, which over time may serve to buffer against negative adjustment. Curbow et al. (1993) measured both positive and negative changes in their sample of bone marrow transplant survivors and found that negative changes were more strongly associated with measures of negative adjustment. Similar findings were reported by Updegraff et al. (2002) in their sample of HIV positive women. Although negative changes were not assessed in the present sample, it seems likely that mothers were continuing to experience an elevated number of stressors (frequent trips to hospital, separation from family and friends, etc.) at the time of assessment, which may have been exerting undue influence on negative adjustment domains. Thus, it is possible that

benefit-finding would be able to wield a more significant impact on negative adjustment once negative changes had dissipated somewhat.

Another possibility is that changes in certain domains of benefit-finding are significantly associated with negative adjustment, whereas changes in other domains are associated in the opposite direction (or not at all), thereby obscuring the picture as a whole. Empirical support for this hypothesis is limited, as few researchers have examined the relationship between more than one domain of benefit-finding and adjustment. However, in one of the few studies that did address this issue, Pakenham (2005) found that benefit-finding in the realm of Family Relations was significantly and positively associated with negative affect, while benefit-finding in the Personal Growth domain did not have a significant relationship with negative affect. In the present sample, results were supportive of a one-factor solution, thus indicating that examination of individual domains was quite tenuous and should not inform any substantive interpretations. However, it is interesting to note that finding benefits in the domain of Personal Strength was significantly and negatively associated with symptoms of depression, whereas finding benefits in the Relating to Others subscale was positively associated (albeit marginally) with symptoms of depression. It is possible that, within this sample, noting positive changes in one's relationship with others was associated with a temporary increase in distress, as mothers were often separated from their families and having to spend increased amounts of time alone in the hospital. Perhaps once an infant has been discharged and the mother can return home perception of benefits in one's relationship with others would result in the expected association with symptoms of distress.

It has also been suggested that the conflicting findings in assessment of the relationship between benefit-finding and negative adjustment may be caused by the tendency of some who report growth to deny certain of the more negative aspects of their experiences (Park, 1998). A related perspective is that perceiving personal growth is a way for some to cope with trauma, and that these individuals may actually exaggerate self-improvement as a way to help alleviate distress (McFarland & Alvaro, 2000). While these are certainly plausible interpretations of the mixed findings in the benefit-finding literature, testing their accuracy would be challenging, if not impossible.

Benefit-Finding and Dispositional Optimism

The findings from the present study add further support to the idea that benefit-finding and dispositional optimism are two very distinct constructs. This was demonstrated not only by the lack of association between benefit-finding and dispositional optimism in the bivariate correlations, but by the significant contribution of benefit-finding over and above optimism in the prediction of positive psychological outcomes. Thus, there is strong evidence that both of these constructs are independent from one another and uniquely valuable in their associations with positive adjustment.

The utter lack of association between benefit-finding and dispositional optimism was contrary to a priori hypotheses, and somewhat surprising, given that these constructs have been found to be associated in several other studies (e.g. Rini et al., 2004). However, many of the studies that found an association between benefit-finding and dispositional optimism utilized the original LOT to measure optimism (Curbow et al., 1993; Park et al., 1996; Rini et al., 2004; Tennen et al., 1992). Two items thought to potentially measure benefit-finding (“I always look on the bright side of things” and “I’m a believer in the idea that ‘every cloud has

a silver lining”) were dropped from the LOT to create the LOT-R; thus, the association found between benefit-finding and optimism when using the LOT may have been a function of overlap in the constructs being measured. In studies using the LOT-R to measure optimism, Antoni et al. (2001) found no association between benefit-finding and dispositional optimism at baseline or post-treatment assessments (a modest association was found between them at 3- and 9-month follow-ups), and Park and Fenster (2004) found no association between dispositional optimism at Time 1 and benefit-finding six months later ($r = .03$). Thus, there is accumulating evidence that the relationship between dispositional optimism and benefit-finding may, in fact, be significantly weaker than originally thought.

Correlates of Benefit-Finding

Results from the present study appear to add support to the idea that benefit-finding is present shortly after the occurrence of a significant stressor, rather than needing time to develop. This is an important finding, as people who are able to quickly begin to find benefits in a traumatic experience may be able to more efficiently and successfully adjust to the demands associated with that experience.

