

Title Page**Resilience and Mental Health: How Multisystemic Processes Contribute to Positive Outcomes**

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Summary

We know more about the factors that predict disorder than the factors and processes that promote positive development among individuals exposed to atypically high levels of stress or adversity. In this brief review of the science of resilience, we show that the concept is best understood as the process of multiple biological, psychological, social and ecological systems interacting in ways that help individuals to regain, sustain or improve their mental wellbeing when challenged by one or more risk factors. Studies in fields as diverse as genetics, psychology, political science, architecture and human ecology are demonstrating that resilience depends just as much on the culturally relevant resources available to stressed individuals in their social, built and natural environments as it does individual thoughts, feelings and behaviours. With growing interest in resilience among mental health care providers, there is a need to recognize the complex interactions across systems that predict which individuals will do well and to use this insight to advance mental health interventions.

Introduction

Mental health scholars with first-hand experience of World War II's profound challenges to human health and wellbeing pioneered systematic interest in the human capacity to adapt competently to adverse life circumstances or events.¹ This interest in human resilience has endured, as has interest in the global challenges to human health and wellbeing that has made resilience an even more relevant concept today.² Along with this need for human resilience has come calls for complex, social-ecological explanations of positive human development in contexts of atypically high levels of stress exposure such as catastrophic climate events and forced migration.³⁻⁵ Rather than being narrowly focused on what an individual contributes to the process of resilience, social-ecological explanations define resilience as a process that is **co-facilitated by individuals and their physical and social ecologies**⁴. Further, **social-ecological accounts are sensitive to how contextual realities (e.g., woman-headed households) and/or cultural norms (e.g., hierarchical and extended family structures) nuance resilience processes in diverse ways**³⁻⁴. This focus on the complexities of social-ecological resilience introduces new questions to research and clinical practice. Specifically, "Which promotive and protective factors or processes are best for which people in which contexts at what level of risk exposure and for which outcomes?"^{6.p(2)}

For mental health practitioners, the outcomes of most concern are invariably mental health (e.g., decreased symptoms of depression) or psychological wellbeing (e.g., self-efficacy). Indeed, the need for advanced understandings of what protects people against mental illness is pronounced in a world where at least one in five adults reports a common mental health disorder (i.e., a mood, anxiety or substance-use disorder)⁷, and where a significant number of children are similarly affected.⁸ Unfortunately, the promotive and protective factors and processes (PPFPs) typically associated with positive mental health outcomes are too often limited to adaptive psychological systems, such as self-regulation or cognitive coping strategies, even though the science of resilience demonstrates that regulatory capacities and changes to cognitions are unsustainable unless other co-occurring social and physical systems such as the family, one's housing, and natural environment are robust enough to support new regimes of adaptive behavior.^{9,10} While individual cognitions and attributions filter experience of the external world

and exert a direct impact on mental health outcomes,¹¹ studies of resilience show that in contexts where there is a high degree of exposure to adversity (a precondition for a discussion of resilience) *resourced* individuals show more resilience than *rugged* individuals.¹²

The early literature, though ground-breaking, offered relatively narrow explanations of human resilience that underscored naïve notions of individual invulnerability.^{13,14} While even the first studies of resilience recognized that social-ecological resources, such as loving families, contributed to an individual's resilience, researchers tended to focus most of their attention on "internal resiliency factors" such as "genetic and biological invulnerability factors,"^{13,p(185-95)} including ego resiliency.¹⁴ Mental health scholars are now unequivocal that systemic influences matter at least as much to positive outcomes. To this end, Masten and Cicchetti¹ have proposed that "the resilience of an individual child that is manifested and observable at the level of behavior depends on the operation and interaction of many other systems, both within the child (immune system, stress response system, etc.), in relationships or family resilience, or in the larger sociocultural and ecological systems in which that child's life and development are embedded".^{p(275-6)} Resilience in adulthood and old age is equally dependent on these multiple systems.^{15,16} **Put differently, systemic influences matter for resilience across the life course.**

Our aim in this paper is to advance mental health practitioner understanding of the multiple, interacting systems that facilitate the mental health of individuals challenged by atypical stress. Although it is true that chronic exposure to low levels of stress could negatively impact mental health, we are concerned with contexts of significant stress. Positive responses to low levels of stress (albeit chronic) are typically thought to be a characteristic of coping, and not resilience.¹⁷ To this end, we first show that the concept of resilience is best understood as a process in which PPFPS found within relational, sociocultural and ecological systems work together to support individuals to regain, sustain or improve their mental wellbeing in contexts of adversity. Next, we caution that contextual and cultural factors can influence these PPFPS in many ways. Finally, we draw on this complex understanding to distil pointers for resilience-enabling mental health practices and future research agendas.

