

Posttraumatic growth in clinical psychology — A critical review and introduction of a two component model

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Abstract

Positive psychological or personal changes in the aftermath of trauma, defined as the result of the struggle with highly stressful events, have recently elicited heightened attention by trauma researchers. This article aims at summarizing the most important theoretical models and conceptualizations of posttraumatic growth (PTG) and addresses the issue of the adaptive significance of this phenomenon. It further renders a thorough empirical review of the relationship between PTG and psychological adjustment. European findings are specifically incorporated. As a conclusion, a two component cognitive model of PTG will be proposed that may explain the contradicting empirical findings in regard to the relationship between mental health and PTG. The Janus-Face model of PTG [Maercker, A. and Zoellner, T. (2004). The Janus face of self-perceived growth: Toward a two-component model of posttraumatic growth. *Psychological Inquiry*, 15, 41–48.] incorporates a constructive and an illusory aspect. On this basis, findings regarding relevant cognitive factors as predictors of PTG are summarized and evaluated. The article ends with a discussion of fruitful future research directions and how PTG can add a new perspective into trauma therapy.

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Keywords: Posttraumatic growth; Posttraumatic stress disorder; Coping; Cognitive restructuring; Protective illusions

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It's not that I am glad that it [traumatic accident] happened and that it [life] is the way it is, but for the first time in my life, I take time for myself and for what is important to me. I attend meditation classes now and that gives a lot to me. I also appreciate life a lot more. I am more aware of every day's pleasures and I am thankful for what I still have. I am very thankful for my husband. I can fully rely on him.

This statement by a patient with accident-related PTSD and severe bodily injuries in her right leg forcing her to give up work is an example of the potential positive changes that might also occur in the aftermath of trauma. Positive effects of struggling with traumatic events have been prominent themes throughout human history as reflected in literature and philosophy (e.g. Kierkegaard, 1983; Nietzsche, 1955). In the clinical literature as well, many authors have acknowledged the potential for growth from adversity (e.g. Caplan, 1964; Finkel, 1974; Frankl, 1961). In line with a reviving interest in beneficial psychological processes, it is only recently that the phenomenon of posttraumatic growth (PTG) has elicited the attention of clinicians and has inspired systematic research endeavors. Richardson (2002, p. 307) depicts the growing interest as part of a “paradigm shift from a reductionistic, problem-oriented approach to ‘nurturing strengths’ as a prevalent theme across academic disciplines.”

This article aims at giving an overview of theoretical considerations and existing theoretical models with regard to the phenomenon of posttraumatic growth. Different conceptualizations of PTG as result of the struggle with trauma or as a coping strategy will be explored. Then, important issues in concern to the meaning and adaptive significance of posttraumatic growth will be discussed. The empirical review will first focus on how growth from traumatic events relates to psychological adaptation. A critical evaluation of research results will lead to the proposition of a two-component cognitive model of self-perceived posttraumatic growth. Then, in light of this approach, a further empirical review will cover the question of cognitive predictors of PTG. The article concludes with ideas for future research and guidelines for implementing a growth perspective into clinical practice.

1. Theoretical status of posttraumatic growth

1.1. Definitions

Traumatic events are defined by the [APA \(1994\)](#) diagnostic criteria as events that involve actual or threatened death or serious injury. The response of the person who was exposed to such a traumatic event has to be one of fear, helplessness, or horror.

Posttraumatic stress disorder (PTSD) is a common psychiatric outcome after trauma. The disorder is characterized by persistent re-experience of the traumatic event in one or more of the following ways: Recurrent recollections, recurrent dreams, flashbacks, intense cue-sensitivity, or physiological reactivity. Furthermore, persistent avoidance of internal or external cues associated with the trauma in three or more of the following ways is characteristic of PTSD: Avoiding thoughts, avoiding activities, inability to recall, diminished interest, detachment, restricted affect, and sense of foreshortened future. Persistent increased arousal in two or more of the following is the third symptom cluster of PTSD: Difficulty sleeping, irritability, difficulty concentrating, hypervigilance, and exaggerated startle response. The full symptom picture must be present until at least one month after the trauma. Epidemiological studies showed, for example, an incidence of PTSD of about 55% after rape, of about 35% after childhood sexual or physical abuse, of about 17% after physical and armed assaults, and of about 7% after severe accidents ([Kessler, Sonnega, Bromet, & Nelson, 1995](#); [Maercker, Michael, Fehm, Becker, & Margraf, 2004](#)).

A growing body of empirical studies reveals that many trauma survivors also experience positive psychological changes after trauma. Posttraumatic growth is defined as the subjective experience of positive psychological change reported by an individual as result of the struggle with trauma. Examples of positive psychological change are an increased appreciation of life, setting of new life priorities, a sense of increased personal strength, identification of new possibilities, improved closeness of intimate relationships, or positive spiritual change ([Tedeschi, Park, & Calhoun, 1998](#)).

People report those positive outcomes following extremely stressful situations, either as a direct result of the event or as a kind of learning that occurred through their efforts to cope with the events (see [Park, 1999](#)). Posttraumatic growth describes the experience of individuals who do not only recover from trauma, i.e. return back to pre-trauma functioning after a period of emotional distress, but use it as an opportunity for further individual development. Those individuals overcome trauma with improved psychological functioning in specific domains. [Calhoun, Cann, Tedeschi, and McMillan \(2000\)](#) defined the concept of posttraumatic growth as “the experience of significant positive change arising from the struggle with a major life crisis” (p. 521). For example, a person who has managed to overcome a traumatic death of a partner might discover her personal strength through the experience of struggling with it. She may lose her fear of the future because she feels “if I could handle that, I can handle everything.” Or, an individual who is confronted with having a terminal disease like cancer might experience over time a profound shift in priorities that results in a decision to spend more time with loved ones.

Different terms are used to describe posttraumatic growth. PTG has also been referred to as *finding benefits* ([Affleck & Tennen, 1996](#)), *stress-related growth* ([Park, Cohen, & Murch, 1996](#)), *thriving* ([O’Leary, Alday, & Ickovics, 1998](#)), *positive psychological changes* ([Yalom & Lieberman, 1991](#)), or *adversarial growth* ([Linley & Joseph, 2004](#)). This article follows [Tedeschi and Calhoun \(1995, 2004\)](#) and uses the term posttraumatic growth as it best and most clearly expresses the meaning of the phenomenon: The term “posttraumatic” stresses that growth happens in the aftermath of an *extremely stressful event* (traumatic event), not as the result of any minor stress or as a part of a natural developmental process. The usage of the terms “trauma” or “traumatic event” in writings by Tedeschi and Calhoun, is a bit broader and more inclusive than the more restrictive DSM-IV ([APA, 1994](#)) criteria. For example, PTG has often been studied in people having a terminal disease like cancer or AIDS. The term “growth” underscores that the person has developed *beyond* her previous level of adaptation, psychological functioning, or life awareness. It expresses that in people’s lives there is something positively new which signifies a kind of *additional* benefit compared to pre-crisis level. Those beneficial outcomes might include individual development, personal benefits, new life priorities, a deepened sense of meaning, a deepened sense of connection with others or with a higher power. “[P]osttraumatic growth refers to a change in people that goes beyond an ability to resist and not be damaged by highly stressful circumstances; it involves a movement beyond pretrauma levels of adaptation. ... [I]t has a quality of transformation, or a qualitative change in functioning” ([Tedeschi & Calhoun, 2004](#), p. 4). In this text, the term posttraumatic growth is used throughout the article, even though other authors might have used different terms to describe the phenomenon.

However, even the term “posttraumatic growth” is an imprecise term for the phenomenon because the majority of the theoretical and empirical literature on PTG describes and measures the *subjective perception* of PTG. Therefore, the term “posttraumatic growth” is often a shortened version of “self-perceived posttraumatic growth.”

1.2. Theoretical conceptualizations of PTG

Different theorists have proposed diverse conceptualizations of PTG. The phenomenon has been conceptualized as an *outcome* of the struggle with a traumatic event (Schaefer & Moos, 1992, 1998; Tedeschi & Calhoun, 1995, 2004), or as a *coping strategy* (e.g. Affleck & Tennen, 1996). As an outcome of coping with trauma, posttraumatic growth denotes a significant beneficial change in cognitive and emotional life that may be the “antithesis” of posttraumatic stress disorder (PTSD). To clarify this line of thinking, it is important to underline that PTG and PTSD are distinct, independent constructs representing separate but in either case continuous dimensions. Both concepts are not regarded as two ends of the same continuum of, for example, adaptation to trauma. PTG and traditional measures of psychological adjustment are thought to be independent, because domains of growth are conceptually distinct from general emotional adjustment. PTG is not the same as an increase in well-being or decrease in distress (Tedeschi & Calhoun, 2004). Therefore, growth and emotional distress may well coexist for some people.

1.3. Models of PTG as outcome

In general, models of unintentional change depict change – including PTG – as a byproduct of attempts to cope with a life-changing, traumatic event. As Janoff-Bulman put it (1992, pp. 138): “Not a chosen fate but some choice in coping.” For example, Aldwin (1994) emphasizes the potential benefits of handling a stressful event by proposing that stress might not always be negative, but supposedly necessary for personal development. In her model of “transformational coping,” she postulates that coping serves either as a homeostatic or a transformational function. The latter results in positive or negative changes. Therefore, three possible modes of coping result in three different outcomes after a stressful event. Homeostatic coping leads to a return to base line, transformational negative coping leads to a lower level of functioning, and transformational positive coping leads to a higher level of functioning (growth). Similarly, in their model of discontinuous change, O’Leary and Ickovics (1995) describe three possible outcomes following challenge: Return to the old level of functioning (recovery), to a lower level (survival), or to a higher level of functioning (thriving) (for a more detailed account of change models see O’Leary et al., 1998). In contrast to those general models of change, the models by Schaefer and Moos (1992), and most prominent, by Tedeschi and Calhoun (1995, 2004), have been explicitly developed to illustrate the mechanisms of PTG.

1.3.1. Schaefer and Moos (1992): model of life crises and personal growth

In their “conceptual model of positive outcomes of life crises and transitions,” Schaefer and Moos (1992) outline the determinants of positive outcomes of crises: Environmental and personal system factors are supposed to shape the life crisis experience and its aftermath. They influence cognitive appraisal processes and coping responses which, in turn, affect the outcome of the crisis. All components of the model are linked by feedback loops, thus influencing one another. The personal system includes socio-demographic characteristics and personal resources such as self-efficacy, resilience, optimism, self-confidence, an easy-going disposition, motivation, health status, and prior crisis experience. Environmental factors include personal relationships, support from family, friends and social environment as well as financial resources and other aspects of the living situation. Event-related factors comprise the effects of the severity, duration, and timing of the life crisis and its scope on the individual. The authors point to the important role of approach coping for growth to occur as opposed to avoidance coping.

