

Resilience to Loss and Potential Trauma

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Abstract

Initial research on loss and potentially traumatic events (PTEs) has been dominated by either a psychopathological approach emphasizing individual dysfunction or an event approach emphasizing average differences between exposed and nonexposed groups. We consider the limitations of these approaches and review more recent research that has focused on the heterogeneity of outcomes following aversive events. Using both traditional analytic tools and sophisticated latent trajectory modeling, this research has identified a set of prototypical outcome patterns. Typically, the most common outcome following PTEs is a stable trajectory of healthy functioning or resilience. We review research showing that resilience is not the result of a few dominant factors, but rather that there are multiple independent predictors of resilient outcomes. Finally, we critically evaluate the question of whether resilience-building interventions can actually make people more resilient, and we close with suggestions for future research on resilience.

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Potentially traumatic events (PTEs): events that meet criteria from the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* for the PTSD diagnosis for a psychological trauma (e.g., threat of serious personal harm or injury)

INTRODUCTION

Bad things happen. Although we tend to think of traumatic events as rare, population-based studies have consistently documented that over the course of a normal lifespan most people are exposed to at least one event severe enough to meet the criteria from the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* for a psychological trauma (e.g., an event

that threatens or causes serious personal harm or injury) (Norris 1992). Bereavement is even more common. Most people at different points in their lives will experience grief over the death of a close friend or relation. These events can be distressing and disturbing, and sometimes debilitating. But not everyone reacts the same way. Prospective and longitudinal research has repeatedly reported clear individual differences in how people respond to loss and potential trauma. Some people feel overwhelmed. Others struggle for months and then gradually recover, while still others manage to continue functioning at normal levels even soon after the event and appear resilient (Bonanno 2004). Indeed, the marked variability in adaptation to such events suggests that the commonly used term “traumatic” is a misnomer. Rather, such events are more appropriately referred to as “potentially traumatic events” or PTEs (Bonanno 2004, 2005; Bonanno & Mancini 2008; Norris 1992). Here we use the acronym to refer to both loss and potential trauma.

This article focuses on that portion of individuals exposed to PTEs who continue to demonstrate stable, healthy adjustment or resilience. We begin by examining how psychology has traditionally viewed outcome following PTEs. We review two approaches that have dominated the literature (Bonanno & Mancini 2010, Bonanno et al. 2010): the focus on extreme reactions and psychopathology and the focus on average levels of adjustment as a means of comparing exposed and nonexposed groups. We consider the advantages and limitations of each approach and then present a broader view of individual differences. To that end, we review the statistical assumptions underlying both traditional approaches and more recent individual differences approaches, and we focus on recent studies that have employed sophisticated latent growth modeling as a means of empirically identifying different longitudinal trajectories of outcome. Next, we review the available evidence on predictors of resilient outcomes. We also devote a considerable portion of our review to the question of whether resilience can be enhanced through one-size-fits-all

resilience-building interventions. In an effort to place such interventions in a broader empirical context, we consider data from related literatures in which global interventions have been used prophylactically to prevent the onset of psychopathology, as well as theoretical models of risk homeostasis and risk compensation. Finally, we consider future directions for research on resilient outcomes following PTEs.

THE LIMITS OF DIAGNOSES AND THE PROBLEM WITH AVERAGES

Until recently the vast majority of research on loss and potential trauma has used either a psychopathology approach or an event approach (Bonanno & Mancini 2010). The psychopathology approach, by far the most typical approach, focuses almost exclusively on individual psychopathological reactions, most commonly posttraumatic stress disorder (PTSD), major depressive disorder, and complicated grief (CG). That the emphasis on psychopathology would dominate early research efforts is not surprising. PTEs create an imperative public health need. It is inevitable that some people will suffer PTEs and as a result will suffer lasting psychological difficulties, and that some will require therapeutic intervention. Identifying and treating such problems thus becomes an obvious first priority.

Interestingly, the question of what might constitute a psychopathological response to a PTE has a long and controversial history. During most of the twentieth century, the idea of psychological trauma was viewed with considerable suspicion and clouded by doubts about malingering, secondary gain, or personal weakness (Lamprecht & Sack 2002). These concerns were especially prominent in the context of war-related psychological difficulties and continue to be controversial in that sphere even today. For example, a recent survey of soldiers returning from combat operations in Iraq and Afghanistan indicated that many desired but did not seek treatment because of prevailing stigma about perceptions of weakness (Hoge et al. 2004). Ironically, controversies about patholog-

ical grief reactions following loss have tended to gather at the opposite end of the mental health spectrum. There is a long history in the bereavement literature of dismissing genuinely healthy reactions to loss as denial or hidden pathology (see Bonanno 2009, Bonanno & Kaltman 1999).

As these diagnostic controversies were clarified, new research and intervention strategies were quick to follow. The formal recognition of PTSD as a legitimate diagnostic category in the DSM, for example, resulted in a surge of new research on traumatic stress that rapidly advanced our understanding of the etiology, prevalence, neurobiology, and treatment of extreme trauma reactions (McNally 2003). More recently, a similar set of circumstances followed the articulation of diagnostic criteria for CG (e.g., Horowitz et al. 1997). Although a CG diagnosis has not yet been formally entered into the DSM, discussion of the criteria has stimulated new research on the identification and treatment of extreme grief reactions (Boelen et al. 2007, Bonanno et al. 2007b, Shear et al. 2005).

The ability of diagnostic categories to stimulate inquiry and guide intervention on extreme reactions to loss and trauma is clearly advantageous. However, these advances have come at a cost. Diagnostic entities are largely conceptual rather than empirical, and as a result there tends to be little in the way of objective criteria for their revision. For example, since its inception, the PTSD diagnosis has gradually broadened to allow greater weight to the subjective experience of trauma. The resulting “bracket creep” (McNally 2003) may have had unintended consequences of reducing the validity of the diagnosis. Moreover, taxometric analyses of the latent structure of both PTSD symptoms (Broman-Fulks et al. 2006, Ruscio et al. 2002) and grief symptoms (Holland et al. 2009) have failed to support their categorical structure. Rather, these analyses suggest that both disorders are best understood as continuous dimensions and, by extension, that specification of a diagnostic cut-point will always be arbitrary to some extent.

Resilience: an outcome pattern following a PTE characterized by a stable trajectory of healthy psychological and physical functioning

Risk homeostasis: theory positing dynamic interactions between external risk-reduction measures and perceived risk that maintain a constant level of actual risk

Risk compensation: theory positing that people will compensate for risk reduction brought about by external changes with behaviors that increase risk

PTSD: posttraumatic stress disorder

CG: complicated grief

Trajectory:

a developmental pathway that maps changes in a dependent measure over time

More significantly, the nearly exclusive focus on pathological categorization is uninformative about the shape and characteristics of the distribution of nonpathological responses. Of particular relevance to this article, the simple binary distinction between pathology versus the absence of pathology fails to speak to the question of whether the relative absence of grief and trauma reactions are best understood as a dysfunctional aberration, a normal response, or the result of extraordinary coping ability (Bonanno 2004).

