Chapter 14
Struggling to Stay Afloat: Dynamic Models of Poverty-related Adversity and Child Outcomes

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Abstract This chapter outlines several promising ways to capture the respective roles of poverty (as defined by falling below a federally defined threshold based on families' total household income and family size), and co-occurring risks (such as job loss, residential, and household instability) in research on child outcomes in the context of adversity. As high-quality longitudinal data has become increasingly available and the methods for analyzing data are more sophisticated, our approaches to the measurement of poverty-related risk have become more complex. Exposure to poverty-related risk can be understood as dynamic, with consequences for children likely to vary as a function of timing, type, and context (e.g., households, schools, and neighborhoods). The impact of poverty-related adversity may also depend on both adults' and children's subjective experiences of material hardship and level of disadvantage relative to neighbors or peers. The authors draw upon a preschool experiment and subsequent long-term longitudinal follow-up of over 600 low-income children (the Chicago School Readiness Project or CSRP) to illustrate these approaches.

Although decades of research have established that growing up in poverty has deleterious consequences for children's development, much of the focus has been on absolute levels of poverty (i.e., having a household income that falls below an established cutoff at a given point in time) (Yoshikawa et al. 2012). In contrast, emerging work in multiple areas of social scientific inquiry suggests that dynamic dimensions of poverty and poverty-related risk are subjectively experienced by families as highly stressful, with families struggling to navigate the concomitant turbulence that sometimes (though not always) accompanies low material resources.

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P.R. Amato et al. (eds.), *Families in an Era of Increasing Inequality*, National Symposium on Family Issues 5, DOI 10.1007/978-3-319-08308-7_14

Families often face periods of cascading or accumulating stressors as a stormy or turbulent time, where events such as financial hardship, job loss, eviction, and dissolution of marriage follow one after another like large waves in close succession. As one parent in our longitudinal Chicago School Readiness Project (CSRP) put it when reporting on material hardship, foreclosure, and divorce all in the past year, "We are struggling. It is hard to keep afloat."

While the literature on the roles of income poverty, residential instability, and changes in family structure have demonstrated the respective negative consequences of each of these types of adversity, their combined role may be less understood. New work in fields of developmental science and health psychology suggests that chronic socioeconomic disadvantage places children at risk for long-term psychobiological and behavioral problems: Much of this new work focuses on ways that the stress associated with low resources and lack of environmental stability (or increased turbulence) may "get under the skin" early in the life course (Blair and Raver 2013; Danese et al. 2009; Miller et al. 2011; Shonkoff et al. 2009). Over the past 10 years, we have carried out a preschool experiment and subsequent long-term longitudinal follow-up of over 600 low-income children in the Chicago School Readiness Project, or CSRP, as they navigate a wide array of poverty-related stressors from early childhood to early adolescence (see Raver et al. 2011 for further detail). Here, we outline several innovative approaches to the measurement and modeling of this turbulence, as a means of clearing the way for advances in our understanding of poverty-related adversity and its role in shaping children's subsequent health, behavior, and cognitive functioning (NICHD Early Child Care Research Network 2005; Raver et al. 2013).

Modeling Poverty-related Risk Over Time

Recently, several innovative analytic approaches have been taken to model the role of multiple dimensions of family economic disadvantage over time in predicting young children's outcomes (Blair et al. 2011; Hutto et al. 2011; Votruba-Drzal 2003). As these new studies suggest, families' experiences of economic disadvantage can be more complexly understood as a dynamic process that may be characterized by trajectories of improvement in families' financial and material well-being, by worsening trajectories marked by income loss and lower material resources, or by patterns of volatility over time.

In previous chapters of this volume, our colleagues have provided us with sobering reminders of the ways that these trajectories have worsened for our nation's children, over the past decade. For example, using a 10-year window from 2000 and 2010 (when families faced 2 periods of significant economic recession), Haskins' analysis illustrates the stark reality that the poverty rate for children has substantially increased, with 40 % of children in female-headed households falling below the poverty line by 2010. Following our CSRP sample of low-income children (and their families) from early childhood through early adolescence, we

have found similar patterns of chronic exposure to income poverty: A large proportion of CSRP families remained very poor from 2004 to 2012, with 70 % of families falling below the poverty line between one to three time points from early through middle childhood.