1.3.2. Tedeschi and Calhoun (1995, 2004): revised model of posttraumatic growth

Tedeschi and Calhoun (2004) have recently outlined a revised version of their earlier model (1995) in which they filled in more details on how the process of growth is conceptualized. In their “functional-descriptive model of PTG,” they describe PTG solely as an outcome variable. The growth process is conceptualized as follows: A traumatic event, which is an event of “seismic” proportions, shakes or destroys some key elements of a person’s important goals and worldviews. It represents a challenge to higher-order goals, higher-order beliefs, and the ability to manage emotional distress. The resulting emotional distress initiates a process of recurrent rumination and attempts to engage in behavior

that is designed to reduce distress. Initially, rumination is more automatic than deliberate. It is characterized by frequent returns to thinking activity regarding the trauma and related issues. After the first coping success (e.g. reduction of emotional distress, disengagement from unreachable goals), rumination transforms into more deliberate thinking about the trauma and its impact on one's life. Rumination in its constructive version of cognitive processing (analyzing the new situation, finding meaning, and re-appraisal) is assumed to play a key role in the development of personal growth. PTG is conceptualized as a multidimensional construct including changes in beliefs, goals, behaviors, and identity as well as the development of a life narrative and wisdom. As in the first conceptualization, pre-trauma variables within the person, social support variables and some enduring distress are assumed to influence the coping process and the emergence of PTG.

Both *explicit models of PTG* (Schaefer & Moos, 1992; Tedeschi & Calhoun, 1995, 2004) are complex and inclusive models of distal and proximal predictors of PTG. For example, in Tedeschi and Calhoun's model (p. 7): Posttraumatic growth is predicted by "person pre-trauma characteristics, self disclosure, fundamental schemas, beliefs and goals" (distal factors) as well as by factors of "rumination, more deliberate, schema change, narrative development" and "enduring distress" (proximal factors). With few exceptions (e.g. enduring stress), the proposed constructs are quite general, seeming to serve as place holders for more specific terms that would allow more concrete operationalizations and theoretical specifications. Due to the vague definition of some of the predictors, both models are difficult to be tested empirically. They can, however, serve as heuristic frame models guiding research questions and encourage more precise formulations of factors and theoretical predictions.

1.4. Models of PTG as coping strategy

PTG as a coping strategy to handle severe stress is usually embedded in general theories of coping as an adaptive response (Affleck & Tennen, 1996). Some approaches on personal growth within coping models are exemplified below.

1.4.1. PTG as one construal of meaning (Davis, Nolen-Hoeksema, & Larson, 1998)

In light of the need in Western cultures to believe that by and large the momentous events in one's life are controllable, comprehensible, and nonrandom (Heider, 1958; Kelley, 1972), the adaptive and important role of making meaning in response to loss or traumatic events has been pointed out by many theorists. Within their conceptualization of meaning making (Davis et al., 1998), PTG has been regarded as one of two possible construals of meaning. The authors pinpoint that researchers have usually given much attention to only one construal of meaning, i.e. causal attributions answering the question "why did it happen?" They consider another construal of meaning as important: Benefit attributions giving answer to the question "what for?" According to this conceptualization, the subjective perception of personal growth would signify a benefit attribution (for similar views see also Janoff-Bulman & Frantz, 1997).

1.4.2. PTG within a meaning-making coping process (Park & Folkman, 1997)

In their conceptualization of meaning in the context of stress and coping, Park and Folkman (1997) distinguish between situational and global meaning. Global meaning encompasses a person's enduring beliefs and valued goals. Situational meaning, in contrast, is the meaning that is formed in the interaction between a person's global meaning and the circumstances of a particular person–environment interaction. A traumatic event threatens global meaning, thereby initiating the meaning-making process. It is the challenge of the coping process to integrate situational meaning (appraisal of the trauma) with global meaning. Within this framework, different areas of posttraumatic growth would fall into different categories of meaning making: Finding benefits from the traumatic event (such as personal strength) would fall into the category of assimilation, i.e. changing the situational meaning to accommodate the global meaning. In contrast, a modified philosophy of life would address enduring changes in global meaning.

1.4.3. PTG as an interpretative process (Filipp, 1999)

Filipp (1999) regards PTG as an interpretative process that she embeds in an information-processing view of coping: She assumes that people being confronted with loss and trauma pass through three processes in their coping efforts. At first, "perceptive reality" is construed by attentive and comparative processes. Attentive processes include the defense of positive illusions, self-enhancing illusions, and hope. Comparative processes designate palliative comparisons by performing social and temporal comparisons. The stage of "perceptive reality" is followed by the stage of

“interpretative reality” which evolves as the result of ruminative thinking, finding explanations for the questions “what happened?” and “why?” Within this conceptualization, PTG is one possibility to construct “interpretative reality.”

1.4.4. PTG as one form of self-enhancing appraisal or positive illusion (Taylor, 1983)

Taylor (1983) has made positive appraisals the centerpiece of her theory of cognitive adaptation to threatening events. In her formulation of the cognitive adaptation to threat, Taylor (e.g. Taylor & Armor, 1996) regards PTG as a form of “positive illusion” with an adaptive function for psychological adjustment. The perception of PTG is one possible self-enhancing appraisal that helps to cope with threat.

The presentation of different concepts for the phenomenon of PTG has artificially opposed PTG as a coping strategy to PTG as an outcome of coping. However, many theorists acknowledge that posttraumatic growth can be both, coping style and coping outcome, and that these two modes can include differentially adaptive proportions (e.g. Affleck & Tennen, 1996; Calhoun & Tedeschi, 2004; Maercker & Zoellner, 2004). Having given an overview of different models and conceptualizations of posttraumatic growth, we will turn to the question of the adaptive significance of PTG.

2. PTG and its relationship to mental health

Within this review, the relationship between PTG and mental health is significant for the following reason: If posttraumatic growth is a phenomenon worthy to be studied in clinical research, it is assumed to make a difference in people's lives by affecting levels of distress, well-being, or other areas of mental health. If it does not have any impact, then, PTG might just be an interesting phenomenon possibly belonging to the areas of social, cognitive, or personality psychology. Curiously, many authors, regardless of their adopted conceptualization of PTG, have accepted the notion of the *adaptive significance* of PTG. However, clear evidence for this hypothesis is still lacking. In the following, we will try to give a brief, but balanced overview of empirical findings on the relationship of PTG with PTSD, depression and other adjustment outcomes without claiming to give a complete review (for other reviews see Affleck & Tennen, 1996; Park & Folkman, 1997; Taylor & Armor, 1996). Before doing so, we will give a brief summary of the measurement of PTG.

2.1. Assessment of PTG

Researchers have attempted to capture the phenomenon of PTG by using qualitative and quantitative methodologies. Many empirical studies used an interview format to assess PTG. Usually, interviews targeted positive life changes or benefits resulting from x (the traumatic event) in an open-ended question format, such as, “have there been any benefits that resulted from your experience of x? Please, describe your experience” (e.g. Davis et al., 1998). Often, positive and negative life changes were assessed simultaneously. Typically, participants' responses were categorized into the domains of PTG by post hoc analyses. In the statistical analyses, authors usually evaluated whether or not there had been any benefit at all and, in a separate analysis, rated the number of reported benefits. Several researchers used scales newly developed for the purpose of their study, such as a measure of positive and negative life changes (Klauer & Filipp, 1997) or the 17-item Life Change Measure (Frazier, Conlon, & Glaser, 2001). Several instruments have been developed as measures of growth. The Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996) contains 21 items forming subscales that assess growth across the dimensions of relating to others, new possibilities, personal strength, appreciation of life, and spiritual change. The Stress-Related Growth Scale (SRGS; Park et al., 1996) is a 50-item measure, with various test results suggesting a single-factor interpretation of growth. The Changes in Outlook Questionnaire (CiOQ; Joseph, Williams, & Yule, 1993) is a 26-item measure of positive and negative changes. The Perceived Benefit Scales (PBS; McMillen & Fisher, 1998) consist of 30 positive change items and 8 negative change items. Among the instruments mentioned above, only the PTGI and the SRGS represent standardized and validated questionnaires (for further information on PTG assessment see Cohen, Hetter, & Pane, 1998).

2.2. PTG and PTSD

Most cross-sectional studies investigating the relationship between posttraumatic growth and symptoms of posttraumatic stress disorder did not find any systematic relationship between the two. The correlation coefficients between the measures for those concepts ranged from $r = -.2$ to $r = .2$ in samples of former East-German political

prisoners (Maercker, 1998), former victims of the Dresden bombing night (Maercker, Herrle, & Grimm, 1999), former refugees and displaced people from Sarajevo (Powell, Rosner, Butollo, Tedeschi, & Calhoun, 2003), and spinal cord injury individuals (Znoj, 1999) (see Table 1).

In two studies, a significant positive association between PTG and PTSD emerged: Within the studies that were designed to develop the Stress-Related-Growth Scale (SRGS) (Park et al., 1996), posttraumatic growth was significantly positively correlated with PTSD symptoms in two large samples of college students with an average correlation coefficient of $r=.25^*$ (see Table 1). A similar finding was reported by Schorr and Roemer (2002): They found low to moderate positive associations ($r=.25^{**}$) between posttraumatic growth and PTSD symptoms (see Table 1). The largest negative relationship between PTG and PTSD was found in a sample of sexual assault survivors (Frazier et al., 2001), with a significant cross-sectional correlation between a life change measure and PTSD symptoms ($r=-.38^{***}$). In the same study, an analysis of variance with four “benefit”-groups and two assessment times (2 weeks and 12 months post-assault) revealed that those who gained positive changes from first to second assessment or always had positive changes suffered from fewer PTSD symptoms compared to women who had lost benefits or never had benefits (see Table 1). In a longitudinal study by McMillen, Smith, and Fisher (1997) who interviewed survivors of three types of disaster 4–6 weeks after the incident and 3 years later, reports of posttraumatic growth at time 1 were predictive of fewer PTSD symptoms at time 2. PTG was, however, not predictive of a change in diagnosis from time 1 to time 2. However, in a comparison of a “benefit”- versus “no-benefit” group, an interaction effect of the severity of exposure and perceived benefit on number of psychiatric diagnoses change emerged. For survivors who reported benefits, the number of diagnoses decreased with increased severity of disaster exposure, whereas for those who did not indicate any benefits, the number of diagnoses increased with increased severity of disaster exposure (see Table 1). These findings may point to a buffering effect of the perception of personal growth in the face of more severe traumatic exposure.

