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Critical Review

Addressing the Significance of Cultural Specificity in Perceptions of Risk in a Changing World: Some Implications of Ecological Systems Theory for Operationalising Risk in Quantitative Models Based on a Critical Review of Theory and Empirical Evidence

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Abstract: *This paper critically reviews the major theoretical treatments of risk and related quantitative empirical evidence. It is argued that the full implications of the ecological dialectic of context/agency have not informed operationalisations and measurements of risk in quantitative models in psychopathology and developmental psychology. In particular, variability in individual perceptions of risk due to cultural differences across ethnic minorities is not satisfactorily handled in efforts to track effects of distal or proximal risk on developmental outcomes in the life course. It is further argued that full recognition of the significance of the joint effect of time-varying characteristics of context and agency in ecological systems theory requires that most types of proximal and distal risk should be better seen as representing continua of risk intensity rather than discrete categories since such a methodology can do more justice to the culturally-induced variability in understandings and handling of risk among people.*

Contextualisation

Risk represents conditions of increased probabilities for adversarial developmental outcomes. In both theoretical treatments and applied research, risk has entered debates in mainstream sociology, psychology and economics. Risk research is a central focus of attention in epidemiology, developmental psychology and psychopathology. Across all these disciplines risk is viewed both as a concomitant of human organisation and development and as a central feature of social change. Socially-significant risk is associated both with macro-level societal changes in institutional structures, culture, politics and the economy as well as with micro-level individual developmental change trajectories over the life course. Since societal change provides the ecological context within which the individual develops across space and time, both processes of change are interdependent and affect each other reciprocally. This paper therefore argues that risk cannot be thought of as a fixed and objective entity but should be seen as a function of people's culturally-linked perceptions as these develop across time and space. It further argues that this realisation should inform methodologies of risk measurement.

Introduction

If ecological systems theory is to fully inform developmental research frameworks, such as the life-course paradigm (Elder, 1999), major system-theoretical implications have to be explicitly addressed in developmental research designs. Thus, an individual's proximal and distal risk perception, recognition and handling will also have to adhere to the central ecological principle as expressed by Bronfenbrenner (1992): Such risk perceptions and related behavioural outcomes will vary systematically as a joint function of that individual's characteristics and the characteristics of the surrounding context. But if that principle is adhered to, then risk should not be operationalised as representing discrete categories if its continuous nature is to be genuinely captured. Nor should individuals within these

categories, which are arbitrarily-defined by the researcher, be assumed to perceive of and react to risk, uniformly or rationally. In that respect, cultural specificity should be allowed to explain variability in risk perception, particularly across ethnic minorities who are typically over-represented in risk-prone contexts.

This paper firstly discusses major theoretical perspectives on risk in sociology and social anthropology and builds the case that risks should be seen as representing ranges of underlying continua. Then it contrasts these perspectives against treatments of risk in epidemiology, psychopathology and developmental psychology with particular attention on risk and resilience research. Methodological implications drawn from that review are then examined and suggestions for better and more theoretically-driven measurement of risk are then discussed.

Conceptions of Risk in Various Theoretical Frameworks

Significant epistemological fault lines segment treatments of risk none of which was at first particularly focused on explaining *ethnic* differentials in effects of risk exposure due to *cultural* specificity until rather recently (Rutter and Tienda, 2005; Tienda, 2005). Constructivist and culturalist treatments of risk emphasised risk as a concept *all* people perceive, assess and live with. People dealt with risk as a function of their risk perception, communication and definition. Risk perceptions are largely *cognitive* processes with risk being ontologically relative to actors' choices and subject to the distortions of time and space such perceptions were subjected to (Giddens, 1994). Risk is not a fixed negative structural feature but a product of technological change in post-modernity (Beck, 1992). Risk is both ontologically variable and known to the actor while risk attributions reduce people's *uncertainty* in a risk environment.

In developmental and epidemiological treatments, risk represents barriers to wellbeing (Kuh, Ben-Shlomo, Lynch, Hallqvist and Power, 2003). It becomes synonymous to a threat which refers both to the *probability* of occurrence and the *substance* of a hazard. Although risk cannot be an *explanation* for why difficulties occur (Croninger and Lee, 2001, p 552), in the life-course developmental paradigm it largely assumes a causal role. Risk exists regardless of how it is perceived, and independently of the actors' volition. Risk itself does not vary *ontologically* but the positions of individuals relative to risk may change and therefore their *vulnerability* to risk varies (Kuh *et al*, 2003, p 781). As such, distal risk associated with people's proximal environments influences a person's development. Actors may possess various degrees of risk *awareness* but some significant risks may still operate unbeknownst to the actors. Research therefore focuses on tracing the causal sequences in biological and psychological *chains of risk* on individual outcomes during the life course (Kuh *et al*, 2003, p 778).

