

Conceptualizing and Re-Evaluating Resilience Across Levels of Risk, Time, and Domains of Competence

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Abstract This article examines potential theoretical constraints on resilience across levels of risk, time, and domain of outcome. Studies of resilience are reviewed as they relate to the prevalence of resilience across levels of risk (e.g., single life events vs. cumulative risk), time, and domains of adjustment. Based on a thorough review of pertinent literature, we conclude that resilience, as a global construct, appears to be rare at the highest levels of risk, and that resilience may benefit from a narrower conceptualization focusing on specific outcomes at specific timepoints in development. The implication of this conclusion for future research and intervention efforts is then discussed.

Keywords Resilience · Chronic risk · Competence · Prevalence

Introduction

Over the past several decades, the concept of resilience has gained prominence as a way to study the processes and mechanisms through which exposure to risk factors may be associated with children's positive and negative outcomes. The term resilience has been defined as a positive outcome in the context of adversity (Luthar et al. 2000a), and centers on the study of various child, family, and community

protective factors that may be associated with positive adjustment despite exposure to risk factors. Resilience has been a hot topic both within the context of developmental research and in the popular media. The allure of resilience arises from the success stories of people who have dealt with seemingly insurmountable odds, inspiring hope, and projecting the notion that there is no difficulty that cannot be overcome. The study of resilience has implications for understanding child development in general, but also for prevention and intervention efforts aimed at guiding public policy and social programs to improve outcomes for children at risk (Masten 2001). Thus, researchers must contend with the dual goals of informing the literature and accurately reporting findings to public health institutions and the media in their endeavor to elucidate the factors that are associated with positive outcomes in the face of adversity (Luthar and Cicchetti 2000).

When the concept of resilience was first introduced in the 1970s, it was conceptualized as a stable personal characteristic; at-risk children who appeared to be doing well were thought to be "invulnerable" (Pines 1975). This perspective that certain children, due to some internal characteristics (e.g., IQ) or positive features of their environment (e.g., strong relationship with a caregiver), could 'beat the odds' and demonstrate positive adjustment in the context of adversity, led to a search for protective factors that could explain such associations. As research in the area of resilience has developed over time, the conceptualization of resilience has been refined, such that most researchers now recognize it as a dynamic process that results from ongoing transactions between a child and the environment, rather than an internal characteristic of the child (Luthar and Zelazo 2003). Few researchers now view children with positive outcomes as "invulnerable," and there is increasing recognition that the effects of risk persist

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over time or emerge in unexpected ways (Luthar 2006). However, despite improvements in the conceptualization of resilience, challenges remain in establishing truly ‘high’ risk contexts, interpreting the degree to which positive adjustment actually occurs in the context of chronic and severe risk, and determining the stability of resilience across time and domains.

First, the variability in the establishment of ‘high risk’ environments has hindered our ability to determine the prevalence of resilience. For example, some studies of resilience have utilized predominantly European American, middle-class children who, although experiencing a significant life event (e.g., divorce), have been exposed to a qualitatively lower level of adversity than children growing up in the context of inner-city poverty. Due to the comparatively low level of risk in the former context, such studies may obtain misleadingly high rates of positive adjustment compared to children living in more chronic and severe settings.

There are also data to suggest that when positive adjustment is identified among children living in adverse contexts, it may vary across time and domains. For example, adjustment may fluctuate over time as children pass through various milestones and their associated challenges, such that some children experiencing high levels of adversity may be doing well socially and academically at school age, but show deterioration in adjustment during the transition to adolescence. Such results demonstrate the challenge of showing persistent positive outcomes in the context of chronic adversity. Furthermore, children who may be doing well in one area, such as school achievement, may demonstrate problems in other areas, such as depression (Luthar et al. 1993). Thus, resilience may not be generalized, but rather specific, with children showing strengths and weaknesses depending on the domain in question.

The primary goal of the current article is to evaluate the utility of the term resilience in the context of severe and chronic adversity. To this end, potential constraints or limitations of resilience in the highest risk contexts (e.g., multiple risks, poverty) will be examined, with particular attention to differences between studies utilizing relatively lower risk versus higher risk samples. Specifically, this review will address the following three issues: (1) the prevalence of resilience in lower versus higher risk studies; (2) the stability of resilience across time; and (3) the continuity of resilience across domains. It is expected that the prevalence of resilience will be lower in the context of relatively higher risk, and that resilience will be limited across time and domains.

The first section of the article discusses definitions of concepts related to resilience, including the operationalization of *risk*, *positive outcome*, and *protective factor*, and identifies important points of controversy therein. A brief

overview of select protective factors associated with positive outcomes is also provided. This is followed by a discussion of potential theoretical constraints on resilience in the context of severe adversity. The next section critically reviews the extant literature on resilience with a focus on the degree to which positive adjustment occurs across different types and levels of risk (e.g., chronic and/or severe), and the stability of positive adjustment in different contexts of risk across time and domains of adjustment. Finally, the article concludes by determining implications of this appraisal for future research on resilience, including implications for prevention research and social policy.

Definition of Resilience and Related Constructs

Resilience is currently conceptualized as a dynamic process consisting of a series of ongoing, reciprocal transactions between the child and the environment (Luthar and Zelazo 2003; Masten 2001). Importantly, this conceptualization rejects the notion of resilience as a personal or individual trait. In fact, researchers have warned against using such terms as “resiliency” because they connote a stable characteristic, and may foster perspectives that blame the individual for their negative outcomes (Luthar et al. 2000a). Although personal traits (e.g., IQ, temperament) can influence outcomes in the context of adversity, they are also often strongly affected by both genetic and contextual factors, and are thus not fully attributable to the child (Luthar and Cicchetti 2000). This distinction is particularly important because if resilience is interpreted as a personal trait, policy makers may then use it as justification to withhold important services to at-risk children by arguing that resilience comes from within the individual (Luthar and Cicchetti 2000).

Resilience has been operationalized in many ways, but it is most commonly defined as a positive outcome in the context of risk, or factors known to be associated with negative outcomes (Luthar et al. 2000a). Explicit within this definition is the requirement of risk, in addition to a positive outcome; thus high functioning children in situations of low adversity would not be considered resilient.

Risk

Resilience research has utilized a number of different risk factors, including parental psychopathology (Conrad and Hammen 1993; Luthar and Sexton 2007), socioeconomic disadvantage (Buckner et al. 2003; Kim-Cohen et al. 2004), urban poverty and community violence (Gorman-Smith et al. 2004; Hammack et al. 2004), negative life events (D’Imperio et al. 2000; Masten et al. 1999), child maltreatment (Cicchetti and Rogosch 1997; Jaffee et al. 2007), and cumulative risk indices (Seifer et al. 1992).

While all of these factors are associated with negative outcomes in children, it is important to note that they are not necessarily equivalent in severity; rather severity depends upon both the risk factor and the population in question. For example, some researchers have utilized normative middle class samples exposed to varying levels of negative life events (e.g., Masten et al. 1999), while others have utilized ethnically diverse samples of children growing up in violent, low-income neighborhoods (e.g., Gorman-Smith et al. 2004). The inner-city poor contend with a substantial number of stressors and adversities, including community violence, crowding, poor quality schools, and inadequate housing (McLoyd 1998; Sampson et al. 1999). Arguably, children growing up in chronic poverty are exposed to a wide array of risks that are both qualitatively and quantitatively more adverse than those experienced by most children living in middle-class environments. It is not clear that results from middle-class, predominantly white samples can be generalized to inner-city, minority children; thus results from the former studies may be over-estimating the degree to which resilience exists in situations of chronic, severe risk.

Relatedly, some researchers have stressed the importance of identifying proximal risk factors to ensure that children within a particular sample are actually exposed to similar levels of risk (Richters and Weintraub 1990). For example, it has been argued that the variability in outcomes for children of psychiatrically ill parents may be due to the fact that not all can truly be considered high risk. Some of these children may live in middle-class homes with adequate resources, and have an engaged, supportive co-parent. Furthermore, their psychiatrically ill parent may be well-monitored and receiving effective treatment. In contrast, other children may have to contend with a hospitalized, single mother who is unable to provide consistent, nurturing care. Obviously, one would expect very different outcomes for these children because they have experienced very different levels of overall adversity. Thus, it is important to select a risk factor that accurately captures the daily experiences of children at risk for negative outcomes.

Finally, Luthar (2003) has also warned against relying on stereotypes to determine what constitutes “high risk.” She notes that although affluent children are generally considered “low risk,” they actually display disturbingly high rates of anxiety, depression, and substance use in adolescence, often well above national norms. Indeed, their rates of such negative outcomes are also higher than those of inner-city adolescents (Luthar 2003). Although one might argue that such problems have less negative consequences for affluent adolescents due to their increased resources, research demonstrates that the negative ramifications are similar across socioeconomic classes, at least in the domain of academic achievement (Luthar and Ansary

2005). Thus, there are many issues involved in determining what is truly high-risk.

Positive Outcome

There are also important differences in the operationalization of “positive outcome,” with some studies focusing on the absence of psychopathology, while others require more positive outcomes such as academic achievement, social competence, or meeting appropriate developmental milestones. Whether resilience is operationalized as the absence of a negative outcome or the presence of a positive outcome (or the combination of both) is largely a matter of theoretical perspective and the nature of the risk factor in question. For example, some risk factors are considered to be so powerful that simply the absence of psychopathology may be quite remarkable, while other more delimited risk factors such as parental divorce may necessitate more evidence of a positive outcome (Luthar and Zelazo 2003). Finally, there is also variability in whether positive adjustment must be demonstrated across several domains, or whether a positive outcome in one domain is considered adequate. As resilience is not an “all-or-nothing” phenomenon, Luthar and Zelazo (2003) assert that it must be measured across domains to ensure that an accurate portrait of positive adjustment is provided. For example, children may be doing well on external measures of functioning such as school achievement, yet demonstrate high levels of internal distress (Luthar 1991).

However, there are many studies which utilize single domains of adjustment (e.g., Radke-Yarrow and Brown 1993; Stouthamer-Loeber et al. 2004; White et al. 1989), and this can be entirely appropriate if the researcher is interested in the factors associated with positive outcomes in a particular domain, such as school grades, rather than overall positive adjustment. The authors must be careful, however, to emphasize that adjustment is context-specific and may not generalize to other domains. Furthermore, it should be noted that the likelihood of finding positive outcomes in one domain is greatly increased when compared to definitions requiring positive outcomes across several domains. This point should be kept in mind when evaluating resilience research, so as to avoid overgeneralizing from studies with less comprehensive definitions of “positive outcome.”

Protective Factors

Protective factors are defined as characteristics of the child, family, and wider environment that reduce the negative effects of adversity on child outcome (Masten and Reed 2002). Although some protective factors such as parenting appear to be important across different risk factors and

outcomes (Masten 2001), there is some evidence that other protective factors may be more specific. For example, one study found that while an easy-going temperament and stimulating activities in the home were associated with positive cognitive outcomes in the context of low SES, they had no association with externalizing behavior (Kim-Cohen et al. 2004). Rutter (2000) has stressed the importance of selecting protective factors that are specific to the risk factor and outcome in question, rather than assuming that the mechanisms are similar across contexts. Furthermore, although few studies have explicitly examined the role of development or gender, it seems likely that protective factors may be more or less salient for different ages or genders. For example, although parental warmth is important across development, it may be particularly important in early childhood when children are most dependent on their parents, rather than in adolescence when influences outside of the family play a larger role. Similarly, Werner and Smith (1982) noted gender differences for children with resilient outcomes, with emotional support from extended family being particularly important for girls and family structure more important for boys.