Taken together, both longitudinal studies found that PTG at first assessment predicted fewer PTSD symptoms at second assessment. Most cross-sectional studies did not find a significant relationship between PTG and PTSD. Interestingly, those studies that employed standardized measures of PTG (either the SRGS or the PTGI) did find either no or a positive association between PTG and PTSD. Those studies that found a negative association between growth and PTSD either used interview format or self-constructed scales to assess PTG.

2.3. PTG and depression

Most studies investigating the relationship between posttraumatic growth and depressive symptoms found no systematic relationship between the two cross-sectionally. This null finding emerged in bone marrow transplantation patients (Curbow, Somerfield, Baker, Wingard, & Legro, 1993), accident survivors (Joseph et al., 1993), college alumni (Aldwin, Levenson, & Spiro, 1994), MS patients (Mohr et al., 1999), bereaved parents and spinal cord injury patients (Znoj, 1999) and breast cancer survivors (Cordova, Cunningham, Carlson, & Andrykowsky, 2001) (see Table 2). The mean correlation coefficients between depression as measured by standardized depression scales and PTG ranged from $r=-.1$ to $r=.1$. In the large sample of over 1000 male veterans, depression was negatively correlated with PTG ($r=-.1^{**}$). In the longitudinal study by Frazier et al. (2001) who assessed sexual assault survivors 2 weeks and 12 months post-assault, depression and PTG were significantly negatively correlated cross-sectionally, with an average effect size of $r=-.5^{**}$. Furthermore, those individuals who gained positive changes from time 1 to time 2, or who always had experienced benefits, were significantly less depressed 12 months post-assault (see Table 2). Not a single study found a positive association between PTG and depression.

2.4. PTG and other outcomes

PTG and its relationship to diverse measures of distress was investigated in studies assessing general distress (e.g. using the Symptom Checklist-90, SCL-90, Derogatis, 1977), general affect, or specific symptoms of anxiety, anger, avoidance or hopelessness. Other studies examined the relationship between PTG and other health-inducing constructs like self-esteem, meaningfulness in life, or the belief in a benevolent world. Results of those studies are inconclusive. Most cross-sectional studies looking at PTG and general distress variables did not reveal any consistent relationship between the two measures (Joseph et al., 1993; Klauer & Filipp, 1997; Lehman et al., 1993; Maercker et al., 1999) with

Table 1
Posttraumatic growth and PTSD

Authors	Sample	<i>n</i>	Measure of posttraumatic growth	Measures of PTSD symptoms	Results relationship between growth and PTSD	Categorical relationship PTG-adjustment
<i>Cross-sectional studies</i>						
Aldwin et al. (1994)	Male veterans (40% in combat)	1,287	28-item scale for un/desirable effects of military service	MSCR-PTSD	$r = -.10^{**}$	+
Park et al. (1996)	1. College students	500	SRGS	IES-R	$r = .31^{***}$	–
	2. College students	250	SRGS	IES-R	$r = .21^{**}$	–
Snape (1997)	Persons having been admitted to hospital after accident or assault	53	PTGI	IES	$r = .48^*$ at 2 months post-incident $r = .46^*$ 4 months post-incident	–
Maercker (1998)	Former East-German political prisoners	124	SRGS (German version)	IES-R	$r = -.23 - r = .13$; n.s.	O
Maercker et al. (1999)	Former victims of Dresden bombing	47	SRGS (German version)	IES-R	$r = .06 - r = .13$; n.s.	O
Znoj (1999)	Bereaved parents	176	SRGS	IES-R	$r = -.11$; n.s.	O
	Spinal cord injured persons	273	SRGS	IES-R	Not specified	O
Cordova et al. (2001)	Breast cancer survivors	70	PTGI	IES-R	$r = -.1 - r = -.2$; n.s.	O
Frazier et al. (2001)	Sexual assault survivors	Ca. 90	17-item life change measure	17-item PTSD	$r = -.38^{***}$ 2 weeks post-assault $r = -.09$; n.s. 12 months post-assault	+
[Cross-sectional part]						O
Schorr and Roemer (2002)	College students	140	PTGI	PTSD checklist	$r = .25^{**}$	–
Powell et al. (2003)	Former refugees and displaced people from Sarajevo, Bosnia	131	PTGI	PDS	$r = .001$; n.s.	O
<i>Longitudinal studies</i>						
McMillen et al. (1997)	3 types of disaster: tornado, 4–6 weeks after mass killing, plane crash incident (T1)	195	Open-ended benefit question	DIS: PTSD diagnosis	Benefit finding at T1 predicted less PTSD symptoms at T2 (OR=0.28, $p < .05$), but did not predict diagnosis change.	+
	three years later (T2)			diagnosis change		
Frazier et al. (2001)	2 Sexual assault survivors weeks post-assault (T1)	171	17-item life change measure	17-item PTSD	Significant group differences among 4 “benefit” groups (benefits at T1 and T2; gained benefits from T1 to T2; never had benefits or lost benefits) in regard to levels of PTSD symptoms ($F = 3.20$, $p < .05$) at 12-months. People who always had positive changes showed less PTSD-symptoms compared to people who lost benefits or never had benefits, but also compared to people who gained positive changes.	+
	12 months post-assault (T2)					

GHQ = General Health Questionnaire; SCL-90 = Symptom Checklist 90; MSCR-PTSD = Mississippi Scale for Combat-Related PTSD; SRGS = Stress-Related Growth Inventory; IES-R = Impact of Event Scale-Revised; BSI = Brief Symptom Inventory; PTGI = Posttraumatic Growth Inventory; PDS = Posttraumatic Diagnostic Scale; DIS = Diagnostic Interview Schedule; $*p < .05$; $**p < .01$; $***p < .001$.

Table 2
Posttraumatic growth and depression

Authors	Sample	<i>n</i>	Measure of posttraumatic growth	Measures of depression	Results relationship between growth and depression	Categorical relationship PTG-adjustment
Curbow et al. (1993)	Survivors of bone marrow transplantation	135	Interview on positive and negative life changes	Abbreviated Profile of Mood States — depression	Correlations n.s.	O
Joseph et al. (1993)	Accident survivors	35	Self-report scale on positive changes following accident	GHQ — depression	Correlations n.s.	O
Aldwin et al. (1994)	Male veterans (40% in combat)	1,287	28-item scale for un/desirable effects of military service	CES — depression	$r = -.10^{**}$	+
Aldwin, Sutton, and Lachman (1996, study 3)	University-alumni trauma=low point	941	Number of possible advantages	CES — depression	$r = -.02$; n.s. (within proposed model)	O
Mohr et al. (1999)	Patients with MS (multiple sclerosis)	50	Constructed questionnaire of Psychosocial Ramifications of MS (factor 2=benefit finding)	POMS — depression	$r = .16$; n.s.	O
Znoj (1999)	Bereaved parents	176	SRGS	BDI	$r = -.10$; n.s.	O
Cordova et al. (2001)	Breast cancer survivors	70	PTGI	CES — depression	$r = -.09$; n.s.	O
Frazier et al. (2001)	Sexual assault survivors	ca. 90	17-item life change measure	BSI — depression	$r = -.50^{***}$ 2 weeks post-assault	+
Longitudinal study 2	Sexual assault survivors	171	17-item life change measure	BSI — depression	$r = -.35^{***}$ 12 months post-assault When sample was divided into 4 “benefit” groups (benefits at T1 and T2; gained benefits from T1 to T2; never had benefits or lost benefits from T1 to T2) significant group differences emerged in regard to levels of depression ($F = 4.51, p < .01$) at 12-months-distress. People who gained positive change or always had positive change were less depressed 12 months post-assault compared to people who lost benefits or never had benefits.	+

GHQ = General Health Questionnaire; CES = Center for Epidemiologic Studies; SRGS = Stress-Related Growth Inventory; IES-R = Impact of Event Scale-Revised; POMS = Profile of Mood States; BDI = Beck Depression Inventory; BSI: Brief Symptom Inventory; PTGI = Posttraumatic Growth Inventory; PDS = Posttraumatic Diagnostic Scale; RA: Regression Analysis; $**p < .01$; $***p < .001$.

the exception of [Mohr et al. \(1999\)](#) who found a small but significant positive correlation between benefit finding and symptoms of anxiety and anger ($r=.21^*$). In regard to PTG and indices of positive adjustment, studies also revealed mixed results. For example, in a sample of sexually abused women, those who reported a high number of benefits from their traumatic event were higher in self-esteem, lower in relationship anxiety and experienced more comfort depending on others when compared to women who indicated not having any benefits. There were no differences, however, between the two groups in regard to comfort with closeness or the perception of the world as benevolent ([McMillen, Zuravain, & Rideout, 1995](#)) (see [Table 3](#)). In contrast, [Klauer and Filipp \(1997\)](#) did not find a relationship between the perception of positive changes and self-esteem. In a sample of stroke victims, the perception of benefit was significantly associated with less depression and greater meaningfulness in life (measured as composite adjustment scale; $r=.5^*$; [Thompson, 1991](#)).

In a prospective study by [Davis et al. \(1998\)](#), individuals coping with the loss of a family member were assessed at four time points over a period of about 20 months. Finding benefits prospectively predicted lower levels of a composite distress measure incorporating depression, anxiety, and PTSD symptoms several months later, with the statistical association growing stronger over time (see [Table 3](#)). Furthermore, when the sample was divided into four groups a remarkable interaction effect emerged. For those who always had experienced benefits and those who had gained benefits a decrease of distress over time was evident, whereas the opposite was true for the other two groups. For those who had lost benefits and for those who never had experienced any benefits, the level of distress increased over time (see [Table 3](#)). Similarly, in a study of individuals with rheumatoid arthritis with severe joint pain and stiffness, fatigue, and immobility the appraisal of benefit was not related to psychological adjustment in terms of daily mood in general ([Tennen, Affleck, Urrows, Higgins, & Mendola, 1992](#)). But an interaction effect pointed to a buffering effect of benefit-finding in the face of severe distress in terms of activity limitation days: Among those with little pain, the benefit appraisal was unrelated to the number of activity limitation days. However, among those with relatively severe pain, benefit-finding predicted fewer activity limitation days (see [Table 3](#)).