Integrative frameworks (Short, 1984; Featherman and Lerner, 1985; Garcia Coll *et al*, 1996; Shanahan, 2000) have not been widely accepted. As a result, treatments of risk have remained segmented within disciplines and precluded development of an integrative metatheory. Operationalisations of risk in empirical research are therefore typically driven by entrenched theoretical conceptions and thus, the *modus operandi* of risk and its handling by individuals is framed in rather narrow terms.

Constructivist and Culturist Conceptions of Risk

Within critical theory in sociology, constructivist treatments of risk fall broadly under the concept of 'risk society', a term originally coined by Beck (1992) and expanded by Giddens (1994). In post-modernity, *risk* defined the probability that a *hazard*, ie, a set of circumstances which may cause harmful consequences will be actualised (Fox, 1999). But

such actuarial accounts of risk typically failed to appreciate the sociohistorical dimension in the definition of risk and the consequent variety in its conceptualisation (Fox, 1999), particularly among culturally diverse ethnic minorities in urban settings.

Beck (1992; 1994) argued that risks 'only exist in terms of the … *knowledge* about them. They can be changed, magnified, dramatised or minimised within knowledge, and to that extent they are particularly *open to social definition and construction'* (Beck, 1992, p 23; emphasis in original). Beck's (1992) conception is traceable to traditions in the sociology of knowledge whereby institutionalisations (including that of 'risk') are functions of *legitimised* knowledge and therefore socially constructed facts (Berger and Luckmann, 1967; see also Tierney, 1999).

Beck referred to a broad range of technological change-induced risks all of which however had socially-significant consequences. Since risk existed within knowledge of it, inequalities in the possession and control of knowledge assumed pivotal importance in a risk society. Further, such social construction of risk became also indicative of reflexivity: Giddens (1994) suggested that individuals in risk society acquired not only awareness of the social context but also a capacity to affect it reflexively, with risk assessment and management becoming critical in this process. Risk definitions are constantly being incorporated into the mainstream episteme and dominant culture. Because people lose confidence in scientific expertise and authority they increasingly rely on group-specific cultures to define and manage risks. *Risk management* occurs within the privatised context of one's life-course, largely as an effect of one's proximal processes. But, by managing risks in their own contexts individuals 'self-create their own biographies', ie, they continuously plan and re-plan the course of their own lives (Super and Harkness, 1992; Taylor-Gooby and Zinn, 2006, p 403). Based on their life-course feedback, people will construct new definitions of risk which will accompany societal change, but at each sociohistorical time risks will be socially constructed.

Douglas (1992) underscored the cultural-anthropological dimension of the social construction of risk, coming closer to recognising the significance of cultural specificity particularly in urban settings (Rogers and Vertovec, 1995). What is considered a risk and how serious that risk is assessed to be were argued to be functions of the group organisation and membership. Thus, a natural hazard would be culturally-assessed as representing 'risk' depending on the social context this assessment took place. Douglas did not deny the *objective* existence of socially-induced, life-threatening hazards but stressed that the perception of risk associated with these hazards was culturally-defined and depended on social context. But, while Beck was describing a macro-process of societal change, Douglas stressed the micro-level cultural dimension of risk assessment. The culturally-defined risk perception as theorised by Douglas describes the social construction of in-group and out-group categorisation found in social categorisation theory (SCT) (Tajfel and Turner, 1979 [2004]; Turner and Reynolds, 2004). As Carter (1995, p 142-143) argued, the range of practices connected with risk assessment had historically targeted specific groups by inserting a moral dimension to the assessment of what risk these out-groups represented as was the case with Black people in the US (Omi and Winant, 1986; Hooks, 1992) and the UK (Lawrence, 1982; Solomos, Findlay, Jones and Gilroy, 1982; Solomos and Back, 1995). Thus, phenomena like racism (Bauman, 1991; Solomos, 1993), discrimination (Kemshall, 1997; McLaren and Johnson, 2004) and ethnic cleansing (Tulloch, 2005) causing various amounts of undeniable adversity and risk for certain ethnic minority groups historically, can easily be accounted for as attributions of (socially-constructed) 'risk'.