Multiple Interacting Systems Account for Human Resilience

Human resilience depends on a range of biological, psychological, social, and ecological systems interacting. More recent definitions of resilience reinforce this (see Panel).

[Insert Panel here: Systemic/process definitions of human resilience and related terms]

To illustrate these complex interactions, Figure One graphically portrays the way a single system can be imagined as different levels of the environment (similar to the equally-weighted concentric circles proposed by Bronfenbrenner's¹⁸ ecological theory of human development), or as a combination of co-occurring and co-dependent elements at different systemic levels. In the case of resilience, these elements represent the many different PFP associated with positive development and functioning under stress.

[Insert Figure One here]

In support of this multisystemic perspective, a systematic review of the moderating and mediating resilience factors associated with children's positive mental health outcomes despite exposure to child abuse found a range of individual and ecological factors that were all important.¹⁹ At the individual level there is evidence that cognitive reappraisal, high rumination, high distress tolerance, low suppression of emotion, low expression of aggression, and a secure attachment can be resilience factors for an abused child. At more social levels, extended family support, family cohesion, parental involvement, positive parenting practices and household income may affect resilience, too. At the level of a child's community, high social support will also change psychosocial and behavioral outcomes. It is important to note, however, that studies like this tend to show that a single resilience factor like father communication or support from one's mother do not contribute to resilience on their own but are instead related to the totality of the family experience, creating an environment of social cohesion and positive family climate which are associated with resilience.

The same complexity emerges from systematic reviews of resilience at specific systemic levels. For example, psychological resilience has been correlated with genetic influences. In one of the few systematic reviews of genetic variants that contribute to the biological capacity for psychological resilience, Niitsu and colleagues²⁰ found six genes mentioned in ten studies as potentially contributing to resilience, among the best known being the long allele genotype of the serotonin-transporter-linked polymorphic region (5-HTTLPR). A better understanding of genetic influences on resilience is, however, complicated by many confounding factors, including demographic characteristics (including risk exposure), epistasis or epigenetics²⁰. While these studies are a beginning, it is unlikely that a human experience as complex as resilience will ever be predicted by a single gene.

In short, it is clear that resilience is more likely to be accounted for by multiple PFFPs across multiple systems even though few studies are comprehensive enough to capture the interactions between individual biological and psychological processes, and the social and ecological conditions that moderate or mediate stress.¹⁹ Even in structurally disadvantaged communities, resilience-enablers are just as likely to be external as internal.²¹ Unfortunately, resilience studies focused on mental health tend to neglect external resilience-enablers, particularly those at the level of the community.^{5,22} When resilience studies are attentive to community-level PFFP, they offer cogent reminders that the built, natural, and/or service environment matters for human resilience. For example, a study with a sample of 628 seniors from 32 neighborhoods in Beijing, found that the quality of the neighborhood, including per capita public space, density of seniors in that space, and the number of seniors services available, mediated by sense of community, were all significantly related to psychological wellbeing.¹⁶ Interestingly, individual resilience only strengthened the associations between neighborhood quality and positive psychological outcomes (i.e., at lower levels of personal resilience, the positive association between neighborhood characteristics and psychological wellbeing was still present, albeit somewhat reduced). Indeed, even preserving natural spaces in an urban environment can have an impact on individual and collective psychological resilience to stress, lessening our anxiety by decreasing urban temperatures and providing a calming space for reflection and physical activity.²³ Built infrastructure, too, can play a similar role with studies of the capacity of seniors to survive heat waves showing that everything from diversification of the power grid (more local generation of electricity to avoid power outages) and communal cooling facilities (opening neighborhood

schools during a heat wave) can influence how well the most vulnerable elderly do both physically and mentally during a crisis.²⁴