The other common approach to loss and trauma, the event approach, attempts to understand the impact of PTEs by focusing on average levels of continuous outcome measures. Average-level data are typically used to compare exposed and nonexposed, as a means of estimating the duration of posttraumatic impact. Average scores are useful in determining within-group predictors of grief or posttraumatic outcome and are especially informative when meta-analyses are used to summarize data across multiple studies (e.g., Currier et al. 2008, Norris et al. 2002).

Importantly, however, the assessment of PTEs in terms of average responses also has crucial limitations. Similar to the focus on

psychopathology, the comparison of average levels of adjustment provides relatively little information about the distribution of nonpathological reactions or the prevalence of resilient outcomes. Moreover, average responses are potentially misleading. Average responses are often taken to represent the modal response to an event. Yet, as we demonstrate below, when assessed over time the statistical average bears little resemblance to the typical patterns of response that are observed following PTEs.

PROTOTYPICAL OUTCOME TRAJECTORIES

Recognition of the limitations of the psychopathology and event approaches has spurred the development of a broader research agenda that emphasizes individual differences in PTE outcome across time. In part, the failure of traditional trauma and loss theory to accommodate the full range of adjustment in the aftermath of acute adversity can be attributed to misconceptions about the nature of the underlying variability in change across time. Both the psychopathological approach and the event approach are predicated on the assumption that aversive life events produce a single homogenous distribution of change over time (Duncan et al. 2004, Muthén 2004). By contrast, recent theoretical (Bonanno 2004, 2005; Bonanno & Mancini 2008, 2010; Mancini & Bonanno 2006) and statistical (Curran & Hussong 2003, Muthén 2004) advances have dramatically underscored the natural heterogeneity of human stress responding.

Increasingly, the available empirical literature suggests that most of this heterogeneity can be captured by a relatively small set of prototypical outcome trajectories (Bonanno 2004). The four most common trajectories and the frequency with which they tend to occur are depicted in **Figure 1**: Resilience is characterized by transient symptoms, minimal impairment, and a relatively stable trajectory of healthy functioning even soon after the PTE;

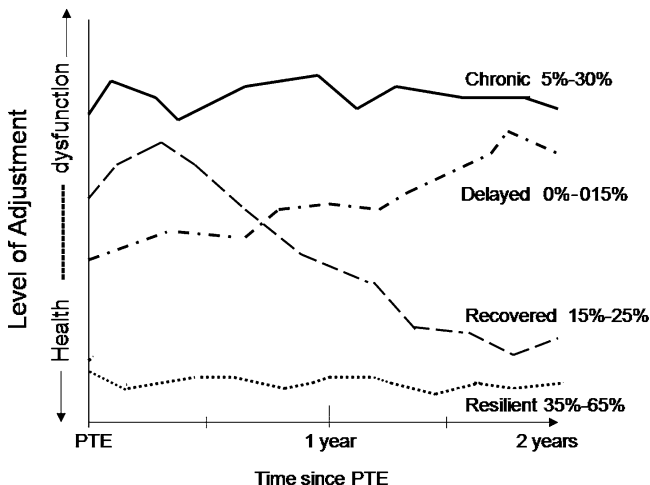


Figure 1

Prototypical trajectories of adjustment following a PTE (adapted from Bonanno 2004).

recovery is distinguished from resilience by elevated symptoms and some functional impairment after the PTE followed by a gradual return to normal levels of functioning; chronic distress is characterized by a sharp elevation in symptoms and in functional impairment that may persist for years after the PTE; finally, delayed distress is characterized by moderate to elevated symptoms soon after the PTE and a gradual worsening across time. Other trajectories that are also sometimes observed include enduring impairment that predates the PTE (continuous distress) and elevated distress prior to the PTE that decreases markedly after the event (distress-improvement) (Bonanno et al. 2002b). We elaborate on these distinctions below.

Resilience

The absence of significant distress and dysfunction after exposure to a PTE was once seen as puzzling and anomalous, the likely result of either exceptional emotional strength or numbness. In the case of bereavement, it was often thought that the relative absence of distress was actually a form of hidden psychopathology. These perspectives continue to exert influence among the lay public (see Bonanno 2009). However, their currency with researchers and theorists has rapidly waned in the face of overwhelming evidence that most people respond to even the most extreme stressors with minimal disruptions in overall functioning. Bonanno (2004) has described this capacity as resilience, defining it as “the ability of adults in otherwise normal circumstances who are exposed to an isolated and potentially highly disruptive event, such as the death of a close relation or a violent or life-threatening situation, to maintain relatively stable, healthy levels of psychological and physical functioning” (p. 20). The capacity for resilience is part and parcel of ordinary human capabilities (Masten 2001), as witnessed by the substantial proportion of people who endure PTEs with relatively minor effects on their everyday lives (Bonanno 2004, 2009).

Recovery

In contrast to resilience, a quite different trajectory describes a pathway of recovery. The term “recovery” connotes a response to a PTE characterized by acute distress, moderate to severe levels of initial symptoms, and some difficulties meeting role obligations. Over time, these difficulties abate, and the person returns to his or her baseline level of functioning, usually within one to two years after the PTE. By contrast, resilience is characterized by relatively minor and transient disruptions in functioning, with few if any marked effects on everyday functioning and routines. An increasing number of studies have demonstrated that resilience and recovery can be mapped as discrete and empirically separable outcome trajectories in response to widely varying acute stressors, including interpersonal loss, major illness, traumatic injury, and terrorist attack (Bonanno et al. 2002b, 2008; deRoon-Cassini et al. 2010; Deshields et al. 2006; Lam et al. 2010; Mancini et al. 2010a).

Chronic Distress

Relatively few individuals go on to develop chronic psychopathology following exposure to a PTE. Although PTEs vary considerably in type, severity, and duration, PTSD is typically observed in 5% to 10% of exposed individuals. When exposure is more prolonged or severe, the proportion exhibiting PTSD or other types of psychopathology may reach higher levels, but rarely exceeds 30% of the sample (Bonanno 2005, Bonanno et al. 2010). For example, among a representative sample of 2,752 New Yorkers interviewed in the months following the 9/11 terrorist attack, the chronic PTSD prevalence was estimated at 6% (Bonanno et al. 2006). Among those physically injured in the attack, however, chronic PTSD was estimated at 26%. In a careful reanalysis of the National Vietnam Veterans Readjustment data, a representative sample of 1,200 veterans, chronic PTSD was estimated at 9% but rose to 28% among veterans with the highest levels of combat exposure (Dohrenwend et al. 2006). Studies of psychopathology during

Recovery:

an outcome pattern characterized by elevated symptoms and functional impairment after the PTE, followed by a gradual return to baseline functioning

bereavement suggest similar proportions. Typically only about 10%–15% of bereaved people will exhibit chronically elevated grief reactions (Bonanno & Kaltman 2001). However, chronic grief reactions tend to be more prevalent following more extreme losses, such as when the death-event involves violence (Kaltman & Bonanno 2003, Mancini et al. 2010b, Zisook et al. 1998) or when a child dies (Bonanno et al. 2005a).

