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In the physical sciences, resilience refers to a quality of a material or an ecosystem (Walker & Salt, 2006). A trestle of steel is more or less resilient depending on its capacity to recover from load bearing and return to its previous state unchanged. A natural environment that sustains an industrial disaster and recovers also demonstrates resilience. The term began to appear with frequency in the psychological sciences in the 1980s and was a metaphor for the ability of individuals to recover from exposure to chronic and acute stress. In the language of human cybernetics (Bateson, 1972; von Bertalanffy, 1968), individuals return to a state of homeostasis (recovery to a previous level of functioning) or, in rare cases, experience change and growth (morphogenesis) following exposure to a toxic environment. These processes, like the environments in which they take place, were theorized as predictable and measurable phenomena that could be manipulated through interventions within neatly nested ecological levels.

A simple example of this positivist epistemology in the study of resilience was Anthony's (1987) notion of psychoimmunization in which early or current experiences of stressful events, when combined with high social support, were shown to be less likely to be pathogenic. The individual was thought to develop an "invulnerability"

to later risk exposure. Recovery from trauma could be stimulated by engaging the individual in a process that promoted his or her expression of latent coping capacity. Resilience was reified in psychological discourse as something intrapersonal even if it was dependent on the resources, or structures, of the wider environment for its realization. Anthony suggested that "what are needed are objective measures regarding such structures and the degree of the individual's participation in them" (p. 7). Almost always, early studies of resilience focused on the individual as the locus of change. The environment (a family, school, institution, or community) was assessed for its influence on individual developmental processes but it was still the qualities of the individual, not the environment, which intrigued researchers. Self-efficacy (Bandura, 1977), sense of coherence (Antonovsky, 1987), self-esteem (Brown & Lohr, 1987), prosociality (Dovidio, Piliavin, Schroeder, & Penner, 2006), and other individual qualities associated with resilience have been hypothesized as more or less amenable to protection from the negative influence of environmental stressors and the health-promoting function of supports (Murphy & Moriarty, 1976; Werner & Smith, 1982).

By implication, within this individually focused view of resilience (what I'll term "the first interpretation of the resilience research"), those who are disadvantaged are expected to exercise personal agency in regard to accessing opportunities in their environments in order to increase their psychological functioning. This approach, mirroring materials science, suggests latent capacity of the

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individual. It focuses attention less on processes of social production that create conditions of risk and growth than it does on the individual's temperament that makes him or her amenable to change. This discourse of individualism embodied by western psychological sciences (and reflecting a cultural narrative of the rugged individual who "beats the odds") is changing as evidence gathers for a more contextualized understanding of human development (Lerner, 2006). Studies of individual qualities limit our understanding of psychological phenomena to a fraction of the potential factors that can explain within and between population differences. It was for this reason that groundbreaking work by Rutter (1987) helped shift our understanding of resilience as the result of individual traits that predicted coping under stress to processes that included reducing risk exposure, developing adequate self-esteem, preventing the negative impact of risk factors on developmental trajectories, and opening new opportunities for development by shaping the child's environment.

In this chapter, I summarize our emerging understanding of the relationship between individuals and the social and physical ecologies that make resilience more likely. Resilience is defined as a set of behaviors over time that reflect the interactions between individuals and their environments, in particular the opportunities for personal growth that are available and accessible (Ungar 2010a, 2010b, 2011b). The likelihood that these interactions will promote well-being under adversity depends on the meaningfulness of these opportunities and the quality of the resources provided. This understanding of resilience distinguishes between strengths within a population and the role strengths play when individuals, families, or communities are under stress. In this chapter I show that resilience results from a cluster of ecological factors that predict positive human development (more than individual traits), and that the effect of an individual's capacity to cope and the resources he or she has is influenced by the nature of the challenges the individual faces. This interactional, ecological understanding of resilience is supported by brief discussion of two studies being done by the Resilience Research Centre (RRC) at Dalhousie University

in Canada (of which I am the Principal Investigator and Co-Director), one mixed methods and one qualitative. Both are international in scope.

An Ecological Perspective of Resilience

Arguing against a paradigm of individualism, Lerner (2006) and other human developmentalists emphasize a more contextualized understanding of children as reflected in the work of Vygotsky (1978) that explores the scaffolding of experience that supports human development. This shift to a position that I will term "ecological" is an important part of the arguments made by all the authors of the chapters in this volume. An interactional, environmental, and culturally pluralistic perspective provides a second way to understand resilience. It builds on the process oriented arguments of Rutter (1987) and Lerner (2006). Its proponents are showing that environments count a great deal more than we thought, perhaps even more than individual capacity, when we investigate the antecedents of positive coping after individuals are exposed to adversity. Whether mapping the effect of schools on individuals (Chapter 21), or the shaping of neuron networks that result from healthy attachments (Chapter 11), a more ecological understanding of resilience suggests complexity in reciprocal person-environment interactions. The goodness of fit between elements of the mesosystem (interactions between family, school, and community systems; Bronfenbrenner, 1979) predicts positive growth in suboptimal conditions. As individuals or environments change, the factors most likely to correlate with positive developmental outcomes also change. Luthar, Cicchetti, and Becker (2000) suggest that successful adaptation is properly operationalized when it reflects high fidelity to the way good development is theorized for a particular sample of at-risk individuals in a particular context. Of course, which interaction is most likely to be a catalyst for resilience depends in part on which outcomes are chosen as the measures of good functioning under stress. In few instances are *a priori* assumptions of positive outcomes negotiated with research participants to

ensure contextual relevance. More often, those studying resilience impose a standard set of outcome measures that are reasoned to be relevant to a population but may overlook indigenous coping strategies that are adaptive in contexts where there are few choices for other forms of adaptation (Castro & Murray, 2010; Gilgun & Abrams, 2005; Ungar 2010a, 2010b). The child who works, for example, may according to a number of researchers (International Union of Anthropological and Ethnological Sciences, 2002; Liborio & Ungar, 2010; Liebel, 2004) argue that his or her burdensome employment brings several advantages with regard to sense of self-worth, hope for the future, and respect from others for the contribution he or she makes to his or her family. While not an argument for complete relativism (not all outcomes desired by a specific population are necessarily advantageous long-term), an ecological understanding of resilience positions these negotiations for control of meaning and the resources that support growth as an integral part of all studies of resilience and their application to practice.