When resilience studies do consider external resilience-enablers, they mostly fail to account for more than proximal protective factors like the mother's mental health or her engagement in full-time employment, leaving us to speculate which factors beyond the family are most likely to improve a child's functioning.^{25,26} When distal factors are studied, mental health outcomes are known to be influenced by multiple levels of the social ecology, from teaching parenting practices that reduce harsh discipline to the promotion of positive interactions with teachers and neighbors and collectivist cultural practices like rituals that offer a buffer against trauma.²⁷

Addressing this problem of inattention to the multiple systems – both proximal and distal – that inform human resilience, researchers like Betancourt²² who studied war-affected children in Sierra Leone, and Wu and her colleagues²⁸ who studied migrant youth in China, along with many others, have called for more attention to children's outcomes as a function of the complex weave of family reunification practices, community stigma, social policies and the availability of institutional resources such as education and training opportunities. Together, these resources predict a child's likelihood of experiencing a successful demobilization or migration and minimizing the potential trauma from their exposure to violence or social marginalization.⁵

Dynamics of Human Resilience

Studies of resilience underscore the view that psychological resilience cannot be solely conceptualized as an individually-focused construct.²⁹ Across the lifespan, multiple PPFs at different systemic levels protect people against the diverse forces that threaten their mental health and psychological wellbeing³⁰⁻³². For instance, personal assets, peer and family supports, and the quality of the school environment all showed significant protective effects on the levels of depression reported by migrant Chinese children.³⁰

Given this complexity, there have been many attempts to organize PPFs. Among the best known is Masten's "shortlist"^{33,34} and the list of resources suggested by Ungar and his colleagues³⁵ (see Table 1 for summary). Regardless of which list is used as the basis for research or intervention, any single PFP can be the catalyst for a cascade of changes to the other PFP on the list. For example, in their work on building resilience to violent extremism among immigrant youth, Grossman, Peucker, Smith, and Dellal³⁶ identified complex patterns related to young people's co-construction of powerful identities that respect their diversity, feelings of social cohesion within their own ethnoracial group and with cultural outsiders, the meeting of basic needs for safety and trust in authorities, and personal and political efficacy. Examples like this show that PPFs are resilience-enabling when they express sensitivity to contextual and cultural dynamics. Thus, it comes as no surprise that South African studies of youth resilience to chronic structural disadvantage and associated mental health risks have shown that both young men and women are more likely to report resilience through connections to women rather than men.^{37,38} This tendency is associated with contextual dynamics (i.e., the high number of woman-headed households in sub-Saharan Africa;³⁹) as well as cultural ones (i.e., African women are traditionally tasked with caring for the younger generation⁴⁰). Similarly, resilience studies have shown that a community's efforts after political violence to promote cultural narratives of

strength, female leadership and cultural rituals will increase community resilience as a whole.⁴¹ The celebration of cultural narratives as a factor in resilience is particularly strong in research with Indigenous and ethnic minority populations.^{42–45}

[Insert Table One here]

Likewise, other research has emphasized different combinations of ecological factors that predict adjustment in contexts of adversity such as housing, education, employment, community safety, engagement in community activities, and a family’s financial security.^{46–48} Importantly, these combinations are likely to be conceptualized differently by youth and adults,⁴⁹ with different resilience-enablers being prioritized as participants mature.²¹

Intervening to Enable Psychological Resilience

As shown, a description of psychological resilience must include details of an individual’s risk exposure, including the quality of adverse experiences, their severity, chronicity, the systemic level they occur at, the individual’s attribution of causality and the cultural relevance of the challenges faced (see Figure Two).⁵⁰ PFFPs can be distinguished as either internal or external, with both dependent upon social considerations which place more or less value on each aspect of resilience in different contexts. Finally, resilience is not the goal; it is the means to achieve functional outcomes like sustained mental health.