Delayed Reactions

Delayed reactions have been a source of controversy and debate. Although the DSM-III formally recognized delayed-onset PTSD in 1980, research has raised important questions about the distinction. Prevalence estimates for delayed PTSD have varied widely, from 0% to 68% (Andrews et al. 2007), and some commentators have questioned whether it exists at all (Bryant & Harvey 2002). Empirical studies that have mapped PTSD symptoms over time in fact observed what appear to be delayed elevations in the direction of threshold symptoms. However, a close examination of these symptom patterns suggest not the sudden onset of pathology but rather subthreshold symptoms levels that grew substantially worse over time (e.g., Bonanno et al. 2005b, Buckley et al. 1996, deRoon-Cassini et al. 2010). Consistent with these observations, a recent review of the literature on delayed PTSD concluded that delayed-onset PTSD is attributable to an exacerbation of existing symptoms (Andrews et al. 2007). Delayed grief during bereavement has long been a source of theoretical speculation (Wortman & Silver 1989). However, in contrast to PTSD, longitudinal bereavement research has yet to offer persuasive documentation of delayed symptom (Bonanno & Field 2001, Bonanno & Kaltman 1999, Middleton et al. 1996), indicating that delayed grief is not a veridical phenomenon.

Continuous Distress and Distress Followed by Improvement

In addition to the four prototypical trajectories, prospective research has identified two

additional growth trajectories, each characterized by elevated symptoms and distress prior to the event's onset. One of these patterns, the continuous distress trajectory, captures individuals who experience persistently elevated symptoms and distress beginning well before the target event's onset and continuing well after the target event had run its course. Importantly, identification of the continuous distress pattern makes it possible to distinguish difficulties specific to the target event from longer-term difficulties that predate the target event. The continuous distress trajectory has been identified in research on loss (Bonanno et al. 2002b, 2005c; Mancini et al. 2010a), unemployment (Galatzer-Levy et al. 2010), and terrorist attack (Bonanno et al. 2005b). A related pattern describes individuals with elevated pre-event symptoms followed by improvement after the event's occurrence. The distress-improvement pattern has been identified in research on loss following chronic illness (Bonanno et al. 2002b), divorce (Mancini et al. 2010a), and military deployment (Dickstein et al. 2010).

EARLY TRAJECTORY RESEARCH

Early investigations of the outcome trajectories described above employed relatively rudimentary methods, using a priori cut points and existing theory to group participants into theoretically derived response patterns. In an early set of bereavement studies using relatively small samples, Bonanno and colleagues described a group of individuals with little or no grief symptoms across time (Bonanno et al. 1995). Using a larger, prospective sample, Bonanno and colleagues (Bonanno et al. 2002b, 2004) identified distinct outcome trajectories following spousal loss using baseline or pre-bereavement means and standard deviations as the metric for normal variability. The majority of the sample (71.7%) was characterized as resilient, recovered, or chronically distressed. Of particular note, resilience was the most common trajectory (45.9%). Subsequent studies have confirmed that these outcome trajectories characterize the vast majority of participants

following a PTE. In a study of high-exposure 9/11 survivors, for example, Bonanno et al. (2005b) found that 35% of participants displayed resilience but also that the other prototypical outcome patterns of recovery (23%), chronic distress (29%), and delayed reactions (13%) were also well represented. In a similar approach examining breast cancer survivors, Deshields and colleagues (Deshields et al. 2006) examined change in depression scores at 0, 3, and 6 months following radiation treatment. Here again most participants displayed resilience (60.7%), but others showed chronic distress (11.9%), recovery (9.5%), as well as a delayed trajectory (3.5%), consistent with the prototypical response patterns described above. However, 13.1% of the sample in this study could not be placed in any of the trajectories, illustrating one key limitation of this method.

Indeed, identifying outcome trajectories by using simple mathematical algorithms has three significant limitations. The first is that this approach relies on a single mean and standard deviation to derive patterns of trajectory change (e.g., Bonanno et al. 2002b). This is problematic because different pathways may possess different degrees of variance, and relying on a single estimate of functioning does not permit this source of variability to influence trajectory designation. In this sense, prior investigations were essentially relying on a fixed effects model to define trajectories. However, given individual differences, a random effects approach is more appropriate because it allows for within-person variability. A second critical limitation of prior research is that using a priori cut points to define trajectories is inherently arbitrary. The trajectories are necessarily imposed on the data rather than emerging directly from them, making it impossible to know whether naturally occurring distinctions are being identified. A third, related limitation is that the operational definitions for the trajectories were based solely on a priori theoretical assumptions about the nature of the prototypical patterns of variation across time. Although, as we describe below, subsequent research has for the most part supported the findings of the initial research,

the use of predetermined theoretical definitions necessarily limits opportunities to identify novel or event-specific patterns of outcome.

Latent Growth Mixture Modeling

A compelling and elegant methodological solution to these basic conceptual problems is found in latent growth mixture modeling (LGMM), a suite of statistical techniques derived from structural equation modeling (Muthén 2004). In contrast to conventional growth modeling techniques, such as hierarchical linear modeling (HLM), LGMM is not limited to the modeling of a single mean response pattern and therefore a single homogeneous distribution (see **Figure 2**). By relaxing the assumption of a single population, LGMM is able to identify heterogeneous subpopulations comprising distinct response patterns across time. The key feature of LGMM is the incorporation of both continuous and categorical latent variables. Latent continuous variables are random effects that define parameters of growth across time (e.g., intercept, slope, and quadratic). These parameters

LGMM: latent growth mixture modeling

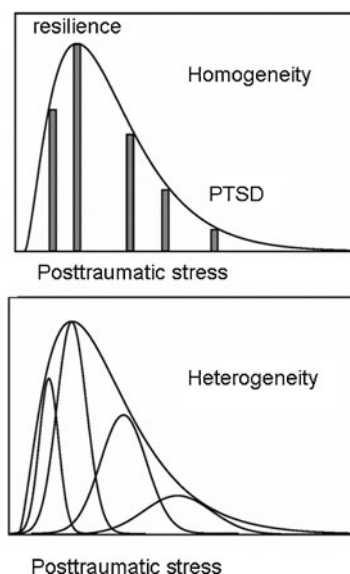


Figure 2

Homogeneous and heterogeneous outcome distributions for posttraumatic stress (adapted from Feldman et al. 2009).

are allowed to vary across unobserved populations or trajectory classes, which are identified through latent categorical variables that group participants according to differing patterns of growth. The appropriate number of trajectory classes is determined primarily by a set of fit statistics, as well as by existing theory and interpretive rationale (Muthén 2004).

To illustrate the insights LGMM can offer into how people cope with adversity, we next contrast research that employed the HLM and LGMM approaches, respectively. Importantly, these studies were all conducted on the same panel dataset, allowing us to directly compare the results of the two methods. Lucas and colleagues (e.g., Lucas 2005, Lucas et al. 2003) used HLM to model subjective well-being following divorce, marriage, widowhood, and unemployment. The random effects HLM identified marked within-person variation in response to each of these events, indicating substantial individual differences in adaptation. For example, people who showed more significant reductions in well-being soon after bereavement also took much longer to recover, while those persons with the strongest positive reactions to marriage saw long-term increases in their well-being. Of particular relevance here, Lucas and colleagues concluded that divorce, widowhood, and unemployment can produce long-term reductions in well-being (Lucas 2005, Lucas et al. 2003). Indeed, divorce and unemployment were characterized as having fundamentally negative effects. Although these findings are certainly informative, we would argue that there is more to the story.