Similar to the issues surrounding the definition of resilience, controversy extends to the operationalization of protective factors. Some researchers have argued that a protective factor should interact with risk status to predict outcome (Garmezy et al. 1984; Rutter 1987). By this definition, only variables that are *more* strongly (or only) associated with positive outcomes in the context of high risk, as opposed to low risk, are considered to be protective. In more recent years, however, this term has been used to refer to all factors associated with positive outcomes, regardless of whether relationships are stronger for children living in high-risk contexts (Luthar and Zelazo 2003). Luthar et al. (2000b) argue that while interaction effects (positive effects only, or to a greater degree, for children at risk) provide useful knowledge on the processes that function specifically under conditions of risk, main effects can also be informative. For example, in designing interventions for at-risk children, addressing any and all factors that attenuate the effects of risk are likely to be beneficial.

Implicit within this controversy is the issue of what type of sample is optimal for studying resilience; for example, if one is primarily focused on identifying factors that are more helpful in the context of risk, then it would be helpful to have both low risk and high risk subgroups (Masten and Reed 2002). Conversely, if the goal is to simply identify protective factors that help children at high levels of risk, regardless of their impact at other levels of risk, the low risk subgroup is unnecessary. Examining different patterns of adjustment within a high-risk group can also help to elucidate the processes that contribute to positive outcomes by highlighting the variation in protective factors and

associated outcomes that might be otherwise obscured in a between-group design (Seidman and Pedersen 2003). Furthermore, comparisons of children at differing levels of high risk can also lead to fine grain distinctions between protective factors that operate in the context of high risk, but not extreme risk. For example, there are several studies of children living in urban poverty, which identified protective factors that were only helpful for children who had been exposed to low levels of community violence (e.g., Kliewer et al. 2004; Miller et al. 1999). Thus, although all of the children in these studies could be considered high risk due to poverty, some were at more extreme risk due to high levels of violence exposure. If these children had been grouped together and compared to a low risk sample of children, the differential benefits of the protective factors within this high-risk group would most likely have been missed.

Overview of Protective Factors

Protective factors have been identified in three main areas: (1) within the child, (2) within the family, and (3) within the community. Widely researched protective factors are briefly reviewed in the following section to familiarize the reader with the area; a full discussion of identified protective factors is beyond the scope of this article (for more comprehensive reviews, see Luthar 2006; Masten and Reed 2002; Rutter 2000).

Child Protective Factors

Child attributes that have been found to be associated with positive outcomes include intelligence, emotion regulation, temperament, coping strategies, locus of control, attention, and genetic influences (Masten and Powell 2003). As noted above, it is important to keep in mind that although child attributes can be protective in the context of adversity, they are also influenced by external factors, such as family environment and the overall context in which the child lives. As such, they are not entirely “personal” traits. The following brief review presents some representative child protective factors, and discusses ways in which they may allow the child to interact differently with the environment, and thus have more positive outcomes.

Child IQ has consistently been found to predict a range of positive outcomes, including academic achievement, prosocial behavior, and peer social competence (Masten et al. 1988, 1999), as well as the absence of antisocial behavior (Kandel et al. 1988; Kolvin 1988; White et al. 1989), and other types of psychopathology (Radke-Yarrow and Brown 1993; Tiet et al. 1998, 2001; Werner and Smith 1982, 1992). There are several reasons why IQ may be

important in high-risk contexts. First, children with high IQs may be more likely to possess effective information-processing and problem-solving skills, which enable them to contend with the stresses and challenges they encounter. Children with higher intellectual skills should also perform better at school; increased academic success is associated with the adoption of social norms and integration into prosocial peer groups (Masten and Coatsworth 1998). Although some studies have found that IQ was more important in the context of risk (Kandel et al. 1988; Kolvin et al. 1988; Masten et al. 1988, 1999; Tiet et al. 2001), one study of inner-city adolescents found that high intelligence was only related to positive outcomes in context of *low* negative life events (Luthar 1991). Thus in this particular study, IQ seemed to lose its ability to protect children once stress became too high.

Emotion regulation refers to monitoring, evaluating, and modifying the intensity and duration of emotional reactions to accomplish one's goals (Eisenberg et al. 1997a; Thompson and Calkins 1996). Research demonstrates that a lack of control over emotion is associated with problem behaviors (Calkins and Fox 2002; Eisenberg et al. 1996), while the ability to manage one's emotional expression predicts more positive social functioning in middle childhood both contemporaneously and longitudinally (Buckner et al. 2003; Eisenberg et al. 1997a, b). Furthermore, studies of resilience have found that factors associated with emotion regulation (e.g., self-help skills, ego control, and ego resiliency) are related to positive adjustment across risk status, and that such factors appear to be especially important in the context of adversity (Cicchetti and Rogosch 1997; Cicchetti et al. 1993; Werner and Smith 1982, 1992). Children who are adept at managing their emotions may be better able to proactively cope with stressors (Buckner et al. 2003) and thereby decrease the associated negative effects. They may also be less likely to engage in oppositional behavior such as hitting or throwing a tantrum because of their ability to modulate negative emotion. Such children may be less likely to become involved in coercive cycles with their caregivers, and, therefore, may receive more support from their social environment. Across contexts of risk, such children should function better in school and in social relationships because they are able to modulate negativity and emotional expression.

Researchers have also examined the role of temperament, particularly in infancy and toddlerhood, finding that an easy-going temperament is associated with positive outcomes in both childhood and adulthood (Kim-Cohen et al. 2004; Werner and Smith 1982; Wyman et al. 1999). A child with an easy-going temperament may have positive outcomes later in life for a number of reasons. First, they may respond less negatively to stressful situations and be more flexible in their responses to change or unfamiliarity.

Second, children who display high levels of positive affect and are easy to soothe may evoke more sensitive caregiving and attention from adults in the environment. Conversely, children who display high levels of negative affect, adjust poorly to change and are difficult to soothe may initiate negative patterns of interaction with their caregivers, which may place them at increased risk for negative outcomes later in life.

Research on older children has also focused on internal attributes such as locus of control, appraisal, and coping skills, finding associations with a range of positive outcomes, including social competence, school grades, and internalizing and externalizing symptomatology (Cauce et al. 2003; Lin et al. 2004; Luthar 1991; Luthar and Zigler 1992). Children and adolescents who have less negative appraisals of difficult situations, or who see themselves as having control over situations in their lives may respond less negatively to difficult situations and be better equipped to problem-solve. Conversely, children who think they have no control over external situations may feel helpless and be less likely to take action. Coping skills are also important because children's coping during difficult situations can moderate the impact of the situation. For example, ignoring a negative situation maintains the status quo, whereas reaching out for social support can generate solutions and decrease a sense of isolation.

Finally, a relatively new line of research has begun examining gene-environment interactions, finding that certain genotypes appear to moderate the effect of environmental risk. For example, a study of child maltreatment found that a functional polymorphism at the promoter of the monoamine oxidase A (MAOA) gene was related to anti-social problems in adolescence and adulthood, such that high MAOA activity was protective in the context of severe maltreatment (Caspi et al. 2002). Another study of depression found that a functional polymorphism in the promoter regions of the serotonin transporter (5-HTT) gene moderated the effect of life stress (Caspi et al. 2003). Although such research is still in its early stages and requires replication, these studies suggest that genetic variation, as well as environmental variation, can be protective.

Family Protective Factors

Researchers agree that one of the most important resources for normal development is the presence of a caregiver to provide both material resources, such as nutrition and shelter, and more abstract resources, such as love, nurturance, and a sense of safety and security (Masten 2001). When this system breaks down, the chances for normal development are severely limited. In extreme instances, such as the Romanian orphanages where children were denied basic care and nurturance, the developmental

consequences are stark and undeniable (Beckett et al. 2006; Fisher et al. 1997; MacLean 2003). Even among materially privileged children, the absence of a close parent–child relationship is linked with negative outcomes (Luthar and Latendresse 2005). Conversely, Masten (2001) argues that if the caregiving system is functional, this can help children to overcome considerable adversity. Parents teach their children the skills they need to succeed in later developmental tasks, set guidelines for acceptable behavior, and provide opportunities for cognitive and social stimulation (Masten and Coatsworth 1998). In addition to specific parenting practices, having a good relationship with a parent prepares the child to engage in healthy, productive relationships with other people in the social environment.

Resilience research clearly demonstrates the importance of the caregiving system. Researchers have examined protective factors such as the quality of the parent–child relationship, attachment security in toddlerhood, and the type of parenting strategies employed. Indeed, a high quality relationship with at least one parent, characterized by high levels of warmth and openness and low levels of conflict is associated with positive outcomes across levels of risk and stages of development (Emery and Forehand 1996; Luthar and Latendresse 2005; Owens and Shaw 2003; Radke-Yarrow and Brown 1993; Stouthamer-Loeber et al. 1993, 2002; Vanderbilt-Adriance and Shaw in press; Werner and Smith 1982). Similarly, warm, responsive parenting styles are associated with positive child adjustment across social, emotional, and academic domains (Kim-Cohen et al. 2004; Masten et al. 1999; Werner and Smith 1982, 1992).

Parental monitoring is another protective factor that has been investigated in older children and adolescents. Research shows that adolescents whose parents are familiar with their friends and know their child’s activities and whereabouts are less likely to engage in deviant behavior (Dishion and McMahon 1998), be diagnosed with a psychiatric disorder (Tiet et al. 1998, 2001), or display problems across a range of areas (Buckner et al. 2003). Once again, however, monitoring does not always counteract high levels of risk (Sullivan et al. 2004), suggesting that while parental monitoring is important, it may not be enough to overcome other prominent risk factors.

Community-Level Protective Factors

Although community-level protective factors have been less extensively studied than attributes of the child and family, they are also important for child outcomes. Neighborhood quality (Barbarin et al. 2006), neighborhood cohesion (Gorman-Smith et al. 2000; Jaffee et al. 2007; Kliwer et al. 2004; Li et al. 2007), youth community organizations (Cauce et al. 2003), quality of the school environment (Ozer and Weinstein 2004), and after-school

activities (Wyman 2003) have all been shown to impact child functioning. Bronfenbrenner (1979) has written extensively on the importance of such community-level or *exosystem* factors. The exosystem can affect the child both directly, through his or her experience of it (e.g., attending school), or indirectly, through influences on parents and family. For example, a single mother living in poverty who has to commute 3 h/day to get to her job will be less able to monitor her child, or even to be physically present to provide the same level of care as a parent who can afford to work part-time or to pay for high quality after-school care.

Community-level influences can also be protective in the context of family and neighborhood risk; for example, risk for serious chronic delinquency in adolescents from inner-city families low on warmth and cohesion was decreased in the context of high social organization in the community (Gorman-Smith et al. 2000). The authors suggest that emotional needs for closeness and belonging can sometimes be addressed at the community level, and recommend that interventions focus on community-level protective factors, as well as improving family functioning (Gorman-Smith and Tolan 2003).