I've termed this contextualized approach to the study of resilience a social ecological one (Ungar, 2008, 2011a). Whereas proponents of an individual interpretation of capacity under stress still emphasize personal qualities as the *sine qua non* of developmental outcomes, interactionists posit individual gains as the consequence of congruence between individual needs and environments that facilitate growth. A social ecological perspective on resilience that evolves from this interactional perspective results in more focus on the social and physical environment as the locus of resources for personal growth. As the authors in this volume show, the individual and ecological positions are neither mutually exclusive nor antagonistic. They simply emphasize different aspects of the processes associated with resilience, whether those processes are compensatory, protective, or promotive (Luthar et al., 2000). For example, the capacity to avoid delinquency despite early experiences of deprivation may be attributable to individual traits like attachment to a caregiver, a lack of genetic predisposition towards antisocial behavior, self-regulation, or gender (Henry, Caspi, Moffitt, Harrington, &

Silva, 1999; Moffitt, 1997; Rutter, 2008), or be a consequence of structural factors like neighborhood stability, access to employment, and avoidance of discrimination (Elliott et al., 2006; Law & Barker, 2006; Sampson, 2003). Ecological interpretations of resilience make clear the complexity inherent in the processes that contribute to growth. Even in optimal neighborhoods a child's capacity to avoid delinquency may still depend on early attachments with caregivers (Sroufe, Egeland, Carlson, & Collins, 2005) and epigenetic processes that moderate the effects of genes that predispose a child from a criminogenic home from repeating patterns of antisocial behavior (Hudziak & Bartels, 2008; Moffitt, Caspi, Rutter, & Silva, 2001).

The problem is not the complementarity of individual and ecological approaches to the study of resilience, but the oversight that results when ecological aspects of resilience are de-emphasized (individual resilience is seldom overlooked in psychological research). Understood in this complex, multidimensional way, resilience is as, or more, dependent on the capacity of the individual's physical and social ecology to *potentiate* positive development under stress than the capacity of individuals to exercise personal agency during their recovery from risk exposure. A broader ecological understanding of resilience is more likely to produce interpretive models that explain how people navigate through adverse environments over time (Schoon, 2006).

Ecological Opportunity Structures and Resilience

An intervention by Bierman et al. (2004), members of the Conduct Problems Prevention Research Group, provides support for this ecological interpretation of resilience. Based on a survey of 10,000 kindergarten students in four high-risk neighborhoods (Durham, NC; Nashville, TN; Seattle, WA; rural central Pennsylvania), 891 children were identified as being at risk for future conduct problems. Using random assignment to intervention and control groups, a 10-year intervention was performed that included

parent behavior management training, child social cognitive skills training, reading support, home visiting, mentoring and changes to classroom curriculum. Assessment of the children over time suggests that programming with multiple elements can have a significant impact on children's development, but that the impact varies by an individual's level of risk (based on assessments during kindergarten) and the intensity of the services provided. Fast Track, as the program was known, "had a statistically significant and clinically meaningful positive effect on preventing childhood and adolescent externalizing psychiatric disorders and antisocial behavior, but only among the highest risk subgroup of kindergarteners" (p. 1259). Notably, it was the combination of long term developmentally appropriate services that focused on children's cognitive skills, peer relationships, parenting practices and the quality of the school climate that accounted for changes in expected child functioning. Youth who experienced the greatest fidelity to the intervention, and were at the highest risk for conduct disorder when first assessed, were those most likely to benefit from the intervention. Youth at little risk of conduct disorder showed little change from their matched controls.

The study tells us three things about resilience. First, resilience depends on clusters of factors that influence individual, relational, and broader social factors. Second, it is the intervention, and its intensity (a change in the child's social ecology), more than individual motivation that accounts for the greatest amount of variation in outcomes (Bierman et al., 2004). In other words, the locus of change is the intervention. The quality of its design and implementation determine whether children do well. Very little individual level change is attributable to personal traits. Motivation to attend and the exercise of personal agency to do so may have been a contributing factor to Fast Track's success, but the ability of the program to attract youth and families was likely more important to its overall effectiveness.

Third, a protective process like an intervention to prevent conduct disorder may have little promotive effect on a population as a whole, but

instead interacts with the risk factors that are present to produce changes in those most at-risk. Though individual level variables are important and may co-vary with changes to the environment, more change can be accounted for by environment-level variation than by individual factors (Ungar, 2011b). In other words, an individually focused interpretation of resilience could overlook the cause for much of an individual's change over time (Laub & Sampson, 2003). Furthermore, protective processes are most likely to affect those who face above average levels of risk but may have no effect at all on individuals who are already better resourced.

Distinguishing Resilience from Assets

The Fast Track example illustrates how factors associated with resilience are different than strengths or assets. Despite definitional ambiguity among proponents of positive youth development, assets are best defined as characteristics shared by a population regardless of level of risk exposure (Lerner, Dowling, & Anderson, 2003; Moore, Lippman, & Brown, 2004). Their function is assumed to be always positive, with a greater number of internal and external assets correlating with an individual's capacity to resist (in the case of youth) delinquency, drug abuse, early sexual initiation, and school dropout (Benson, 2003; Larson, 2006). Martin and Marsh (2006, 2009), for example, are explicit with regard to this difference when they define "academic buoyancy," their construct for the everyday "cumulative enabling factors" (p. 358) that all students use to buffer normal educational stress. Assets (and the processes associated with their acquisition) are, however, more or less protective depending on the individual's level of exposure to adversity. As Zautra, Hall, and Murray (2010) explain, there is an interaction between factors associated with positive development (common across a population) and factors that suppress the impact of risk (specific to those who are vulnerable). This more complex interpretation of our "psychological economy"

(p. 10) suggests that well-being is more than the absence of disorder and the profusion of internal and external strengths. It is the active engagement in processes that promote well-being even when disorder is present. A program like Fast Tracks changes social structures and provides assets that interact with levels of disorder to change developmental pathways. The potential for disorder is still there, but the adapted social ecology changes the likelihood negative qualities get expressed (much as genes get triggered by environmental stressors). An intervention that assesses only assets and not risk is likely to miss the complex interchanges in which assets become protective factors and contribute to what is understood as patterns of behavior associated with resilience when risk is present.