Previous findings from other recent studies suggest that the chronicity, volatility, and depth of poverty exposure matter for children's development. The chronicity of exposure to poverty has been found to be more deleterious to children's outcomes than family poverty status at a single point in time (Duncan and Brooks-Gunn 1997; Magnuson and Duncan 2006; Wagmiller et al. 2006). Accordingly, we are testing ways that those patterns of chronic exposure to time-varying hazards are predictive of specific self-regulatory mechanisms that serve as strong candidate mechanisms for poverty's negative impact on children's cognitive and behavioral development. Previous analyses (including our own) of the role of chronic poverty and poverty-related risk suggest that children's executive function (a key component of self-regulation) is jeopardized by each successive year spent in poverty, even after taking into account the depth of poverty and hardship experienced by families early in their child's lifetime (Raver et al. 2013). Moreover, recent work has argued that income volatility, or regular or repeated patterns of income *change*, may also have implications for children's development (Hill et al. 2013). This work argues that while increases in or chronic exposure to poverty may be detrimental for children's development, unexpected shifts or "shocks" in family economic circumstances may also have long-term consequences for family functioning and children's well-being. In short, the study of poverty and child cognitive function will be strengthened by increased attention not only to the depth (or frank magnitude) of poverty-related risk at any given time point, but also by more complex modeling of the chronicity and volatility of exposure to poverty and related risk over time.

Constellations of Risk Across Type

A second insight provided in several chapters in this volume is that for many children in the USA, exposure to income poverty co-occurs with a host of exposures to other poverty-related risks that increase children's odds of later emotional, behavioral, and cognitive difficulty, including their residence in single-headed households. In order to empirically specify this multivariate framework of cascading, or clustering of risks, investigators have alternately included a large number of individual variables for each type of risk as additive predictors of children's outcomes or have created cumulative risk models where risks are unit-weighted and summed to form a single risk index (e.g., Sameroff et al. 1993). More recently, several investigators have made a compelling case for the ways that a person-centered approach, using latent class analysis (LCA), offers a theoretically and empirically powerful solution to the problem of how best to analyze the role of "constellations of multiple, interacting risk factors" in the lives of young children

(Lanza et al. 2011, p. 391; Collins and Lanza 2010; Copeland et al. 2009). In the context of research on poverty-related risk and child outcomes, LCA offers a means of understanding ways that risks may coincide to predict negative outcomes in infancy (Rhoades et al. 2011), clinical outcomes in later childhood (Copeland et al. 2009), and academic trajectories in adolescence (Suárez-Orozco et al. 2010). To our knowledge, however, this approach has not been used extensively to understand the constellations of risk that may put children in jeopardy for school failure during the preschool and early elementary years.

Analyses of CSRP data suggest that LCA can be profitably leveraged to understand the ways that children's early experiences of deep poverty (income to needs ratio <0.5) and four other key risks (residence in a single-parent household, residential crowding, caregiver depression, and stressful life events) co-occur in preschool (Roy and Raver 2014). Even within a homogeneously low-income sample (i.e., families had to fall below the federal poverty guidelines in order to qualify for enrollment in Head Start programming at the outset of our study), we were able to identify variation in risk profiles. Almost half of the sample (47 %) fell into what we labeled the "low risk" profile, characterized by low probabilities of families' experience with most of the risks. However, a large percentage of families fell into the "deep poverty and single" (40 %) profile, characterized by high probabilities of being in deep poverty and of residing in a single-parent household. In addition, 9 % of families were labeled "single and stressed," characterized by high probabilities of being single, depressed, and experiencing many life stressors, and 5 % fell into the "deep poverty, crowded" profile, characterized by high probabilities of being in deep poverty and experiencing residential crowding. Results confirmed our hypothesis that while families were at or below the Federal poverty line at the study's outset, some children faced dramatically different constellations of family risk than others, and correspondingly faced greater odds of long-term academic and behavioral difficulty. Not surprisingly, children who experienced early "low risk" profiles (characterized by low levels of risk experienced when they were enrolled in Head Start) had higher levels of academic, behavioral, and self-regulatory functioning in 3rd grade than children in the other three classes. However, children who were identified as falling into the "single and stressed" and "deep poverty, crowded" profiles had the lowest levels of functioning, although these patterns varied across outcomes; children in the "single and stressed" profile experienced the largest detriments in behavior problems, while children in the "deep poverty and crowded" profile experienced the largest detriments in academic performance.