Summary

A wide variety of protective factors have been identified that are associated with positive outcomes for children exposed to adversity, including those at the level of the child, family, and community. Notably, child protective factors have been most heavily studied, perhaps due to the earlier conceptualization of resilience as a “personal” trait.

The majority of protective factors have been found to help across levels of risk, sometimes with an increased benefit for children at high levels of risk. Some protective factors may help at-risk children more than low risk children because low risk children may not need as many resources to have positive outcomes, given that they have fewer stressors to contend with. However, some studies of particularly high-risk children and adolescents (e.g., those living in the inner-city or low-income households), suggest that certain factors may not provide protection at the highest levels of risk (e.g., Luthar 1991; Sullivan et al. 2004). Theoretically, this makes sense because it seems unlikely that a single protective factor would be able to counteract the impact of so many interrelated risks. The next section discusses issues related to potential constraints upon resilience at high levels of risk in more depth.

Potential Theoretical Constraints on Resilience

Why might resilience be constrained in the context of extreme or severe risk? Two potential reasons have to do with

the nature of both risk and protective factors. First, risk tends to be cumulative and stable (Rutter 2000), thereby magnifying the negative consequences associated with it. Second, protective factors appear to be less frequently identified at the highest level of risk (Luthar and Goldstein 2004).

Cumulative Risk

Although the association between individual risk factors and negative outcomes tends to be relatively small, it is rare for risk factors to exist in isolation (Rutter 2000). For example, living in a low-income neighborhood is associated with lower educational attainment, exposure to deviant peers, decreased access to resources, and higher levels of negative life events (Leventhal and Brooks-Gunn 2000). Relatedly, environmental risks and genetic risks often covary as well. For example, the well-documented link between maternal depression and negative child outcomes is likely due to a combination of genetic and environmental factors. Extended twin studies, which include monozygotic and dizygotic twins, as well as their parents, have demonstrated that there is a genetic component to the intergenerational transmission of depression (Rice et al. 2002, 2005, 2006). However, depressed mothers are also more likely to display higher rates of negativity, coercive control, inconsistency, and unresponsiveness than non-depressed mothers when parenting their children (Goodman and Gotlib 1999); these styles are, in turn, associated with negative child outcomes. Similarly, some researchers have argued that families “select” environments, such that families at high genetic risk for externalizing or internalizing symptoms tend to cluster in poor neighborhoods (Plotnick and Hoffman 1999; Rowe and Rodgers 1997), which are also associated with negative child outcomes (Leventhal and Brooks-Gunn 2000). Thus children are often exposed to a “double whammy” of risk factors, both environmental and genetic.

Furthermore, many studies have demonstrated that cumulative risk is highly associated with negative outcomes, and that the probability of a negative outcome increases as the number of risk factors increases (Fergusson and Lynskey 1996; Kolvin et al. 1988; Rutter 2000). In a sample of 4-year-old children, an index of cumulative risk explained three times the variation in outcomes compared to individual risk factors (Sameroff et al. 1987). In fact, cumulative risk scores predicted outcome even after SES, minority status, and maternal IQ were partialled out, suggesting that the type of risk factor matters less than the number of risks (Sameroff et al. 1993). Perhaps even more startling, another study found that rates of crime recidivism increased drastically as the number of risks increased, from 11% recidivism with no family risk to 47% with five risks (Stattin et al. 1997).

In addition to the cumulative nature of risk, the high continuity over time also magnifies its impact. A longitudinal study of cumulative risk by Sameroff et al. (1993) found that the stability of risk between ages 4 and 13 was .77, rivaling the stability of IQ, which is generally considered to fluctuate very little. Intuitively, the longer a child is exposed to high levels of risk, the higher the chances that important developmental processes will be disrupted and behavior will be impaired. Indeed, studies of Romanian orphans who experienced extreme deprivation prior to adoption demonstrate that the likelihood of pervasive, negative outcomes across a variety of domains (e.g., behavior problems, attachment disorders, cognitive delays, attention problems) increased the longer the children lived in the orphanages (see Maclean 2003, for a review). Obviously, this is an extreme example, but similar dose-response findings have emerged from studies of children living in poverty, with those experiencing extreme or chronic poverty exhibiting worse outcomes than children exposed to less severe or intermittent poverty (Duncan et al. 1994; Korenman et al. 1995).

Protective Factors at the Highest Levels of Risk

Not only do risks covary and generally remain fairly stable over time, but they also can decrease the likelihood of protective factors. Several studies have shown that children at higher levels of risk have significantly lower levels of protective factors (Dubow et al. 1997; Farber and Egeland 1987). In particular, potential child protective factors are greatly impacted by the environment (Luthar and Cicchetti 2000). For example, a child who does not receive cognitive stimulation and appropriate caregiving in the home may be less likely to demonstrate high intelligence than another child without such risks. Similarly, the likelihood of a child retaining an internal locus of control when he or she is experiencing a high number of uncontrollable, chronic stressors is greatly reduced compared to a child who is accustomed to life going smoothly. Even potential protective factors outside of the child can be affected by the larger environmental context. For example, parenting can be influenced by a number of factors, including work situation, income, social support, and daily stressors (Belsky 1984). A parent who is concerned with having enough money for food and has little social support may have more difficulty providing his or her child with warm, sensitive parenting.

Even in the context of identified protective factors, higher risk samples (e.g., low SES, multiple risks) may demonstrate lower rates of resilience than would be expected because protective factors may not equally benefit children across various levels of risk. For example, a study of 97, predominantly ethnic minority, urban boys (ages 6–10)

with adjudicated older brothers examined the effects of community violence exposure on antisocial behavior (Miller et al. 1999). The authors found that among this sample of high-risk boys, low levels of family conflict were only associated with lower levels of antisocial behavior in the context of *low* community violence exposure (Miller et al. 1999). Thus, living in a family low in conflict was not a protective factor for antisocial behavior when community violence exposure was *high*. In line with this result, another study of urban African American youths found that family support was less important in the context of high levels of either violence exposure or hassles (Li et al. 2007).

Using a range of protective factors and outcomes (e.g., internalizing/externalizing, drug initiation, adaptive functioning, school achievement), several articles from a special series on community violence exposure also found that not all protective factors were beneficial for children who had been exposed to high levels of violence (Hammack et al. 2004; Kliewer et al. 2004; Sullivan et al. 2004). The samples were predominantly low-income, urban, ethnic minority preadolescents (Hammack et al. 2004; Kliewer et al. 2004), but one study of children living in rural poverty also found that there were fewer protective factors at the highest level of exposure (Sullivan et al. 2004), suggesting that such findings are not limited to urban settings. Although it should be noted that main effects were most common (i.e., protective factors worked similarly across levels of risk), there was only one study from this special series that found protective factors to be *more* important at high levels of risk (Ozer and Weinstein 2004).

Several studies have found that some protective effects are diminished in the context of neighborhood poverty (Silk et al. 2007; Stouthamer-Loeber et al. 2002; Vanderbilt-Adriance and Shaw in press), with differences emerging even between low-income urban neighborhoods and inner city neighborhoods or projects (Gorman-Smith et al. 1999; Shaw et al. 2004). Results from the Pittsburgh Youth Study, a longitudinal study of public school boys oversampled for high levels of antisocial behavior are consistent with the above findings (Stouthamer-Loeber et al. 2002). The authors examined the overall balance of risk and protective factors and found that, at least for older adolescents, a score indicating higher levels of protective factors and lower levels of risk factors was not entirely protective for those living in disadvantaged neighborhoods. Twenty-two percent of these boys were classified as “serious, persistent delinquents” at age 19, indicating that they had repeatedly engaged in crimes such as robbery, assault, or selling drugs. The authors suggest that risks for adolescent boys from disadvantaged neighborhoods may be of larger magnitude and, therefore, may be more likely to overwhelm protective factors.

Finally, a study of a nationally representative sample of 1,116 twin pairs in the UK examining maltreatment found that the protective effects of high IQ and positive temperament disappeared once cumulative family stressors were examined (Jaffee et al. 2007). This suggests that while certain factors may be associated with resilience, they may lose their ability to counteract risk once it reaches a certain level.

In short, there is significant evidence that protective factors do not always generalize across levels of risk. Importantly, this does not mean that there are no protective factors that benefit children exposed to severe levels of risk; indeed, many of the studies above also found evidence of main effects (i.e., protective factors beneficial at all levels of risk). However, it is important to note that there do appear to be limits to the effects of some protective factors in the highest level of risk (e.g., low SES, multiple risks), which suggests that it may be difficult for children exposed to severe adversity to demonstrate positive outcomes.

In summary, given that risks tend to covary and that cumulative risk is highly predictive of negative outcomes, as well as the fact that protective factors are less frequent in situations of high risk, children at the highest levels of risk appear to have rather low odds for success. Rather, one would expect rates of positive outcomes to be considerably lower at the highest levels of risk compared to lower levels of risk. Furthermore, when positive outcomes are identified at the highest levels of risk, one would expect them to be qualified across time and domains of adjustment. With these hypotheses in mind, the next section reviews the extant literature on resilience, with particular emphasis on resilience at the highest levels of risk.

Literature Review

Rutter (2000) has commented that although there are many studies which are relevant to resilience, the number of studies that directly compare resilient and non-resilient groups is fairly limited. This is particularly relevant to the present review since one of the main goals is to compare rates of resilience in children exposed to higher versus lower rates of risk. Such percentages can only be determined if researchers utilize person-centered approaches, where children are divided into groups based on risk and outcome status. In addition, this review also focuses on rates of resilience over time and across domains, further limiting the number of relevant studies. Given the specific nature of the question at hand (i.e., the nature of resilience at the highest levels of risk), the following review limits discussion to studies that fall into three categories: (1) studies reporting prevalence rates of positive outcomes; (2)

studies that examine positive outcomes across time; and (3) studies that examine positive outcomes across multiple domains of functioning. With these constraints in mind, a search was conducted in Ovid psychINFO using the keywords “resilience” and “protective factors”; relevant studies were also selected from references in review papers. It is important to keep in mind that not all studies of resilience met the criteria for the current review, and therefore may have been excluded.

Rates of Resilience in Lower Versus Higher Risk Contexts

There has been great variability in the operationalization of risk, ranging from children who have experienced a negative life event, such as divorce, to children who have experienced chronic poverty, community violence, and any number of related risk factors. While there are certainly negative consequences for some children related to life events such as parental divorce, the experience of divorce can vary greatly from child to child, with some being exposed to a high number of related risks and others maintaining a relatively low-risk environment. Arguably, children living in poverty in the inner city are less able to avoid risk exposure due to the all-compassing nature of the risk. Similarly, cumulative risk indices also ensure significant exposure to risk. As many studies of resilience have utilized relatively lower risk samples of white, middle class children (Masten et al. 1999; Radke-Yarrow and Brown 1993) or examined single risks (White et al. 1989), it is possible that such studies have overestimated the percentage of children with resilient outcomes. The following section compares rates of positive outcomes in the context of lower versus higher risk.