[Insert Figure Two here]

Figure Two provides a guide for mental health practitioners to advance their clients’ resilience to experiences or circumstances that heighten the chances of mental illness. As a first step, clinicians should routinely assess risk exposure and the availability of PFFPs.⁵¹ Given the multisystemic nature of resilience and time constraints, however, useful measurement would likely be easiest to achieve by using validated, brief scales that are not limited to measurement of individual PFFPs but capture instead individual, social and ecological factors at one time (e.g.,^{52,53}). While a structured and standardized clinical interview protocol that includes resilience is likely to advance clinicians’ capacity to assess for risk exposure and contextually and culturally meaningful PFFPs, once informed, those intervening to build resilience can draw on **relevant interventions from** the wide range of evidence-informed, manualized resilience-enabling interventions that can be used one-on-one or with groups (see⁵⁴). Many of these resilience interventions are being adapted for virtual therapy or teletherapy.

Regardless of the intervention path, clinicians concerned with resilience should consider contextual, cultural, life course and other dynamics that are likely to influence which PFFPs matter more, or less; the form interventions should take; and how to advance multiple individual and systemic capacities at the same time. Although further empirical work is required to confirm its usefulness, one such approach to enhancing resilience is the multidimensional Resilience Portfolio Model developed by Grych and colleagues.⁵⁵ Piloting with 2,565 adolescents and adults from a rural, disadvantaged community in southern Appalachia in the United States showed the value of enabling “poly-strengths” – a compendium of diverse and dense supports, including regulatory strengths, meaning-making strengths that reflect relevant faith and cultural processes, social support from immediate family, peers and adults, and community supports – for mental

health and psychological wellbeing.⁵⁶ In many ways these poly-strengths reflect Masten's³³ contention that resilience is scaffolded by "ordinary" or everyday resources at the level of the individual and beyond. In contrast, interventions that try and change just one system, like a program to improve a child's sense of self-esteem at school which focuses only on changing a child's cognitions, tend to show limited long-term impact at follow-up.⁵⁷ For this reason, interventions like social prescribing⁵⁸ are finding a foothold among mental health and medical services providers concerned with improving the resilience of patients experiencing complex sources of individual and social stress. By facilitating change in a patient's social environment, better than expected outcomes are experienced when compared with interventions focused exclusively on psychopharmacological or cognitive treatments. More multi-dimensional and multi-level interventions also reduce concerns that a resilience focus serves neoliberal agendas by blaming those who fail to thrive for their lack of success.^{59,60} Interventions that enable or sustain the ecological, social, and structural determinants of resilience reduce the social injustices that are frequently associated with mental illness.⁶¹

[Insert Panel here: Search strategy and selection criteria]

Implications for Research

Despite the accumulating evidence that multiple systems play a role in individual resilience, there remain epistemological problems with assessing resilience across systems, especially when we add cultural and contextual (horizontal) variability to within person and within community (vertical) differences in the factors that predict better coping under stress. This may account for the persistent bias when studying resilience towards a narrow set of variables that increase sample homogeneity and control for risk exposure. For example, Johnson and colleagues⁶² conducted a systematic review of 38 papers drawing on data from 46 studies reporting on the factors that predict resilience to failure. The papers chosen were exclusively those that included data from experimental designs which reported on discrete failure experiences which manipulated participants emotionally through unsolvable tasks. Oddly, the review purposefully excluded studies of people's reactions to genuine non-experiment derived experiences of social failure or rejection, judging such social interactions too complex to measure. Furthermore, differences in levels of risk exposure were never accounted for. In highly artificial laboratory settings, three individual factors were found to enhance resilience the most: higher emotional intelligence, lower trait reappraisal, and lower socially-prescribed perfectionism. While the predictive power of each characteristic increased as risk of failure was experimentally induced, the controlled environments in which the studies took place are not optimally helpful to understanding people in real-life contexts where these traits likely interact with social processes and exposure to multiple risk factors at different systemic levels.