Fox (1999, p 19) even argued that risk perceptions could even *fabricate* hazards. Thus, *perception* of hazards was argued to depend on judgements of some 'prior' knowledge of what kind of hazard seemed 'unlikely', 'serious', 'trivial' or seemingly 'absurd'. These judgements may depend on 'common-sense', 'experiential' or 'scientific' sources (Fox, 1999, p 20-21). Thus while high-school dropout, substance abuse or teenage pregnancy represent

real risks for certain groups, what needed to be explained was *why* in certain family environments dropping out of school was not necessarily seen as something negative or as a risk (Masten and Garmezy, 1985; Masten and Coatsworth, 1998; Elder, 1999; Masten, 1999). Or why in some other families, lack of parental involvement in young people's education was not considered a risk at all (Steinberg, Elmen and Mounts, 1989; Steinberg, Dornbusch and Brown, 1992). Similarly, *risk-taking* among certain groups of young women resulting in premarital births remained unexplained and is rather conveniently attributed to family or individual psychopathology.

The *effectiveness* of proximal processes may well be not only a function of the objectively-assessed amount and level of surrounding environmental risk but also a function of how this risk is perceived and negotiated within proximal processes. Insights from the sociological perspective on risk stressed therefore that people, even in the same family, will not *perceive* risks in similar ways or as having similar intrinsic severity, and that these risks are thus probably perceived as *ranges* rather than discrete categories by different members; that these risks are daily negotiated by the actors involved (parents, young people, peer-group) and thus vary with time; and that actors' risk *assessment* is a function of their proximal interactions that negotiate distal risk.

The main insight gained by the constructivist and culturalist approaches to risk is that risk perception is largely unique to each individual because it reflects a deeper and more pervasive individualisation of the citizens of risk society. Understanding risk, its assessment and management are underscored by cultural values and mark a growing disjunction between expert knowledge and lay understandings of risk. Thus, the process of understanding risks among socially and culturally-distinct people cannot be assumed to be uniform. Assessment of the severity of any risk therefore must be assumed to move along an underlying continuum rather than denoting a fixed discrete high or low level.

Cognitive-Learning Perspectives on Risk

In mainstream psychology, research concerns regarding risk reflect an individualistic approach to the cognitive basis of risk perception. These concerns centre on the observed variation in risk perception and the inconsistency between perceptions of risk and behaviour (Weyman and Kelly, 1999); mental models used in risk communication ie, how risk is understood among lay people (Morgan, Fischoff, Bostrom and Atman, 2002; Cox and Darby, 2003; see also Graham and Clavel, 2003; Simpson and Lee, 2003); and how affect and emotion can supplant people's rational judgement in making choices between judgements of risk and benefit to reduce uncertainty.

Positive affect associated with a particular behaviour, the so-called 'affect heuristic' (Alhakami and Slovic, 1994), was argued to be linked to perception of both benefit and risk associated with behaviour. Thus, even if a rational cognitive process led a person to quit smoking based on the assessment of high risk value of smoking (high threat), positive affect associated with cigarette smoking may override the decision to quit (Slovic, Finucane, Peters and MacGregor, 2004). This 'risk override' is not rational. Further, the amount of perceived risk is not necessarily commensurate to perceived benefit and it is possible that a perceived small benefit can override a big risk, if affect and emotion perplex the process of risk assessment. The psychological cognitive-learning perspective has thus pointed to conditions that constituted particularly significant *distorted* risk cognitions (Taylor-Gooby and Zinn, 2006, p 399). But if risk cognitions can be distorted, interpretations of risk *severity* will vary in the population.

Perception of risk also involves an important nonlinear temporal dimension. Attribution of a particular behaviour as risk (negative value) or asset (positive value) heavily depended on

the most recent positive or negative affect. Thus, it was the last few minutes of the experience rather than the whole history of the experience that affected risk perception (Kahnemann, 2000). In this valuation process individuals were argued to draw on a starting point marking a range across which they rated an experience as positive (incurring benefits) or negative (incurring risks). The more recent the impressions of the experience in time the most likely they were to influence the assessment of the experience as 'risky' or not (Taylor-Gooby and Zinn, 2006, p 400).

While an individual's risk perception was a complex function of that individual's psychological, social, institutional and cultural position (Slovic, 2001), risk *acceptance* was basically determined by two factors: dread (how fearful that risk was) and familiarity (how habituated the individual was to that risk) (Rohrmann, 1999; Renn, 2005). In life-threatening situations, risk-dread could simply be overridden by risk-familiarity due to a person's habituation to high levels of risk. In less life-threatening risk situations such as living in low socioeconomic (SES) conditions, it may still be the case that individuals perceive risk as an inverse function of their adaptation to it.