Lower Risk Contexts: Single Risk Factors and Middle Class Samples

Rates of positive outcomes vary greatly from study to study, depending on sample demographics and the operationalization of risk. When single measures of risk are used, or samples consist of predominantly white, middle-class samples, rates of positive outcomes are considerably higher (see Table 1) than those found in studies of multiple risks or in demographically at-risk samples (e.g., ethnic minority status, low SES). Although studies of predominantly white samples with single risk factors have found rates of positive outcomes ranging from 25% (Jaffee et al. 2007) to 92% (White et al. 1989), the majority of studies report rates of 40–60% (Collishaw et al. 2007; Kandel et al. 1988; Lin et al. 2004; Masten et al. 1999; Radke-Yarrow and Brown 1993; Tiet et al. 1998, 2001).

For example, Masten et al. (1999) followed a community sample of children from elementary school through early adulthood and found that 57% of children exposed to high levels of negative life events were judged “resilient” on measures of childhood and adolescent competence. A cross-sectional study of 1,285 children from a household probability sample found that 62% of the girls and 50% of the boys whose mothers displayed significant psychopathology were judged to be resilient (Tiet et al. 2001). An earlier study utilizing the same sample found that when children experienced both maternal psychopathology and high levels of negative life events, 40% of them still had positive outcomes (Tiet et al. 1998). It should be noted, however, that a positive outcome was defined as the absence of a psychiatric disorder and the presence of good functioning on a psychiatric assessment. It is still possible though that these children evidenced significant problems, albeit not a psychiatric diagnosis, so this is likely not the best measure of their overall functioning. Furthermore, as this was a cross-sectional study, there is no prospective measurement of their functioning over time.

In another study of parental psychopathology, Radke-Yarrow and Brown (1993) found that 41% of their sample of middle- to upper-middle-class children of psychiatrically ill parents displayed positive outcomes (e.g., lack of psychiatric diagnosis or borderline criteria). Although the sample size for this study was considerably smaller than the previous study, it has several important strengths that should be noted. First, in addition to a diagnosis of severe maternal depression (e.g., early onset, multiple severe episodes), the authors also required a paternal diagnosis of depression, anxiety, or substance abuse; the presence of affective illness in first- or second-degree relatives of one or both parents; and high levels of chronic stress or chaos within the family. Thus children were at extremely high levels of both environmental and genetic risk for psychiatric diagnoses. Second, children had to demonstrate good functioning across four assessments over a period of 10 years in order to ensure that children defined as “resilient” were consistently doing well. Despite the stringent criteria for assessing both risk and positive outcome, it is striking that 41% of these children were still without a diagnosis. This is perhaps accounted for by the fact that they were relatively privileged in other ways (e.g., high SES).

Finally, a retrospective study of a nationally representative UK sample found that 45% of adults who reported childhood maltreatment were “resilient,” based on the absence of lifetime psychiatric diagnoses (Collishaw et al. 2007). Interestingly, another study of a representative UK sample found only 25% of maltreated children had positive outcomes, defined as at or below the median on teacher-rated behavior problems at ages 5 and 7 (Jaffee et al. 2007).

Table 1 Studies of predominantly white, middle class children or single risk factors

Authors	Sample	Design	Risk	Protective factors	Outcome	Results
Collishaw et al. (2007)	N = 378 total, N = 44 maltreated Ages 42–46 Isle of Wight epidemiological study	Longitudinal (Ages 14–15 to ages 42–46)	Retrospective reports of childhood maltreatment	Perceived parental care Adolescent peer relationships Quality of adult love relationships Personality style	Absence of lifetime psychiatric diagnoses	45% resilient Appeared to be doing well across domains of functioning
Jaffee et al. (2007)	N = 1,167 twin pairs Ages 5 and 7 UK representative sample	Longitudinal (Ages 5–7)	Retrospective parental report of childhood maltreatment	IQ Positive temperament Absence of parental psychiatric symptoms Neighborhood safety & cohesion	At or below the median on teacher-reported behavior problems at ages 5 and 7	25% resilient Doing well across domains 1/3 of resilient children at age 5 not resilient at age 7
Lin et al. (2004)	N = 179 Ages 8–16 62% white Middle class community sample recruited for a prevention program	Cross-sectional	Parental bereavement	Parental warmth, discipline, & mental health Child self-esteem, self-efficacy, appraisal of threat, unknown control beliefs, & active inhibition of emotional expression	Below clinical cut-off on parent-, child-, and teacher-reported internalizing and externalizing symptomatology	44% resilient Main effects for all parent measures, child threat appraisal and self-efficacy
Kandel et al. (1988)	N = 94 adult males Subset of 1930s Danish male birth cohort	Cross-sectional	Father received at least one jail sentence	IQ	Absence of jail sentence or recorded offenses	60% resilient Main effect and interaction of IQ and risk
Masten et al. (1999)	N = 202 Ages 17–23 73% white Normative school sample	Longitudinal (ages 7–12 through ages 17–23)	Life events	IQ Parenting quality	Conduct problems Academic achievement Social competence Psychological well-being	Highest IQ for resilient group 57% resilient Main effects and interactions Resilient group low on internalizing
Radke-Yarrow et al. (1993)	N = 63 Ages 11–13, 15–18 Predominantly white, middle to upper middle class Subsample of the NIMH study of offspring of affectively ill and well parents	Longitudinal (followed over 10 years)	Severe familial psychopathology, high chronic stress	IQ, favored child status, positive self-perception, good relationships with teachers and peers, coping, physical health, temperament, social support	No psychiatric diagnosis over course of study	41% resilient But 56% resilient children had somatic complaints, low self-confidence, poor coping strategies Main effects for a number of protective factors, particularly those related to social relationships

Table 1 continued

Authors	Sample	Design	Risk	Protective factors	Outcome	Results
Tiet et al. (2001)	<i>N</i> = 1,285 Ages 9–17 51% white Household probability sample (MECA)	Cross-sectional	Maternal psychopathology	Child protective factors: gender, IQ, educational aspiration, physical health, low adverse life events Family protective factors: SES, lack of paternal psychopathology, family structure, marital relationship quality, parental monitoring, family functioning, # adults in family	No psychiatric disorder or Functional impairment	62% high risk girls and 50% high risk boys = resilient IQ more important in context of maternal psychopathology Main effects for parental monitoring, family functioning, educational aspiration, and gender
Tiet et al. (1998)	<i>N</i> = 1,285 Ages 9–17 51% white Household probability sample (MECA)	Cross-sectional	Negative life events	Child protective factors: gender, IQ, educational aspiration, physical health Family protective factors: SES, lack of maternal psychopathology, family structure, marital relationship quality, parental monitoring, family functioning, # adults in family	No psychiatric disorder or Functional impairment	40% resilient, even when high negative life events and maternal psychopathology Main effects for parental monitoring, IQ, family functioning, # adults in family, educational aspiration.
White et al. (1989)	<i>N</i> = 976 Age 15 Predominantly white 1970s Dunedin, NZ, birth cohort	Longitudinal (ages 5–15)	Antisocial behavior at age 5	IQ	Juvenile delinquency at ages 13, 15	84% high risk boys & 92% high risk girls had nondelinquent outcomes Main effect of IQ, no interaction

It is likely that method differences account for the discrepancy in resilience rates. For example, requiring individuals to be low on symptomatology, rather than merely diagnosis-free is a much more stringent definition of resilience. Furthermore, requiring positive outcomes across time and informants also decreases the likelihood that a child will be considered “resilient” (Jaffee et al. 2007). In fact, given that the comprehensive way in which “positive outcome” was defined, it is remarkable that 25% of the high-risk subsample still met classification criteria.

In sum, studies of single risk factors and studies utilizing predominantly white, middle-class samples tend to find rates of positive outcomes ranging from approximately 30–90%, with the majority clustering around 40–60%. This wide range of outcomes across studies clearly illustrates the difficulty inherent in attempting to summarize research on resilience, even among relatively lower-risk children. The considerable heterogeneity with which risk and positive outcome are operationalized contributes to differences in results. How does one pull together results from offspring of psychiatrically ill parent with results from adolescents at risk due to high rates of childhood antisocial behavior? Despite the wide variety of differences, studies of children with single risk factors or from predominantly white, middle-class backgrounds generally have relatively high rates of positive outcomes; as will be demonstrated in the next section, these rates are consistently higher than among children who come from impoverished backgrounds or experience multiple risks.

Higher Risk Contexts: Multiple Risk Factors and Impoverished Samples

Indeed, studies examining the impact of multiple risks or utilizing impoverished samples are much less optimistic in their findings (see Table 2). The Rochester Longitudinal Study, which studied children from birth through early adulthood, utilized a cumulative risk score and found that only 3 out of 50 high-risk children were above the sample mean on positive outcomes at age 13 (Seifer et al. 1992). The authors point out that these three children all experienced decreases in their risk scores over time, suggesting that perhaps their more positive outcomes were actually due to lower levels of risk, rather than protective factors enabling them to “overcome” risk. Regardless of the reason for positive outcomes, however, the small number of high-risk children who achieved outcomes at the sample mean is striking.

The Christchurch Health and Development Study, a 16-year longitudinal study of a New Zealand birth cohort, also utilized a cumulative risk approach (Fergusson and Lynskey 1996). They found that approximately 37% of high-risk children had positive outcomes as measured by

low scores on externalizing symptomatology at ages 15 and 16. However, the authors also noted that whereas the resilient children had high cumulative risk scores by definition, their overall levels of risk were significantly lower than children who had less positive outcomes. Furthermore, when they examined outcomes for adolescents from the top 5% most disadvantaged backgrounds, they found that the likelihood of being problem-free at age 15 was only 13% (Fergusson et al. 1994). In comparison, 80% of adolescents from the top 50% most advantaged backgrounds were problem-free, and the likelihood of an adolescent from an advantaged background having multiple problems was 1 in every 400–500 (Fergusson et al. 1994).

One of the longest running resilience studies followed the 1955 birth cohort on Kauai from birth to middle adulthood (Werner and Smith 1982, 1992). The authors defined risk status as having four or more risks, covering a range of domains including demographic factors, child physical health and behavior, and family problems; approximately half of the families were also living in poverty. Twenty-six percent of the high-risk subsample demonstrated positive outcomes on behavioral, mental health, and learning problem measures at age 18. This rate is higher than most of the other multiple risk studies discussed above, but there are a number of potential explanations for this difference. First, it has been noted that more recent studies of low-income samples have demonstrated considerably worse outcomes than the Kauai study (Egeland et al. 1993), perhaps because of societal changes affecting the experience of poverty since the 1950s. Egeland and colleagues suggested that poverty might be associated with a higher number of risks than in the past due to increases in single parents, divorce, and substance use. Furthermore, although approximately half of the families in the Kauai study were living in poverty, there was excellent health and prenatal care available when this study commenced (Werner and Smith 1982), which is certainly not the case for most low-income families currently.