A similar challenge can be found in studies of mindfulness-based stress reduction (MBSR) programs intended to improve mental health resilience. Goyal and colleagues⁶³ evaluated 47 randomized clinical trials to determine the protective value of MBSR programs. Notwithstanding some methodological limitations (e.g., most evaluated trials were not registered and/or did not measure participants' meditation practices), the authors concluded that mindfulness meditation programs had only small to moderate protective effects for psychological stress. Similarly, in a systematic review and meta-analysis of 25 randomized trials of resilience training programs with

adults (using varied therapeutic approaches, including cognitive ones), Leppin and colleagues⁶⁴ found a small to moderate positive effect on resilience for programs with manualized protocols. In general, however, population samples could be considered a limitation (e.g., they were small and pre-selected for homogeneity, like cancer survivors who were peer mentors to those who had been newly diagnosed). Even more troubling, while samples were sometimes chosen for their exposure to risk, few studies analyzed outcomes by the frequency, chronicity, or cumulative effect of risk factors over time. As Joyce and her colleagues⁶⁵ note in their meta-analysis of resilience training programs that used cognitive behavioral therapy (CBT) or MBSR techniques, or a combination of both, “None of the included studies investigated the impact of adverse situations following intervention”.^{p(1)} And yet, where there has been a closer read of the research in a field like psychoanalysis, resilience has been shown to be a process that is influenced by the social context in which it is measured.⁶⁶

Given these shortcomings in resilience research, greater attention is needed to how factors such as gender, developmental stage, race and systemic disadvantage intersect. Heightened awareness of how resilience interventions can meaningfully respond to such intersectionality has the potential to enable mental health practitioners to better support positive mental health outcomes for individuals from varying social locations. With this expanded focus, research on resilience will be better able to shift clinical work from building rugged individualism (personal recovery and adaptation) to interventions that create resourced individuals with the external supports required to manage adversity well.¹²

Unfortunately, much of the work done to demonstrate the efficacy of interventions to bolster psychological resilience is weak by design.⁵⁴ A great many studies mistakenly (1) include resilience as the outcome variable instead of as the moderator between risk and mental health, (2) show an over-reliance on change in mental health outcomes without controlling for differences in stressor load, (3) poorly match the aspects of resilience being measured and the measures that are chosen, and (4) fail to account for external drivers of resilience. A reductionistic approach that simplifies the study of resilience to the study of just genes, cognitions, family functioning or even a single ecological factor like neighborhood cohesion will not be enough to explain human resilience. As Infurna and Luthar¹⁵ remind us, resilience is never just one dimension of a person’s life.

[Insert Panel here: Future directions for research and intervention]

Conclusion

Resilience is not solely a quality inside individuals; it grows from access to and use of the resources needed to support mental health and wellbeing. Culture and context both affect what resilience looks like and the factors and processes that make individuals better able to manage situations where stress is atypically high. The science of resilience is teaching us that enabling mental health outcomes is ultimately about more than treating people who seek professional mental health care without attention to their context. Although this can be important, ‘treating’ people’s social and physical ecologies is an equally important pathway to resilience and sustainable psychological wellbeing. To this end mental health professionals will need to work in multidisciplinary teams that include professionals who can facilitate access to protective social

ecological supports while treating disorders. The more systems that resilience-enabling interventions influence at the same time, the more likely they are to build the psychological capacity individuals require to cope well with severe or chronic exposure to adversity now and into the future.

[Panel] Systemic/process definitions of human resilience and related terms

Resilience

“Resilience is a dynamic process that encompasses the attainment of positive adaptation within the context of exposure to significant adversity that typically exerts major assaults on biological and psychological development.”^{67,p(411)}

“Resilience can be broadly defined as the capacity of a dynamic system to adapt successfully to disturbances that threaten system function, viability, or development. The concept can be applied to systems of many kinds at many interacting levels, both living and nonliving, such as a microorganism, a child, a family, a security system, an economy, a forest, or the global climate.”^{33,p(6)}

“In the context of exposure to significant adversity, resilience is both the capacity of individuals to navigate their way to the psychological, social, cultural, and physical resources that sustain their wellbeing, and their capacity individually and collectively to negotiate for these resources to be provided and experienced in culturally meaningful ways.”^{68,p(225)}

“Resilience is the process of effectively negotiating, adapting to, or managing significant sources of stress or trauma. Assets and resources within the individual, their life and environment facilitate this capacity for adaptation and ‘bouncing back’ in the face of adversity. Across the life course, the experience of resilience will vary.”^{69,p(163)}

Related terms

Adversity/disturbance/risk: Event/s or circumstance/s that are associated with poorer behavior, psychological functioning, or development; the events can be historic or current, chronic or traumatic.

Atypical stress: Levels of stress exposure that go beyond routine frustrations (e.g., traffic jams) or expected stress (e.g., exam-related stress).