2.5. Discussion of empirical findings

The short summary of empirical studies on the relationship between PTG and PTSD, depression and other adjustment outcomes reveals a rather irritating and inconclusive picture in terms of the adaptive significance of PTG. Numerous studies did not find any relevant relationship between PTG and psychological distress or adjustment variables. This null finding does not seem to depend on the nature of the sample, the nature or severity of the traumatic event, or the methods used to measure posttraumatic growth and psychological adjustment, because the studies vary greatly from one another in regard to those aspects. Overall, there seems to be no systematic relationship between PTG and PTSD symptoms or unspecific measures of distress in cross-sectional studies. In most cases, PTG and PTSD seemed to be unrelated, or, if related, then there was a positive relationship between the two. In contrast, depressive symptoms never showed a positive association with PTG. Depression was either unrelated or negatively related with the perception of personal growth. This observation makes sense: A depressed mood is usually accompanied by negative thinking, making the perception of any positive aspects of a situation less likely. The few longitudinal studies found that PTG predicted future reductions of distress or showed a buffering effect of PTG in cases of high trauma exposure. Those results point to the potential adaptive significance of PTG.

On the one hand one could argue that the existing empirical results provide preliminary evidence for the adaptive value of PTG. On the other hand, looking at the same results, one could also argue for the absence of an adaptive significance of PTG. And in fact, different authors have come to contradicting conclusions in their reviews of the empirical literature on PTG and adjustment. For example, [Affleck and Tennen \(1996, p. 904\)](#) state: “In summary, research on the adaptive correlates of benefit-finding among individuals facing serious medical problems is beginning to document its unique ability to predict emotional well-being.” In contrast, [Filipp \(1999, pp. 72–73\)](#) warns that “the current state of research indicates that attempts aimed at construing benefits from loss and trauma or at finding meaning by reframing losses as gains seem to be highly limited with regard to their adaptive value.”

2.6. Study limitations and problems of study comparability

There are several limitations making it difficult to interpret the results or to compare across studies: First, studies typically want to show that PTG fosters psychological adjustment. However, the instruments usually used are

Table 3
Posttraumatic growth and other adjustment outcome measures

Authors	Sample	<i>n</i>	Measure of posttraumatic growth	Measures of psychological distress/adjustment	Results relationship between growth and distress	Categorical relationship PTG-adjustment
Thompson (1991)	Stroke victims 9 months post-stroke	40	Open-ended question of perceived benefit	Composite adjustment score from depression and meaningfulness in life scales	$r = .50$ RA: $b = .24$; final $R = .70$ controlling for other factors Correlations n.s.	+
Joseph et al. (1993)	Accident survivors	35	Self-report scale on positive changes following accident	GHQ — anxiety		O
Lehman et al. (1993)	Bereaved spouses and parents (4–7 years after death)	94	Open-ended questions of life changes (interview): positive life changes	SCL-90-R Braedburn Affects Balance Scale	$r = .02$; n.s. $r = -.07$; n.s.	O O
McMillen et al. (1995)	Sexually abused (as child) low-income women	154	Interview on perceived benefits; ratings were coded in 3 categories (no, little, quite)		RA with factor “much vs. no benefit”:	
				Rosenberg Self Esteem-Scale	3.49** (beta)	+
				Relationship anxiety	-.337** (beta)	+
				Comfort depending on others	2.72** (beta)	+
				Comfort closeness	1.12 (beta); n.s.	O
				Benevolent world	1.76 (beta); n.s.	O
Klauer and Filipp (1997)	Cancer patients	100	“Changometer” of positive and negative life changes	Hopelessness Self-esteem	Reporting positive changes as a result of coping with cancer was unrelated to measures of adjustment.	O
Maercker (1998)	Former East-German political prisoners	124	SRGS (German version)	SCL-90-R	$r = -.19$ – $r = .08$; n.s.	O
Mohr et al. (1999)	patients with MS (multiple sclerosis)	50	Constructed questionnaire of Psychosocial Ramifications of MS (factor 2=benefit finding)	POMS: – Anxiety – Anger	$r = .21^*$ $r = .21^*$	– –

Best et al. (2001)	Parents of children treated for leukemia	113	PTGI	Pediatric Anxiety and Avoidance Scale (PAAS)	In RA, PTG was a significant individual predictor of anxiety and avoidance symptoms in mothers ($\Delta R^2 = .25$, $\beta = .38^{***}$) and fathers ($\Delta R^2 = .33$, $\beta = .55^{***}$)	–
<i>Longitudinal studies</i>						
Tennen et al. (1992)	Rheumatoid arthritis experiencing joint pain		5-item-benefit appraisal questionnaire at T1	POMS-daily mood Daily activity limitations	Benefit appraisal was unrelated to daily mood (adjustment measure) when dispositional optimism was controlled for. Independent from optimism, however, was the association between benefit finding and daily activity limitations: Among those with severe pain, growth appraisals predicted fewer activity limitation days.	O
				Both were assessed daily on 75 consecutive days		+
Davis et al. (1998)	People coping with loss of family member	205	Interview on benefit finding	Composite measure of distress (Symptoms of Depression, Anxiety, PTSD)	Benefit finding at T1 predicted distress levels at T2 ($\beta = -.11$, $p < .05$) and T3 ($\beta = -.14$, $p < .05$). Benefit finding at 13 months post-loss (T3) significantly predicted lower distress at T3 ($\beta = -.18$, $p < .01$) and at T4 ($\beta = -.26$, $p < .01$). The association between benefit finding and later lower distress grew stronger over time.	+
Sears et al. (2003)	Breast cancer patients after medical treatment completion	58	PTGI (T3)	POMS-distress (anger, depression, tension, fatigue, confusion)	Correlations between PTGI at 12 months and 12-months distress ($r = -.04$; n.s.) and perceived health scores ($r = -.09$; n.s.) not significant. Significant correlation was found between more PTG and higher positive mood ($r = .32^{**}$; $p = .01$). Hierarchical RA revealed that controlling for positive mood at study entry, the PTGI significantly added to the prediction of 12-months POMS-Vigor ($\Delta R^2 = .07$, $\Delta F(1, 55) = 8.83^{**}$, partial $r = .37$).	O
3 months posttreatment (T2)				Perceived health score		+
12 months posttreatment (T3)				POMS-vigor (=positive mood)		+

RA = Regression Analysis; GHQ = General Health Questionnaire; SCL-90 = Symptom Checklist 90; SRGS = Stress-Related Growth Inventory; POMS = Profile of Mood States; PTGI = Posttraumatic Growth Inventory; PAAS = Pediatric Anxiety and Avoidance Scale (15 items derived from the Impact of Traumatic Stressors Interview Schedule); * $p < .05$; ** $p < .01$; *** $p < .001$.

instruments of psychological distress or specific diagnostic instruments. It is open to discussion whether or not psychological adjustment should be considered the absence of psychological distress. Second, PTG is measured very differently: Some studies relied on interviews while others employed more or less validated PTG instruments. When an interview form was used, the problem of defining what counts as “positive” or “growth” emerges (for this issue see also [Park, 1999](#)). Third, the studied traumata vary widely. Some of them constitute sudden, relatively short-term traumatic events (such as an air plane crash), others are long-term stressors such as the foreseeable death of a loved one. It is quite probable that the adaptation processes to these different kinds of traumatic events differ from one another and that the perception of benefits or growth may play a different role for different kinds of traumata. The studies also vary in terms of severity of the investigated traumatic incident. As [Powell et al. \(2003\)](#) pointed out in their overview of differing severities of traumata, there seems to be an inverted U-relationship between the severity of trauma and the perception of posttraumatic growth, with medium stress producing the highest growth. However, there are exceptions to this observation: [Snape \(1997\)](#) compared trauma severity and the extent of PTG in people admitted to a hospital following an accident or assault with [Tedeschi and Calhoun's \(1996\)](#) undergraduate sample reporting on a selected stressful life event. The author reports that higher trauma severity – but probably of medium intensity – produces lower overall PTGI scores. Fourth, another fundamental problem is that researchers usually want to make statements on PTG in general but what they measure is *self-perceived* PTG. One can suppose that the predictors of self-perceived PTG and its adaptational role are different from the predictors and adaptive significance of an assumed “true” or objective PTG. A general problem connected with assessing PTG in the studies under review is the difficulty to know how significant exactly the designated positive changes are in the lives of the study participants. One can assume that this also varies among individuals. For some, the simple identification of benefits does not result in any changes in daily life whereas for others, the perception of benefits influences daily life experiences greatly. One can further assume that the different meanings and implications of benefit appraisals differently affect psychological adjustment. [Sears, Stanton, and Danoff-Burg \(2003\)](#) report an interesting result pointing into that direction. They showed that the simple identification of benefits from the experience of having cancer did not sufficiently influence adjustment. But the effortful and regular use of benefit information was a predictor of future positive mood and perceived health. As mentioned above, the reviewed empirical studies could be regarded as evidence for the adaptive significance of PTG as well as for the absence of the adaptive value of PTG. The next section presents arguments for both positions.

2.7. Arguments for the adaptive significance of PTG

Notably, all longitudinal studies find (mild) positive relations between perceived growth and adjustment. Mixed results and negative results are mainly cross-sectional. This may point to a curvilinear or at least non-linear relation between PTG and adjustment. The typical null findings in regard to the cross-sectional relationship between PTG and adjustment could be explained by the assumption that the adaptive value of PTG shows its effect in the long run and can only be discovered over a period of time. In a study that assesses PTG at just one point in time, the particular stage of the post-traumatic coping process cannot also be taken into account for each study participant. Probably, different participants within a sample are at different points in their coping process. For some of them, the perception of PTG represents a form of coping effort (similar to [Affleck and Tennen's](#) “benefit reminding”) in the face of enduring distress, whereas for others, the perception of PTG is a sign of coping success. Taken together, these differing stages within the coping process produce an overall non-linear relationship between PTG and psychological adjustment. Another argument for this view is that in the longitudinal studies ([Davis et al., 1998](#); [Frazier et al., 2001](#); [McMillen et al., 1997](#)) as well as in some cross-sectional studies ([Aldwin et al., 1994](#)) there were some interesting interaction effects with time or trauma severity providing preliminary evidence for a buffering or moderator effect of PTG on psychological adjustment. Usually those interaction effects showed that for people who perceive benefits from traumatic events, psychological distress decreases over time, while for those without benefits, psychological distress increases over time. Moreover, negative correlations between PTG and adjustment were often found in college student samples reporting about a recent “low point” as “traumatic” event. As consequence, the nature and severity of the stressful event showed a wide variability within these nonclinical samples, ranging from something as common as difficulties with parents/boy-friend to the loss of a family member. Therefore, the negative correlation between perceived PTG and adjustment might just be a sign that those who indicated growth had experienced a more severe traumatic event with the typical initial psychological distress.