To address this possibility, we reanalyzed these same data using LGMMs (Galatzer-Levy et al. 2010, Mancini et al. 2010a). Consistent with previous findings, we found multiple and divergent trajectories in response to divorce, marriage, unemployment, and widowhood, indicating considerable individual differences. However, substantively different conclusions emerged regarding the overall impact of these events as well as the nature of these individual differences. Specifically, only a relatively small subset of persons experienced lasting reduc-

tions in well-being after divorce, widowhood, or unemployment. Moreover, in response to each of these events, the substantial majority showed a stable trajectory of high well-being similar to resilience, clearly indicating that most people coped extremely well with these experiences. In addition, we found evidence for other trajectories, including the distress-improvement pattern, following widowhood and divorce, which characterized an important minority of the sample for both events (5.4% and 9.1%, respectively). The HLM approach has considerably more difficulty capturing these divergent patterns because it only models a single estimate of functioning. Moreover, HLM cannot group participants into trajectories and thus cannot estimate the prevalence of different response patterns. We would emphasize that the primary reason for these different results is that HLMs model variation around a single average response pattern and thus assume a homogeneous distribution.

One distinct virtue therefore of LGMM is its capacity to differentiate trajectory patterns and then to estimate their prevalence. LGMM does this in an empirical and nonarbitrary fashion, providing estimates that are uncontaminated by a priori assumptions. In a recent program of research, together with our colleagues we have applied LGMM to a wide range of stressors, and found that resilience—or a stable trajectory of healthy adjustment across time—was invariably the modal response. For example, using LGMM, we found a high proportion of resilience among bereaved spouses, 58.7% (Mancini et al. 2010a); divorced persons, 71.9% (Mancini et al. 2010a); persons admitted for surgery following a traumatic injury, 59.2% (deRoon-Cassini et al. 2010); breast cancer surgery survivors, 66.3% (Lam et al. 2010); hospitalized survivors of the severe acute respiratory syndrome (SARS) epidemic in Hong Kong, 35% (Bonanno et al. 2008); and unemployed persons, 66.8% (Galatzer-Levy et al. 2010). In the context of the methodological strengths of LGMMs, these findings provide further and particularly compelling evidence that resilience is a robust phenomenon

emerging in response to widely varying stressful experiences.

MULTIPLE, INDEPENDENT PREDICTORS OF RESILIENT OUTCOMES

Why are some people more likely to show resilient outcomes than others? As we noted above, traditional models of potential trauma, which assumed stable healthy adjustment following PTEs to be rare, viewed this question in relatively simplistic terms: Resilience was either the result of extraordinary mental health, and thus the province only of supercopers, or a denial-like state associated with dysfunction and psychopathology (Bonanno, 2004, 2009). The fact that resilience is not rare but rather typically the modal outcome trajectory following a PTE suggests a dramatically different interpretation. For starters, before even considering additional research, we should expect there to be considerable heterogeneity among resilient individuals. Because such a large proportion of the population tends to be resilient, resilient individuals will likely vary across demographic profiles, personality, life history, past and current stressors, social and economic resources, and a host of other factors.

Given the heterogeneity of resilient individuals, we would anticipate that there should be multiple, independent predictors of resilient outcomes. Developmental researchers have long observed that children who ultimately evidenced resilient outcomes despite facing corrosive life circumstances were able to utilize an array of resilience-promoting factors, including person-centered variables (e.g., personality) and socio-contextual factors (e.g., supportive relations) (e.g., Werner 1985). The same appears to be true for both children and adults confronted with PTEs. Resilience after these events does not appear to result from any one dominant factor. Rather, various risk and resilience factors coalesce in a cumulative or additive manner, each contributing or subtracting from the overall likelihood of a resilient outcome (Bonanno et al. 2007a). Some resilience

factors may be stable over time (e.g., personality), while others will likely fluctuate with life circumstances or changes in the availability of resources (Hobfoll 1989, 2002). In other words, at any given instant, persons may be more or less likely to be resilient, depending on their recent history and the broader context of their lives.

Because research that explicitly defined resilient outcomes following PTEs is still sparse, a limited body of data is available to examine predictors of resilient outcomes. Below we detail the most robust predictors of resilient outcomes.

Personality

It is widely assumed that resilience is determined to a large extent by personality; that is, that there are resilient types who cope markedly better with adversity than do nonresilient types (e.g., Connor & Davidson 2003, Schok et al. 2010). This assumption is rooted in widespread beliefs about the impact of personality on human behavior. We caution, however, that although personality traits may be salient, their explanatory power is easily overestimated. As Mischel (1969) famously observed, personality rarely explains more than 10% of the actual variance in people's behavior across situations. In keeping with the multidimensional nature of resilient outcomes, therefore, we suggest that personality is best thought of as one of many risk and resilience factors that might contribute to the course and ultimately the outcome of a person's adjustment following PTEs (Bonanno & Mancini 2008).

A number of personality variables have also been associated with favorable adjustment after PTEs (Bonanno 2005, Bonanno et al. 2010). An important methodological limitation in the vast majority of these studies, however, is that personality was measured after the PTE had already occurred. Personality variables are assumed to be stable over time, and a number of measures have shown impressive reliability over relatively short intervals (e.g., six weeks; Gosling et al. 2003). Nonetheless, it is plausible that the experience of a PTE may inform

Proximal exposure:

events and consequences that occurred during the approximate period in which the PTE occurred

Distal exposure:

events and consequences that arise in the PTE's aftermath, such as the loss of resources or income

participants' personality scores rather than the other way around, especially when the personality variable is measured many months after the PTE (Bonanno & Mancini 2008).

Within the context of this limitation, then, the most compelling evidence necessarily comes from multivariate studies that measure personality prior to the advent of the PTE. Studies that have met these stringent criteria have associated better post-event outcome with high pre-event scores on perceived control (Ullman & Newcomb 1999) and trait resilience (Ong et al. 2010b), and with low pre-event scores on measures of negative affectivity (Weems et al. 2010) and a ruminative response style (Nolen-Hoeksema & Morrow 1991).

Somewhat counterintuitive, there is also prospective evidence linking resilience with trait self-enhancement. Trait self-enhancers are individuals who habitually engage in overly positive or unrealistic and self-serving biases (e.g., Taylor & Brown 1988). Although this dimension can be something of a mixed blessing, as trait self-enhancers often evoke negative reactions in other people (Paulhus 1998), there is also considerable evidence to suggest that trait self-enhancers cope exceptionally well with potential trauma (Bonanno et al. 2002a). In a recent prospective, multivariate study, trait self-enhancement predicted better adjustment after subsequent exposure to potentially traumatic events, over and above its possible overlap with the other personality dimensions, such as optimism and neuroticism (Gupta & Bonanno 2010).

A number of studies have also demonstrated associations between personality variables and explicitly defined resilient outcome trajectories. Specifically, these studies reported links between trait self-enhancement and resilience among high-exposure survivors of the 9/11 attacks in New York (Bonanno et al. 2005b), high perceived coping self-efficacy and resilience following potentially traumatic injury (deRoon-Cassini et al. 2010), and low negative affectivity and high positive affectivity and resilience following either multiple physical traumas or spinal cord injury (Quale & Schanke 2010).