Successful adaptation/positive outcome: Accomplishment of expected developmental tasks (i.e., positive human development) or human functioning that is deemed appropriate or normative in a given context at a given point in time

[Panel] Search strategy and selection criteria

This brief review of resilience science is based on primary and synthesis studies. To identify relevant studies we searched PsychARTICLES, PsychINFO, Medline, and CINAHL for linked full-texts with specific search terms in the title or abstract. The search terms comprised: resil*, and mental health or wellbeing (or wellbeing or well being), and context* or cultur* or ecolog*. We applied no language or time restrictions. Given the number of studies that this search

yielded, we restricted our selection of papers to those that are well-cited, discourage mono-systemic explanations of resilience, or advance appreciation for the differential protective value of specific resources. We supplemented the search results with important resilience publications that we, or prominent resilience researchers, reference regularly.

[Panel] Future directions for research and intervention

Intervention:

- Focus more on promoting people's access to the resources that increase resilience rather than interventions to suppress disorder (but leave people without the resources they need to experience wellbeing).
- Tailor interventions that promote resilience to the cultural and contextual norms of different populations.
- Encourage policymakers to consider the factors that promote resilience in addition to those that prevent disorder.
- Encourage multidisciplinary teams to work together to promote resilience to ensure multiple systems are influenced at the same time.
- Learn from local strategies for resilience from low and middle-income countries, also where the evidence for their effectiveness has not been documented.
- Pay attention to gender differences in the factors that promote resilience and the impact of risk on developmental outcomes.

Research and knowledge mobilization:

- Promote a more systemic understanding of resilience to avoid over-emphasis on resilience as rugged individualism.
- Include multiple systems in studies of resilience to document the interacting processes across systems at different scales that influence positive developmental outcomes under stress.
- Operationalize culturally and contextually specific processes associated with resilience.
- Develop better measures of resilience that are sensitive to culture and context.
- Encourage new perspectives on resilience by promoting South-South and South-North exchange of models of resilience to avoid ethnocentric bias.
- Encourage research designs that explain the differential impact of protective processes on diverse populations at different levels of risk exposure.
- Study resilience as a multisystemic process rather than as a trait.

Contribution

MU conceived the idea with input from LT. LT did the literature search and initial review. MU and LT drafted and edited all versions of the manuscript.

Declaration of interests

MU is the lead applicant, and LT is co-applicant and country lead for a CIHR Team Grant Environments and Health (#IP2- 150708). MU is a consultant with Unilever for a corporate social responsibility initiative. The authors have no other conflicts of interest to declare.

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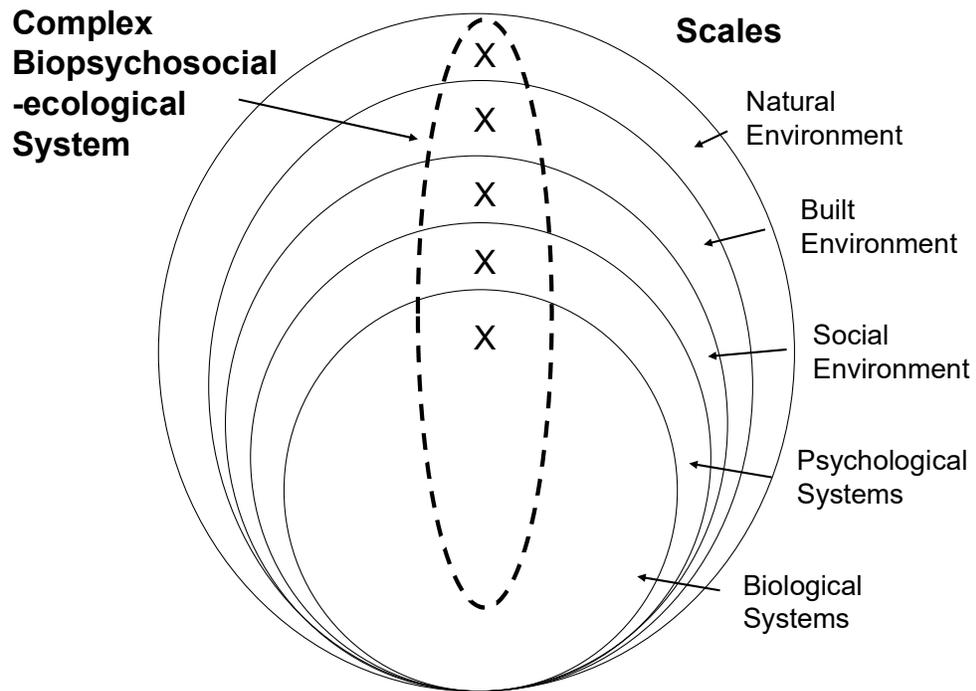