These findings demonstrate that while the accumulation of risk has important implications for children's development, the combination of particular risks may be equally salient. Potential explanations for the patterns in children's outcomes across the "single and stressed" and "deep poverty, crowded" profiles may be both economic and psychological: As indicated in earlier chapters, two-parent households may have better cushioned the children in our study from economic downturns such as the 2008 recession. Having a partner to share the financial burden may have helped parents in staying psychologically "afloat" by reducing feelings of strain or

psychological pressure (e.g., Mistry et al. 2009). While families may "double-up" as a strategy for getting by in times of economic strain, prior work has demonstrated that crowding, particularly when it is uncontrollable, is detrimental for children's socioemotional adjustment (Evans 2004). It is to those subjective experiences of financial hardship, the controllability of poverty-related stressors, and of income inequality among both children and adults in poor households that we now turn.

Subjective Experiences of Poverty-related Risk

As outlined earlier in this chapter, we argue that families' and children's experience of psychological strain when facing multiple types of poverty-related adversity can and should be empirically distinguished from material measures such as income. In much recent research, family financial strain is operationalized in terms of parents' subjective experience of not being able to keep up with the challenges of providing basic necessities such as food, clothing, and shelter with the limited income that is available (Conger et al. 1994). Parents' reports of financial strain are prospectively predictive of greater "wear and tear" or allostatic load on key physiological systems (such as the metabolic and cardiovascular systems) and lower levels of psychological well-being among adults, even after taking into account families' income insufficiency or poverty status (Edin and Lein 1997; McLoyd 1998; Newland et al. 2013; Raver et al. 2011; Burchinal et al. 2008). Recent work also indicates that parents' subjective experiences of financial strain may have substantial predictive power when trying to understand ways that parents make tough choices on how and when to best support (or invest in) their children's well-being. In fact, some work has found subjective perceptions of financial strain to be more consistently related to cutbacks in expenditures on children than objective experiences of strain (i.e., job loss and food insecurity) (Kalil et al. 2013).

A key question is the extent to which children are also consciously aware of and psychologically burdened by their families' financial struggles. Although much developmental literature calls for children to be considered as "active agents" who shape their environments (e.g., Bronfenbrenner and Morris 1998; Conger and Donnellan 2007), fewer poverty-related studies have included the child's perspective of family economic hardship and financial strain. Children are clearly aware of and able to report on their families' experiences of poverty-related adversity, as indicated by positive correlations between child-reported and parent-reported measures of poverty (e.g., Clark-Lempers et al. 1990; Conger et al. 1999; McLoyd et al. 1994). Yet, while child and parent measures are correlated, they are often not synonymous, as likely parents, may not discuss the household's entire financial context to children (e.g., Clark-Lempers et al. 1990) or children may cope with stress via denial or wishful thinking (Wadsworth and Compas 2002). Parental reluctance may buffer children from undue stress as McLoyd and Wilson (1990) found; when isolated single mothers shared their worries with their offspring, these stressors quickly overburdened children, resulting in decreases to their psychological and emotional

well-being. Often startling is the young age at which children are able to recount realistic portraits of the financial pressures their families are under. As early as 6th grade, children's reports of family financial pressures are corroborated by parents (Clark-Lempers et al. 1990). Further, the links between child and adolescent perceptions of family economic hardship or financial strain and their own well-being are robust across "social address" characteristics such as child gender, race/ethnicity, geographical residence, parent occupation, and marital status (Clark-Lempers et al. 1990; Conger et al. 1999; McLoyd et al. 1994; Mistry et al. 2009; Shek 2003). It is clear from this small set of studies that youth are aware of the strain their family members feel and it is at least partially through these perceptions that economic hardship can negatively impact youth functioning across multiple domains (Conger et al. 1999; McLoyd et al. 1994; Mistry et al. 2009; Shek 2003). Finally, we must not ignore that families, and especially children, often do not have enough tools in their tool kits to effectively cope with these stressors (Wadsworth and Compas 2002; Wadsworth et al. 2005). Undoubtedly, there is great potential for future research to closely examine the links between youth perceptions of economic hardship and functioning as valuable empirical tools that can be combined with other measures of income poverty deployed in current literature.