In regards to research examining sociodemographic correlates of benefit-finding, there has been a fair amount of inconsistency. Some studies have found a negative association between age and benefit-finding (e.g. Davis et al., 1998; Lechner et al., 2003), whereas others have found no association (e.g. Mohr et al., 1999; Tomich & Helgeson, 2004). In looking at the association of education and income with benefit-finding, benefit-finding has been positively associated with education and income in some studies (e.g. Updegraff et al., 2002), unassociated with education and income in others (e.g. Lechner et al., 2003), and negatively associated with education and income in at least one (Tomich &

Helgeson, 2004). In short, there remain a number of contradictions that need to be further explored. These disparities may be partially explained by the enormous variety in the types of populations being assessed, the length of time that has elapsed since the stressor, etc. In addition, to the author's knowledge, only one study (Manne et al., 2004) has examined sociodemographic correlates of benefit-finding in a multiple regression equation (as opposed to bivariate correlations), such that the unique contribution of potential correlates are assessed.

In the present study, benefit-finding was regressed onto all of the potential covariates that were found to be significant in the bivariate correlations, thereby enabling examination of the unique contribution of each covariate, controlling for the effects of the others. Results indicated that non-white ethnicity and higher levels of social support were all associated with higher levels of benefit-finding. Although extensive interpretation of these results is not warranted given the exploratory nature of these analyses, there are potential explanations for these results.

Regarding the finding that non-white mothers reported higher levels of benefit-finding than white ones, Tomich and Helgeson (2004) documented a similar trend in their sample. They went on to propose that this association may be related to the tendency of minorities to rely on religious coping as a way to search for significance in negative events (Pargament, 1997). Even though frequency of worship or spirituality were not associated with benefit-finding in this sample, it is possible that the simple questions used in the present study did not adequately assess the use of religion as a coping mechanism. It has also been suggested that non-white women face more negative experiences throughout their lives, and

may therefore be more accustomed to searching for benefits as a way of coping with adverse events (Tomich and Helgeson).

The positive association between social support and benefit-finding is not a surprising one, as having someone to talk to may facilitate the cognitive processing of the trauma thought to be necessary in order to engage in benefit-finding (Tedeschi & Calhoun, 2004). This hypothesis has been supported by previous research; among others, Nolen-Hoeksema and Larson (1999) found that seeking social support was significantly associated with benefit-finding in their sample of breast cancer patients, and Cordova et al. (2001) reported lower levels of benefit-finding in individuals whose friends and families were unwilling to engage in discussion with participants about their illness. Further such analyses in this and other populations may provide a more comprehensive and clear understanding of the association between benefit-finding and various sociodemographic correlates.

Domains of Benefit-Finding

The results from this study suggest that there is more justification for assessment of benefit-finding as a unitary construct than there is for assessment of benefit-finding domains. Across the benefit-finding literature, solid support for the examination of benefit-finding as a global construct has consistently been demonstrated, while there has been little agreement as to what domains of benefit-finding should be assessed, or whether domains of benefit-finding are, in fact, meaningful (Park, 2004). Factor analyses of the PTGI and other scales have produced a variety of factor structures; for example, Tedeschi and Calhoun (1996) identified five domains on the PTGI, McMillen and Fisher (1998) found eight domains in their analysis of the Perceived Benefits Scale, and six domains were identified by a third set of researchers (Armeli, Gunthert, & Cohen, 2001). Analyses of the same scale in different samples drawn

from a similar population have also yielded distinct results. In a sample of breast cancer survivors, Tomich and Helgeson (2002) used Behr's Positive Contributions Scale (Behr, Murphy, & Summers, 1992) and identified two distinct factors. When using the same scale in another sample of breast cancer survivors (2004), factor analyses indicated that use of the scale as a whole was preferable. Other researchers have also found justification for a single primary underlying factor structure (Antoni et al., 2001; Best, Streisand, Catania, & Kazak, 2001). In short, there remains considerable need for further investigation in the area of benefit-finding domains, with identification of domains driven and supported not just by statistical analyses, but by relevant theory. Until such investigation occurs, examination of benefit-finding as a single global construct is likely to be more psychometrically sound than is analysis of benefit-finding domains.