Insights from the psychological perspective on risk perception suggested that risk perception is a complex process and not necessarily rational. Further, people rate behaviours in *ranges* of asset/risk continua. Therefore all situations carried both risk and asset and people do not take risks simply because their risk perceptions vary by social class (Murdock, Petts and Horlick-Jones, 2003). Risk valuations will vary as a function of individual's development, type and recency of affect; An individual's risk perception and his or her ability to cope in the presence of such risk are complexly related. Consequently, risk operationalised as 'high' or 'low' by the researcher will not be necessarily perceived as high or low by the respondent. Instead, a range of valuations for hypothesised risk should be allowed to *mediate* the effect of any objectively-assessed risk on time-dependent outcomes. Further, such mediation may vary with cultural specificity across ethnically diverse contexts. Cultural specificity in risk perception may explain ethnic disparities in health (Hertzman and Power, 2006) or variations in *induction periods* (time between exposure and initiation of disease) or *latency periods* (time between disease initiation and detection) (Kuh *et al*, 2003). Cultural specificity may in other words be a modifying factor affecting the association between exposure and disease and this hypothesis should be investigated (Kuh *et al*, 2003, p 780).

Risk in the Life-Course Developmental Paradigm

Risk in the life-course paradigm comprising the research strands of the developmental perspective and resilience, refers to the actuarial probability of risk resulting in maladjustment (Rutter, 1988; Masten, Morison, Pellegrini and Tellegen, 1990; Masten, 2001). Risk is epidemiologically defined as objectively *real* and concerns all possible prior causes responsible for the incidence of later adverse outcomes in the life course studied under the broad theoretical framework of the ecological systems theory (Bronfenbrenner, 1979; 1992; Bronfenbrenner and Ceci, 1994). One of the central drivers of risk research therefore is the assumption that prior negative events or circumstances in the life course pose risks for individual's later negative outcomes (Rutter, 1990; Elder, 1994; Masten, 1994). Therefore risk is not pre-defined, but it exists only if there is a good probability that the adversity-driven hazards to health and behavioral outcomes will actually occur (Power, Manor and Fox, 1991; Hertzman, 1995; Maugham, 2002). Thus, risk and its severity are always defined in relation to the outcome. The risk factor must be a potential cause or precursor of the specified outcome in question and represent a high risk within the sample under consideration (Schoon, 2006, p 10). Prediction of adversarial outcomes therefore is of central concern in this perspective. Such adversarial outcomes are studied within a broad framework of general stages of human development (Erikson, 1959; Gottfredson, 1981).

At least in its early treatments (Garmezy, 1983) this epidemiological variant of risk research maintained a selective research focus on at-risk populations but not specifically on ethnic minorities. Resilience research examined individuals who showed satisfactory adjustment levels and positive outcomes in the face of extreme adversity (Garmezy and Rutter, 1983; Rutter, 1990; Masten, 1994; Luthar, Cicchetti and Becker, 2000) thus focusing on even smaller subsamples of the population but with crucial implications for the population at large. Resilience research in particular, with its shift from explaining failure to explaining success despite the high incidence of failure-causing factors (Werner, 1993; Schaffer, 1996; Masten, 2001; Ungar, 2005), was the closest analogy to preparing a vaccine: it sought to understand the processes that made people not only naturally resistant to the deleterious influences of adversity (Boyden and Mann, 2005) but empowered them so that they manifested *acceptable* levels of competence (Rutter, 1995; 1999; Masten and Coatsworth, 1998; Luthar, 1999) with adaptation and adjustment equal to those of people who were not exposed to such adversity (Schoon *et al*, 2002; Schoon, Sacker and Bartley, 2003; Schoon, 2006; 2008). Resilience research therefore was meant to drive policy interventions aimed at triggering positive chain reactions in people's lives (Masten 2001; Schoon, 2006, p 7). Yet, this very focus initially constrained the concept of risk research to isolating causal patterns linking early risk and later developmental outcomes common between groups rather than identifying unique causal patterns within-groups.