An additional lens through which we can understand families' subjective experiences of poverty is through recent work on the controllability of psychological stressors. While past research suggests that material hardship and low (or falling) income places all members of the household under stress, different family members may cope with those stressors in different ways. Longitudinal analyses suggest adults and youth engage in both "primary" and "secondary" coping strategies that involve problem-solving, emotional regulation, cognitive restructuring, or alternately, active acceptance of the stressors that the family faces (Wadsworth and Compas 2002). Recent evidence from health research suggests that maintaining a "shift-and-persist" strategy of cognitively re-framing or re-appraising highly stressful socioeconomic conditions, while also setting a positive goal or intention to endure or overcome those conditions is associated with lower risk of the biobehavioral "wear and tear" (e.g., high blood pressure, higher risk of diabetes, and compromised immune function) (Chen and Miller 2012). Innovative work in prevention science has demonstrated that families' coping strategies are amenable to change. Involvement in psychoeducational intervention designed to support parents' positive coping strategies was associated both with improved coping and with later "down stream" outcomes including reduced depressive symptoms, reduced conflict among parents, and higher levels of adjustment among children (Wadsworth et al. 2011).

While the number of US children in poverty continues to climb, the divide between the nations' rich and poor also continues to widen. As such, another key dimension to consider is parents' and childrens' perceptions of economic inequality, or one's own economic standing relative to others in society. Prior work has shown that among adults, lower perceived economic standing (relative to others in the USA and the community) is related to detriments in physical and mental health (Franzini and Fernandez-Esquer 2006; Gong et al. 2012; Singh-Manoux et al. 2005) that are not explained by objective economic standing alone. While this

body of work suggests that perceptions of economic standing is an important predictor of adult health and well-being, almost nothing is known about how perceptions of economic standing affect parenting practices or investments in children. Moreover, children's own perceptions of their family's economic standing may have implications for development. Children and adults develop perceptions of economic standing based on knowledge of their financial resources and experiences with the people and settings in their environment; this makes the examination of poverty-related risks across contexts essential to the study of poverty and children's development.

Risks Across Contexts

How do we place families' perceptions of their economic position within larger social contexts? Recent application of ecological frameworks to studies of allostatic load, self-regulation, and children's longer-term outcomes have highlighted the fact that children are embedded within multiple social contexts (i.e., family, school, and neighborhood). As such, negative life events may both objectively vary and be subjectively perceived as larger or smaller in frequency and magnitude across those multiple contexts, particularly as children grow older (Bronfenbrenner 1979). For example, families who are poor may be more likely to be exposed to neighborhood poverty and crime, experience low quality housing, and attend lower quality schools, relative to their more economically advantaged counterparts (Yoshikawa et al. 2012). Many children in CSRP attended schools characterized by high poverty, high need, and low performance (e.g., where only 66 % of students within the child's school, on average, were able to pass grade-level proficiency standards in Language Arts and Math) (Raver et al. 2013). Our analyses (as well as those of others) suggest that it is critically important to consider children's exposure to risk across both home and school contexts. Analyses of CSRP children's self-regulation from preschool to elementary school suggest that family poverty across all time points was significantly associated with greater difficulty in key self-regulatory domains of attention and impulse control in 3rd grade. Importantly, lack of school safety during the elementary school years served as a particularly serious risk for children who had been identified as at greatest behavioral risk in early childhood, even after exposure to family poverty had been statistically taken into account (Raver et al. 2013). Analyses are currently underway to detect whether unsafe school climate substantially contributes to children's difficulty with cognitive dysregulation through 5th grade, even after taking into account the role of family poverty.

In addition, we learned that the children in our CSRP sample have been (and continue to be) exposed to staggering levels of community violence. Linking publically available crime statistics from Chicago's Police Department with children's geocoded home addresses revealed that, on average, over 500 violent crimes occurred in CSRP children's 5th grade neighborhoods (i.e., census tracts) over the course of a year. Our analyses suggest that exposure to neighborhood violence was

related to decreases in attention, impulse control, and pre-academic skills when children were in preschool (Sharkey et al. 2012) and attentional bias toward emotion stimuli when children were in 5th grade (McCoy et al. 2013).