Limitations

Several limitations of this study deserve mention. First, the cross-sectional design of the study does not permit any interpretations of a causal nature between benefit-finding and adjustment. Rather, conclusions can only be drawn as to the presence of an association between variables of interest. For example, as mentioned above, higher benefit-finding may be resulting in higher levels of positive affect; however, it is also possible that women with higher levels of positive affect are more able to perceive benefits in their traumatic experiences. Alternatively, a third underlying factor may be resulting in higher levels of both benefit-finding and positive affect. In order to begin to examine cause and effect, a longitudinal design is necessary. Such a design would also be useful in assessing change in benefit-finding over time, which was not possible in the present study.

Another limitation was the moderately small sample size. Although sufficient power was obtained for the main analyses, it was not possible to carry out a CFA of the PTGI, which had been one of the original aims of the study.

Third, generalizability of these results may be limited due to certain characteristics of the sample. Mothers were recruited once their infants were medically stable and out of crisis; although there continued to be uncertainty as to long-term outcomes for the infants, immediate danger had largely passed. Thus, these participants may have responded differently from medically ill populations whose outcomes may be yet unknown (e.g. breast cancer patients). In addition, participants in this sample were unusual in that their own health and survival was not in question; rather, the threat was to their newborn infants. Therefore, the nature and experience of benefit-finding may be different in a population that has not been personally threatened in the same manner as some of the other populations previously studied.

Finally, a potential limitation was the timing of recruitment, which was closer to the occurrence of the stressor (3 to 5 weeks) than most other assessments of benefit-finding have been. Thus, it is possible that benefit-finding had not yet had sufficient time to exert an impact on measures of negative adjustment. On the other hand, the early assessment of benefit-finding in this sample had the advantage of demonstrating that benefit-finding does occur quickly after the occurrence of a traumatic event and that it may have an effect on measures of positive adjustment almost immediately.

Implications and Future Directions

The results from the present study provide support for the role of benefit-finding in promoting positive adjustment within the context of an ongoing stressor. Even if benefit-

finding is limited in its ability to attenuate the negative sequelae of a trauma, its possible role in heightening positive adjustment may be crucial in promoting good outcomes in those suffering from negative life events. In addition, the findings indicate that assessment of dispositional optimism alone in examining adjustment to traumatic events is not sufficient; benefit-finding appears to be a distinct construct that is important in its own right, particularly in its association with positive psychological adjustment. Finally, the findings lend additional support to the theory that negative and positive adjustment are orthogonal constructs, and indicate that measurement of just one of these constructs alone is insufficient in obtaining a complete picture of adaptation.

The present study is the first to focus on the role of benefit-finding within a population comprised exclusively of mothers of VLBW infants, and represents an initial step in working toward intervention research within this population. As with other research involving benefit-finding, however, several further steps need to be taken before the clinical implications of these and other results can fully be understood. First, the nature of the relationship between benefit-finding and psychological adjustment must be definitively established. This would be facilitated by longitudinal research, which would allow examination of the temporal nature of the relationship between benefit-finding and adjustment. For example, in this population, it would be interesting to repeat assessments at 6-month intervals over at least a year or, preferably, several. Goals would include determining whether: there are changes in benefit-finding over time; early benefit-finding predicts future changes in adjustment; benefit-finding continues to be associated with measures of positive adjustment over time; a relationship develops between benefit-finding

and measures of negative adjustment; and early positive adjustment serves to buffer against future symptoms of negative adjustment.

In addition, it would be interesting to assess benefit-finding on a more frequent basis by asking mothers of VLBW infants to complete daily diary measures of benefit-finding and adjustment, beginning shortly after birth and continuing post-discharge. This would enable clarification of how quickly benefit-finding begins after the occurrence of a stressor, and whether there are daily fluctuations in benefit-finding. If so, these fluctuations could then be compared with variability in mood and other measures of adjustment in order to examine the temporal relationship between these constructs in more depth.

Presuming such research reinforces the importance of benefit-finding in facilitating adjustment, it is also imperative to gain greater understanding about benefit-finding as a construct before proceeding to intervention research. Further distinction between benefit-finding and other related constructs, such as positive reappraisal coping and situational optimism, is important and could be easily accomplished by including measures of these similar constructs in subsequent studies. Moreover, additional research into the sociodemographic correlates of benefit-finding, as well as further investigation into the variables that may serve to moderate the relationship between benefit-finding and adjustment, is also warranted, so that those individuals who are less likely to engage in benefit-finding and who may therefore be at greater risk for poor adaptation can be more readily identified and targeted.