Social and Physical Ecologies Potentiate Resilience

Conceptualizing this ecological understanding of resilience requires that elements of temporality, opportunity, and meaning be accounted for. Where there is potential for exposure to significant adversity, resilience is both the capacity of individuals to *navigate* their way to the psychological, social, cultural, and physical resources that build and sustain their well-being, and their individual and collective capacity to *negotiate* for these resources to be provided and experienced in culturally meaningful ways (adapted from Ungar, 2011b). These dual processes of navigation and negotiation are important. They emphasize that individuals engage in processes that demonstrate resilience when they take advantage of the opportunities they have and do better when they exercise influence over what those opportunities are and how they are provided. While individual agency is a component of one's ability to navigate to resources, it remains the role of families, communities, and governments to make those resources available in culturally meaningful ways that reflect the preferences of those who need them. Therefore, resilience is a shared quality of the individual and the individual's social ecology, with the social ecology likely more important than

individual factors to recovery and sustainable well-being for populations under stress.

These negotiations are clear when we look at the co-construction of deviance. Crime, for example, is construed situationally, with certain behaviors judged to be criminal in some contexts but not others (Latimer & Foss, 2005; Lesko, 2001). An individual's motivation to commit a crime arises because of interactive processes between individuals and their environments in which the costs and benefits of antisocial behavior are assessed with delinquency seeming to be worthwhile when other opportunities are unavailable or inaccessible (Gilgun & Abrams, 2005; Wikström, 2005). Understood this way, behaviors that are perceived as delinquent by some may be thought of as functional or even prosocial by others, though often these decisions lack self-reflexivity and are instead reflections of broader meaning systems that support or discourage particular actions (Bottrell, Armstrong, & France, 2010). Resilience shares much the same quality, with positive outcomes negotiated within discursive spaces that influence our judgment of what is and is not experienced as an indicator of well-being under stress in different contexts.

To illustrate, an individual personality trait like the ability to act independently, resisting the need to participate in delinquent behavior and remain an outsider to a peer group, requires that the skills of resistance be seen as active and empowering. A positive self-concept should reasonably precede their expression. Murray (2010) notes that young people who resist offending behaviors are not doing nothing (resistance as a passive coping strategy). They are demonstrating "active resilience" by preventing themselves from engaging in problem behaviors that change life trajectories. According to Murray, youth use several strategies, such as "othering" offenders, avoiding offending peers, and thinking about their future as ways to avoid the potential risk impact posed by peers. These are active intelligible strategies responsive to very specific ecological stressors that result in individuals experiencing a sense of personal efficacy. Suggesting that these young people simply do nothing diminishes their experience of their own

power. In this regard, the process of participating in a social discourse that values their resistance skills (an ecological process) is likely to make youth who resist delinquency more self-satisfied as a result of the recognition their actions bring. As a number of qualitative studies have shown, however, denying children participation in a discourse that supports their active coping strategies will make it more likely that they participate in delinquent activities to satisfy their need to feel powerful (Bottrell, 2009; Hecht, 1998; Munford & Sanders, 2005; Ungar, 2007).

The same processes of navigation and negotiation occur at the level of mesosystemic interactions between the family and other systems. For example, Driscoll, Russell, and Crockett (2008) have shown that while authoritative parenting is just as effective with Mexican immigrant youth as it is for White Americans, other aspects of family functioning carry different meaning depending on the degree of family acculturation. In this case, studies of acculturation processes suggest that acculturation can pose a risk to mental health and is associated with negative behaviors among Latino youth such as smoking cigarettes, using drugs, and alcohol related problems. It is thought that the emphasis in American culture on independence and autonomy undermine cultural expectations for family ties, mutual support and social obligations. In fact, US born Mexican-American parents are more likely to be permissive than their authoritative immigrant parents. By the third generation, acculturation and the relinquishing of traditional values brought from the family's country of origin result in the adoption of dominant cultural values. The result is that children of more recent immigrants have better mental health than children of parents who are fully acculturated. The benefits, however, show a complex pattern. Third generation youth with problem behaviors report higher self-esteem (possibly an artifact of their acceptance of dominant cultural values), though depression levels are stable across all three generations and lower than the national mean. In this case, parenting styles, the transmission of values, and processes of acculturation exert a direct influence on measures of personal functioning associated with

mental health and conduct. From the point of view of an ecological interpretation of resilience, one can see that resources like family ties and values may, or may not, be protective depending on cultural and temporal factors. In this case, Latino families that argue against acculturation (and are privileged in the social discourse that defines the antecedents of mental health among immigrants) need to have their voices privileged.

Beyond the family, socioeconomic factors account for significant amounts of the variance between populations. Parke et al. (2004) examined economic stress, parenting, and child adjustment in Mexican-American and European-American families. Similar to the results from Driscoll et al. (2008), Mexican-American families who were the least acculturated and had the lowest annual incomes experienced the least economic stress. Parke et al., speculate that their results suggest that less acculturated families who engage in the dual processes of resisting dominant culture and promoting indigenous values and beliefs avoid the threats to well-being that accompany social comparison.

This shift in focus to a contextually-relevant understanding of resilience de-centers the individual as the primary unit of analysis. Instead, the role played by the individual's social and physical ecology is emphasized and patterns of coping that are synonymous with resilience are identified (Dawes & Donald, 2000). To illustrate this point further, we can look critically at the work of Masten and Obradović (2006) who, building on Murphy's (1962) work, distinguish two types of coping. Coping I, referring to internal integration, and Coping II, external adaptation. Both represent aspects of individual competence and reflect a degree of personal agency. One might also imagine, however, Coping III, the adaptation of the environment to the individual in order to moderate exposure to risk, mitigate the consequences of exposure when it does occur, or suppress risk altogether. Changing the environment potentiates the long-term positive development among children who are at-risk. This view of resilience starts with the premise that individuals do not need to demonstrate internal integration

or external adaptation if the environment is sufficiently modified to remove conditions that threaten development.