Demographic Variation

Another set of factors that inform resilient outcomes are the relatively straightforward effects of demographic variation. Most notably, resilient outcomes in the aftermath of a PTE have been associated with male gender, older age, and greater education (Bonanno et al. 2007a, Murrell & Norris 1983). There is also some evidence to suggest a predictive role for race/ethnicity. For example, following the 9/11 attacks in New York, African American and Latino groups (e.g., Dominicans, Puerto Ricans) have been associated with poorer physical and mental health (Adams & Boscarino 2005) and less resilience (Bonanno et al. 2006) compared to whites. However, these categories of race/ethnicity are typically confounded with low socioeconomic status (Norris et al. 2002), and when such factors are controlled for in multivariate analyses, they are typically no longer predictive in relation to resilience (Bonanno et al. 2007a).

Proximal and Distal Exposure

The impact of PTE exposure on adjustment evidences a consistent dose-response effect. Greater exposure is generally associated with poorer psychological adjustment, whereas resilient outcomes are associated with reduced exposure. As suggested above, however, exposure is only one of many cumulative risk and resilience factors, and the available evidence indicates that even when exposure is extreme, psychological resilience is still likely to be highly evident. Parsing the relation of exposure and resilience is complex, however, because exposure potentially encompasses many different aspects of a PTE. In the service of parsimony, we have adopted a distinction between proximal and distal aspects of exposure (Bonanno et al. 2010). Proximal exposure refers to events and consequences that occur during the approximate period in which the PTE occurred. By contrast, distal exposure refers to events and consequences that arise in the PTE's aftermath, such as the loss of resources or income.

Two important aspects of proximal exposure are captured by the event criteria specified in the PTSD diagnosis: being in immediate physical danger and/or witnessing death or serious injury to others. These dimensions have been consistently linked with greater levels of posttraumatic stress (Bonanno et al. 2005b, Nolen-Hoeksema & Morrow 1991), especially in youths (La Greca et al. 1996). Importantly, a detailed analysis of multiple types of proximal exposure among New Yorkers during 9/11 attacks indicated clear variation in relationship to resilience (Bonanno et al. 2006). For example, well over half (55.6%) of those who witnessed the attack in person still evidenced a healthy profile during the first six months after 9/11, whereas the proportion of resilience dropped to one third (32.8%) and was the lowest level observed in the study, among those physically injured in the attack.

Social and Economic Resources

The important role played by social and economic resources in stress responding is well documented (Hobfoll 1989, 2002). There are many different kinds of social resources, including emotional, instrumental, and informational support (Kaniasty & Norris 2009). A growing body of research has linked emotional support with positive adjustment following disaster (Kaniasty & Norris 2009, La Greca et al. 1996), and multivariate disaster studies have provided compelling evidence for an explicit link between social support and resilient outcomes (Bonanno et al. 2007a, 2008). Although it is widely assumed that social support also buffers the stress of bereavement, prospective research has failed to corroborate this idea (Stroebe et al. 2005). However, prospective data have indicated a relationship between resilient outcomes following loss and pre-existing levels of instrumental support (i.e., assistance with the tasks of daily living) (Bonanno et al. 2002b).

The availability of economic resources has consistently been associated with better adjustment following PTEs (Brewin et al. 2000, Norris et al. 2002). However, studies

that have explicitly examined resilient outcome trajectories have failed to detect a relationship to economic variables (Bonanno et al. 2005b, 2007a). An important consideration, however, is that PTEs can also alter the availability of resources (Hobfoll 1989, 2002), and the loss of resources (e.g., decrease in income) has been associated with reduced prevalence of resilience (Bonanno et al. 2007a).

Past and Current Stress

Considerable research has linked past and current life stress with both increased risk for PTSD (Brewin et al. 2000) and a decreased likelihood of resilience (Bonanno et al. 2007a). It is important to note, however, that prospective research indicates that only prior stressors that result in PTSD tend to predict PTSD at subsequent exposure (Breslau et al. 2008). It is not yet clear that resilience to past stressors also predicts subsequent resilience. Interestingly, for some types of PTEs (e.g., disaster), prior experience with similar events predicts better adjustment at subsequent exposures (see Bonanno et al. 2010), presumably because prior experience helps a person prepare for and understand the pending sequence of events.

Worldviews (A Priori Beliefs) and Meaning Making

It is widely assumed that pre-existing worldviews influence reactions to aversive life events. At present, however, only a few studies have actually assessed worldviews prior to the advent of a PTE. In a prospective study of bereavement Bonanno et al. (2002b) found that preloss measures of beliefs (justice and acceptance of death) predicted a resilient trajectory after the death of a spouse. Subsequent analyses showed that favorable worldviews were related to adjustment over time only among bereaved persons and not among nonbereaved controls (Mancini et al. 2010c). In one of the few investigations of PTSD to use pre-event data, Bryant & Guthrie (2007) reported that negative beliefs about the self among a sample of firefighters undergoing

training predicted elevated PTSD symptoms four years later, accounting for 20% of the variance in those symptoms. These findings suggest that positive worldviews, when measured before the PTE has occurred, are associated with more adaptive coping.

By contrast, there is minimal evidence that worldviews, when measured after the PTE has occurred, predict later adjustment. In one recent study, worldviews were assessed after spousal loss and showed no relation to subsequent adjustment, suggesting that worldviews play little or no role in maintaining symptoms across time (Mancini et al. 2010c). A similar finding emerged in a study on PTSD following heart attacks: Compromised worldviews were only present in persons with concomitant PTSD (Ginzburg 2004). Taken together, these findings suggest that negative worldviews are an associated feature of trauma-related symptoms rather than their underlying cause. Moreover, they call into question the notion that PTEs give rise to PTSD and other symptoms by “shattering” our worldviews (Janoff-Bulman 1992).

What about the role of meaning following a PTE? Park (2010) recently emphasized the important distinction between searching for meaning (“meaning-making efforts”) versus arriving at a meaning (“meaning made”). It appears that the search for meaning is not salutary in and of itself and may actually reflect a continuing preoccupation with the PTE (Bonanno et al. 2005a). Indeed, some research has found that seeking meaning following a PTE is actually associated with worse adjustment (Bonanno et al. 2005a, Park 2010). However, initial evidence does suggest that meanings may have favorable effects on adjustment following a PTE (Park et al. 2008).

Positive Emotions

Positive emotions provide a number of adaptive benefits (Fredrickson 2001, Keltner & Bonanno 1997). Although positive emotions are crucial in everyday life, the link between positive emotions and adjustment appears

to be especially prominent in the context of aversive situations (Bonanno 2004, 2005; Ong et al. 2010a). In an experimental study conducted just after the 9/11 attacks, Papa & Bonanno (2008) exposed New York college students to either a sadness-induction or an amusement-induction task and then asked them to talk about their life since the terrorist disaster. The expression of genuine smiles during the monologue predicted better psychological adjustment two years later, but only for the students who were first made to feel sad. Genuine smiles following the amusement induction were unrelated to long-term adjustment. In field studies, bereaved individuals who exhibited genuine laughs and smiles while talking about their recent loss had better adjustment over the next several years of bereavement compared to bereaved individuals who did not make these expressions (Bonanno & Keltner 1997). A prospective study on remote reactions to the 9/11 terrorist attacks among college students showed that positive emotions, such as love, interest, and gratitude, fully mediated the relation between pre-event ego resilience, a trait-like personality characteristic, and post-event depression and perceived growth (Fredrickson et al. 2003). Finally, in a study of high-exposure survivors of the 9/11 attacks, trait self-enhancers were more likely than other participants to exhibit a resilient outcome trajectory and were also more likely to have experienced positive affect when talking about the attack (Bonanno et al. 2005b).