2.8. Arguments against an adaptive view of PTG

Several studies found significant negative relationships between posttraumatic growth and adjustment measures or significant positive relationships between PTG and psychological distress. When applying the usual logic of psychopathology research to the negative associations between PTG and psychological adjustment, one could also conclude that the perception of PTG constitutes a dysfunctional coping strategy: A positive association between dysfunctional coping strategies (e.g. rumination in the sense of Ehlers and Steil (1995) as avoidant cognitive strategy) and PTSD-symptoms is usually interpreted to mean that dysfunctional coping strategies predict distress. Applying the same kind of logic, the positive correlation of PTG and distress might also point to some kind of maladaptive cognitive process being involved in self-perceived PTG. Thus, one could also conclude that the perception of PTG itself constitutes a dysfunctional coping strategy. Remarkably, researchers usually put forth the following argument to deal with these counterintuitive empirical findings: They point out that PTG and psychological distress are different concepts unrelated to one another or that PTG might be related to some aspects of well-being (e.g. Calhoun & Tedeschi, 1998). The reasoning of a possible maladaptive role of PTG might be counterintuitive, but – on the empirical basis – is not less justified than the notion that the two concepts might be unrelated to one another. Moreover, positive findings between the relation of PTG and adjustment are usually only found in studies with non-standardized assessments of PTG, thus using procedures with low reliability and validity. Studies that used validated instruments like the PTGI or the SRGS usually did not find any systematic relationship of that kind. A confounding factor is, however, their cross-sectional design that might also contribute to the nonsystematic relationship.

But even the positive associations between PTG and adjustment in longitudinal studies do not necessarily point to the adaptive significance of PTG. It might be that a third variable is responsible for the association. As Davis et al. (1998, p. 563) state: “Though supporting data are frequently interpreted as evidence for the importance of meaning, these significant associations between meaning and adjustment obviously are open to several alternative interpretations.” Possibly, the perception of growth is a sign or part of an underlying broader constellation of personality traits or coping style that is associated with healthier and more effective coping leading to better adjustment. This assumed underlying habitual processing style is then responsible for both, the nature of psychological adjustment as well as the likelihood of PTG. Therefore, it might not be the perception of PTG that promotes adjustment. Another third variable that might influence PTG as well as psychological adjustment consists in the quality and nature of environmental factors and life circumstances (e.g. stability, safety, basic needs of love, support, and nurturance, support system and the like). One can assume that the same traumatic event may have a very different impact on people’s lives not only due to their different personalities but due to their very diverse life circumstances.

Even if one assumes that PTG shows its adaptive effect only in the long run, the missing systematic relationship between PTG and adjustment in cross-sectional studies must be considered relevant here. The reviewed studies usually assessed PTG and psychological adjustment *several years after* the critical incident. Therefore, acute or “emergency” coping strategies should have been overcome at the time of the assessment and study participants should have managed to attain their best individual coping result. If the perception of PTG had any adaptive significance, then, this positive effect should be detectable several years after the incident even in a cross-sectional design.

3. Cognitive predictors of PTG

Three aspects of the discussion point to the possibility of different cognitive factors being involved in self-perceived PTG at different stages of the coping process: (a) the mixed results of the empirical literature with regard to the relationship between PTG and adjustment, (b) the apparent difference between cross-sectional and longitudinal findings concerning the relationship of PTG and adjustment and (c) the relation of PTG to other underlying cognitive factors (see below).

3.1. Proposition for a two-component-model: the Janus-Face of PTG

The idea of different cognitive predictors of PTG has been outlined in the “Janus-Face-model of self-perceived PTG” (Maercker & Zoellner, 2004). The Roman God, Janus, was usually depicted as Janus Geminus (twin Janus), with two faces looking in opposite directions. The Janus Face model proposes a two-component model as an adequate approach to the phenomenon of self-perceived posttraumatic growth: Posttraumatic growth, hence, is considered to have a *functional*, self-transcending or constructive side, as Tedeschi and Calhoun see it, and also an *illusory*, self-

deceptive, or dysfunctional side. The latter has been subject to research by Taylor and coworkers (Taylor & Brown, 1994; Taylor, Kemeny, Reed, Bower, & Gruenwald, 2000) who used the term *positive illusions*. The two faces of PTG are assumed to represent co-existing components. Most authors and researchers in the PTG field have paid exclusive attention to the functional, constructive side of PTG. The one-sided conceptualization of PTG as functional may not be justified in many cases. The Janus-Face model assumes that perceptions of PTG are, at least in part, distorted positive illusions that might help people counterbalance emotional distress (for similar ideas see also Taylor, 1983; Taylor & Armor, 1996). On the illusory side, statements of a trauma survivor could indicate some insight into self-deception: “If it had to happen, then, at least, it should have been good for something.” The two components of PTG are assumed to have different time courses and be related differently to adjustment. The constructive side of self-perceived PTG is correlated with healthy adjustment, with its adaptive effects showing in the long run. In contrast, the illusory, self-deceptive side of PTG might be correlated with self-consolidation or even with denial in the short or in the long run.

The following statement by a bereaved wife within a therapy session may serve as an example of the *constructive/functional* side of PTG: “Although I do want him back and I wish it had not happened, it is awful for me to admit, but his death has taught me to be more appreciative of the little gifts in life. I am more thankful than before of what others do for me, like the support that is brought to me by my family and friends.” In contrast, a striking impression of *self-deception* is given by an individual who has recently experienced a dramatic setback, but declares with painful and sorrowful expression in her face that the experience has not made her poorer, but instead richer and more mature. The same person is, however, not able to describe more precisely how the gained richness or maturity may manifest itself. From outside, it rather looks as if the person is currently more miserable and disillusioned than before. One cannot help the impression that she tries to self-consolidate by switching losses into benefits, while simultaneously being in denial of her current distressed state. In this example, self-perceived PTG may represent a cognitive avoidance strategy which is normally assumed to be maladaptive. If the illusory component of PTG is associated with cognitive avoidance strategies such as deliberate efforts not to think about the trauma, then, in the long run, the perception of PTG may itself become a cognitive avoidance strategy. In those cases, it will have deleterious effects on adjustment.

However, the illusory, self-deceptive side of PTG does not always simply lead to maladjustment. If the illusory perception of PTG co-exists with deliberate thinking about the trauma and does not preclude active coping efforts, then, it may serve as a short-term adaptive palliative coping strategy. A patient who was forced to be a helpless witness of an ongoing ritual sexual abuse of her husband by a mafia-like professional organization and who has lost him due to this experience after a 15 year long good marital relationship reported that “Nobody can imagine the horrors I have been through. The memories about what happened make me sad. Those people have stolen my innocence and my belief in a good world. But I also try to value the lessons I have learned. I guess I know better now what is really important. Material things or success do not mean anything to me anymore. What really counts is love and people who are close to me.” This same patient who declared that love and close relationships are the most important things in her life did not, however, have any close friends or family members. Instead, she often devalued other people as being superficial and as not trustworthy. The therapist gained the impression that the proclaimed new valuing of love and close relationships was not something new to the patient, but something that she had already nurtured in her pre-trauma life and lost the capacity for its realization after the trauma. In this case, the perception of PTG – though illusory – represents an acute coping effort with a short-term palliative function but with neither positive nor negative long-term effects, since the individual did not deny concurrent negative life changes or psychological distress.

The realistic constructive, self-transforming component of PTG, however, should be positively related to aspects of adjustment or well-being in the long run. In successful coping with trauma, the constructive, self-transforming component of PTG is assumed to grow over time while the illusory component is assumed to decrease over time.

The two-component model (Maercker & Zoellner, 2004) might possibly explain and integrate the observation that longitudinal studies on PTG usually show positive relationships with psychological adjustment whereas the findings in cross-sectional studies usually are more inconclusive: In the longitudinal studies, the constructive side of PTG may have had a chance to manifest itself with its long-term adaptive effects. In contrast, the mixed results of cross-sectional studies mirror unknown proportions of the constructive and the illusory side of PTG being present.

3.2. Preliminary evidence

Preliminary evidence for a two-component model comes from studies that relate the perception of PTG to different coping styles (Maercker, 1998, 1999; Maercker et al., 1999). In those studies, PTG was predicted by

distinct coping strategies approximately representing the two sides of processing threat, namely a constructive side (reappraisal, active mastery in one study and problem-focused coping in another study) and a distractive, palliative side (denial/palliation in one study and emotion-focused coping in the other study). Taken together, those results point to the fact that posttraumatic growth is constituted by constructive, self-transcending statements and by illusory statements which may serve as calming down oneself immediately after a traumatic event. Empirical findings from another study (Armeli, Gunthert, & Cohen, 2001) also suggest that PTG is a multi-dimensional construct that is not predicted in all facets by the same antecedents. For example, in one dimension of PTG called *heightened self-understanding*, maladaptive coping strategies were more predictive than adaptive coping strategies. Similarly, in a longitudinal study on cancer patients undergoing bone marrow transplantation, greater use of positive re-interpretation as well as greater use of avoidance coping and alternative rewards in the pretransplant period were related to greater PTG in the posttransplant period (Widows, Jacobsen, Booth-Jones, & Fields, 2005). Those results highlight the possibility of co-existing adaptive and maladaptive processes in PTG. Results from another study can also be taken as evidence for an underlying illusory and palliative component in PTG: In a sample of parents of children treated for leukemia, PTG was positively associated with parental anxiety and cognitive avoidance of children's cancer related and medical issues after the end of treatment (Best, Streisand, Catania, & Kazak, 2001). The authors discuss the results as showing how "elevations in anxiety and avoidance may coexist with these more optimistic frameworks and may be more powerful at certain times than the perceptions of benefit" and that "individuals who are distressed may seek meaning for their situations [which] does not, however, relieve the anxiety and avoidance that accompanies the distress" (p. 306). However, in contrast to the positive association between positive perceptions of life changes after cancer (i.e. PTG) and cognitive avoidance of cancer-related issues, self efficacy cognitions, which were another factor of the above mentioned "optimistic framework," were *negatively* associated with anxiety and avoidance behavior. This result points to the salutary potential of self efficacy cognitions in contrast to positive perceptions of life changes (PTG). Therefore, one could also argue that in this study, overall, the perception of PTG served as a cognitive avoidance strategy in coping with cancer-related psychological distress.