More recent studies of multiple risks in the context of poverty have found even more disheartening results. For example, a study of low birthweight, premature infants from predominantly ethnic minority families living in poverty found that only 12% of the children had met appropriate developmental milestones in cognitive, health, and behavioral domains at age 3 (Bradley et al. 1994). In comparison, 40% of low-birth weight, premature infants *not* living in poverty had met these same milestones by age 3. Thus one can see that, as the number of risk factors increase, the likelihood of positive outcomes decreased drastically. Furthermore, the authors determined that in order for children at the highest level of risk to be considered “resilient,” they needed to have three or more

Table 2 Studies of children from low SES backgrounds or multiple risks

Authors	Sample	Design	Risk	Protective factors	Outcome	Results
Bradley et al. (1994)	N = 243 Age 3 85% ethnic minority Preterm, low birthweight infants living in poverty	Longitudinal (birth—age 3)	Low-income Preterm Low birthweight	Physical aspects of caregiving environment Parental acceptance and responsibility	Cognitive and behavioral competence; health and growth status at age 3 Normal range on all four measures	12% highest risk vs. 40% non-poverty children had positive outcomes Only 15% have good outcomes with >3 protective factors
Buckner et al. (2003)	N = 155 Ages 8–17 35% white Low-income families in Worcester, MA	Cross-sectional	Low-income	IQ, self-regulatory skills, self-esteem, social support, & parental monitoring,	Composite including behavior problems, mental health symptoms, adaptive functioning, & competence	29% resilient Nonresilient children had more negative events, chronic stressors, and abuse Resilient did not differ from non-resilient on social support or IQ Resilient = 18% Maltreated more disruptive/aggressive, withdrawn, internalizing, and lower overall competence, lower IQ and ego resiliency
Cicchetti et al. (1993)	N = 206 Ages 8–13 69% ethnic minority, 59% below poverty line, 83% on public assistance	Cross-sectional	Maltreatment Low SES	Ego control Ego resiliency Self-esteem IQ	7 measures of adaptive functioning Adaptive composite	Number of maltreated in resilient group = nonmaltreated, but more maltreated in lower functioning groups too Replicated above results. Resilience over 3 years = 1.5%. 10% maltreated had no indicators of competence at any timepoint Relationship factors important for nonmaltreated only
Cicchetti et al. (1997)	N = 213 Ages 6–11 81% ethnic minority, 87% on public assistance	Longitudinal (over 3 years)	Maltreatment Low SES	Ego control Ego resiliency Self-esteem IQ Relationship quality with mother and camp counselor	7 measures of adaptive functioning Adaptive composite	Maltreated resilience = 6.1%. Nonmaltreated resilience = 11.8% All protective factors independently predicted resilience
Cicchetti et al. (2007)	N = 677 Ages 6–12 81% ethnic minority, 94.8% had received public assistance	Cross-sectional	Maltreatment Low SES	Ego control Ego resiliency Cortisol DHEA	7 measures of adaptive functioning Adaptive composite	Maltreated resilience = 6.1%. Nonmaltreated resilience = 11.8% All protective factors independently predicted resilience
Fergusson et al. (1994)	N = 942 Age 15 Birth cohort from Christchurch, NZ	Longitudinal (birth—age 15)	Cumulative risk score	N/A	Multiple problem outcomes (early sexual activity, conduct/oppositional disorder, police contact for offending, cannabis use, alcohol use)	Only 13% of adolescents from 5% most disadvantaged childhoods were problem-free Chances of children from advantaged backgrounds having multiple problems was 1 in every 400–500

Table 2 continued

Authors	Sample	Design	Risk	Protective factors	Outcome	Results
Fergusson et al. (1996)	N = 940 Age 16 Birth cohort from Christchurch, NZ	Longitudinal (birth—age 16)	Cumulative risk score	Child protective factors: IQ, emotional/behavioral problems, temperament, interests, close relationships Family protective factors: Parenting, parental attachment, home environment	Substance use Delinquency School problems	37% resilient Resilient children did not differ from maladjusted on internalizing symptoms Lower family adversity Main effects for IQ, novelty seeking, deviant peer affiliation
Luthar et al. (2007)	N = 360 Ages 8–17 2/3 ethnic minority Approximately 50% on welfare	Cross-sectional	Maternal diagnosis of affective disorder or drug use disorder Low SES	Negative parenting behavior Limit setting Closeness Low parenting stress	Average social competence Internalizing & externalizing symptomatology	7–21% resilient 23% resilient if no maternal diagnosis Negative parenting most assoc w/ neg child outcomes
Seifer et al. (1992)	N = 152 Age 13 ~50% low SES, ~60% white Subsample of Rochester Longitudinal Study	Longitudinal (ages 4–13)	Cumulative risk score	Child and mother personality disposition, social support, and family cohesion	Changes scores from ages 4–13 on IQ and socio-emotional indices	Only 3/50 high risk kids above sample mean at age 13 Most protective factors supported across risk status Some interactions suggesting more importance in the context of risk
Stouthamer-Loeber et al. (2004)	N = 506 Age 25 ~50% African American ~40% on public assistance	Longitudinal (ages 13–25)	Serious persistent delinquency in adolescence	Low physical punishment Employed or in school	Absence of serious persistent delinquency at follow-up	40% resilient However, 56% of those individuals continued to offend at lower rates Showing difficulties in other domains too
Werner et al. (1982, 1992)	N = 505 Predominantly ethnic minority 54% poverty 1955 Kauai birth cohort	Longitudinal (birth to middle adulthood)	Cumulative risk score	Child protective factors: e.g., temperament, IQ Family protective factors: e.g., parent–child relationship quality, parenting	Delinquency Mental health problems Judgment of “doing well” across domains	26% resilient Many child and family protective factors Rates of somatic & physical complaints 2× higher for “resilient” group

protective factors. However, even with three or more protective factors, children at the highest level of risk still had very low rates of positive outcomes; with fewer than three protective factors, none of the children at the highest level of risk had positive outcomes. This finding further emphasizes the difficulty of achieving positive outcomes at the highest level of risk.

A study of maltreatment in low-income children found that 18% of children in the maltreated group had positive outcomes (Cicchetti et al. 1993). Seven domains of adaptive functioning were measured, and children who were within the top third of adaptive functioning on four domains were considered competent. Interestingly, while maltreated and nonmaltreated children were equally likely to be in the competent group, maltreated children were overrepresented in the lowest functioning group that had zero or only one domain of competent functioning. Furthermore, maltreated children were higher than nonmaltreated children on continuous measures of disruptive/aggressive behavior, withdrawal, internalizing, and total competence. Rates of positive outcomes were higher in this sample than in Bradley et al. (1994) study, which also utilized a low-income sample. However, it is important to note that Cicchetti et al. (1993) based on their definition of positive outcomes on relative standing with other high risk, low-income children in the sample, whereas Bradley and colleagues used cut-offs from normative samples. Given that low-income is a risk factor in and of itself, and that 83% of the overall sample was receiving public assistance, one would expect that children in the maltreated group would fare even more poorly in comparison with a normative sample. While the authors' decision to compare low-income groups makes sense in terms of parsing out the additional risk associated with maltreatment versus low-income alone, it is likely that the children in the maltreatment group were exhibiting lower rates of competence in comparison with normative samples.

The results of Cicchetti et al. (1993) were replicated in two other studies of similar groups of low-income children who varied on maltreatment status (Cicchetti and Rogosch 1997, 2007). For example, when the adjustment group classification was averaged across three consecutive yearly assessments, only 1.5% ($n = 2$) of the maltreated children were classified as "competent" (top third of functioning in four or more domains), versus 41% of the nonmaltreated children. Only 10% of the maltreated children were ever classified in the competent group at any of the three timepoints. Perhaps even more striking, 10% of the maltreated children exhibited no competence in any of the seven domains at any of the three timepoints. These results present the stark reality of the detrimental effects of maltreatment, particularly in the context of low-income.

Other samples of predominantly low-income, ethnically diverse samples also show a high rate of problems among at-risk children (Buckner et al. 2003; Luthar and Sexton 2007; Stouthamer-Loeber et al. 2004). For example, a study of low-income children of mothers with psychiatric diagnoses found that only 7–21% of the children displayed positive outcomes (i.e., average levels of social competence and low externalizing or internalizing symptoms; Luthar and Sexton 2007). Sadly, even among a control group of children whose mothers had no diagnoses, only 23% had positive outcomes, demonstrating that although having a mother with a psychiatric illness is detrimental, so is living in a low-income family. Another study examining desistance from persistent serious delinquency found that 40% of adolescents had desisted by young adulthood (Stouthamer-Loeber et al. 2004). However, closer examination reveals that over half of those individuals had committed criminal offenses, albeit at lower levels, suggesting that in fact positive outcomes were much lower, on par with the previous study.

In summary, although rates of positive outcomes in studies of higher-risk children (e.g. multiple risks, low SES) range widely from 1.5 to 40%, positive outcomes are generally much less common in these studies than in those utilizing white, middle-class samples or single risk factors. Only two studies found prevalence rates over 35%, while nine studies found that approximately a quarter or less of the high-risk group was resilient. Importantly, of the two studies finding higher rates of resilience, one found that approximately half of the "resilient" group was still exhibiting problems (Stouthamer-Loeber et al. 2004), suggesting that in fact resilient outcomes above 25% are quite rare in higher risk samples.

As mentioned above, resilience rates fluctuate greatly depending on the sample demographics (with white, middle class children faring best), number of risks, and the type and number of outcomes measured. Certainly, the more outcomes that are measured and the more stringent the requirements for "positive outcome," the lower the number of children who can be considered resilient. Although it is not possible to arrive at a normative rate of resilience due to the substantial variability between studies on methodology and measurement, it does seem clear that there are significant differences between studies based on their degree of risk, with considerably more constraints upon resilience in the context of multiple, high risks.

Resilience Across Time

There are a limited number of studies that examine continuity and discontinuity in resilience over time, but those that do generally demonstrate that resilience is not stable (see Table 3). For example, the Rochester Longitudinal

Table 3 Studies of resilience across time

Authors	Sample	Design	Risk	Protective factors	Outcome	Results
Farrington et al. (1988a, b)	N = 411 males Age 32 Working-class London families	Longitudinal (ages 8–32)	Cumulative risk score	N/A	Nine criteria of competent functioning (e.g., successful employment, cohabitation, absence of deviant behavior, etc.)	50% of “resilient” adolescents convicted of a crime by age 32 Unconvicted high-risk men often had the worst outcomes
Farber et al. (1987)	N = 44 maltreated N = 88 non-maltreated Age 48 mos Low SES Subsample of children from the Minnesota Mother–Child Interaction Project	Longitudinal (12–48 mos)	Maltreatment SES	Infant temperament and behavior Parental characteristics, parenting knowledge, parent–child interaction quality, life stress	Developmental competence (e.g., attachment, problem-solving, behavior)	Low continuity of resilience (none consistently competent from 12 to 48 mos) Decrease in competence over time Some protective factors overall, but not for abused children
Felsman et al. (1987)	N = 456 non-delinquent, inner city, adolescent males Recruited 1940–1944 Low SES Matched w/ reform school boys on IQ, age, neighborhood crime rate, ethnicity	Longitudinal (ages 12–16 to middle adulthood)	Low SES	Childhood strengths: e.g., relationship quality with family members, school/social adjustment, physical health, IQ, etc. Adulthood strengths: e.g., object relations, Erickson’s life stage, maturity of defenses, SES, etc.	Global mental health in middle adulthood (e.g., social competence, employment, happy marriage, income)	Anecdotal evidence of “enormous discontinuity” in competence over the lifespan
Jaffee et al. (2007)	N = 1,167 twin pairs Ages 5 and 7 UK representative sample	Longitudinal (ages 5–7)	Retrospective parental report of childhood maltreatment	IQ Positive temperament Absence of parental psychiatric symptoms Neighborhood safety & cohesion	At or below the median on teacher-reported behavior problems at ages 5 and 7	25% resilient Doing well across domains 1/3 of resilient children at age 5 not resilient at age 7
Masten et al. (2004)	N = 173 Ages 28–36 73% white Normative school sample	Longitudinal (ages 8–12 to 28–36)	Life events	IQ Parenting quality Adaptive resources (e.g., coping, motivation, support)	Age-appropriate competence (e.g., academic achievement, social competence, conduct)	Continuity in resilience Resilient children had more protective factors, higher SES Childhood/adol adversity only modestly associated with young adult success