SUMMARY

Despite the deluge of studies on resilience over the past decade, much of the available research has focused on risk for poor outcome rather than resilience per se. Only a limited number of studies have examined predictors using prospective, multivariate designs and have explicitly defined resilient outcomes. This research has revealed a number of independent resilience-promoting factors, including personality, demographic variation, level of trauma exposure, social and economic resources, a priori

world views, and capacity for positive emotions. It is important to note, however, that most of these predictors reflect relatively stable dimensions that either cannot be changed (e.g., gender) or are not easily changed (e.g., personality or level of social resources). Given this context, it would seem that the recent surge of interest in prophylactic programs aimed at building resilience in large groups of individuals may be somewhat premature. Programs of this nature have been developed primarily on the basis of cross-sectional, retrospective studies of adjustment on the one hand and literature on risk factors in psychopathology on the other, and thus in their current form rest on underdeveloped and potentially misleading theoretical and methodological foundations. Given these caveats, in the section that follows we adopt a relatively critical approach in examining the potential risks and benefits of resilience-building interventions.

CAN RESILIENCE-BUILDING INTERVENTIONS MAKE PEOPLE MORE RESILIENT?

The growing interest in resilience among psychological researchers and clinicians over the past decade has imparted several benefits to the discipline, such as a broadening of research and intervention agendas to include the possibility of positive outcomes in the face of adversity. Increasing recognition of variability in outcome after exposure to PTEs has also resulted in the development of alternative theoretical models and more sophisticated statistical methods to elucidate mechanisms and factors that may contribute to a resilient outcome trajectory over time. However, when it comes to preventative interventions aiming to promote resilience to PTEs, there continues to be a substantial gap between the goals of these interventions and empirical research supporting their efficacy.

To address this gap, we end our review by examining the potential risks and benefits of resilience-building interventions. First, we review universal prophylactic interventions designed to minimize the occurrence of

self-injurious behaviors, such as suicide and disordered eating. On the balance, these interventions have been surprisingly ineffective. We consider why such interventions might fail or succeed and the lessons they may hold for resilience promotion. Next we consider how resilience-building programs may directly or indirectly influence perceptions of risk and whether changes in risk perception might interact with pre-existing strengths and vulnerabilities. To this end we review the risk management literature, focusing on the concepts of risk homeostasis and risk compensation. Finally, we consider issues of compatibility between resilience promotion goals and various cultural, personal, and situational differences among its recipients.

Prophylactic Interventions

Suicide prevention. The development of prophylactic interventions designed to protect against the onset of psychopathology or self-injury is a noteworthy goal. Alarmed by reports of rising numbers of suicides among currently or recently deployed troops, federal agencies have funded several large-scale projects to investigate risk and resilience factors and to implement and test the effectiveness of resilience interventions in service members routinely exposed to PTEs (Natl. Inst. Mental Health 2009).

While the idea of preventing the development of trauma-related psychopathology in individuals exposed to high-stress situations such as combat has obvious merit, it is important to anticipate potential adverse consequences of these interventions. The case of Critical Incident Stress Debriefing (CISD), a single-session intervention that was widely expected to lower the incidence of psychopathology after potentially traumatic life events, highlights the importance of exercising caution when contemplating large-scale administrations of psychological interventions. Multiple studies have shown that CISD is not only ineffective but actually may be psychologically harmful to some people (Litz et al.

Prophylactic: describes a measure taken for the prevention of a disease or condition (e.g., dental care to prevent onset of caries)

2002, McNally et al. 2003). Similarly, a recent review of multiple-session interventions aimed at everyone exposed to a specific traumatic event concluded that there is insufficient evidence for their effectiveness (Roberts et al. 2009). There was in fact an overall trend for less self-reported PTSD symptoms in the no-intervention comparison groups at 3–6-month follow-up (Roberts et al. 2009). The authors pointed out that whether or not these preventative interventions might cause harm is largely unknown because out of the randomized controlled trials included in their review, only one reported data on adverse effects. The data from that particular trial revealed that individuals in a preventative counseling intervention with a past psychiatric history tended to do worse at six-month follow-up (Holmes et al. 2007).

There have been a number of attempts to implement national programs aimed at the prevention of specific target problems, such as suicide (Mann et al. 2005). The most common types of universal suicide preventative interventions can be grouped into two broad categories. One category includes large-scale public education initiatives that seek to increase recognition of suicide risk and help seeking by providing information on causes and risk factors, such as mental illness, that may increase suicidal behavior. A second category may also include an educational component but is distinguished primarily by the use of screening for at-risk individuals and incorporation of targeted interventions for the latter (e.g., treatment referrals).

Large-scale public education programs have been relatively ineffective in reducing suicide risk. Although some public education and awareness campaigns have had modest effects on changing attitudes regarding causes and treatment of mental illnesses associated with increased risk for suicide, they rarely led to reductions in suicidal acts or produced other behavioral changes that may decrease the risk for suicide (Mann et al. 2005). Similarly, a review of curriculum-based programs administered to youth in school and community settings found no changes in the rates of youth suicide (Guo & Harstall 2002). Many studies

have reported overall improvements in knowledge and attitudes toward suicidal peers and help seeking, and increased willingness to seek help if distressed (Gould et al. 2003). However, in others, program-induced changes in attitude turned out to be contrary to what was intended (Ploeg et al. 1996). For example, Shaffer and colleagues found that participants who at the beginning of the program gave a negative response to the question whether suicide could be a reasonable solution for people with a lot of problems actually answered this same question in the affirmative after attending the program (Shaffer et al. 1991). Notably, this effect was particularly pronounced among black participants. Similarly, another study found that after completion of a suicide awareness curriculum, male students showed increased levels of hopelessness and maladaptive coping responses. The male students in this study were also more likely to endorse statements that discussing suicide could increase a person's risk for attempting suicide, a negative evaluative attitude thought to present a barrier to addressing suicidal tendencies in an open and constructive manner (Overholser et al. 1989). In yet another study, Shaffer and colleagues found that adolescents with a history of previous suicide attempts responded to a suicide prevention program by endorsing more negative attitudes and beliefs about suicide than nonattempters (Shaffer et al. 1990). Despite these concerning findings, there has been widespread implementation of curriculum-based prevention programs in the United States; indeed, such programs are either required or recommended (Stevens et al. 2008).

More promising results have been obtained from suicide prevention programs that included a screening mechanism to identify those most at risk (Spirito & Esposito-Smythers 2006). Two programs identified as particularly promising are the Signs of Suicide program (Aseltine & DeMartino 2004) and the Columbia Teen Screen (Shaffer & Craft 1999). The latter program involves a stepped approach in which only students identified as at-risk move on to a second level of more intensive screening that may result in referrals for psychiatric evaluation and

treatment. Thus, it is important to note that unlike many universal curriculum-based programs, the Columbia Teen Screen does not administer all components of the intervention to an entire cohort in a one-size-fits-all approach, but rather aims to identify and refer students with previously unrecognized psychiatric symptoms who evidence at least some risk for suicidal behavior.