If research in the area of benefit-finding can progress to address the questions and concerns raised above, we will be better equipped to extend the findings that currently exist regarding benefit-finding and adjustment from the empirical realm into the clinical realm. As

knowledge about the nature of benefit-finding increases, researchers can move further toward designing interventions based on that knowledge. Two studies to date have reported increased rates of benefit-finding among individuals who received cognitive-behavioral interventions (Antoni et al., 2001; McGregor et al., 2004); however, a great deal of further information is needed in order to determine whether interventions can be designed to specifically target benefit-finding, which individuals might benefit most from these interventions, whether there are certain populations that are more amenable to learning to find benefits than others, and the most appropriate timing for instituting such interventions. For example, the results of the present study suggest that benefit-finding is particularly important for mothers with infants at greater risk for health problems; consequently, such mothers may receive differentially greater psychological improvements from interventions aimed at increasing benefit-finding. Moreover, the evidence as to the ability of such interventions to influence outcomes and adjustment via an improvement in benefit-finding is inconclusive; whereas McGregor et al. and Antoni et al. both found that their interventions resulted in an improvement in outcomes, there is no evidence that the positive changes they noted were related to benefit-finding. Finally, it should be noted that interventions specifically targeting benefit-finding will need to be conducted carefully and with great tact, due to the delicate nature of attempting to encourage individuals dealing with adversity to focus on the positive aspects of what may be a very traumatic situation. Keeping this in mind, the more informed researchers can be about the factors associated with benefit-finding, the more efficiently and effectively they can target individuals who may be most likely to benefit from potential interventions. In this way, it is hoped that superior adjustment, both psychological and physical, will be promoted in individuals affected by trauma.

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Table 1

Descriptive Information for the Post-Traumatic Growth Inventory

Researchers	Study Sample	<i>N</i>	Mean	<i>SD</i>	Range
Present Study	Mothers of VLBW infants	67	67.84	24.85	0-103
Calhoun, Cann, Tedeschi, & McMillan (2000)*	Undergraduates with various traumas	54	76.5	22.0	
Cordova, Cunningham, Carlson & Andrykowski (2001)*	Breast cancer patients	70	64.1	24.8	
Oh, Heflin, Meyerowitz, Desmond, Rowland & Ganz (2004)	Relapsed breast cancer patients	54	47.8	27.1	0-105
Sears, Stanton, Danoff-Burg (2003) *	Early-stage breast cancer patients	60	58.43	25.82	

Note. VLBW = very low birthweight

* Ranges were not provided

Table 2

Descriptive Information for Measures of Dispositional Optimism, Positive Adjustment, and Negative Adjustment

Measure	<i>N</i>	Mean	<i>SD</i>	Range	α
LOTR	68	15.09	4.13	0-24	.81
QOLI (t-score)	68	52.00	11.18	13-71	.85
PANAS – PA	68	23.25	8.33	4-39	.88
PANAS – NA	68	11.18	7.13	0-26	.84
BDI	66	11.30	7.60	0-42	.88
BAI	68	11.16	9.54	0-43	.89

Note. BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; LOTR = Life Orientation Test – Revised; PANAS – NA = Positive and Negative Affect Scale – Negative Affect; PANAS – PA = Positive and Negative Affect Scale – Positive Affect; QOLI = Quality of Life Inventory.

Table 3

Correlations between Benefit Finding and Measures of Positive and Negative Adjustment

Measure	PTGI	QOLI	PANAS- PA	PANAS- NA	BDI
PTGI					
QOLI	.27*				
PANAS - PA	.57***	.42***			
PANAS - NA	.09	-.16	-.23		
BDI	.01	-.38**	-.31*	.53***	
BAI	.03	-.36**	-.17	.61***	.73***

BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; PANAS – NA =

Positive and Negative Affect Scale – Negative Affect; PANAS – PA = Positive and

Negative Affect Scale – Positive Affect; PTGI = Posttraumatic Growth Inventory; QOLI

= Quality of Life Inventory.