One way to show this is to examine the compounding effect of ADHD and peer rejection on educational achievement (as a proxy measure for resilience) over time. Mikami and Hinshaw (2006) worked with an ethnically diverse sample of girls aged 6–13, assessing them at baseline and 5 years later. One hundred and forty participants with ADHD and 88 without were included in the study. Ninety-two percent of the original sample was retained. Interestingly, they found that ADHD and peer rejection in childhood does not contribute to internalizing and externalizing behaviors 5 years later, but does contribute to decreased academic achievement. Notably, children with self-perceived academic competence in childhood had lower levels of adolescent externalizing and internalizing behavior. This effect held for both children with ADHD and those without, meaning self-perceived competence was a promotive factor that also buffered the impact of ADHD when present. The findings suggest that “self-perceived scholastic competence buffers against externalizing behavior and substance use through the mediator of keeping adolescents connected to school and away from deviant peer groups” (pp. 835–836). The results suggest that the risks girls with ADHD face are cumulative, and that processes associated with resilience change children’s experiences of their social ecologies. While both risk factors (one individual, the other relational) threaten children’s developmental paths, it is the maintenance of a school attachment (and the facilitative environment of the school which makes this attachment possible) that contributes to positive development regardless of the risks the child faces.

Resilience is, therefore, the ecologically complex (multi-dimensional) processes that people engage in that makes positive growth possible (e.g., engaging in school, resisting prejudice, creating networks of support, attending religious institutions), all of which are dependent upon the capacity of social and physical ecologies to provide opportunities for positive adaptation (preferably in ways that express prosocial collective norms). When

resilience is measured as an outcome, individual traits, behaviors and cognitions are always outcomes that result from positive developmental processes that have been made possible by an individual’s wider ecology. Higher self-esteem may result from success with peers, family cohesion, or success at school (Kidd & Shahar, 2008). Secure attachment results from adequate caregiving (Beckett et al., 2006). Efficacy is the result of opportunities to make a meaningful contribution to others or find other ways to control one’s world (Bandura 1977; Emond, 2010). Delayed sexual initiation has been attributed to cultural factors, peer associations and opportunities to experience self-esteem (Shoveller, Johnson, Langille, & Mitchell, 2003; Spencer, Zimet, Aalsma, & Orr, 2002). And positive peer relations depend on neighborhood characteristics to provide children with a selection of choices (Barber, 2006; Chauhan, Reppucci, Burnette, & Reiner, 2010). Outcomes from each of these experiences will depend more on the quality of the environment (its capacity to meet the needs of vulnerable individuals) than individual competence. The error of attribution in many studies of resilience is to measure personal agency and ignore the larger influence of sociopolitical, economic and cultural factors that shape developmental paths.

An Ecological Expression of Resilience

To account for this complexity, I borrow from Kurt Lewin’s (1951) work in the early 1950s, his expression $B=f(P, E)$ which says that behavior is a function of the person in interaction with his or her environment. The expression can be modified to describe a more ecological understanding of resilience (Ungar, 2011b) – in the context of exposure to significant adversity:

$$R_{B(1,2,3,\dots)} = \frac{f(P_{SC}, E)}{(O_{Av}, O_{Ac})(M)}.$$

In the expression, R_B refers to resilience as a set of observable behaviors associated with adaptive outcomes in contexts of adversity. These behaviors (functional outcomes that we can measure or

observe like high school graduation, association with prosocial peers, and description of one's feelings of self-esteem) can be assumed as proxies for internal integration and external adaptation that makes individual coping more likely. As longitudinal studies of resilience and risk show, these patterns of behavior are temporal, changing over time as new horizontal stressors (normative developmental challenges that occur over the lifespan) and vertical stressors (acute or chronic challenges that transect the developmental life course and negatively skew growth) influence the individual's capacity to cope and the resources available (Laub & Sampson, 2003; Schoon, 2006; Werner & Smith, 1992). At different points in a child's development, there are windows of opportunity that maximize the potential for positive growth or change (Masten & Wright, 2010).

Behaviors we associate with resilience (like staying in school, or associating with non-delinquent peers) are a function of the person (P) and his or her strengths and challenges (s_c), expressed within a complex ecology (E). The emphasis on both strengths and challenges makes explicit findings from studies of resilience that show it is a combination of personal advantages and disadvantages that influence life trajectories. It is easy to assume, for example, that intelligence would be a strength, while intellectual delay would be a challenge in most contexts. The nature of the interaction between strengths and challenges, however, is more complicated when the risk posed by the environment is also considered. To illustrate, Tiet et al. (1998) showed in their analysis of data from a household survey in four geographic areas of the United States that IQ affects coping positively for high-risk children but has less effect on the coping skills of children at lower risk.

A similar pattern is evident in the work of Obradović, Bush, Stamerdahl, Adler, and Boyce (2010) who showed that among primary school children, stress reactivity (when measured using biological markers like cortisol levels) biologically predisposed sensitive children to feel emotional slights and be prone to anxiety that decreased school performance when in a threatening environment such as one where bullying is prevalent.

These same children, however, will outperform their less anxiety-prone peers when there is little stress in their environment. Such children are not only more likely to do better academically, they are also likely to be creative, expressive individuals, and it's those characteristics that endear them to their parents and teachers. The differences in performance are situational, not child-dependent. The child who is not reactive, not anxious, who can seem aloof or even aggressive, may be the child who survives better in a stressful environment, outperforming the more sensitive child whose talents cannot be properly used when he or she feels threatened. The advantage that the less reactive child experiences, however, is only seen in stressful environments where the child is stressed. The above expression of an ecological model of resilience is meant to capture these nuances in protective processes and suggest their interaction with individual differences.

Further updating Lewin, the E here refers to ecology rather than environment. Human cybernetics (Bateson, 1972) and even theories of human ecology (Bronfenbrenner, 1979) reified an understanding of the environment that was progressive a half century ago. Advances in the physical sciences have shown, however, that the assumptions of environmentalism differ from those of ecology (Naess, 1989). Environmentalism reflects a positivist orientation towards systems that emphasize causality, hierarchy and disciplined processes of change. Environments can be manipulated. They serve the purpose of meeting the needs of one part (typically individual humans) and reflect the values of colonization, extraction, and endless growth. Ecology is a post-positivist interpretation of the relationship between elements of an ecosystem, where emphasis is placed on the intrinsic worth of each part regardless of its perceived utility (Drengson, 2000). Even those elements of an ecology that are noxious, or apparently redundant, have value in and of themselves. Relationships are complex and outcomes non-teleological (there are no assumptions that one set of outcomes are necessarily better than another). The subjectivity of the observer is accounted for in what is taken to be a valued aspect of one ecology and not another.