Eating disorders prevention. Mirroring findings in the suicide prevention literature, universal prevention programs for eating disorders directed at everyone regardless of symptom status have tended to be less effective than interventions targeting subgroups of participants identified at high risk for eating pathology (Stice & Shaw 2004). A more recent review (Stice et al. 2007) identified multiple promising interventions. Again, however, only programs targeting high-risk individuals (commonly referred to as selected intervention and contrasted with universal campaigns conducted with entire populations or cohorts) prevented future increases in eating pathology compared to control groups who did not receive the intervention.

Many studies on the efficacy of eating disorders prevention programs have serious methodological weaknesses, such as lack of alternative intervention control group or nonrandom assignment to condition (Stice & Shaw 2004). In the absence of a control group, it cannot be determined whether positive effects are due to the intervention, regression to the mean, the passage of time, measurement artifacts, demand characteristics, expectancies, or other confounders. Moreover, several interventions that were effective in reducing eating disorder symptoms actually resulted in increased dietary restriction (Groesz & Stice 2007, Presnell & Stice 2003, Stice et al. 2006), which is known to increase risk for developing an eating disorder (Patton et al. 1990). A widely cited eating disorder prevention study in children and adolescents (Carter et al. 1998) reported counterproductive effects of school-based eating disorder prevention programs. Although the program

resulted in increased knowledge and temporary decrease in the level of eating disorders features, this decrease was not maintained at six-month follow-up. In addition, there was an increase in the level of dietary restraint compared to baseline. However, this study did not include a control group, and in a later controlled trial of the same intervention (Stewart et al. 2001), no such harmful effects were observed. Importantly, observing that positive changes in dietary restraint and attitudes to shape and weight were modest and not sustained over time, the authors of the follow-up study concluded that targeting high-risk subgroups of dieters might present a more effective prevention strategy than offering the intervention to entire school groups or cohorts (Stewart et al. 2001).

Multiple studies have demonstrated that merely providing information about the harmful effects of eating disorders does not appear to deter people from engaging in maladaptive eating behaviors (Pratt & Woolfenden 2002). Conversely, programs that were successful at decreasing current eating pathology and preventing future increases in eating pathology incorporated interactive exercises designed to modify specific risk factors for onset of eating pathology among high-risk groups (Stice et al. 2007).

In summary, two interrelated patterns of findings emerging from both eating disorders and suicide prevention programs are the relative ineffectiveness of universal curriculum-based programs that emphasize didactics and the relatively greater effectiveness of intensive, interactive programs targeting at-risk groups. The challenge with such multi-component prevention programs is that not enough is known about the processes that mediate positive effects (i.e., how the program works). Thus, only a handful of studies have investigated factors that may mediate intervention effects, leaving uncertainty about the relative contribution of non-specific factors to outcome and which specific components of programs may account for positive effects (Stice et al. 2007). Similarly, only a few studies have conducted analyses examining moderators of intervention effects (e.g., Taylor

et al. 2006) that could shed light on characteristics of responders and those that do not benefit or may even be adversely affected by the intervention (Stice et al. 2007).

Risk Management

The fact that many and often a majority of people exposed to PTEs evidence resilient outcomes raises the intriguing question of how such individuals might have reacted had they been previously exposed to the communications and goals of a resilience promotion program. Ideally, such a program would only have enhanced whatever pre-existing skills or strengths a person might have possessed already. However, it is worth considering the opposite outcome, that a resilience intervention might undermine a person's natural tendencies. One way such an untoward shift might come about is through changes in a person's perception of relative risk.

Risk management is an important and widely used concept in the area of emergency and disaster management. The risk management framework provides a flexible vehicle for understanding, analyzing, and predicting variability in outcome when people are exposed to PTEs (Paton et al. 2000). Risk in the context of risk management theory refers both to the rate and the magnitude of consequences associated with a specific hazardous activity such as high-speed driving (Hood & Jones 1996). Risk management models include trait vulnerability factors as predictors but also emphasize the interaction of individual difference variables (e.g., sensation-seeking personality) with environmental contingencies (e.g., penalties for risky driving and financial rewards for accident-free driving records) in producing negative and positive outcomes.

The theory of risk homeostasis (Wilde 1982) that informed much of the early research in this area highlights the potential perils of implementing interventions designed to decrease risk and promote positive outcomes. Risk homeostasis theory was originally developed to test and explain the effects of programs designed

to increase road safety but has since been applied to many other behavioral domains, such as smoking and settling in flood-prone territories (Adams 1995). The central tenet of risk homeostasis theory is that people will continuously compare the amount of risk they perceive in a given behavior or situation (risk perception) with whatever level of risk is acceptable to them personally (target level of risk) and will modify their behaviors and subsequent decision to minimize discrepancies between the two. This dynamic interaction of risk perceptions, target level of risk, and behavior modification means that people will maintain a constant level of risk even when induced to make behavioral changes that presumably should decrease risk exposure.

The closely related theory of risk compensation posits that people will react to changes in their environment with behaviors that increase their risk of injury, thus compensating for reductions in risk brought about by the external changes (Adams 1995). This theory would predict, for example, that the installation of airbags in cars that automatically inflate when the car collides with another vehicle will actually lead to an increase in "risky" driving behavior due to the driver's perception that the airbags will protect him or her from injury (Peterson et al. 1995). Several studies on driving behavior have provided evidence consistent with the predictions of risk compensation theory as well as studies examining the impact of product safety campaigns on consumers (see Hedlund 2000 for a review). For example, introducing safety mechanisms on cigarette lighters in households of families with children has been shown to result in parents taking reduced precautions regarding lighters and fire safety (Viscusi & Cavallo 1996). Similarly, a study by Morrongiello & Major (2002) showed that parents perceived less risk and showed increased tolerance for children's risk taking in play situations involving use of bicycle helmets.

Although risk compensation and risk homeostasis theories are not free of controversy (e.g., Evans 1986), they provide a useful framework from which to evaluate the possibility that large-scale interventions designed to promote

optimal adjustment among people exposed to PTEs may have unintended side effects. For example, the idea that everybody could become resilient if taught certain coping skills might lead some people to overestimate their own coping ability or to underestimate the level of distress they might experience in response to a potential psychological hazard such as combat. Misperceptions of risk and coping ability may be especially likely among individuals who have previously demonstrated resilience following exposure to PTEs. Risk underestimation may also attract certain individuals to occupations they may not be suited for.

Another unintended effect of resilience-building interventions may be their potential to increase stigma attached to mental health problems experienced following exposure to PTEs (e.g., if people can be trained to be resilient, the absence of resilient outcomes may be attributed to a person's failure to benefit from training). In this way, interventions involving instruction of coping strategies that are thought to increase resilience to psychological stress may convey messages that serve to counteract or even reverse potential positive changes resulting from these interventions.

Compatibility

Another important issue is the compatibility of coping strategies taught in resilience interventions with recipients' cultural values and dispositional differences in coping with stress. Although the positive psychology movement that inspired many of the current resilience-building interventions has found a following across the globe (Novotney 2009, Seligman & Peterson 2003), it is important to be aware of the potential of resilience interventions that were primarily developed in Western countries to conflict with value systems held in other societies. Such conflict may detract from the ability of some recipients to benefit from these interventions as well as potentially undermine their use of culture-specific resources to achieve positive outcomes. Because most data on feasibility and effectiveness of interventions

designed to prevent mental disorders in adults come from studies conducted in high-income countries (Patel et al. 2007), little is known about the appropriateness and effectiveness of interventions in different cultural contexts. Research on mental health promotion programs has shown large variation in the effectiveness of identical mental health promotion or prevention programs across different socioeconomic and cultural context (Zechmeister et al. 2008).