In addition to absolute levels of exposure, children may experience their environments as neither uniformly good or bad, but rather as turbulent or chaotic. For example, CSRP families not only experienced substantial risk of chronic exposure to poverty, but also experienced high levels of household turbulence (i.e., changes in marital status, people moving in or out of the household); in preschool, over half (or 54 %) of families had experienced at least one of five indicators of household turbulence in the prior year. Children residing in highly turbulent homes had lower levels of early self-regulatory skills compared to children in stable homes (McCoy and Raver 2013). CSRP-enrolled families also had high rates of residential mobility with almost three-fourths of children (or 72 %) having moved at least once over the course of the study. Eleven percent of families, who moved, did so at least 3 times between preschool and 5th grade. Our examination of trajectories of the quality of move experienced by children in CSRP was illuminating: Although 41 % of the sample made a lateral move (moving into neighborhoods with a similar poverty level), 24 % of the sample moved into less safe neighborhoods with higher poverty levels (Roy et al. 2014). Residential mobility was clearly associated with substantial decrements (of almost 1/4 of a SD in effect size) in children's self-regulation in 5th grade (as indicated by both teacher reports and by standardized direct assessments of their executive function) (Roy et al. 2014).

Putting It All Together: Conclusions and Next Steps

In sum, our lab has spent a decade learning about self-regulation in early and middle childhood, and is well-poised to build on the knowledge gained from our previous studies and to learn about poverty, self-regulation, health, and mental health as our sample passes through key adolescent transitions in the life course. Moving forward, we plan to use the ideas presented in this chapter as a framework for conceptualizing and measuring the dynamic complexity of poverty-related adversity and the role it plays in children's development. Specifically, this work will focus on four key dimensions of risk: timing, type, perceptions, and context. Prior work has demonstrated that the influence of poverty is not static, but varies as a function of the **timing** of exposure. Our continued work in this area will explore both the chronicity and volatility of exposure to poverty, with special attention paid to whether influences on children's development vary by developmental period. Future work will also continue to keep in mind that poverty co-occurs with other poverty-related risk factors (e.g., single-headed household and residential crowding), and as such the **types** of risk that youth experience may matter. In addition, a growing body of work has found individual **perceptions** of financial strain and economic inequality to be predictive of individual health and well-being above and beyond the influence of absolute income alone. Therefore, it will be integral to

integrate both adult and child perceptions of economic hardship into our conceptualization and modeling of adversity and development. Finally, our work will continue to explore children's experiences of adversity **across** contexts (e.g., households, schools, and neighborhoods), keeping in mind that dimensions of timing, type, and perceptions can operate at multiple contextual levels.

Expansion in the conceptualization of poverty goes hand in hand with advances in analytic methods and measurement. As high-quality longitudinal data has become increasingly available and the methods for analyzing more sophisticated, the questions that researchers are able to pose have become more complex. In addition, the development of new measures is often both driven by and a precursor to the expansion of key constructs. As such, not only do we encourage researchers to draw on the ideas presented here in order to more accurately capture the diversity of lived experience, but also to move the field forward in terms of how we think about, measure, and model poverty-related adversity.

Innovations in the conceptualization and measurement of poverty-related adversity have potential to inform anti-poverty policy approaches. Prior work suggests that it may be instability or volatility (which often accompanies experiences of absolute poverty) which matters most for a families' functioning. As such, the provision of income supports in combination with services aimed at reducing family instability (e.g., child care) may produce the largest gains for both parents and children. In addition, recent advances in modeling the co-occurrence of poverty-related risk may provide a useful tool for identifying particular subsamples of the population who might benefit most from targeted intervention strategies. Finally, research demonstrating the power of subjective perceptions of economic standing present the possibility that psychological (e.g., changing perceptions on the controllability of risk) or skill-based interventions (e.g., increasing parents executive function skills—paying attention, planning, and remembering—as a means of coping with the multitude of stressors encountered on a daily basis), particularly when paired with economic supports, may provide an innovative approach to poverty reduction. As a whole, the ideas outlined here stress the dynamic and complex nature of the poverty-related adversity that many US families face, but more importantly provide a starting point for developing new and targeted policies designed to expand the safety net and throw life-lines out to families who are having trouble staying afloat.

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