By theorizing resilience as a social ecological construct, this same post-positivism and subjectivity can be accounted for. Thinking ecologically, researchers studying resilience acknowledge variability in the definition of what constitutes the individual's environment (does the researcher include measures of family functioning, school engagement, community cohesion, neighborhood stability, or political empowerment?). The individual's strengths and challenges are also understood as contextually dependent for their definition as they are expressions of culturally embedded values that influence the co-construction of what is meant by successful coping and risk (Dawes & Donald, 2000; Ungar et al., 2007).

Opportunity

All of this depends on two aspects of the individual's social and physical ecology, represented by elements in the denominator of the expression. The capacity of the social and physical ecology to provide resources for internal integration and external adaptation is constrained by the opportunity structure (O) that surrounds the individual. Opportunity structures are a quality of the social and physical ecology, not the individual. As the research discussed above shows, opportunity dramatically influences developmental trajectories by making resources available ($_{Av}$) and accessible ($_{Ac}$). Processes associated with resilience (whether characterized by adaptive or maladaptive coping) (Bottrell, 2009) are always dependent upon the factors that trigger and sustain them. At the most individual level, that of one's genetic profile, studies of epigenetics suggest that resilience is triggered by aspects of the environment that bolster the expression of latent individual capacity, just as noxious environments can trigger dysfunctional self-regulatory processes (Caspi, Taylor, Moffitt, & Plomin, 2000). Likewise, immunity to future adversity can develop through exposure to manageable amounts of stress earlier in life (Lemery-Chalfant, 2010). In other words, the opportunity structures that surround an individual will shape the individual's capacity to experience resilience when facing adversity. The locus for

change, however, is within the social and physical ecology that shapes the individual's behavior. For example, Laub and Sampson (2003) provide evidence in their longitudinal study of elderly men who were once delinquent boys that those who formed secure bonds with an intimate partner (i.e., married well) were more likely to desist from problem behaviors. In other words, a fortuitous relationship provides the former delinquent with available and accessible supports that promote positive behavior and prevent the continuation of growth along negative life trajectories (incarceration, drug abuse, unemployment).

It can be difficult to predict the influence of an opportunity without understanding both the context in which it becomes available, as well as the strengths and challenges of those who access it. To illustrate, Sloboda et al. (2009) conducted a randomized field trial of a substance abuse prevention program delivered to all students in 83 school clusters (high schools and their feeder schools). They showed that over a period of 5 years post-intervention that universal school-based substance abuse prevention targeting tobacco, alcohol and marijuana can have a negative effect on baseline non-users of tobacco and alcohol. The opportunity afforded by this kind of intervention makes it more likely students who were baseline non-users will use substances later. However, students who were baseline marijuana users seemed to take advantage of the opportunity presented by the intervention and were more likely than controls to reduce or avoid drug use later. The intervention used Drug Abuse Resistance Education (D.A.R.E.) officers who delivered ten lessons during seventh grade and seven "booster" sessions in grade nine. Contrary to expectations, "Of those who did not use alcohol or smoke cigarettes at baseline, a statistically significantly higher proportion of treatment than control students drank or smoked in the past 30 days when in grade 11" (pp. 6–7). There were, however, no differences between controls and intervention group on marijuana use suggesting great specificity in how an opportunity like a drug and alcohol prevention program influences a process such as resisting substance use which is often associated with resilience.

Sloboda and his colleagues also found gender and race/ethnicity differences, suggesting that individual personality differences may be less important than macrosystemic contextual variables related to social location. In regard to gender, males in the treatment condition had higher rates of alcohol use than females, while female students who participated in the intervention were more likely to binge drink and smoke. When the participants were stratified by race/ethnicity (white and non-white in order to get cell frequencies large enough for analysis) the white students who participated in the intervention had higher risk ratios for all the substance use categories, though the differences were not statistically significant. Only with regard to cigarette use were non-white students more likely than controls to report significantly higher levels of use (risk ratio 1.23). Among white students, the intervention group was more likely to binge drink, use alcohol, get drunk, and smoke when compared to the controls.

Interestingly, students who were already substance users at baseline showed significant and positive treatment effects, reporting declining rates of substance use 5 years later. These findings demonstrate an iatrogenic effect for a universal program of substance abuse prevention. Only those youth were already users were likely to benefit. The intervention appears to create school wide shifts in access to information about drugs, alcohol and tobacco and “may increase interest in substance use” (p. 8). Thus, as reflected in the above expression of *R*, in and of itself, the amount of risk a child faces, and the amount of protection afforded a child by a resource (like an alcohol and drug prevention program) cannot be predicted without also accounting for the nature of the child’s strengths and challenges (including behavior) and the opportunities that are available.

Meaning

The last element of the expression is the *M*, the meaning systems to which individuals and their communities adhere. It is this meaning which determines the decisions people make with regard to which resources (opportunities) they value and

access and which resources their family, school, community and nation provides. Meaning depends on cultural constructions of the factors that influence well-being. The concept is multidimensional. At the level of individuals, values and beliefs (reflecting socialization processes like acculturation) shape individual discrimination of experiences as either facilitative of growth or posing a barrier to personal development. As shown above, a drug and alcohol prevention program, an intimate relationship, or resistance to acculturation, can either help or hinder resilience depending on what the resource means to those using it. A resource like prevention programming is a value laden opportunity. One could equally imagine harm reduction workshops for teenagers or the decriminalization of alcohol consumption as a status offence (removing the notion of underage drinking). While both strategies could do more harm than good, what is interesting is that those intervening have preferred to focus on programming that promotes abstinence without questioning the culturally embedded bias and historical context that influences their perspectives with regard to what is appropriate behavior by an adolescent. One could also imagine (and find) a society where limited substance use is not seen as a social problem, but a normative rite of passage which contributes to an adolescent’s self-esteem. In moderation, and under the influence of a different meaning system, well-defined alcohol use might be an opportunity for a young person to show he or she is becoming a responsible adult (a rite of passage).