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 4

Correlations between Benefit Finding, Measures of Adjustment, Maternal Demographic, Psychosocial, and Personality Variables, and Infant Variables

	PTGI	QOLI	PANAS- PA	PANAS- NA	BDI	BAI
Maternal Variables						
Age	-.30*	.19	.17	-.24*	-.32**	-.29*
Ethnicity (white vs. non)	-.33**	-.09	-.09	.08	-.06	-.06
Education ^a	-.23	.17	.00	-.05	-.15	-.27*
No. of Biological Children	-.20	-.18	-.10	-.06	-.01	.01
Spirituality	.21	.38***	.39***	-.15	-.21	-.28*
Frequency of Worship	.29*	.24	.27*	.05	.01	.03
History of Depression	-.07	-.20	-.18	.24*	.30*	.40***
History of Treatment						
for Depression	-.07	-.16	-.14	.31*	.18	.35**
History of Anxiety	-.01	-.20	-.05	.21	.21	.35**
History of Treatment						
for Anxiety	-.17	-.24*	-.01	.02	.15	.34**
Dispositional Optimism	.04	.44***	.43***	-.30*	-.30*	-.35**
Social Support	.32**	.39***	.22	.12	-.14	-.11

Table 4 (cont'd)

Correlations Between Benefit Finding, Measures of Adjustment, Maternal Demographic, Psychosocial, and Personality Variables, and Infant Variables

	PTGI	QOLI	PANAS- PA	PANAS- NA	BDI	BAI
Infant Variables						
Birthweight	-.07	.22	.15	-.09	-.25*	-.03
SNAPPE-II	.16	-.27*	.08	.00	.21	.06

Note. BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; PANAS – NA = Positive and Negative Affect Scale – Negative Affect; PANAS – PA = Positive and Negative Affect Scale – Positive Affect; PTGI = Posttraumatic Growth Inventory; QOLI = Quality of Life Inventory; SNAPPE-II = Score for Neonatal Acute Physiology, Perinatal Extension, Version II.

^a Spearman's rank correlation test used instead of Pearson's correlation due to ordinal nature of variable

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 5

MANOVA Results from Regression Analysis of Positive Affect and Quality of Life on Benefit-Finding, Dispositional Optimism, and Additional Covariates

Variable	<i>F</i>	<i>A</i>	<i>p</i> -value
Maternal Age	9.17	.71	< .001
Maternal Ethnicity (white v. non-white)	0.59	.97	.56
Education (college v. high school)	1.09	.95	.35
Education (graduate school v. high school)	2.14	.91	.13
Education (college v. graduate school)	1.75	.93	.19
Number of Biological Children	3.29	.87	.05
Infant SNAPPE-II	0.75	.97	.48
Infant Birthweight	0.52	.98	.60
Spirituality	0.00	.99	.99
Frequency of Worship	0.30	.99	.74
History of Depression	0.20	.99	.82
History of Anxiety	0.03	.99	.97
History of Treatment for Anxiety	1.48	.94	.24
Social Support	4.24	.84	.02
Dispositional Optimism	6.83	.76	<.01
Benefit-Finding	14.22	.61	<.0001

Note. SNAPPE-II = Score for Neonatal Acute Physiology, Perinatal Extension, Version II. All variables refer to the participant, with the exception of the two specified as pertaining to the infant.

Table 6

Hierarchical Regression Analysis of Positive Affect on Benefit-Finding and Covariates

Variable	R^2	ΔR^2	B	β	p -value
Step 1:	.09				
Maternal Age			0.28	.24	.06
Number of Biological Children			-2.43	-.25	.05
Step 2:	.26	.17			<.01
Maternal Age			0.17	.14	.25
Number of Biological Children			-2.07	-.21	.08
Social Support			0.12	.14	.25
Dispositional Optimism			0.77	.38	<.01
Step 3:	.53	.31			<.0001
Maternal Age			0.35	.31	<.01
Number of Biological Children			-1.68	-.17	.06
Social Support			-0.01	-.01	.95
Dispositional Optimism			0.65	.32	<.01
Benefit-Finding			0.21	.61	<.0001

Table 7

Hierarchical Regression Analysis of Quality of Life on Benefit-Finding and Covariates

Variable	R^2	ΔR^2	B	β	p -value
Step 1:	.06				
Maternal Age			0.37	.24	.06
Number of biological children			-2.22	-.17	.18
Step 2:	.34	.28			<.0001
Maternal Age			0.29	.19	.11
Number of biological children			-1.03	-.08	.48
Social Support			0.42	.37	<.01
Dispositional Optimism			0.93	.34	<.01
Step 3:	.38	.04			.06
Maternal Age			0.38	.25	.04
Number of biological children			-0.85	-.07	.55
Social Support			0.36	.32	<.01
Dispositional Optimism			0.87	.32	<.01
Benefit-Finding			0.10	.21	.06