An impressive body of empirical evidence showed a consistent developmental link between early adjustment indices summarily called *developmental tasks,* and overall adaptation in later development (Sroufe, 1996; Masten and Coatsworth, 1998). More specifically, children's attachment to adults (Carlson and Sroufe, 1995), self regulation (Cicchetti and Tucker, 1994), social competence with peers (Masten, Morison and Pellegrini, 1985), competence in conforming to school norms (Masten *et al*, 1995) all proved valid predictors of later adult performance in the same areas. Thus, low early adjustment in these areas predicted adverse later developmental outcomes (Masten and Coatsworth, 1998). Further, problematic academic achievement has been linked to problems in self-regulation and conduct (Cairns, Cairns and Neckerman, 1989), lack of proper parenting (Dornbush, Ritter, Leiderman, Roberts and Fraleigh, 1987; McHale, Bartko, Crouter and Perry-Jenkins, 1990; Okagaki and Sternberg, 1993; Luthar and Becker, 2002), involvement and engagement (Reynolds and Wahlberg, 1991; Steinberg, Lamborn, Dornbusch and Darling, 1992; Ryan, Adams, Gullotta, Weissberg and Humpton, 1995; Steinberg, Brown and Dornbusch, 1996; Sorensen *et al*, 2003); peer group influences (Sameroff, Seifer, Baldwin and Baldwin, 1993; Steinberg *et al*, 1996; Luthar and Becker, 2002; Robertson and Symons, 2003) and tobacco, alcohol and substance use (Bachman and Schulenberg, 1993; Luthar and Becker, 2002) net of children's intelligence. Also, early socioeconomic deprivation has been repeatedly shown to be linked to children's both later adjustment (Flanagan and Eccles, 1993; Bynner, 2001; Feinstein, 2003; Buchman, 2009) and lower achievement outcomes and academic ability development (Masten, 2001; Schoon, McCulloch, Joshi, Wiggins and Bynner, 2001; Schoon *et al,* 2002; Robertson and Symons, 2003; Schoon, 2006). Yet other research failed to confirm significant associations between composite risk scores and socioeconomic status (SES) (Sameroff *et al*, 1993). McCulloch, Wiggins, Joshi and Sachdev (2000) also showed that economic deprivation or SES level per se was not necessarily related to internalising behavioural problems in young people and that family disruption (ie, disruption of proximal processes) was a far more significant risk factor than economic deprivation.

The body of empirical evidence notwithstanding, prediction of later adversarial outcomes, given types and amount of early risk, was argued to be still increasingly uncertain and calls for a paradigmatic shift from the static determinism of earlier models (Elder, 1994; Masten and Coatsworth, 1998) were the result of two central recognitions. Firstly, it was recognised that human interaction in an individual's life-course was a process infinitely more complex than previously thought because life-courses were iterative-interactive bio-social processes (Featherman and Lerner, 1985). Therefore, isolating causal patterns between early risk and

later developmental outcomes in the life course of a human being required much greater attention and considerable more effort (Rutter, 1996; 2005).

Secondly the organismic analogy (Rutter, 1987; 1995; 1999) had to be abandoned, ironically because its central principle was given full recognition: all people are protected by a biologically similar immune system to viral infections. Inductively therefore, resilience came to be seen as a universal feature potentially found on *all* rather than some people. Resilience was not a particular personality trait (referred to as 'resiliency' by some, see Block, 1980 cited in Luthar *et al*, 2000) that made certain individuals 'invulnerable' to risk because they possessed a rare, unequally-distributed, internal trait. Nor could later policy interventions foster this trait to 'inoculate' all at-risk populations (Nettles and Pleck, 1996). Resilience mechanisms were shown to be naturally-occurring as long as adversity did not compromise brain development, basic psychological and emotional attachment to an adult (not necessarily parental) and attention, emotion and behavior self-management (Masten and Coatsworth, 1998, p 215).

Unlike the immune system which is similar in all people, research showed that there could hardly be something like a 'universal' resilience trait, but rather, that resilience manifested itself only in risk-specific situations. Therefore, resilience was context-specific and individuals could show resilience in one context but not in another (Ungar, 2004a). Attention therefore shifted to proximal processes that provided the basic and vital feedback to the growing organism, in the presence *or* absence of adversity, the understanding being that protective factors from adversity-related risk must rather be sought in the proximal processes per se of *all* people, rather than in specific individuals or particular at-risk populations (Masten and Coatsworth, 1998; Masten, 2001). But proximal processes themselves developed with time and earlier environmental influences determined later adaptation (Sroufe, Egeland and Kreutzer, 1990).

The above brought the life-course paradigm closer to the person-process-context-time (PPCT) ecological model (Bronfenbrenner, 1992) but also revealed its remaining gaps. Risk perception was still largely neglected while the above research findings begged the question of how risk was *managed* and *perceived* within the proximal processes, the quality of which was the key to their potential for resilience (Bronferbrenner, 1995, p 634).