Further evidence for the existence of self-enhancing illusions after threatening events derives from exciting psychological experiments (McFarland & Alvaro, 2000). They demonstrated that the perception of personal growth could be manipulated by the confrontation with threatening experiences and that threatening feelings about the self played a causal role in prompting illusory self-enhancing temporal comparisons which then led to the perception of personal growth. In one study, individuals were randomly assigned to focus either on a traumatic event or on a mildly negative event prior to rating their degree of self-improvement on a series of self-attributes (e.g. compassionate, wise, strong sense of inner strength, certain that I have a clear direction). Participants were asked to indicate their present level and their recalled past level – pre-event level – on those self-statements. Results revealed no differences between the two groups in regard to the level of present self ratings. However, threatened individuals (trauma condition) demonstrated heightened perceptions of improvement by deprecating the attributes they had possessed in the distant past. Their recalled ranking on the self-attributes was significantly lower than the recalled ranking of non-threatened individuals. The findings suggest that there is an illusory component to victims' perceptions of personal improvement and that these illusions derive from a distortion of the past rather than a distortion of the present.

Similar findings that point to an illusory component in the perception of personal growth were also obtained in a clinical sample of cancer patients undergoing bone marrow transplantation (BMT) (Widows et al., 2005). There was a general tendency for patients to perceive a decrease in distress over time from pre-to post-BMT that was attributable to overestimation (i.e. negatively biased recall) of distress prior to transplant, because there were no actual differences in distress measured before and after BMT. Furthermore, the amount of PTG as measured by the PTGI (Tedeschi & Calhoun, 1996) experienced by patients was related to *perceived* and *not actual* changes in psychological distress over time, whereby greater perceived improvement in distress was related to greater PTG. PTG was unrelated to actual pre- or post-BMT levels of psychological distress or concurrent level of PTSD symptomatology. The results cannot demonstrate clearly the illusory component in the perception of posttraumatic growth but they demonstrate the illusory perception of distress improvement that was associated with the perception of PTG. The findings strongly imply that greater experience of posttraumatic growth is related to perceptions of change that are attributable to deprecation of past psychological status rather than to actual changes in psychological status.

Table 4
Posttraumatic growth and habitual cognitive processing factors

Authors	Design	Sample	<i>n</i>	Measure of post-traumatic growth	Habitual cognitive processing factor	Results
<i>Optimism</i>						
Park et al. (1996)	Longitudinal 2 assessments separated by 6 months	1st year college students reporting on their most negative event within the last 6 months	256	SRGS at T1 and T2	Optimism (LOT)	PTG and optimism did not correlate at T1, but at T2 ($r=.27$); optimism at T1 was not predictive of T2-growth. T2-growth scores were related to increases in optimism scores from time 1 to time 2 (F change=5.09; R^2 change=.03).
Tedeschi and Calhoun (1996)	Cross-sectional questionnaires	Undergraduate students reporting to have experienced significant negative life event (bereavement, injury related accident, separation/death of parents, or victimization)	449	PTGI	Optimism (LOT)	PTG showed moderate to low significant correlations with optimism ($r=.23^{***}$) and openness to new experience ($r=.21^{***}$).
			325	PTGI	Openness (NEO-Personality Inventory)	Highest associations were found for 2 subscales: “New possibilities” and “Personal strength” (for both: $r=.25^{***}$ with openness and $r=.22$ with optimism). The overall growth score correlated most highly with the “feeling facet” of openness ($r=.28^{***}$)
Bower et al. (1998)	Retrospective semi-structured bereavement interviews (ca. 8 months post-loss)	HIV seropositive men having experienced AIDS-related bereavement (mean age=39)	40	Major shifts in values, priorities, or perspective in response to loss	Optimism (LOT)	Optimism was not related with finding meaning in any of the categories.

Davis et al. (1998)	Longitudinal T1: pre-loss interview (3 months before death) T2: 6 months after death	Persons coping with loss of a family member (74% female; mean age=51)	204	Open-ended question in regard to benefit finding categorized as yes, no, or partly	Optimism (LOT) at T1	Pre-loss optimism was the only significant predictor of post-loss benefit finding ($b=.22^{**}$) Reports of finding benefits were marginally but consistently related to changes in optimism.
<i>Controllability/locus of control</i>						
Park et al. (1996)	Cross-sectional questionnaires	College students reporting on most stressful event within last 12 months	160	SRGS	Locus of control (i.e. ratings on controllability of the event)	PTG and an internal locus of control were moderately but significantly positively correlated ($r=.24^*$)
Maercker et al. (1999)	Retrospective questionnaire	Dresden bombing victims (age range 57–95 years)	47	SRGS (German version)	Locus of control	Internal locus of control and PTG were significantly positively correlated ($r=.34^*$)
<i>Hardiness/sense of coherence</i>						
Waysman et al. (2001)	Cross-sectional questionnaires	Male Yom Kippur war veterans: POWs and combat controls (18–35 years)	348	Number of positive changes after war (TABC)	Hardiness (Hardiness Inventory)	There were significant positive associations between hardiness and reports of positive changes only for POWs ($r=.24$). For combat controls, the correlation was n.s. For whole sample, hardiness showed to be a significant predictor for positive changes ($\beta=.11^*$).
Znoj (1999)	Cross-sectional questionnaire	Bereaved parents (age of child at death ranged from several months to 20 years)	176	SRGS	Sense of coherence (SOC)	The meaningfulness facet of the SOC correlated significantly with posttraumatic growth ($r=.27^{**}$) and meaningfulness predicted stress-related growth ($\beta=.38^{**}$). Also in the second sample did the meaningfulness facet of the SOC correlated significantly with growth ($r=.24^{**}$).
		Spinal cord injured persons	259	SRGS	Sense of coherence (SOC)	

SRGS = Stress-Related Growth Scale; LOT = Life-Orientation Test; PTGI = Posttraumatic Growth Inventory; POWs = Prisoners of War; TABC = 5-point ratings on Trait, Attitude, and Behavioral Change; SOC = Sense of Coherence; $*p<.05$; $**p<.01$; $***p<.001$.

3.3. *The domination of the constructive side of PTG*

In the following section we will give a rough overview of empirical investigations on cognitive factors and processes that have been proposed to play a role in the prediction of posttraumatic growth. Most of these researched cognitive factors resemble a constructive, potentially functional dimension. Throughout the review, the illusory component will be mentioned if applicable, although the cited authors might have not conceptualized the investigated cognitive factors this way.

3.4. *Empirical review of habitual cognitive processing styles*

Parting from the traditional conceptualization, we consider some of the so-called *personality traits* as *habitual cognitive processing styles* and subsume them under this discussion. It is assumed that individuals consistently differ in their habitual ways of processing styles but that these styles are not as stable as personality traits are considered typically. This conceptualization agrees with research findings showing that dispositional traits are not as stable as formerly thought (Davis et al., 1998; Park et al., 1996).

3.4.1. *Openness to new experience (potentially functional)*

Openness to new experience describes individuals who are imaginative, emotionally responsive, and intellectually curious. Therefore, these individuals might be particularly prone to “draw strength from adversity.” In a study that related PTG to all personality dimensions of the “big five” in a large sample of college students, Tedeschi and Calhoun (1996) found a small, but significant cross-sectional correlation between *Openness to experience* and overall PTG (see Table 4) that was specifically accounted for by significant correlations with the dimensions *New possibilities* and *Personal strength*. In regard to different facets of openness, especially the emotional facet correlated most strongly with PTG (see Table 4).

3.4.2. *Hardiness and sense of coherence (potentially functional)*

The concept of hardiness has originally been proposed by Kobasa (1979) and comprises a stable personality resource consisting of three sets of cognitions: Commitment, challenge, and control. Commitment captures a person’s curiosity about and sense of the meaningfulness of the world. Control is the belief that one can influence the course of events. Challenge summarizes the expectation that change belongs to the normal course of life and is necessary for development. It has been proposed that a hardy personality is not only a buffer to stress (King, King, Fairbank, Keane, & Adams, 1998), but that it might also facilitate posttraumatic growth. Preliminary support for this notion is provided by a cross-sectional study on hardiness and positive and negative changes in a sample of Israeli prisoners of war (POWs) and a control group of veterans of the Yom Kippur war (Waysman, Schwarzwald, & Solomon, 2001). Hardiness played a protective role in both groups in regard to trauma-related negative changes. In regard to positive changes, however, hardiness served as a protective factor only for those exposed to more severe traumatic stress, i.e. the POWs. Hardiness was found to be associated with higher levels of positive changes among POWs, but not in the control group.

Similar to the concept of hardiness is the concept of “sense of coherence” by Antonovsky (1993). It is also a three-fold concept including the sense that the world is comprehensible, manageable, and meaningful. Znoj (1999) found in two samples, spinal cord injured people and bereaved parents, that posttraumatic growth was moderately positively related to one aspect of the sense of coherence: The sense that the world is meaningful (Table 4). These findings seem to be plausible: People who are generally convinced that the world is meaningful might find benefits and meaning from adversity more easily. However, the studies are cross-sectional, and one could critically point to the measurement and conceptual overlap of the two factors. Possibly, both measures, the SRGS (Park et al., 1996) as well as the subscale meaningfulness of the Sense-of-Coherence scale (SOC, Antonovsky, 1993), have measured the same underlying factor. Or, it is plausible that people who indicate that they generally believe in a meaningful world would also – for the sake of avoiding cognitive dissonance – more likely indicate that they found meaning from their experience.