Table 8

MANOVA Results from Regression Analysis of Negative Affect, Symptoms of Anxiety, and Symptoms of Depression on Benefit-Finding, Dispositional Optimism, and Additional Covariates

Variable	<i>F</i>	<i>λ</i>	<i>p</i> -value
Maternal Age	3.16	.83	.03
Maternal Ethnicity (white v. non-white)	0.18	.99	.91
Education (college v. high school)	3.45	.82	.02
Education (graduate school v. high school)	0.99	.94	.41
Education (college v. graduate school)	0.07	.99	.97
Number of Biological Children	0.25	.98	.86
Infant Birthweight	2.29	.87	.09
Spirituality	1.22	.93	.31
Frequency of Worship	3.12	.83	.03
History of Depression	1.23	.93	.31
History of Anxiety	0.33	.98	.80
History of Treatment for Depression	2.01	.88	.13
History of Treatment for Anxiety	2.84	.84	.05
Social Support	0.49	.97	.69
Dispositional Optimism	1.81	.89	.16
Benefit-Finding	0.24	.98	.87

Note. All variables refer to the participant, with the exception of the two specified as pertaining to the infant.

Table 9

Linear Regression Model of Negative Affect on Benefit-finding, Dispositional Optimism, and Additional Covariates Identified in MANOVAs

Variable	<i>B</i>	β	part <i>r</i>	<i>p</i> -value
Maternal Age	-0.35	-.36	-.26	.03
Education (college v. high school)	3.97	.28	.22	.07
Education (graduate school vs. high school)	5.46	.26	.19	.12
Infant Birthweight	-0.00	-.11	-.11	.37
Frequency of Worship	0.48	.13	.11	.34
History of Treatment for Anxiety	2.01	.10	.09	.45
Dispositional Optimism	-0.56	-.32	-.28	.02
Benefit-Finding	0.00	.00	.00	.98

Table 10

Linear Regression Model of Symptoms of Anxiety on Benefit-finding, Dispositional Optimism, and Additional Covariates Identified in MANOVAs

Variable	<i>B</i>	β	part <i>r</i>	<i>p</i> -value
Maternal Age	-0.40	-.31	-.22	.04
Education (college v. high school)	-2.18	-.12	-.09	.41
Education (graduate school vs. high school)	-0.47	-.02	-.01	.91
Infant Birthweight	-0.00	-.09	-.09	.43
Frequency of Worship	1.41	.30	.25	.02
History of Treatment for Anxiety	11.10	.40	.37	<.01
Dispositional Optimism	-0.55	-.24	-.21	.06
Benefit-Finding	-0.03	-.07	-.05	.61

Table 11

Linear Regression Model of Symptoms of Depression on Benefit-finding, Dispositional Optimism, and Additional Covariates Identified in MANOVAs

Variable	<i>B</i>	β	part <i>r</i>	<i>p</i> -value
Maternal Age	-0.49	-.47	-.35	<.01
Education (college v. high school)	2.45	.16	.13	.26
Education (graduate school vs. high school)	3.31	.15	.11	.34
Infant Birthweight	-0.01	-.31	-.30	.01
Frequency of Worship	0.89	.24	.20	.08
History of Treatment for Anxiety	5.76	.26	.24	.04
Dispositional Optimism	-0.41	-.22	-.19	.09
Benefit-Finding	-0.05	-.15	-.13	.26

Table 12

Linear Regression Model of Positive Affect on Benefit-finding, Infant Illness Severity, Their Interaction and Additional Covariates: High Illness Severity

Variable	β	part r	p -value
Maternal Age	.29	.25	<.01
Number of Biological Children	-.17	-.15	.08
Social Support	-.02	-.02	.85
Dispositional Optimism	.26	.24	<.01
Benefit-Finding	.45	.33	<.0001
Illness Severity – High	-.08	-.07	.43
Interaction	.29	.21	.02

Note. $F(7, 53) = 12.14$, $p < .0001$, adjusted $R^2 = .565$ for Tables 12 – 14

Table 13

Linear Regression Model of Positive Affect on Benefit-finding, Infant Illness Severity, Their Interaction and Additional Covariates: Medium Illness Severity