Table 3 continued

Authors	Sample	Design	Risk	Protective factors	Outcome	Results
Moffitt et al. (2002)	N = 477 males Age 26 Predominantly white Birth cohort from Dunedin, NZ	Longitudinal (ages 5–26)	Antisocial behavior in childhood and/or adolescence	N/A	Criminal offending Personality Psychopathology Personal life Economic life	25% of adolescent “recoveries” exhibited illegal behavior Resilient group high on internalizing, social isolation, etc.
Sameroff et al. (1987, 1993)	N = 152 Age 13 ~50% low SES, ~60% white Subsample of Rochester Longitudinal Study	Longitudinal (ages 4–13)	Cumulative risk score	N/A	Measures of child functioning (e.g., IQ, language development, behavior, etc.)	High stability of risk over time Child ability severely undermined by environmental risk

Study found that competence (e.g., IQ, mental health) at one time point was not related to competence at a later age (Sameroff 1998; Sameroff et al. 1987). Rather, the level of risk was the most significant predictor of positive outcomes over time. As reported by Sameroff (Sameroff 1998, 2005), children were divided into groups based on their cumulative risk score (e.g., number of family and sociodemographic risk factors) and various competence measures, such as cognitive ability (e.g., IQ scores) and mental health (e.g., social-emotional functioning, psychiatric symptomatology), and then tracked on their outcomes over time. Although children high on social-emotional functioning or IQ at age 4 tended to do better on similar measures at the age 18 follow-up, these associations were much smaller in magnitude than those explained by risk level at age 4. In fact, children in the high competence, high-risk group at age 4 had *worse* outcomes at age 18 than children in the low competence, low risk group. This procedure was then repeated at age 13, predicting to age 18 outcomes, with the idea that perhaps age 4 competence was not stable enough to predict positive outcomes in adolescence. However, similar results were found, regardless of which time point was used. In sum, the early competence of high-risk children did not seem to predict to later competence, suggesting little continuity in the positive outcomes of high-risk children.

Similarly, a longitudinal study of a New Zealand birth cohort found questionable continuity over time in positive outcomes (Moffitt et al. 2002). A group of boys who had evidenced high levels of aggression as children, yet displayed low levels in adolescence, were termed “recoveries” for their apparent desistance. Yet, at age 26, the authors noted that a full 25% of these “recoveries” had demonstrated illegal behavior, and were in fact more appropriately termed low-level offenders. Thus, although their outcomes looked promising in adolescence, these gains deteriorated over time. Another follow-up of adolescent males at high risk for antisocial behavior found even more disheartening results, in that almost half of the resilient adolescents (14 of 31) had been convicted of a crime by age 32 (Farrington et al. 1988a). Other longitudinal studies following individuals from adolescence into middle adulthood have also anecdotally reported discontinuity in outcomes over time (Felsman and Vaillant 1987).

However, perhaps it is expecting too much for high-risk children to maintain positive outcomes over such long periods of time. What about shorter follow-ups? A study of childhood maltreatment in a representative UK sample found that one-third of the children who were classified as resilient at age 5 fell into the non-resilient group by age 7 (Jaffee et al. 2007). Another study of a low-income, maltreated subsample of children from the Minnesota Mother–Child Project found even more substantial variability in

positive outcomes over time, such that no high-risk children were consistently rated as competent from 12 to 42 months (Farber and Egeland 1987). In fact, by preschool, none of the maltreated children displayed competent outcomes. Furthermore, there appeared to be decreases in competence over time among all low-income children in the sample, regardless of maltreatment status. While the sample size for the maltreated group was relatively small ($N = 44$), this is still an impressive finding, suggesting that continuity in competence in the context of such risk is unlikely. Taken together, these two studies suggest that there is substantial variability in resilience, even over shorter time periods.

There is one exception to this trend of low stability of resilience and that is Project Competence, a community sample of predominantly white middle class children in Minneapolis. Masten et al. (2004) followed this group of children from elementary school into adulthood, using a measure of negative life events (e.g., death or sickness in the family, birth of sibling) to determine risk status, and found continuity in resilience over time. There are several explanations, which may account for the fact that this study found continuity in resilience over time, while other studies have not. First, this sample was substantially different from the children discussed in the other studies above, which were generally low-income and were exposed to arguably more severe levels of risk. Second, negative life events had only modest associations with outcomes in young adulthood, and then only in two domains (academic achievement and conduct problems), suggesting that perhaps the risk associated with negative life events was not as high in magnitude as other risks. Thus, it is not surprising that Masten et al. (2004) should find continuity in resilience among children who most likely have more resources to begin with and have experienced an overall lower level of risk. In contrast, results from the other six samples reviewed demonstrate discontinuity and even decreases in competence over time. Interestingly, two studies that found discontinuity over time could be considered relatively lower risk, as they focused on single risk factors and consisted of predominantly white children (Jaffee et al. 2007; Moffitt et al. 2002), suggesting that this pattern is not always limited to children experiencing the highest level of adversity. Overall, this points to the decreased likelihood of sustained resilience over time, particularly in the context of higher risk.

Resilience Across Domains of Competence

In addition to findings of discontinuity over time, studies have also examined positive outcomes across domains and found that high-risk children who have positive outcomes in one domain do not necessarily have positive outcomes in

other domains (see Table 4). Luthar and colleagues (Luthar 1991, 1995; Luthar et al. 1993) have conducted a number of studies of ethnically diverse, inner city adolescents and found discontinuities across domains of functioning. In a widely cited study of 9th graders exposed to high levels of negative life events, “resilient” children who were doing well in terms of school-based social competence were also found to have high rates of internal distress (Luthar 1991). These results were replicated and expanded upon in a 6-month prospective study of positive adjustment across domains in another sample of inner-city adolescents (Luthar et al. 1993). The authors reported that 60% of adolescents who fell within the upper 1/3 on one measure of competence were in the lowest 1/3 of another measure of social competence. Interestingly, while these measures were different aspects of social competence, they were all still within the overall domain of school-based social competence, and thus one might expect a greater degree of continuity between them. Furthermore, when the absence of emotional distress was included as a necessary component of a positive outcome, only 15% of the original “resilient” group retained that classification. A third study of a similar sample found that peer-rated sociability prospectively predicted lower indices of school functioning, and that low anxiety in girls was related to decreased performance in school over a 6-month period (Luthar 1995). Thus, the author concluded that although there was some continuity across domains for academic achievement and teacher-rated classroom behavior, it was also true that adolescents with the best interpersonal or emotional adjustment may also be those who are not doing well in other aspects of functioning.

Another study of inner city middle school students who had experienced differing levels of negative life events also found increased rates of internalizing in “resilient” children compared to their lower-risk peers (D’Imperio et al. 2000). In fact, rates of internalizing symptomatology were related to risk exposure, rather than competence level, such that differences in the rates of distress for resilient and stress-affected children were not statistically significant, although “resilient” children actually had *higher* distress (32% vs. 20%).

Longitudinal community studies of antisocial behavior in boys have also demonstrated discontinuity across domains of functioning. The Dunedin Study found that although there was a group of boys termed “recoveries” because they ceased to exhibit antisocial behavior in adolescence, this term may have been overly optimistic because these boys exhibited problems in adulthood (Moffitt et al. 2002). They were characterized by higher rates of internalizing disorders, with 1/3 formally diagnosed with depressive or anxiety disorders. They tended to be neurotic and socially isolated, and had obtained lower

Table 4 Studies of resilience across domains

Authors	Sample	Design	Risk	Protective factors	Outcome	Results
Anthony (1987)	St. Louis Risk Research Project Offspring of parents with schizophrenia or manic-depression	Longitudinal (15 years)	Parent with schizophrenia or manic-depression	Child personality traits Ability to distance from parent	Psychological functioning (diagnosis, severity, symptomatology)	“Psychological cost” to resilience Difficulties in intimate relationships Felt “strangely unsatisfied”
D’Imperio et al. (2000)	N = 185 7–8th graders from disadvantaged, urban areas 18% white	Cross-sectional	Stressful events or neighborhood disadvantage	Coping, self-perception Family cohesion, expressiveness, and conflict Extrafamilial support	Above median on 2/3 competence factors (antisocial behavior; school grades, behavior, and attendance) Internalizing symptomatology	Protective factors didn’t differentiate btwn outcomes High stress assoc with lower protective factors Similar rates of internalizing for resilient and maladjusted
Farrington et al. (1988a, b)	N = 411 males Age 32 Working-class London families	Longitudinal (ages 8–32)	Cumulative risk score	N/A	Nine criteria of competent functioning (e.g., successful employment, cohabitation, absence of deviant behavior, etc.)	50% of “resilient” adolescents convicted of a crime by age 32 Unconvicted high-risk men often had the worst outcomes
Loeber et al. (2007)	N = 503 Age 20 56.4% African American	Longitudinal (ages 7–20)	Serious persistent delinquency in adolescence	Cognitive abilities Skin conductance Heart rate Community, family, and peer protective factors	Absence of serious persistent delinquency at follow-up	Desisters had difficulty with anxiety, employment, educational attainment
Luthar (1991)	N = 144 9th graders 77% minority, inner city, low SES	Cross-sectional	Stressful life events	IQ Social skills Locus of control Ego development Positive life events	School-based social competence (e.g., teacher and peer ratings, school grades) Internalizing symptomatology	Resilient children had high rates of internal distress Main effects for several protective factors IQ not protective at highest levels of risk
Luthar et al. (1993)	N = 138 9th graders 85% minority, inner city, low SES	Longitudinal (6 mos)	Stressful life events	N/A	School-based social competence (e.g., teacher and peer ratings, school grades) Internalizing/externalizing symptomatology	Children not resilient across domains. Resilient children had high internal distress.
Luthar (1995)	N = 138 9th graders 84% minority, inner city, low SES	Longitudinal (6 mos)	Inner city poverty	N/A	School-based social competence (e.g., teacher and peer ratings, school grades) Internalizing/externalizing symptomatology	Not as much cross-domain continuity for inner city kids as found in lower risk samples Peer-rated sociability assoc. with lower school functioning, anxiety w/ girls assoc. with academic achievement