Figure 1: A systemic model of resilience

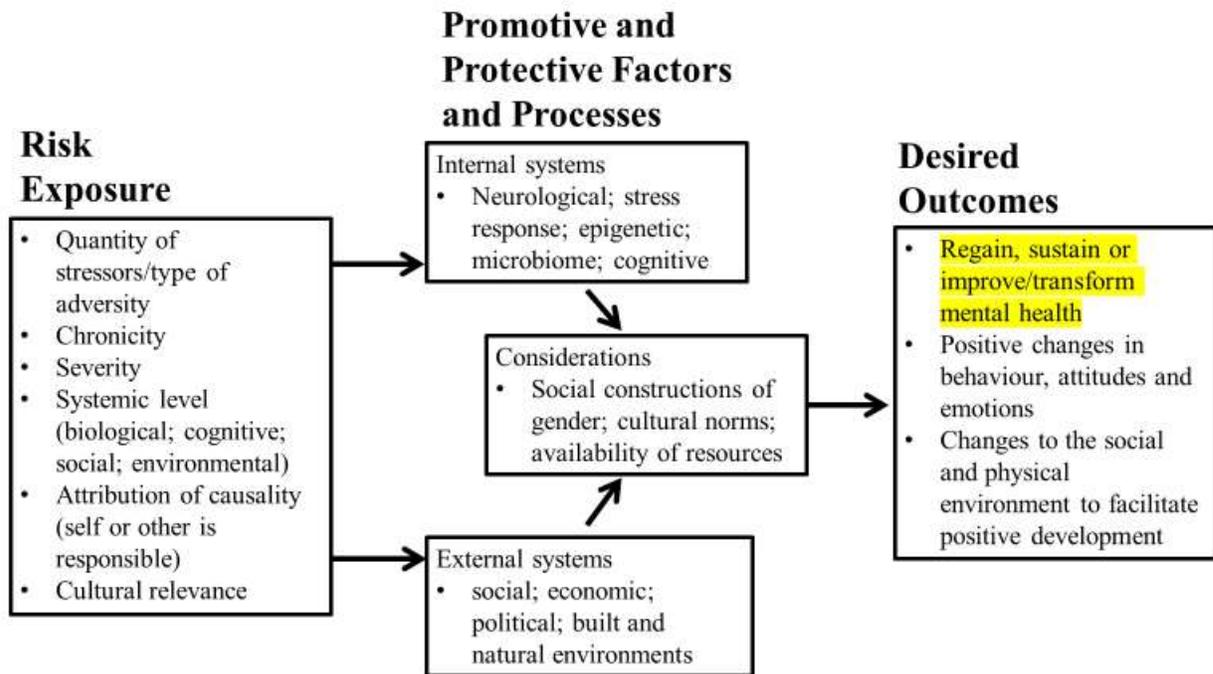


Figure 2: Multiple considerations when researching resilience and designing interventions

Masten's shortlist	Ungar et al.'s tensions	Examples of associated resources
Attachment	Relationships	Significant others, including parents, caregivers, relatives, romantic partners Social networks
Self-regulation	Experiences of control and efficacy	Central nervous/stress response system Family/community systems Culturally valued norms
Faith, hope, and other forms of meaning-making	Social justice	Justice systems Spiritual or cultural belief systems Cognitive appraisal
Agency and mastery	Access to basic resources	Mastery motivation and other rewards systems
Intelligence and problem solving	A powerful identity	Central nervous system Effective schools and education system
Collective efficacy	Sense of cohesion Cultural adherence	Community systems Cultural rituals

Table 1: Sample of useful frameworks for categorising PFFPs