At the level of the collective, families, schools, communities, and governments take action and invest in resources that are meaningful based on negotiations to decide policy and resource allocation (Leadbeater, Dodgen, & Solarz, 2005; Lyons, 2004). This is one dimension of the relationship between meaning and resilience. The meaning we attribute to aspects of our social and physical ecology shape the opportunities that we create (Ungar, 2005). For example, do we support workfare that forces single parents to work and put their children in daycare, or do we support social assistance that is adequate to allow economically disadvantaged parents time at home with their

pre-school aged children? The ability of people to navigate to resources is based on the preferences of those in power.

A second dimension of meaning as it relates to resilience is the relative power of each individual in the social discourse to influence the definition of what resilience looks like. Our sense of who we are, our identity as resilient or vulnerable, depends on these processes of co-construction and negotiation (see Bruner, 1997). The self is both what we learn from the statements of others, as well as self-generated meaning-making within culturally diverse social spaces that provide varying opportunities for accessing the resources we need to experience resilience. Just as we are influenced by the meaning systems of others, so too do we participate in their co-construction which reflexively determines who we think we are, what we value, and how we behave (Walsh & Banaji, 1997). To see ourselves and our patterns of coping as resilient, both must be vested with positive regard by ourselves and others. This is particularly evident in gendered constructions of resilience (Leadbeater & Way, 2007) and those by racialized minorities (Blackstock & Trocmé, 2005) where meaningful patterns of resistance to dominant norms may be adaptive for individuals but viewed as antisocial by cultural elites when the patterns of those facing significant adversity do not conform to conventional norms. An interesting, albeit potentially dangerous, example of this is the pro-ana movement in which people diagnosed with anorexia nervosa argue that their “disorder” is a coping strategy that sustains their sense of well-being.

The co-construction of what is a meaningful expression of resilience, then, reflects the relative power of those involved to argue for the legitimacy of their experience. For example, Nguyen-Gillham (2008), reporting results from a qualitative inquiry with 321 Palestinian youth, explains resilience as social suffering. “The Palestinian concept of *samud* – a determination to exist through being steadfast and rooted to the land – is at the heart of resilience. Within a Palestinian context, suffering and endurance have to be interpreted at both an individual and collective level. The construct of resilience goes beyond

an individualistic interpretation: resilience is (re) constituted as a wider collective and social representation of what it means to endure” (p. 292). Observations of Israeli youth present a different understanding of resilience, one focused on selfless contribution and defense of nationhood, a meaning system no less powerful than that expressed by the Palestinians (Ungar, 2007).

This meaning which is attributed to a particular coping strategy is not just an artifact of language, but shapes behavior at multiple levels, even down to the level of neural functioning. Though there is little work that links brain physiology to resilience as a process (studies of neuroplasticity have tended to only focus on individual capacity to heal brain physiology after trauma and subsequent behavioral change), there is evidence that resilience can be compromised by the effect of risk exposure on brain functioning. For example, Lewis, Granic, and Lamm’s (2006) work on aggression in children has shown that “reduced neural activity related to emotion regulation corresponds with an overall decrease in behavioral flexibility in children with aggressive behavior problems” (p. 165). Significantly, this pattern of brain development is directly attributable to parenting and socialization which stimulates reactive self-regulation. Changing the family’s capacity to socialize the child not only changes the child’s behavior, helping him or her inhibit aggression (Nagin & Tremblay, 1999), it also changes brain physiology. How a family chooses to socialize their child, however, is a function of what they believe to be in the child’s best interest and reflects a meaning system that reinforces those beliefs.

An ecological expression of *R* can also be used to deconstruct aspects of risk that, by extension, help identify the processes that are necessary to create resilience. To illustrate, Chauhan et al. (2010) used data gathered from 141 girls aged 13–19 recruited from a juvenile correction center in Virginia. The youth were 50% black, 38% white, and 12% from other ethnoracial groups. The girls did not differ in regard to severity of previous criminal charges, violence, or delinquency, with 79% of the total sample having at least one prior charge for violence such as

assault, attempted murder or armed robbery. Eighty percent of the group was re-contacted 6 months after they left the correctional center. Using rearrest data and geo-coding of neighborhood census tracts, disadvantage was calculated as the percentage of people below the poverty line, households on public assistance, female headed households (sole parents), and rates of unemployment. Though both black and white girls self-reported rates of offending post-discharge that were not significantly different, black girls were more likely to be rearrested, especially for nonviolent crimes. These black girls were also the youth most likely to live in disadvantaged neighborhoods. Logistic regressions were run to examine the relationship between neighborhood disadvantage, race, rearrest overall, and nonviolent rearrest. Race was significantly associated with overall rearrest but not neighborhood disadvantage. Furthermore, race was not significantly related to rearrest for nonviolent crime once neighborhood disadvantage was accounted for. "A standard deviation increase in neighborhood disadvantage increased the odds of being rearrested for a nonviolent crime by about a ten-fold" (p. 537). The authors conclude that one can show that while both black and white girls are just as likely to commit the same crimes (there is no differential involvement between the two racial groups), differences in where the girls live, and how their neighborhoods are policed, results in different rates of arrest (there is differential selection based on the social ecology of the girls' neighborhoods). While black girls were no more likely to reoffend than their white peers, they were much more likely to be caught. The issue is not race as much as it is neighborhood disadvantage which results when minorities are marginalized in poorer communities with differences in expressions of state control like policing and arrest patterns.

Over time, then, the opportunities presented by an economically advantaged community interact with personal strengths and challenges (like a pattern of delinquency, or status as a ethnoracial minority). The disproportionately high numbers of black girls in detention is the result of social ecological factors more than individual factors

that distinguish them from white girls their same age. Race and neighborhood disadvantage combine to change opportunity structures. Arguably, engaging delinquent girls in processes to bolster resilience would be most effective if they focused on positive aspects of development in specific social ecologies. However, unless interventions also address the unfair treatment of black girls in their communities, the clinical intervention is unlikely to be effective. Environment may trigger personal predispositions (Moffitt et al., 2001), but it is structural constraints on development that make a child more or less resilient over time (i.e., time in jail skews future opportunities for life success)(Blackstock & Trocmé, 2005). Patterns of individual maladaptive coping (delinquency) and their consequences are contextually dependent. In the previous example, individual qualities may predict recidivism, but they do not predict the outcomes that follow such as rearrest or changes in a child's capacity to cope with disadvantage. A youths' experience is more a function of contextual variation (and the value laden responses that address the risks children face) than individual disposition.