Table 4 continued

Authors	Sample	Design	Risk	Protective factors	Outcome	Results
Masten et al. (1999)	N = 202 Ages 17–23 73% white Normative school sample	Longitudinal (ages 7–12 through ages 17–23)	Life events	IQ Parenting quality	Conduct problems Academic achievement Social competence Psychological well-being	57% resilient Main effects and interactions Resilient group low on internalizing 25% of adolescent “recoveries” exhibited illegal behavior
Moffitt et al. (2002)	N = 477 males Age 26 Predominantly white Birth cohort from Dunedin, NZ	Longitudinal (age 5–26)	Antisocial behavior in childhood and/or adolescence	N/A	Criminal offending Personality Psychopathology Personal life Economic life	Resilient group high on internalizing, social isolation, etc.
Radke-Yarrow et al. (1993)	N = 63 Ages 11–13, 15–18 Predominantly white, middle to upper middle class Subsample of the NIMH study of offspring of affectively ill and well parents	Longitudinal (followed over 10 years)	Severe familial psychopathology, high chronic stress	IQ, favored child status, positive self-perception, good relationships with teachers and peers, coping, physical health, temperament, social support	No psychiatric diagnosis over course of study	41% resilient But 56% resilient children had somatic complaints, low self-confidence, poor coping strategies
Stouthamer-Loeber et al. (2004)	N = 506 Age 25 ~50% African American ~40% on public assistance	Longitudinal (ages 13 to 25)	Serious persistent delinquency in adolescence	Low physical punishment Employed or in school	Absence of serious persistent delinquency at follow-up	40% resilient However, 56% of those individuals continued to offend at lower rates Showing difficulties in other domains too
Werner et al. (1982, 1992)	N = 505 Predominantly ethnic minority 54% poverty 1955 Kauai birth cohort	Longitudinal (birth to middle adulthood)	Cumulative risk score	Child protective factors: e.g., temperament, IQ Family protective factors: e.g., parent-child relationship quality, parenting	Delinquency Mental health problems Judgment of “doing well” across domains	26% resilient Many child and family protective factors Rates of somatic & physical complaints 2× higher for “resilient” group

rates of education and lower-status occupations. These men were also more likely to engage in drug or alcohol use. Similarly, the Pittsburgh Youth Study found that even among those who desisted from serious crime in early adulthood, there still appeared to be detrimental effects in the realms of educational attainment, cigarette and marijuana use, unemployment, and anxiety (Loeber et al. 2007; Stouthamer-Loeber et al. 2004). Furthermore, although these individuals had better outcomes across domains in general than persisters, they still had more negative outcomes than less serious or non-delinquents. This suggests that they were experiencing difficulties in other areas of their lives, despite demonstrating improvement in antisocial behavior.

Farrington et al. (1988a, b) found that non-delinquent, high-risk adolescents were often the least successful on a variety of later outcomes, and that conviction status in general had little relation to success in adulthood. High-risk men who remained unconvicted at age 32 often had the worst outcomes on other measures of functioning, including poor home conditions, low paid jobs, and poor family relationships (Farrington et al. 1988b). They also tended to have been socially isolated as children; in fact, having few or no friends at age 8 was the best predictor of remaining unconvicted (Farrington et al. 1988b). Furthermore, the men who were rated as successful at age 32 tended to be neurotic and of low intelligence in childhood (Farrington et al. 1988a), suggesting that there was little relation between success in one domain and another, particularly over time.

Similarly, the Kauai Longitudinal Study found that although participants in the “resilient” group in general did have positive outcomes across domains, they had considerably higher rates of physical problems and somatic complaints than their low-risk counterparts and even their high-risk, maladjusted counterparts (Werner and Smith 1992). They also tended to report themselves as disconnected from their families, and were less likely to rely on their friends for support. The authors described them as “interpersonally aloof.” In particular, the men had fewer long-term committed relationships, while the women expressed more tension between career and family commitments.

A study of the offspring of individuals with schizophrenic, bipolar, and depressive disorders similarly found that adults who were classified as “resilient” due to the absence of a psychiatric illness displayed difficulties in intimate relationships and employed less healthy coping strategies (Anthony 1987). Another study of offspring of psychiatrically ill parents found that of children who were consistently diagnosis-free across time, 56% had somatic complaints (Radke-Yarrow and Brown 1993). This was in comparison to 21% of the control children from well families. The authors also pointed out that the resilient

children were not without “covert troubles,” including low self-confidence and the employment of escape and denial coping strategies. Taken together, these studies illustrate the difficulty of maintaining positive outcomes across domains.

Once again, however, studies of predominantly white community samples have found more evidence of cross-domain competence. For example, a retrospective study of childhood maltreatment in a representative UK sample found that adults classified as “resilient” due to the absence of psychiatric diagnoses also were functioning fairly well in the areas of personal difficulties, criminality, poor health, and relationship instability; in fact, they showed more positive outcomes in these areas than the non-maltreated comparison group (Collishaw et al. 2007). Another study of childhood maltreatment that examined childhood behavioral outcomes in a representative UK sample found that resilient and non-maltreated children did not vary on measures of mental health, social competence, or academic achievement (Jaffee et al. 2007). Masten et al. (1999) also found that resilient adolescents seemed to be doing quite well across domains.

The overall sample demographics of these studies suggest that, in general, the samples may have experience qualitatively different types of risk than some of the other samples from studies discussed above. Specifically, the Masten et al. (1999) sample was predominantly European-American, middle class children representative of the Minneapolis area, while the other two comprised of representative samples from the UK (Collishaw et al. 2007; Jaffee et al. 2007). As previously noted, compared with samples of low-income, minority children living in violent neighborhoods, it is likely that these children did not have the same overall level of stress to deal with in their lives, regardless of the negative life events they may have experienced. This may explain the fact that these children were more likely to evidence competence across domains than children in the previous studies.

In sum, the bulk of studies (10/13) examining resilience across domains suggest that while children exposed to high levels of risk may show positive outcomes in one domain, this does not necessarily generalize to other domains. The three exceptions to this pattern comprised of lower risk samples (Collishaw et al. 2007; Jaffee et al. 2007; Masten et al. 1999); however, two other lower risk samples also found evidence of discontinuity across domains (Moffitt et al. 2002; Radke-Yarrow and Brown 1993), suggesting that this finding is not necessarily limited to the highest level of adversity.

As these studies show, “resilient” individuals may exhibit high rates of internal distress, physical or somatic complaints, or difficulties in intimate relationships. As Luthar et al. (1993) demonstrated, there may even be

discontinuity within a general domain such as school-based social competence, illustrating the difficulty of achieving positive outcomes in the context of risk. Rutter (2000) has pointed out that a certain amount of discontinuity across domains is to be expected, given that risks and protective factors may be specific to particular outcomes; for example, we would not expect that because someone has avoided cancer they would be protected against coronary artery disease. However, while this is an important point, it is also true that the likelihood of discontinuity across domains appear to increase as the level of risk increases, such that the middle class children experiencing negative life events are more likely to have positive outcomes across domains than low-income minority children. Once again, this illustrates the importance of not generalizing across levels of risk, as well as the importance of looking at outcomes across domains, or at the very least taking a more specific approach, such as talking about domain-specific resilience (Luthar 1993).

Summary and Integration of Findings

The aim of this review was to examine potential constraints or limitations of resilience in the highest-risk contexts (e.g., multiple risks, low SES), with particular attention to differences between studies utilizing relatively lower risk versus high-risk samples. To this end, the article reviewed studies that examined rates of resilience across levels of risk, as well as studies looking at resilience across time and domains of competence. As noted from the outset, integrating findings from the literature on resilience has inherent difficulties due to the variability with which risk, protection, and positive outcome have been operationalized (Rutter 2000). It is challenging to determine criteria for meaningfully grouping studies together, and questions arise regarding interpreting differences in results across studies. For example, it is unclear whether disparate results are due to differences in sample demographics, risk factors, protective factors, and/or outcomes measured. Such problems are inevitable given the many permutations that arise from different combinations of risks, protective factors, and outcomes that can be investigated. In order to truly arrive at consensus about a particular risk or protective factor, each must be thoroughly researched on its own. At present, while some broad generalizations can be made, we are still limited about specific conclusions about any particular risk or protective factor and their association with specific outcomes, and, consequently, much future research is needed before we can draw firm conclusions about specific associations in specific contexts. However, there is a positive side to this heterogeneity in that one could also argue that part of the appeal of resilience is that it *does* cut

across so many areas of research. Thus, while such breadth can be frustrating, there is also the potential for the concept of resilience to inform any number of research areas.

Specific to this review, integration efforts are also qualified by the fact that although there are many studies of resilience, the majority of them look at continuous measures of positive outcomes and do not create and compare groups based on risk status and outcome. While these studies provide valuable information on protective factors that are associated with positive outcomes, they do not allow for the examinations of the prevalence of resilience, group differences, change in adjustment status over time, or fluctuations in outcome across domains. Consequently, the number of studies that were relevant to this particular review was limited, qualifying the strength of any conclusions that can be drawn. Relatedly, there were a number of studies whose results were reported in books or book chapters, as opposed to peer-reviewed journals (Anthony 1987; Farber and Egeland 1987; Farrington et al. 1988b; Felsman and Vaillant 1987; Werner and Smith 1982, 1992). As such, they were not subject to the same level of rigorous review of methodology. Other limitations include retrospective reports of risk (Collishaw et al. 2007; Jaffee et al. 2007; Masten et al. 1999), relatively small samples of high-risk children (Collishaw et al. 2007; Farber and Egeland 1987; Radke-Yarrow and Brown 1993), and cross-sectional methodologies (Buckner et al. 2003; D'Imperio et al. 2000; Lin et al. 2004; Luthar 1991; Luthar and Sexton 2007; Tiet et al. 1998, 2001), all of which constrain the strength of the conclusions that can be drawn.

In spite of these limitations, however, some interesting trends emerged that are worth considering. First, rates of positive outcomes differed widely depending on sample demographics, number of risks, and the number and type of outcomes. Although there was some overlap between sets of studies, in general, studies utilizing predominantly white, middle class samples and single risk factors found higher rates of positive outcomes than studies utilizing ethnically diverse, low-income samples and multiple risk factors. While it is hardly surprising that higher risk levels are associated with higher rates of negative outcome, it is nonetheless an important finding, and suggests that great care should be executed in how results from one study are generalized to other samples, so that resilience rates are not overestimated. In addition, other related findings support a cautionary approach to generalizing across levels of risk. For example, children at the highest level of risk are less likely to have protective factors (e.g., Dubow et al. 1997), or to benefit from them if they do exist (Luthar and Goldstein 2004). In sum, these findings illustrate the sad reality of the negative effects of high risk, and the great difficulty in promoting positive outcomes at the highest level of risk.

Second, the majority of studies examining positive outcomes in the context of adversity across time and across domains of functioning support the idea of resilience as a dynamic process that fluctuates within and across development. Certainly it does not support the initial perspective of resilience as a static outcome or a stable characteristic. It also points to the fact that while not all children exposed to high levels of risk have disastrous outcomes, it is also rare for them to completely “escape” the negative effects of risk altogether, particularly in the context of chronic or cumulative risk. While there is cause to promote and celebrate the positive outcomes of children at risk, the deep negative impact of risk also needs to be recognized and addressed.

From a more conceptual standpoint, the lack of consistency in positive outcomes across time and domains suggests that “global resilience” is at best quite rare, if not nonexistent. Thus, resilience might be better conceptualized in terms of specific outcomes at specific time points. Researchers should exhibit caution in discussing resilience in a general or global way, and instead focus on circumscribed outcomes, such as “resilience in externalizing behaviors” or “resilience in school achievement.” Given this narrower conceptualization of resilience, some might wonder about its continued utility. What is to be gained from research on resilience if it needs to be defined in such constrained ways? While this is certainly a reasonable and thought-provoking question, completely dismissing the construct of resilience may be excessive. In fact, one could argue that a narrower definition of resilience may well contribute positively to the literature and our understanding of risk and protective processes because it is a more accurate representation of children’s development in general and risk of continuity in psychopathology in particular. Furthermore, the study of resilience offers a way to understand the mechanisms through which some children demonstrate positive outcomes in particular domains, even in the context of risk, and has important implications for theory, prevention, and intervention. Thus there is much to be gained from retaining resilience as a construct, albeit in a more constrained version.