Remaining Problems in the Risk and Resilience Research Strand

Risk and resilience research is still plagued by fixed assumptions about people's handling of risk, notably by neglecting variability in people's *risk* perceptions and risk management. While perceptions of *risk* logically precede people's ideas of *resilience* and risk *management*, the latter two concepts involve interpretations of performance outcomes that in turn effect perception of risk. Thus, people's ways of handling risk also reflect people's ways of perceiving risk and vice versa. This simple statement contains the central axiom of ecological systems theory that developmental outcomes are joint functions of time-dependent interactive effects of characteristics of people and of their proximal environment (Bronfenbrenner, 1992). Accepting this axiom requires that we recognise that the concepts of resilience to risk and risk management are linked to critically important *variability* in risk perceptions and that all are ultimately linked to time-varying proximal processes. But while this ecological axiom has been in principle recognised by researchers, it has not led to true process-person-context-time research designs (Bronfenbrenner, 2005).

In fact criticism and interrogation of the treatment of risk in the risk and resilience perspective is premised precisely on this apparent inconsistency. Thus, the ecological principles of reciprocal interaction of context and agency (Bronfenbrenner, 1977; 1979; 2005), bounded agency (Elder, 1974; Evans, 2002; Heintz, 2002) and linked lives (Elder, 1998) preclude any

universal classification of certain experiences as 'risky' or 'dangerous' (Boyden and Mann, 2005, p 4). Thus, treatments of 'risk', 'adversity', 'competence', 'resilience' and 'adaptation' in risk and resilience research were argued to make sense only in Western cultures and to become hopelessly partial, naïve and shortsighted in others. This is because people construct culture as much as cultures influence people (Rogoff, 2003, p 51; see also Garcia and Cueller, 2006). Hence, *any* exclusion of culture from the equation of risk effects on people was bound to lead to shortsighted and biased modeling of such influences (Ungar, 2004a). As Boyden and Mann (2005, p 10) put it, 'there is a case to be made that adversity is as much a matter of *perception* as of situational fact' (emphasis added). Ungar (2004a, p. 342) suggested that 'resilience is the outcome from negotiations between individuals and their environment for the resources to define themselves as healthy amidst conditions collectively viewed as adverse'. 'Normality' in outcomes like health was argued to be also the product of negotiation between agency and context and that therefore the relationship of risk and any 'protective factors' was context-specific. Evidence confirmed that no consistent pattern of variation existed regarding resilience either within (Connell, Spencer and Aber, 1994; Catterall, 1998; Buchman, 2009) or between (Gottfredson, McNeill and Gottfredson, 1991; Sameroff *et al*, 1993; Kaplan, 1999; Mandara, 2006) groups. Therefore no universal patterns could be securely established (Alexander, Entwisle and Kabbani, 2001; Yates, Egeland and Sroufe, 2003; Toldson, Harrison, Perine, Carreiro and Caldwell, 2006; Gibson and Hidalgo, 2009).

Scholars abandoned an individual-based concept of resilience and directed their efforts to family proximal processes as depositories of potentially protective factors. But recognition of culture as a powerful mediator of people's understandings of distal risk entails *ipso facto* cultural variability in people's definitions of risk and resilience and cultural specificity in risk perceptions. This is also the theoretical foundation of the life-course paradigm. Such variability is natural and a function of the social, cultural, economic and political environment in which people live (Boyden and Mann, 2005, p 5). Ironically, the need to attend to people's different 'cognitive styles' in explaining development of resilience has been acknowledged in the life-course paradigm (Rutter, 1999, p 134). But Rutter's suggestion concerned tracing genetic links to cognitive processes rather than allowing culture into the explanation of individual cognitive differences. By and large the link between culture and risk and thus, between culture and resilience, has not taken root in current modelling in the life course paradigm.

The need to address the cultural dimension in defining resilience has been recognised (Elder, 1998; Masten and Coatsworth, 1998; Masten 2001; Ungar, 2004a; 2000b). But the response to that recognition has been at best slow or impractical. For example, Luthar *et al* (2000, p 551) took issue with concerns about different perceptions of risk and subjective ratings. Their argument was that since none of these subjective reports necessarily captured 'the truth' about the objective level of risk any more than did others, we should contrast all pertinent reports against the indisputable adversive outcome as a function of risk and try to explain why certain raters differed. In other words, Luthar *et al* (2000) suggested that different raters' reports of risk should be contrasted against an arbitrary benchmark (the researcher's) regarding the level of risk. But the mere *variety* of perceptions about risk should have demonstrated to these researchers that risk itself was a matter of *context-relative* perceptions and belied negotiations among actors. Not accepting this possibility *ipso facto* rejects the principle of context-bounded agency, a major consequence of which is precisely this variability in perceptions of both risk and resilience.