A Program of Research

To explore the social ecologies that make resilience more likely to occur, the RRC has conducted a number of interrelated studies across different cultures and contexts. These studies have helped to both innovate and validate theory. A summary of findings from two of these studies is presented here in order to demonstrate how a social ecological understanding of resilience informs the expression presented above.

Multiple Service Users, Risk, and Resilience

The Pathways to Resilience (PTR) study is a mixed method, multi-year study that began in Atlantic Canada and has since expanded to South Africa, Colombia, China and New Zealand. The study seeks to understand how youth ages 13–19

experience multiple mandated services (child welfare, corrections, mental health and special education) and less formal community programming (recreation centers, community programming by NGO's) and informal family and community supports. The study examines service and support use patterns in relation to risk mitigation and the processes associated with resilience. Phase One of the study included 531 urban and rural youth using at least 2 mandated services and a comparison group of 91 youth who rely on non-mandated community services provided by an organization that supports street-involved youth and their families. The study included questions that explored ecological complexity (differences in individual, family, peer, school, community and cultural resources). All participants were referred to the study by their service providers, or in the case of the comparison group, staff at community programs. Although the sample was not random, care was taken to conduct the study in regions and communities throughout Atlantic Canada that would contribute to the rural, urban and cultural diversity of the sample.

Each of the main study variables (service use, risk, and resilience) was assessed as follows. Service use comprised a composite score assessing service use history (i.e., has the youth ever used a service, and if so, how often) of mental health, child welfare, youth corrections (including contact with the police), and educational supports beyond regular classroom programming. Youth were provided with a list of possible services and scored themselves on lifetime use. Scores for each service type were standardized with a minimum score of zero and a maximum score of 10. Higher scores indicated greater involvement with service providers.

Risk was assessed through measures of both community dangers and personal characteristics associated with acute or chronic adversity. Specifically, delinquency was assessed using the *Delinquency* sub-scale of the 4HSQ (Phelps et al., 2007; Theokas & Lerner, 2006). The 12-item version of the Centre for Epidemiological Studies Depression Scale (CES-D-12-NLSCY) (Poulin, Hand, & Boudreau, 2005) was included to assess levels of depression among participants.

A composite score was also computed for sense of community danger using items from the Boston Youth Survey (BYS), a biennial, survey of high school students in Boston Public Schools.

Resilience was measured using the four subscales of the Child and Youth Resilience Measure (CYRM) (Ungar, Liebenberg, Boothroyd, & Duque, 2008). The CYRM is a 28-item instrument validated with a purposeful sample of 1,451 youth growing up facing diverse forms of adversity in 11 countries (Canada, USA, Colombia, China, India, Russia, Palestine, Israel, Tanzania, the Gambia, and South Africa). Items measuring individual characteristics (Individual) include "I cooperate with people around me," "I try to finish what I start," "I am aware of my own strengths," and "I know how to behave in different social situations." The alpha coefficient in the first phase study was 0.795.

Items measuring relationships with parents or primary caregivers (Relationships A) include "My caregiver(s) watch me closely," "My caregiver(s) know a lot about me," and "If I am hungry, there is enough to eat." The alpha coefficient was 0.793.

Items measuring relationships with peers and mentors (Relationships B) include "I feel supported by my friends," "My friends stand by me during difficult times," and "I have people I look up to." The alpha coefficient was 0.751.

Items measuring contextual characteristics (Context) include "Spiritual beliefs are a source of strength for me," "I think it is important to serve my community," "I have opportunities to develop skills that will be useful later in life (like job skills and skills to care for others)," "I am proud of my ethnic background," and "I am treated fairly in my community." The alpha coefficient for the present sample was 0.785.

Results of the study have shown that contextual characteristics measured by the CYRM and other aspects of the youths' environment combine to provide the best prediction of functional indicators of positive development such as school engagement. For example, using a hierarchical regression analysis to examine the effects of risk, resilience and service use on degree of school

engagement, results show that resilience, service use and three risk variables (engagement in delinquent behavior, depression, and perceived danger within one's community) provided a model that could account for 32% of the variance in school engagement within the sample. Only the context subscale of the CYRM ($t(475)=3.426, p=0.001$) was significant. Engagement in delinquent behavior ($t(475)=-6.675, p=0.000$), participation in correctional mandated services ($t(475)=-2.567, p=0.011$), and risk of depression ($t(475)=-2.644, p=0.008$) all have a significant and inverse association with school engagement. The findings show that specific patterns of service provision (availability) and use (accessibility) affect school engagement. Furthermore, contextual factors related to culture, participation in religious activity, nationalism and rites of passage, appear to influence functional outcomes like a child's school attendance, thoughts about school, and feelings of belonging when at school.

A Visual Methods Study in Five Countries

A methodologically different study by the RRC, The Negotiating Resilience Project (NRP), conducted 16 case studies of 13–16-year-olds in 5 countries (Canada, China, Thailand, India, and South Africa) (Theron, Ungar, & Didkowsky, 2011). The study's goal was to identify culturally embedded patterns of adaptive coping among youth who face significant chronic stress. Local researchers assembled advisory committees who then referred young people to the study. Selection criteria included youth who faced a chronic stressor understood to cause children developmental problems in each country context, as well as being a child "out of place" but still "doing well" on functional behavioral indicators associated in the resilience literature with positive development in adverse circumstances. The out of place significance was used to maintain homogeneity across the sample by identifying young people with a common experience of being different from their peers, even though these differences varied by context. These differences included: youth with

physical disabilities in mainstream schools or communities where they were marginalized; Aboriginal youth living in urban environments; youth displaced because they were orphaned, political refugees or economic migrants. While qualitative case studies cannot produce generalizable theory regarding the nature of children's coping strategies, they were useful identifying meaningful patterns of resilience relevant to youth who experience some disadvantage. Between 2008 and 2009, one boy and one girl were chosen from eight matched sites: Vaal Triangle, South Africa and Halifax, Canada; Chiang Mai, Thailand and Vancouver, Canada; Jinan, China and Saskatoon, Canada; and Meghalaya, India and Montreal, Canada. Doing well was understood as variable by context. In China a child's focus on his or her studies outside of school was considered important. In Thailand, a child's ability to cope with minimal parental supervision was considered a sign of positive development. For Aboriginal youth in Saskatoon, local advisors emphasized the young people's resistance to gang involvement.