An important but often overlooked aspect of intervention effectiveness that tends to be strongly influenced by cultural and ethnic group membership is the extent to which recipients accept the intervention. A recent meta-analysis on HIV-prevention programs highlights that individuals are highly sensitive to the content of the preventive interventions and the extent to which interventions match their needs as recipients, particularly when recipients belong to a minority or disenfranchised group (Noguchi et al. 2007). Specifically, recipients of preventative interventions are likely to seek out interventions that validate what they are already doing (Noguchi et al. 2007) or match their stage of willingness to change their behaviors (Prochaska et al. 1994).

A mismatch between the goals of a resilience intervention and dispositional characteristics or situational requirements may also produce results opposite to those intended by the intervention. For example, some dispositional characteristics that have proven highly adaptive in the context of extreme adversity, such as trait self-enhancement (Bonanno et al. 2005b, Gupta & Bonanno 2010), may conflict with and even undermine the goals of resilience promotion. In certain occupational groups, instilling or reinforcing unrealistic positive expectations of finding purpose in life through helping others may increase vulnerability to feeling demoralized and powerless in situations where destruction and loss of life are inevitable (Moran 1999, Paton et al. 2000). For example, a detached coping style may be more adaptive for a surgeon who has to carry out amputations on scores of disaster victims. In this situation, seeking meaning may interfere with the surgeon's ability to

effectively provide assistance to disaster victims and could precipitate burnout.

Perhaps the most crucial limitation of prevention programs is their almost exclusive focus on the individual. As we noted above and elsewhere (Bonanno 2004, Bonanno & Mancini 2008), resilience is not solely the province of individual strengths. Rather, there are multiple risk and resilience factors, only some of which have to do with personality and coping ability. Hobfoll (2002) has argued, for example, that early posttraumatic interventions implemented by psychologists may have been ineffective because they focused exclusively on psychological variables and neglected to address environmental factors that increase risk for chronic posttraumatic difficulties. Similarly, the authors of a recent systematic review of psychosocial interventions designed to prevent stress-related symptoms and psychological disorders in law enforcement officers (Peñalba et al. 2008) noted that none of 10 randomized or quasi-randomized controlled trials that qualified for inclusion targeted stressors related to the job context. Thus, the central aim of these psychosocial interventions was to help police officers cope with stressful events encountered at work rather than changing the conditions or circumstances within a specific organizational context. Yet, there is evidence to suggest that job context may represent a more potent source of occupational stress within the police force than the job content (e.g., Collins & Gibbs 2003, Kirkcaldy et al. 1995).

The need to resolve threatened or actual loss of important internal and external resources, such as safety, shelter, money, and physical well-being, following a trauma is likely to limit the extent to which individuals can benefit from early interventions that target anxiety and affective symptoms (Bonanno et al. 2010, Litz et al. 2002, McNally et al. 2003). Litz et al. (2002) point out the importance of distinguishing between risk mechanisms that mediate the effect of trauma exposure on an individual (e.g., resource loss) and risk indicators that correlate with chronic PTSD (e.g., past history of traumatic experience). Knowledge of risk indica-

tors is important in screening individuals exposed to PTE who are more likely to experience long-term problems. However, the goal to promote resilience on a large scale may prove to be elusive without addressing risk mechanisms and accompanying changes in the broader social systems within which preventative interventions are carried out.

MOVING FORWARD

Over the past decade, the term “resilience” has gained considerable currency in psychology journals. Unfortunately, however, the term is often used casually and interchangeably with other more traditional concepts or phrases. For example, resilience is sometimes defined simply as the absence of diagnosable psychopathology (e.g., Feder et al. 2009). Although it may sound fresh, this kind of binary operational definition is in fact no different from the traditional psychopathological approach. Put another way, defining resilience as the absence of a disorder is akin to defining health as the absence of disease (Almedom & Glandon 2007) and does little to advance our understanding of genuinely resilient outcomes.

To cite another example, the word resilience has begun to crop up in self-report indices (e.g., Connor & Davidson 2003). The reason for this trend is obvious. Self-report measures offer researchers a simple and easy way to assess an important construct. Unfortunately, it is not yet clear what resilience questionnaires actually measure. Perhaps they assess some trait-like aspect, akin to personality. As we noted above, however, personality rarely explains more than a small portion of the outcome variance following a PTE. Given that caveat, it could still be useful to research a measure, regardless of its name, as long as it explained some of the resilience outcome variance. Yet, there is a danger here. As is often the case in psychological research, when an instrument is named for a concept, it is quickly assumed to capture the characteristics of that concept, regardless of its actual validity. Not surprisingly, researchers have already begun to study responses to resilience

measures as a proxy for resilient outcomes, often without bothering to measure actual adjustment (e.g., Connor et al. 2003). In some cases, researchers have studied resilience measures in the absence even of an actual stressor event (e.g., Montross et al. 2006). We caution that in their current form, resilience questionnaires will add little new knowledge to the existing corpus of evidence unless these measures can be shown to have incremental validity. In other words, to be useful, a resilience measure must tell us something more than what can be gained by using established personality measures or methods for assessing resilient outcomes.

In the context of these limitations and potential pitfalls, we conclude this article with a plea for continued systematic and thoughtful research on resilient outcomes in the face of loss and potential trauma. We would argue, as we have throughout this article, that resilience can be adequately understood only when it is operationally defined as a stable trajectory of healthy adjustment across time (Bonanno 2004). We

propose further that the best way to advance research on resilient outcomes is to measure various facets of negative and positive adaptation as soon as possible after the occurrence of a PTE and at multiple times afterward. Ideally, whenever feasible, efforts should also be made to obtain pre-event data on functioning and on possible pre-event predictor variables. As data of this nature are systematically accrued, researchers and theorists will be in a position to take on the bigger questions. Such data will make it possible, for example, to continue to evaluate the most recent evidence about resilience, as reviewed in this article, as well as other as yet unanswered questions. Are the same people resilient across different types of events? How variable are risk and resilience factors across time? How do risk and resilience factors compare with the factors that predict psychopathological outcomes? And perhaps most important: Can we, in fact, make people more resilient, or is resilience building a flawed idea?

SUMMARY POINTS

1. Traditional approaches to loss and potentially traumatic events (PTEs) have emphasized psychopathology or average differences between exposed and nonexposed groups.
2. Traditional approaches to PTEs assume homogeneity in outcome, whereas individual difference approaches assume outcome heterogeneity.
3. The prototypical longitudinal outcome patterns after PTEs are chronic distress, gradual recovery, delayed increases in distress, and resilience.
4. Resilience, when defined as an outcome, is typically the most common pattern observed.
5. Latent growth modeling makes it possible to identify prototypical outcome patterns empirically.
6. There are multiple, independent predictors of resilient outcomes.
7. Resilience-building interventions may be ineffective and perhaps even harmful.

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