Variable	β	part r	p -value
Maternal Age	.29	.25	<.01
Number of Biological Children	-.17	-.15	.08
Social Support	-.02	-.02	.85
Dispositional Optimism	.26	.24	<.01
Benefit-Finding	.68	.58	<.0001
Illness Severity – High	-.08	-.07	.43
Interaction	.23	.21	.02

Table 14

Linear Regression Model of Positive Affect on Benefit-finding, Infant Illness Severity, Their Interaction and Additional Covariates: Low Illness Severity

Variable	β	part r	p -value
Maternal Age	.29	.25	<.01
Number of Biological Children	-.17	-.15	.08
Social Support	-.02	-.02	.85
Dispositional Optimism	.26	.24	<.01
Benefit-Finding	.92	.49	<.0001
Illness Severity – High	-.08	-.07	.43
Interaction	.36	.21	.02

Table 15

Linear Regression Model of Quality of Life on Benefit-finding, Infant Illness Severity, Their Interaction and Additional Covariates: High Illness Severity

Variable	β	part r	p -value
Maternal Age	.34	.30	<.01
Number of Biological Children	-.14	-.13	.17
Social Support	.41	.35	<.01
Dispositional Optimism	.26	.24	.02
Benefit-Finding	.35	.26	.01
Illness Severity – High	-.19	-.18	.07
Interaction	-.28	-.20	.04

Note. $F(7, 53) = 8.24, p < .0001, \text{adjusted } R^2 = .458$ for Tables 15 – 17

Table 16

Linear Regression Model of Quality of Life on Benefit-finding, Infant Illness Severity, Their Interaction and Additional Covariates: Medium Illness Severity

Variable	β	part r	p -value
Maternal Age	.34	.30	<.01
Number of Biological Children	-.14	-.13	.17
Social Support	.41	.35	<.01
Dispositional Optimism	.26	.24	.02
Benefit-Finding	.15	.11	.27
Illness Severity – Medium	-.19	-.18	.07
Interaction	-.22	-.20	.04

Table 17

Linear Regression Model of Quality of Life on Benefit-finding, Infant Illness Severity, Their Interaction and Additional Covariates: Low Illness Severity

Variable	β	part r	p -value
Maternal Age	.34	.30	<.01
Number of Biological Children	-.14	-.13	.17
Social Support	.41	.35	<.0001
Dispositional Optimism	.26	.24	.02
Benefit-Finding	-.10	-.05	.57
Illness Severity – Low	-.19	-.18	.07
Interaction	-.35	-.20	.04

Table 18

Linear Regression Model of Benefit-Finding on Maternal Demographic and Psychosocial Variables

Variable	<i>B</i>	β	part <i>r</i>	<i>p</i> -value
Maternal Age	-0.88	-.26	-.19	.06
Ethnicity (white v. non-white)	-17.91	-.35	-.30	<.01
Education (high school v. college)	-6.04	-.12	-.09	.36
Education (graduate school v. college)	-11.51	-.16	-.14	.18
Number of Biological Children	-4.06	-.14	-.13	.22
Spirituality	1.80	.11	.09	.37
Frequency of Worship	1.92	.15	.12	.23
Social Support	0.64	.26	.22	.03

Table 19

Eigenvalues from Principal Components Analysis of Post-Traumatic Growth Inventory

Factor	Eigenvalue	Proportion of Variance	Cumulative Variance
1	10.74	0.51	0.51
2	1.85	0.09	0.60
3	1.36	0.06	0.66
4	1.17	0.06	0.72
5	0.88	0.04	0.76
6	0.75	0.04	0.80
7	0.70	0.03	0.83
8	0.57	0.03	0.86
9	0.51	0.02	0.88
10	0.42	0.02	0.90
11	0.36	0.02	0.92
12	0.30	0.01	0.93
13	0.28	0.01	0.95
14	0.23	0.01	0.96
15	0.21	0.01	0.97
16	0.18	0.01	0.98
17	0.14	0.01	0.98
18	0.13	0.01	0.99
19	0.10	0.01	0.99
20	0.07	<0.01	0.99
21	0.04	<0.01	1.00

Figure 1

Infant Illness Severity as a Moderator of the Relationship between Benefit-Finding and Quality of Life