Data collection included three types of qualitative data. Youth were asked nine catalyst questions during open-ended interviews that were recorded, transcribed and translated (as required). Questions included: "What would I need to know to grow up well here?" "What do you do when you face difficulties in your life?" and "Can you share with me a story about another youth who grew up well in this community despite facing many challenges?" Next, a video-recording was made of one full day in the life of each participant, beginning when the youth woke and ending later that same evening. In all but two cases, filming took place during a non-school day. Following the filming, each youth was invited to participate in a phase of photo elicitation (Croghan, Griffin, Hunter, & Phoenix, 2008). Each was provided a disposable camera and asked to take pictures of aspects of their lives that helped explain their coping with chronic adversity. Finally, focal interchanges from the recording of a day in the life of each youth were selected by the research team, and shown to the participant for feedback. Focal interchanges from another youth in the

matched site were also shared with the youth to engage them as co-researchers in the interpretation of the data. During the final interview, all the data, including the photos the youth had taken, were discussed.

Findings have suggested a number of unique contextually relevant patterns youth use to cope. For example, the data show two distinct but inter-related patterns to the way participants contribute to the welfare of their families, and in return secure for themselves a powerful identity and sense of personal and social efficacy. Youth contributions were either “precocious” (synonymous with processes of adultification in relationships with caregivers) or developmentally “appropriate” (reflecting culturally sanctioned expectations). Precocious development was expected in situations where the family faces adversity and requires help from its children to cope. Examples included inverting hierarchies and having children assume responsibility for instrumental tasks like domestic chores and childcare. Flattened hierarchies included children in these same tasks but positioned them in a more peer-like relationship with a parent without the youth assuming full responsibility for any other family member. Developmentally appropriate contributions were negotiated as culturally meaningful. A youth might work as part of a family business, or be responsible for the care of a younger sibling temporarily while parents are occupied. They might be expected to navigate between home, school, and activities in their community themselves, or share money they earn with family members in order to ensure everyone’s financial security. Depending on the context, these contributions were distinguished as either culturally normative or exceptional.

Conclusion

If the concept of resilience has struggled to gain credibility, it may be that it has tended simply to replicate studies of individually-focused factors that contribute to growth under stress (Kaplan, 1999). Resilience, however, is more than just a proxy for attachment, self-efficacy, self-esteem,

neuroplasticity, positive peer relationships, or any of a number of other protective factors that are centered on an individual’s traits or behavior. It is the complex interactive processes embedded in social and physical ecologies that contain levels of risk that exceed the norm (Wyman, 2003). These compensatory, promotive and protective processes contribute most to successful coping when individuals, families and communities face significant exposure to adversity. A carefully designed program of research should focus on individuals and fully explore the ecologies that shape the opportunities they experience for positive development.

The study of resilience is necessarily contextual because it always involves the presence of risk. Unlike the study of strengths or assets which are promotive regardless of the presence or absence of stress, processes associated with resilience are dependent upon opportunity structures and meaning systems for their influence on how people navigate and negotiate for resources associated with well-being. As the chapters in this volume show, to understand resilience we must explore the context in which the individual experiences adversity, making resilience first a quality of the broader social and physical ecology, and second a quality of the individual. To invert this order is to misattribute the cause of successful coping to individual traits like motivation or self-esteem which can account for only a small portion of the difference within a population.

A comprehensive and ecological study of resilience helps to explain why, for example, studies of neglected children’s psychosocial development have shown that early deprivation thwarts development, but that certain strengths have a disproportionately large impact on future growth depending on the nature of the child’s early experience and wider context (Beckett et al., 2006). The greater the risk exposure, the more beneficial a secure attachment (Sroufe et al., 2005), school engagement (Dotterer, McHale, & Crouter, 2009), or intervention (DuMont, Widom, & Czaja, 2007) becomes later in life. This is the significance of the concept of resilience. It theorizes factors and processes as

contextually dependent, interacting with social and physical ecologies to create unique outcomes. This focus on process also opens the door to a far less teleological interpretation of lives lived well. No single factor can be assumed to predict in every instance a positive outcome when we account for differences in opportunities and meaning. For example, while there is generally consensus that the parentification of children places them at risk, and that demands for children to provide emotional and instrumental support to their caregivers that invert family hierarchies may disadvantage children, there is contrary evidence that shows that in resource poor environments parentification may in fact be protective (Hooper, Marotta, & Lanthier, 2008; Jurkovic, Morrell, & Casey, 2001; Maratta & Lanthier, 2008). It can provide children with few opportunities to sustain a sense of positive self-worth a means to experience themselves as competent. This is especially true when the child's community or extended family relationships (and the child's parent) acknowledge the parentified child's role as important to the welfare of others. Not only does this finding suggest complexity when we seek to understand protective processes, individual behavior and functional outcomes, it also supports a view of resilience as including heterogeneous processes that can be atypical of what we assume will be the normative developmental pathways employed by children, youth and adults (Ungar 2010a, 2010b, 2011b). Furthermore, it lends support to the argument in this chapter that opportunities and meaning are both aspects of resilience that depend for their influence on the capacity of individuals under stress to navigate to the resources they need, and negotiate with others for what they define as meaningful and supportive.

A social ecological interpretation of resilience points to the need to encourage exploration of the transactional effects of individual traits and chaotic, non-causal environments. This will challenge us to deconstruct individual discourse that remains dominant in the work of those seeking to understand both psychopathology and resilience. For example, Rutter (2008) asks us to consider "What are the causal mechanisms involved in

individual differences in responses to stress and adversity?" (p. 18). The question is a good one. To answer it, we will also need to ask whether changing an individual's ecology can increase the likelihood that resilience will result regardless of individual traits. It is like turning a pair of binoculars around and looking at the world differently. It is this inversion of our thinking that is transforming the study of resilience from attention to the capacities of individuals to a more complex understanding of the capacity of social and physical ecologies to potentiate the protective processes that contribute to what we define as functional outcomes associated with resilience in contexts of adversity.

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