The findings regarding positive outcomes at the highest level of risk and the discontinuity in outcomes across both time and domain also have important implications for prevention and intervention efforts with children at risk. Related to the issue of generalizability, prevention researchers and designers of public policy must be careful to select protective factors that have been shown to be beneficial for the targeted population in regards to the outcome of interest. First, studies show that among high-risk children, protective factors may not always be beneficial at the highest levels of risk (e.g., Miller et al. 1999; Vanderbilt-Adriance and Shaw in press). Therefore, it is

important to ensure that the protective factors targeted for promotion will also benefit those at the highest level of risk. In support of this goal, it would be helpful for researchers to focus more attention on studying within-group differences among high-risk children, so that patterns of adjustment and maladjustment can be better understood (Seidman and Pedersen 2003).

Second, it has also been noted that even given empirical support for a specific protective factor in the context of a specific risk factor, prevention efforts are still in no way guaranteed. Luthar and Cicchetti (2000) point out that the overall context needs to be taken into consideration, and that an understanding of how protective factors emerge, develop, and interact with risk is essential. For example, they point out that although an internal locus of control has been identified as a protective factor, targeting this in an intervention for low-income, inner-city children may not be very effective. Such children have no doubt developed external loci of control because this is the reality of their lives, dealing with many uncontrollable, negative events. The development of this perspective may even be adaptive in some situations. Consequently, attempting to alter this perspective would most likely prove quite difficult because the overall context is working against it. This also speaks to the influence of the overall context on protective factors.

Luthar and Cicchetti (2000) also note that attempting to change *individual* protective factors will most likely be of little benefit because the overall context will remain the same. Indeed, this is one of the problems that child therapists struggle with: they may work effectively with an individual child, but if the child then returns to the same environment, any benefits are likely to be short-lived. Prevention efforts are therefore, better focused on promoting multiple protective factors across domains, including the child, family, and larger community.

Similarly, researchers have pointed out that in addition to increasing the number and quality of protective resources available to children at risk, we also need to focus on decreasing overall exposure to risk because there are limits to the amount of risk that can be overcome (Cauce et al. 2003; Sameroff 1998). Furthermore, because the likelihood of resilience decreases with the number of risks experienced, this also suggests that intervention efforts should focus on contexts where children are exposed to multiple risks (Rutter 2000). Decreasing the level of risk becomes particularly important when considered in the context of several studies demonstrating that not all protective factors are beneficial at the highest levels of risk (e.g., Miller et al. 1999; Vanderbilt-Adriance and Shaw in press). Consequently, even if protective factors are increased for children at the highest levels of risk, one would still expect a high percentage of negative outcomes. Furthermore, as many researchers have noted, prevention is often more effective

and economical than intervention, and in this case, eliminating or decreasing risk would be the most desirable focus, because it goes to the root cause of the problem.

Future Directions

There are many exciting new directions for future research on resilience to explore. In general, there is a need for more studies examining within-group differences in high-risk children to replicate and expand upon findings from previous such studies (Cicchetti and Rogosch 1997; Gorman-Smith et al. 2004; Luthar and Sexton 2007; Vanderbilt-Adriance and Shaw in press). Relating back to a narrower conceptualization of resilience, researchers should clearly specify the particular outcome in question, and discuss their results as specific to that outcome, instead of referring to a general, overall “resilient” outcome. Furthermore, researchers need to investigate and be cognizant of different patterns of association between risks, protective factors, and outcomes, with particular attention to reporting their findings as specific to their selected factors and sample, rather than generalizing to children “at risk.” This is particularly important given that resilience among higher risk children is likely to be less common and to display more discontinuity over time and domains than among lower risk children. In the light of the fact that children at the highest level of risk tend to have lower rates of positive outcomes, it may be important to examine cumulative protective factors. Researchers have pointed out that while an individual protective factor may not be powerful enough to counteract high levels of risk, an accumulation of protective factors may improve outcomes (Bradley et al. 1994; Luthar and Zigler 1992). For example, a study of premature infants with multiple risks found that at least three protective factors were required in order to predict positive outcomes (Bradley et al. 1994). Unfortunately, very few studies have examined the effects of cumulative protective factors. Future studies addressing these issues will help to further delineate the specifics of which protective factors are beneficial in which contexts and for whom, a necessary step towards creating more sophisticated conceptualizations of resilience and also for designing empirically informed prevention and intervention efforts.

Second, while the extant literature examining resilience across time and domains is intriguing, there is still a need for further investigation to make sure that the current findings are robust. For instance, while there are statistical and theoretical reasons for using continuous measures of positive adjustment, it would be beneficial if future studies would also report *rates* of resilience, so that comparisons can be made between groups and across time and domains. An innovative example of the knowledge that can be gained

from such person-centered approaches is provided by researchers from Ann Masten’s lab (Obradovic et al. 2006), who examined patterns of competence over time, assigning individuals to competence trajectories based on their actual data at each time point. Five patterns of competence over time were identified (low-declining, low-improving, middle-improving, middle-declining, and consistently high), with important differences emerging between groups on both levels of risk and protective factors. Supporting earlier theory and research conceptualizing developmental transitions as a time of both vulnerability and opportunity, the authors determined that the most dramatic changes in competence occur during the period of emerging adulthood (ages 17–23). This study was conducted utilizing data from Project Competence, which consists of predominantly white, middle-class participants, the majority of whom were considered low risk by the researchers. Thus, it would be informative to employ similar methods in samples of higher risk children to examine differences and similarities in patterns of competence over time.

Third, while developmental considerations are often implicit within studies (e.g., no one investigates school grades as an outcome in toddlerhood), there is little explicit attention to this issue. Many studies group diverse ages of children together, with minimal regard to potential developmental differences in the effects of risks and protective factors, or their relation to adjustment (Buckner et al. 2003; Cicchetti and Rogosch 1997; Cicchetti et al. 1993; Lin et al. 2004; Luthar and Sexton 2007; Masten et al. 1999; Tiet et al. 1998, 2001). For example, it is possible that certain protective factors may be more or less helpful at particular stages of development. Indeed, one study of elementary school children found that father involvement was most important in infancy (Wyman et al. 1991). Although this study was cross-sectional and necessitated retrospective reporting of early protective factors, it still provides some support for the notion that developmental stage is important to consider.

Examining periods of developmental transition may be another fruitful area for future research. Developmental transitions, such as the emergence of independent mobility in toddlerhood, beginning formal schooling, or entering adolescence and adulthood, may prove to be key points for both increased vulnerability or positive change. To illustrate, a child may be functioning well in preschool, but decline significantly upon reaching elementary school due to increased demands on attention, impulse control, and behavior. At the other end of the spectrum, researchers have discussed the importance of turning points, such as marriage or entering the armed forces, in positively changing the life trajectories of individuals at risk (Laub et al. 1998; Rutter 2000). Pointing to the dynamic nature of resilience, Masten et al. (2004) also noted that although

childhood adversity and protective factors remained important in young adulthood, protective factors in adolescence predicted positive adjustment even after controlling for childhood circumstances. These results point to the dynamic nature of adjustment, for while past circumstances continue to have weight, subsequent circumstances are also of importance.

Fourth, the extant literature has very little to say about the process through which protective factors have their influence. The vast majority of studies examine factors associated with positive outcomes, but they generally do not attempt to unpack *how* these protective factors actually moderate risk, even though there have been calls for more process research in resilience (Gore and Eckenrode 1996). This is an important area for future researchers to investigate. For example, why might parenting be associated with higher academic achievement? There may be cascading effects that emerge as outcomes in one domain influence other domains (Masten et al. 2005), or connections among protective factors, with certain protective factors increasing the likelihood of others emerging (e.g., high parenting warmth contributing to high self esteem). For instance, one study of school performance and adjustment in three independent samples of urban, African American preadolescents and adolescents determined that associations between parent and child protective factors were often bidirectional (Connell et al. 1994). In sum, it is time for research to move beyond establishing *if* factors are associated with positive outcomes to beginning to examine *how* they may play a role.

Finally, studies are only just beginning to examine the role of biology and genetics in resilience (Haglund et al. 2007; Nigg et al. 2007). Several studies have investigated gene by environment interactions, noting that environmental risk was only associated with negative outcomes in the context of genetic risk (Caspi et al. 2002, 2003; Jaffee et al. 2005). Another ground-breaking study utilized a twin design to examine the heritability of positive adaptation in the context of risk, finding that it is both genetically and environmentally determined (Kim-Cohen et al. 2004). There is certainly a need for more studies examining genetic factors as both risk and protective factors because such lines of research present an exciting new framework for conceptualizing and investigating resilience. In particular, genetics studies that employ reasonable measures of environmental factors are necessary because they will allow us to fully capture the role of both environmental and genetic processes, as well as their interaction.

Researchers have also pointed out the gains that could be made by integrating neuroscience findings with resilience research, in particular through informing models of plasticity and/or constraints (Curtis and Cicchetti 2003; Greenberg 2006; Luthar et al. 2006). Biological processes

affect many aspects of behavior, emotion, and cognition and likely mediate and/or moderate the associations between risk, protection, and outcome (Greenberg 2006). Furthermore, there is likely to be both mediation and moderation across social and neurobiological contexts (Silk et al. 2007). Silk et al. (2007) present a model for cross-contextual mediation and moderation, in which they discuss how each context can affect the other. They provide examples of *cross-contextual mediation*, such as how biological characteristics (e.g., emotional reactivity) may affect aspects of the environment (e.g., responses from caregivers), and vice versa; and *cross-contextual moderation*, such as how biological or genetic risk and environmental risk may interact, as in the case of skin cancer. Such models have the potential to greatly increase our understanding of both risk and resilience processes.

Although such integrative efforts are still in the beginning stages, a recent New York Academies of Sciences conference on resilience in children aptly demonstrated the many ways in which genetics, biology, and neuroscience can inform resilience research (Lester et al. 2006). Future research examining processes that have already been demonstrated to be important, such as those involving human relationships, attention-regulation and stress-regulation systems are suggested as good places to start integrating neuroscience and biobehavioral research with resilience research (Masten and Obradovic 2006).

Conclusion

In conclusion, the present review supports the conceptualization of resilience as a dynamic process that varies within and across time, rather than a stable, static trait. It also points to the value of reconceptualizing resilience in narrower, specific terms to more accurately represent resilience as it is observed in the real world. Relatedly, differences in the prevalence of resilience across the highest levels of risk, as well as discontinuity across time and domains, emphasize the difficulty of “escaping” risk, and illustrate the need for both researchers and policy makers to target established protective factors that have been reliably shown to be associated with positive outcomes in similar samples. Furthermore, we must be realistic in our expectations for positive outcomes at the highest level of risk, and turn towards reducing risk as well as increasing protective factors. As Luthar and Goldstein (2004) noted, “if children are faced with continuing and severe assaults from the external environment, then they simply cannot sustain resilience adaptation over time—regardless of how much they are helped to believe in themselves, how intelligent they are, or how well they learn to regulate their emotions” (pp. 503).

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