Further, while the complexity of the life course was itself explicitly recognised in the key concepts of the life-course paradigm research has failed to explain *why* apparently similar types and levels of risk varied in *meaning* among different groups of people (Wu and Martinson, 1993) nor how *subjective understandings* of developmental stages (Shanahan, 2000, p 684) could interact with risk interpretations. In short, life course developmental

models, and in particular risk and resilience models, did *not* generally take advantage of the full implications of the ecological paradigm to which they typically ascribed.

Methodological Implications for the Measurement of Risk Factors

Continuous Bipolar Scales Rather Than Discrete Measures of Risk Factors

This review has indicated that operationalising risk factors as bipolar constructs carrying both a positive and a negative end is better theoretically grounded and methodologically safer. In discussing this issue, Masten (2001) suggested that although one could isolate 'pure' negative or positive factors, 'most risk factors actually indexed continuous bipolar dimensions' (Masten, 2001, p 228). Further, one could invert a risk gradient, such that it represented asset rather than risk *(ibid*, p 228). Masten's argument for the bipolarity of risk factors finds support in a much wider research base already discussed. For example, both assets and stressors were perceived as *ranges* rather than as discrete categories by at-risk people (Woodhead, 1998; Rutter, 1999). Risk was differentially perceived by people and this perception varied with time. Thus, a survey at time *t* may capture time-specific risk responses (snapshots) that could represent any point along an unknown prior distribution of perceived severity of risk or unobserved (latent) risk continua. Because such information is rarely available, assumptions about this unknown prior distribution (in this case, of perceptions of risk severity) as being continuous and random have to be made.

This review has also shown that culturally-induced risk perceptions reflected covarying ranges of 'cost' and 'benefit' with *every* single risk factor (Woodhead, 1998). Across culturally diverse contexts, each risk situation may differentially convey both dread and pleasure; it may be differentially regarded as both a benefit and a liability and a balance is invariably struck in every individual during risk management as a function of that individual's *perceptions* of risk. Outcomes linked to risk should therefore take this individual variability into serious consideration. It would be naïve to operationalise risk as a discrete category (ie, as a dummy variable coded as 0 or 1) as this would mean that there is such a thing as 'zero or no risk'. This assumption would run contrary to the insights gained from research experience across all fields of risk research. Besides, operationalising risk as an ordered-categorical variable was quite often preferred to 2-point (0,1) categorical operationalizations (Sameroff *et al*, 1993; Connell *et al*, 1994; McCulloch *et al*, 2000; Luthar and Becker, 2002; Schoon *et al*, 2002) which were seen as problematic (Wu and Martinson, 1993, p 214).

Even in cases of risk that are typically operationalised as dummies, ie, single-parenthood, unemployment, part-time work status, etc., the review has shown that such risks *alone* could hardly explain much variation in any outcome (Rutter, 1979; Sameroff *et al*, 1993; Masten, 2001). Further, it was hardly the state itself (ie, single parenthood) but its duration and sequences with other states in one's life course that mattered as risk factor (Ungar, 2004b). Stability in single parenthood could therefore denote *less* risk, while a long sequence of alternating states *more* risk. Sequence analysis (Billari, 2001) and optimal matching analysis (Martin and Wiggins, 2011) would be the methods of choice to test this hypothesis. In any case, single parenthood would represent a risk gradient rather than a discrete category.

Risks Should Rather be Operationalised as Combined Constructs Rather Than Single Factors

As evidence showed, risks come in bundles (Masten and Coatsworth, 1998; Masten, 2001; Schoon, 2006). In that respect, risk would not simply inhere in single parenthood *per se* but in what single parenthood *meant* in terms of income privation or compromise in the quality of proximal processes. The cause of risk would need to be sought in these other prior factors with single parenthood carrying *variable* levels of risk for different people. Clearly, single parenthood could be an asset in some cases and a risk in others. In fact, provided that a child's attachment to an adult has been developing normally, that child would have much lower probabilities for adverse outcomes in later life even in the face of extreme adversity (Sroufe *et al*, 1990; Masten and Coatsworth, 1998).

Researchers usually standardise scores on single factors and then additively combine them in scales (Sameroff *et al*, 1993; Yip and Fuligni, 2002; Sorensen *et al*, 2003; Toldson *et al*, 2006). However, this strategy assumes that each risk carries the same weight in real life, an unfounded assumption (Schoon, 2006). Fewer researchers apply factor analysis (FA) or principal component analysis (PCA) on separate risk scores to arrive at usually two or three components representing risk dimensions (Feinstein, 2003). The latter procedure is more likely to be followed when researchers work within a confirmatory factor analysis (CFA) framework. The latent constructs arrived at via confirmatory factor analysis are more likely to be theory-driven provided the available data include adequate measures of these theoretical constructs (Brown, 2006; Byrne, 2010).