3.4.3. *Dispositional optimism (potentially functional as well as illusory)*

Optimism is defined as a self-reported general expectation of good things to happen more often, relative to bad things. It is known that optimistic people usually show more flexibility in their coping strategies which therefore

tend to be adaptive with regard to the problematic situation: They employ more problem focused coping in controllable situations and make more use of reframing and acceptance coping in uncontrollable situations (Scheier, Carver, & Bridge, 2001). Several studies have shown a small to moderate correlation between optimism and posttraumatic growth (Affleck, Tennen, & Rowe, 1991; Curbow et al., 1993; Park et al., 1996; Tedeschi & Calhoun, 1996) (see Table 4). In their prospective study of people coping with the loss of a family member, Davis et al. (1998) could demonstrate that pre-loss optimism was the only significant predictor of finding benefits 6 months post-loss (see Table 4). In contrast, optimism was not predictive of “making sense of the loss.” Similar to the findings by Park et al. (1996), they found that people who reported benefits from dealing with their loss became somewhat more optimistic about life over the course of the study. The results of both studies can point out two things: First, optimism and personal growth seem to be related. Second, the relationship does not seem to be as straightforward as formerly proposed, i.e. optimism as a stable personality trait predicts personal growth as a coping outcome. Possibly, optimism and posttraumatic growth are overlapping concepts, or one concept includes the other as a subset. However, in another study, optimism and posttraumatic growth were not related (Bower, Kemeny, Taylor, & Fahey, 1998). Furthermore, the enthusiasm about the role of optimism in PTG is dampened by new refinements of the Life Orientation Test (LOT, Scheier & Carver, 1985; Scheier, Carver, & Bridge, 1994): When the old version of the LOT was employed, optimism was related to PTG. Using the revised version, however, optimism was not related to PTG (Tennen & Affleck, 1998). The reported correlations between dispositional optimism measured by the LOT and benefit finding may have simply been due to overlapping measures, since two of the original items of the optimism scale measured the ability to extract positive value from negative circumstances.

3.4.4. *Internal locus of control (potentially functional as well as illusory)*

An internal locus of control has been assumed to be related to PTG since it is associated with the perception and employment of personal resources that might foster a successful coping process, potentially including personal growth. Preliminary support comes from a cross-sectional study by Maercker et al. (1999) with Dresden bombing victims 50 years later: They found that the perceived posttraumatic growth was significantly associated with the extent of internal locus of control (see Table 4). In the study by Park et al. (1996) with younger adults, there was a significant positive correlation between perceived personal growth and the perception of controllability of the event (see Table 4). The difference between the two studies is that in the study of Maercker et al., the general perception of internal control was assessed, whereas the perception of control in the study of Park et al. referred only to the controllability of the specific stressful event. Although not conceived this way by the authors of both studies, the positive associations between internal locus of control and PTG might indicate the illusory side of PTG. Traumatic events are only minimally controllable. Thus, the perception of control associated with traumatic events may hint at a cognitive illusion. Therefore, the positive association between PTG and an internal locus of control can be regarded as evidence for the potentially illusory side in PTG. The findings in the study of Maercker et al. that a high internal locus of control was associated with high posttraumatic avoidance in the high trauma exposure subgroup, supports this argument.

3.5. *Empirical review of cognitive processing or coping factors*

3.5.1. *Positive re-appraisal (potentially functional)*

Many theorists hold that the strategy of positive re-appraisal is crucial for successful adaptation to traumatic events and constitutes a pre-requisite for personal growth to occur (Calhoun & Tedeschi, 1998; Janoff-Bulman, 1992). There is preliminary evidence from several studies for the hypothesis that posttraumatic growth is related to positive re-interpretation coping (e.g. Maercker, 1999; Park et al., 1996; Sears et al., 2003). In the study of Park et al. (1996), positive re-appraisal was significantly positively correlated with reported personal growth (see Table 5). More far reaching conclusions can be drawn from a longitudinal study by Sears and colleagues (2003) on a sample of women with early-stage breast cancer 3 and 12 months post medical treatment. Positive re-appraisal coping at study inception (3 months) predicted – apart from positive mood and perceived health at both times (3 and 12 months) – future posttraumatic growth (at 12 months). The results indicate that the regular, effortful use of benefit-related information (positive re-appraisal) as a coping strategy is one path to the emergence of posttraumatic growth (see Table 5).

Table 5
Posttraumatic growth and situation-related cognitive processing factors

Authors	Design	Sample	<i>n</i>	Measure of post-traumatic growth	Measures of situation-related cognitive factors	Results
Park et al. (1996)	Cross-sectional, retrospective, questionnaires	1st year college students reporting on their most negative event within the last 6 months	256	SRGS	Positive re-appraisal (COPE) Acceptance coping (COPE)	Significant positive correlations between PTG and coping styles emerged: with positive re-interpretation ($r=.55^{**}$) and with acceptance coping ($r=.36^{**}$). In a blocked RA, both were significant predictors of growth: positive re-interpretation ($b=.42^{***}$) and acceptance coping ($b=.19^*$).
Maercker (1999)	Cross-sectional questionnaire	Traumatized former political prisoners (age mean=54)	114	SRGS	Positive re-appraisal (Coping Stress and Coping Process Questionnaire)	Positive re-appraisal and posttraumatic growth were marginally but significantly positively correlated ($r=.18^*$).
Znoj (1999)	Cross-sectional questionnaire	Spinal cord injured persons	259	SRGS	Positive re-appraisal (COPE) Acceptance coping (COPE)	The sample was divided into 3 groups for analysis: A. $n=95$) high growth/low distress B. ($n=52$) medium growth/high distress C. ($n=112$) little growth/ low distress Significant group differences in regard to coping strategies were evident: Specifically group A showed significantly more positive re-interpretation ($p<.001$) and acceptance coping ($p<.01$) than the other two groups.
Armeli et al. (2001)	Retrospective questionnaire	University alumni, college students reporting on their most stressful event within past 2 years	447 472	SRGS	Positive re-appraisal (COPE) Acceptance coping (COPE)	For analysis, sample was divided into 5 groups according to high, moderate, and low stress as well as adaptive and maladaptive coping profiles. Growth was highest for those individuals who reported highly stressful event and used adaptive coping strategies such as positive re-interpretation and acceptance coping. The group with a profile of high threat and adaptive coping showed the highest growth scores.

Sears et al. (2003)	Longitudinal Questionnaire interviews	Women with early-stage breast cancer 3 months and 12 months post medical treatment	92 60	PTGI	Positive re-appraisal (COPE)	Positive re-appraisal coping at 3 months significantly predicted posttraumatic growth at 12 months and added to its prediction above time since diagnosis and perceived cancer stress ($[\Delta R^2 = .08$, $\Delta F(1,54) = 6.94^{**}$, partial $r = .34$). 65% had engaged in active deliberate thinking about the death. 40% reported major value shifts. CP was significantly positively associated with finding meaning ($\chi^2 = 5.93^{**}$). 12 out of 26 classified as high in CP, however, did not find meaning
Bower et al. (1998)	Retrospective semi-structured bereavement interviews (ca. 8 months post-loss)	HIV seropositive men having experienced AIDS-related bereavement	40	Major shifts in values, priorities, or perspective in response to loss	Cognitive processing (CP) Self-constructed measure (=deliberate effortful or long-lasting thinking about death)	Self-reported rumination soon after the trauma was positively associated with PTG ($r = .57^{**}$). Recent rumination was also positively associated with PTG ($r = .45^{**}$). In a regression analysis, however, only early event-related rumination remained a significant predictor of growth (beta = .47***; semi-partial correlation was $r = .32$).
Calhoun et al. (2000)	Cross-sectional Retrospective, questionnaire	Students having experienced a traumatic event within past 3 years (35 female; 19 male; mean age 22 years)	54	PTGI	Rumination (items rationally derived from several instruments reflecting deliberate and intrusive thinking)	Those who reported to “search for a way to make sense of their experience” were more likely to endorse experiences of PTG than those who were not trying to make sense ($t = -3.77^{***}$). But the “feeling to have found a way to make sense” was unrelated to PTG.
Schorr and Roemer (2002)	Questionnaire survey	Commuter campus students having reported traumatic event or significant loss in their lives (90 female, 51 male; mean age 25)	141	PTGI	Sense making Rationally derived measure	

SRGS = Stress Related Growth Inventory; COPE = Coping-Inventory; PTGI = Post Traumatic Growth Inventory; * $p < .05$; ** $p < .01$; *** $p < .001$.

3.5.2. *Acceptance coping (potentially functional)*

The ability to accept situations that cannot be changed is assumed to be crucial for adaptation to uncontrollable or unchangeable life-events. Therefore, accepting that the traumatic event happened is proposed to be one important factor within the process that can lead to personal growth (Calhoun et al., 2000). The link between acceptance coping and posttraumatic growth has been demonstrated in several studies: In the study by Park et al. (1996) mentioned earlier, acceptance coping was a significant predictor of personal growth cross-sectionally (see Table 5). Znoj (1999) pointed out that the relationship between PTG and acceptance coping as well as positive re-interpretation is not a linear one: Only when the sample was divided into three groups according to high, medium, and low levels of posttraumatic growth, did significant group differences in coping strategies emerge: Among other differences, significantly higher use of acceptance coping and re-interpretation coping was found in the high growth group. Similar observations come from a large cross-sectional study of university alumni and college students reporting on their most stressful event (Armeli et al., 2001): PTG was highest for those who used adaptive coping strategies including positive re-interpretation, the use of humor and acceptance coping. Interestingly, however, only for those who had experienced a highly stressful event, were adaptive coping strategies related to PTG (see Table 5).

3.5.3. *Sense making and the quest for meaning (potentially functional as well as illusory)*

The search for meaning is considered to be central to psychological adaptation and is assumed to be associated with the perception of PTG. In a study of college students, Schorr and Roemer (2002) found the following interesting results: Those who reported searching for a way to make sense of a distressing experience and were currently distressed by PTSD symptoms were more likely to also report PTG compared to those who were not trying to make sense of anything. But reporting to having found a way to make sense of the experience was unrelated to PTG (see Table 5). The results may contribute evidence to the notion of PTG as a palliative coping effort, and thus, point to the potentially illusory side of PTG. The quest for meaning seems to be involved in PTG, but PTG is not necessarily linked to having found meaning. These results remind of findings by Davis and coworkers (1998) who showed that making sense of trauma is a different concept than finding benefits and that the two construals of meaning were not significantly associated and were related to adjustment in different ways.