Arbitrarily splitting the income distribution in quintiles (see Sameroff *et al*, 1993) and coding only the lowest quintile of this distribution as risk assumes that the rest of the distribution carries zero risk. This seriously compromises theory that suggests risks operate and are perceived as *gradients* (Masten, 2001), and reflect *ranges* of susceptibility (Rutter, 1999). It also introduces serious bias due to small frequencies at the ends of the distribution (Luthar, 2001; 2003; Luthar and Becker, 2002). People comprising the rest of the distribution, ranging from 75%-80%, are arbitrarily assigned with total *absence* of risk. Thus, interactions between risks, that would require more complete ranges of scores to reveal themselves (or not) would be eclipsed.

Elder (1986) and Rutter (1999) pointed to another reason that strongly suggested that risks should be expressed as ranges representing a continuous latent dimension: There is hardly such a thing as an *inherently* negative (or positive) factor. A factor *becomes* negative or positive within a particular context, depending on a number of other parameters, such as age, gender, family background and ethnicity. *Timing* and *length* of exposure to the risk factor is critical (Rutter, 1999, p 132). Thus, arbitrarily forcing a factor to only its one extreme at time *t*, denies that factor the potential to covary with other risk correlates at time *t*, and most importantly, produces biased estimates of the hypothesised risk because it assumes that all people under the lower 20% of the distribution are homogenous in that category. Thus, measurement error which would have spread out throughout the range of the distribution, if the variable was unconstrained, becomes critically important for this 20% of the distribution. Even slight measurement error associated with the responses of the people in this lower 20% of the distribution could result in biased estimates, given the much lower frequencies in the extremes. The situation gets worse if this lower 20% lumps together culturally-diverse members of minority ethnic groups who are simply over-represented in that category, increasing its heterogeneity.

Risks Are Context-Specific and Interrelated

The above review has further suggested that risks not only come in bundles but that risks associated with one proximal context are related to risks in other proximal contexts. According to Rutter (1999, p 139) 'a central feature of systems concepts is that changes in one part of a system may well lead to effects in other, distant parts of the same system through indirect chain effects…resilience research [indicates] the importance of peer-group as well as family influences, together with individual features'. Thus, research designs should incorporate mesosystems (Bronfenbrenner, 1992).

The Effects of Risk on Outcomes Varies with Cultural Input in Proximal and Distal Contexts

This idea pervades the culturalist, sociological and anthropological perspectives and is central in the ecological model. This review brought attention to the individual variability in cognitions, interpretation, understanding, perceptions and management of risk not only across but within cultures. Though slow to respond to calls for expanding the definition of risk to include risk cognitions and risk perceptions, psychopathologists have finally recognised that need as well. According to Rutter (1999, p 139) '…there is a need to pay attention to the suggestion that the psychopathological effects of risk experiences are strongly moderated by how individuals cognitively and affectively process their experiences and how the resulting working model of relationships is integrated into the self-concept' (see also, Rutter, Giller and Hagell, 1998). The call for a deeper understanding of risk influences requires recourse into embracing cultural variability in risk interpretation as a *sine qua non* in explaining how risk is perceived, explained, understood, acted and reacted upon by people in their everyday lived experience.

Conclusions

This review has discussed treatments of risk in sociological, psychological and life-course developmental perspectives. The importance of incorporating perceptions of risk and risk-taking of the participants who are affected by risk into the explanatory framework of life-course models was highlighted. It was also argued that these considerations were important in explaining how human agency interacted with context as theorised in ecological systems theory. Excluding subjective or culturally-based understandings of risk and resilience from the exploratory framework may lead to serious bias.

In that respect, ethnicity, encapsulating cultural specificity, becomes a critical distal environment in mediating risk effects on later outcomes. If this ethnicity-linked cultural conditioning of risk influences is ignored, or worse, taken for granted, then cultural specificity in risk-perceptions and thus responses to risk, as a function of these perceptions, cannot be studied.

To understand how risks work in culturally- or ethnically- different environments we need to know how risks are perceived, explained, understood, managed and acted upon by the participants that have to bear the consequences of these risks. Research and theory showed that risk carried both cost and benefit. It is therefore important to see if risk *effects* on outcomes are similar or different across cultures. Far from being incompatible with the ecological model as Ungar (2005) seems to suggest, such inter-cultural comparative research frameworks would bring such models closer to the person-process-context-time ecological design.

Towards this objective, the review has suggested a number of theory-driven methodological considerations regarding the measurement of risk, necessary to make such measurement more sensitive to the complexity of people's treatment of risk in their lives.

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