3.5.4. *Rumination (potentially functional as well as illusory)*

Ruminative thinking has been generally implicated in changes in beliefs, goals, behaviors, and identity (Martin & Tesser, 1989). This conceptualization of rumination is to be distinguished from counterproductive versions of rumination described by other trauma researchers (e.g. Ehlers & Steil, 1995). Tedeschi and Calhoun (2004) regard rumination – seen as automatic or deliberate constructive thinking about the traumatic event – as one central process for the development of PTG. Preliminary support for this proposition comes from the study by Bower and coworkers (1998) mentioned earlier. They found that men who engaged in active or deliberate thinking about the death (labeled cognitive processing) were more likely to report positive shifts in their values or priorities in response to loss (see Table 5). Furthermore, in a sample of students having experienced various major traumatic events, early event-related rumination was significantly positively associated with posttraumatic growth, while later rumination was not (Calhoun et al., 2000) (see Table 5). The measurement of rumination in this study did not clearly distinguish between constructive, deliberate ways of thinking about the trauma and the intrusive quality of automatic event-related thinking. The differentiation between adaptive and maladaptive rumination is, however, crucial. This might explain why some study participants indicated to engage in rumination without finding benefits or meaning. Possibly, some of them have been involved in more maladaptive forms of event-related rumination or their reports reflected the existence of intrusive thoughts. In regard to both studies, one may further critically point out that there is apparent overlap in the semantics and therefore in the measurement of PTG and rumination. Therefore, the correlations between cognitive processing and posttraumatic growth might partly be measurement artifacts. Taken together, both studies support the view that cognitive processing as deliberate event-related thinking is a helpful, but not sufficient process to foster self-perceived posttraumatic growth. As outlined above, future studies should carefully consider the possibility of co-existing adaptive and maladaptive ruminative activities (see Treynor, Gonzalez, & Nolen-Hoeksema, 2003).

The empirical associations between PTG and other well-researched concepts like optimism, or openness to experience are low. PTG seems to be more strongly associated with certain cognitive coping strategies such as positive re-appraisal or finding meaning. The empirical studies cited above on positive re-appraisal, acceptance coping, and finding meaning are mainly cross-sectional in nature. Therefore, they do not allow the conclusion that those cognitive

coping strategies lead to personal growth. However, the studies highlight the interrelations of self-perceived PTG and the cognitive coping factors. Depending on the theoretical viewpoint, one may regard the three concepts as parts of PTG, or, conversely, as one possible form of finding meaning. In addition, some cognitive factors show considerable conceptual (finding meaning) and measurement (rumination) overlaps with PTG.

Some of the cognitive factors that are generally regarded as adaptive, for example rumination or optimism, might also play a role in the proposed illusory side of PTG.

4. General summary and future directions

The phenomenon of self-perceived PTG is still not well understood and cannot yet be described in a theoretically satisfying manner or measured with reliability and validity. PTG does not show any strong associations with well-researched concepts in psychology. Furthermore, PTG is not reliably linked to measures of adjustment. The proposed models of PTG (especially those by [Tedeschi & Calhoun, 2004](#) as well as [Schaefer & Moos, 1992](#)) have been of great value. However, both models implicitly assume that PTG is a positive and adaptive phenomenon, but this has not yet been demonstrated convincingly. As has been outlined by the Janus-Face model of PTG ([Maercker & Zoellner, 2004](#)) and by other authors ([Nolen-Hoeksema & Davis, 2004](#); [Park, 2004](#); [Wortman, 2004](#)), the possibility of an illusory component co-existing with a constructive component in self-perceived PTG should be considered by theorists and researchers. The ongoing open debates of the significance of PTG and its role for psychological adjustment can only be resolved empirically. Naturally, more research, especially longitudinal and possibly process-oriented research, is highly needed. For more knowledge of the phenomenon of PTG, it is also important that researchers of PTG remain open to competing views concerning the phenomenon itself and the adaptive role of PTG. Therefore, it seems important that adaptive as well as maladaptive predictors or processes are studied simultaneously when investigating PTG to better disentangle one from the other. Future research could assess external criteria for the illusory side of PTG by looking at the individual's effort to avoid the negative impact of the trauma cognitively, or by gauging the individual propensity for illusory thinking in general. External criteria for the functional, constructive side could consist of measures of cognitive processing (cf. [Bower et al., 1998](#)) or of behavioral change. This would assist in enhancing the validity and pragmatic value of the PTG concept.

Future research could also adapt methodology used in research on temporal comparisons ([McFarland & Alvaro, 2000](#)) and in the study by Widows and colleagues ([Widows et al., 2005](#)) to test the proposition made by the Janus-Face model of an illusory component in PTG: In a longitudinal design, victims provide ratings of their current positive personal attributes as well as recollections of their pre-event or prior standings over several measurement points. These ratings on self-attributes could be related to measures of adjustment (current and recalled) as well as ratings of posttraumatic growth. This type of research could reveal whether reports of posttraumatic growth or perceived self-improvements reflect actual changes over time or perceived improvements in the absence of real changes that are attributable to condemnation of past attributes.

Another incentive for further research on PTG could come from research on the parallel construct of wisdom. All attempts to measure the empirical construct of wisdom with self-report questionnaires derived from different methodological constructs have failed to find any effects (U. Staudinger, personal communication). In wisdom research, only the content rating method using answers to thinking-aloud tasks (i.e. the recording of objectifiable performances) is used. In regard to posttraumatic growth, it is also questionable whether the ability to introspect is really valid enough, for instance, to support and explain the statement "I have more sympathy for others." Therefore, behavioral performance tasks could contribute to the question of the veracity of reports of PTG. Recently, more quantitative measures have been employed to study PTG. However, PTG is still a phenomenon not well positioned within the theoretical and conceptual realm; therefore, qualitative studies and idiographic approaches may be of unique additional and heuristic value to the field (see also the critique by [Saakvitne, Tennen, & Affleck, 1998](#)).

Moreover, the role of emotions, in particular positive ones, has been underestimated in studying PTG. Models of PTG and research studies have usually concentrated on cognitive factors, coping strategies, or personality differences when assessing predictors of PTG, but the role of emotions might play a greater role than previously assumed. The finding that specifically the emotional facet of openness to experience was linked to PTG, in contrast to the behavioral or cognitive side of openness ([Tedeschi & Calhoun, 1996](#)), concurs with this proposition. Interesting results from a recent study exemplify the possibly overestimated role of cognitive factors and the underestimated role of (positive) emotions: In a longitudinal study of college students who were assessed in early 2001 and again shortly after

September 11, 2001, positive emotions in the aftermath of crisis fully accounted for the relation between pre-crisis resilience (personality trait) and post-crisis growth, conceptualized as increases in life satisfaction, optimism, and tranquility (Fredrickson, Tugade, Waugh, & Larkin, 2003). Without assessing positive emotions simultaneously, post-crisis growth would have been predicted by pre-crisis resilience. However, it was not the personality factor of resilience that played the crucial role, but the existence of positive emotions.

Another interesting and possibly fruitful field of research is the investigation of posttraumatic growth within the context of psychotherapy. Other authors (Calhoun & Tedeschi, 1998; Saakvitne et al., 1998) have already discussed the potential of psychotherapy for personal growth as well as its neglected role within therapeutic conceptualizations. Research of PTG within psychotherapy can offer exciting perspectives for exploring how change in assumed relevant factors (such as cognitive processing factors as well as affective states) might effect the emergence of PTG and how PTG is interrelated with other factors that are usually explicitly fostered in the therapeutic context such as adaptive cognitive strategies or the reduction of emotional distress.

5. Clinical utility of PTG research and conceptualizations

Having outlined some critical aspects and concerns about the concept of PTG, we would like to stress that we do consider PTG a worthwhile concept to be investigated by trauma researchers. Furthermore, we regard PTG as a new perspective worthwhile to be integrated into clinical practice. Psychotraumatology has too long focused solely on the detrimental effects of traumata and has, thus, confined the understanding of trauma recovery to a deficit oriented model. Considering PTG as a further potential outcome of coping with trauma broadens our clinical perspective. In this realm, recent attempts have been made to develop models of trauma response that encompass both, PTSD and PTG (Christopher, 2004). The concept of PTG adds a *new perspective*, not a new treatment, into psychotherapy. For example, clinicians might recognize the patient's distressing struggle to understand the impact of trauma and the distress of disbelief not solely as a posttraumatic response (deficit) but as a potential precursor to growth.

We would like to end with some thoughts on the clinical utility of PTG (for a more thorough and detailed discussion see Calhoun & Tedeschi, 1999). It seems important to raise clinicians' awareness of the possibility of growth. Only then are they able to perceive PTG, as their clients begin to consider such possibilities. For too long clinicians may have short-changed trauma survivors by focusing so closely on reducing symptoms of trauma, that they may have failed to support clients as they reflect upon their basic beliefs more generally. When the possibilities of PTG remain salient to the clinician, he or she can help the client to identify PTG as aspects of PTG emerge in particular sessions. Therapists should have an understanding of how the process of working through the impact of trauma is linked to the potential revision of trauma affected schemas. Traumatic events are more or less linked to life threat. These experiences may make individuals more aware of their own mortality and the fragility of life in general. This acknowledgment may lead to a heightened appreciation for life as one dimension of PTG. Also, traumatic experiences include almost always some kind of loss. Therefore, a return to the old, "innocent" pre-trauma state is often not possible. Realistic change seems to be part of the recovery process implicating PTG to be potentially an integral part of the healing process. Further, trauma survivors often have a need to understand what happened and struggle with the meaning of the event. Psychology has long focused on one aspect of meaning: meaning as causal attribution. The search for an answer to the question "why did it happen" must fail because trauma per se does not make sense — at least, if one does not find a self-deprecating explanation ("It happened because I deserve to be punished"). The perception of PTG may add another perspective to the meaning-making need of clients: It may give an answer to the question "what for."

Psychotherapy constitutes a good context to explore positive changes in the aftermath of trauma. The simultaneous acknowledgement of patients' suffering enables them — on the basis of a trustful and intimate therapeutic relationship — to explore positive changes as result of their coping process as well. Outside of the therapeutic context, clients may have been given advice by friends to "see the positive" or "concentrate on the good things" when they talked about the negative impact of trauma. Such hasty advice is usually not helpful because it is often linked to the denial of suffering. A professional abstinence from a naïve use of positive thinking should be accompanied by an open-minded attitude on the side of the therapist allowing patients to find their own specific meanings, interpretations, ways of coping and recovery. Perceptions of growth should be supported and encouraged when they occur and clinicians can promote the active use of this growth perspective in patients' daily life. Clinicians ought, however, to remember that the absence of growth should not be regarded as a failure. Therapists

should be particularly careful not to suggest that patients must grow from their experience. Such suggestions may be offensive and minimize the patient's experience. Furthermore, we would like to remind that there is no evidence up to date that PTG is necessary for successful recovery from trauma.

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