

## Some Thoughts about Resilience versus Positive Development, Main Effects versus Interactions, and the Value of Resilience

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Interaction effects are the defining feature of resilience and resilience research and are responsible for the unique contributions of this field of study to our understanding of human development. The methodological and statistical challenges posed by interaction effects do not, by themselves, undermine the value of resilience as a construct.

### INTRODUCTION

For over three decades, a growing group of researchers has pursued the construct of resilience. These researchers have expanded our understanding of human development from explanations of positive development under normative conditions to better-than-expected development under adverse conditions. Simultaneously, some have criticized the construct of resilience, the methods used by resilience researchers, and the value of this research. Luthar, Cicchetti, and Becker (2000) have thoughtfully addressed many of these criticisms. Although I agree with many points made by these authors, other points cause concern. In particular their cautions about, and possible devaluing of, the role of interactions in resilience research seem to undermine the importance of what may be the most valuable and distinguishing feature of the resilience construct.

An interrelated set of themes in Luthar et al. (2000) is the tension between interactions and main effects, between less stable and more stable effects, and between resilience research and “positive adjustment” research. Luthar et al. caution against a focus on interaction effects because they create more difficult statistical issues and the results are likely to be less stable. I contend that interactions are the heart and soul of resilience and arguably the most important and distinguishing feature of this concept. Without interactions that “explain” positive or relatively positive development in the presence of adversity, when main effects models predict poor adaptation, we face the serious question of “Has the resilience concept added to our understanding of human development?”

The discussion about the proper place or importance of interactions within resilience research gets

confusing when virtually every example of resilience in Luthar et al. (2000) is an example of an interactive effect. Furthermore, Luthar et al. propose an expanded vocabulary to provide greater precision in describing interactive effects. In contrast, Luthar et al. go on to describe main effects resilience research as a special case of “positive adjustment” research in such a way that the only distinction between these two paradigms is the populations they study (at-risk groups versus mainstream, nonrisk groups). Is that reason enough for a separate concept and research tradition? Generally we require greater distinctions between concepts and research traditions to recognize them as separate from one another.

Perhaps part of the confusion comes from interactions disguised as main effects. When researchers study only extremely high-risk groups (Wyman et al., 1999), main effect differences between those who have adapted positively and those who have not may represent interactions in other samples that show greater variability on the risk factor. Similarly, when researchers discover a main effect associated with positive adaptation in a high-risk group that contrasts with results from research on mainstream children, their main effect is really an interaction. In both of these examples, researchers identified main effects *within their samples* that are, in fact, interaction effects when a broader perspective (comparisons with results in studies with mainstream samples) is taken. The point is that researchers do not necessarily have to find interaction effects, statistically or otherwise, within their sample or study to identify an interaction effect in the general population and make a contribution to resilience.

When children with easy temperaments, warm, supportive families and communities, and little if any

adversity are well adjusted as children, youth, and adults, we are not surprised. Similarly, we are not surprised when children who face major or multiple adversities in life are less well adjusted across the life span. Nor should we be surprised when the developmental outcomes for many children seem to reflect, albeit roughly, a weighted sum of the combined positive and negative influences in their lives. Main effect models have supported such conclusions consistently over many decades.

However, a major contribution of resilience research, and the distinction made by its early adherents (Garmezy, Masten, & Tellegen, 1984; Masten et al., 1988; Rutter, 1987, 1990), is a greater understanding of those cases that defy this simple linear logic. What is it about some children, their families, or their larger environments that allows them to maintain a positive developmental trajectory when many of their peers in similar circumstances are not able to do so? In particular, what factors contribute to positive development in the face of adversity but have little or no positive impact, or even have negative impact, on development in the absence of adversity? The answers to these questions are the essence of the resilience concept and of utmost importance for advancing our understanding of human development under a variety of conditions, for understanding discontinuities in development, and for guiding the development of interventions for children in adverse circumstances (Wyman, Sandler, Wolchik, & Nelson, in press). Despite the statistical or methodological challenges that interactive effects present, the unique contributions of resilience research to our understanding of human development and the primary distinction between resilience research and other paradigms come from *its expectations* of interactions that lead to positive development when competing developmental models predict poor adaptation (Rutter, 1990).

If interactions are the heart of the resilience construct, what about criticisms of the difficulty of finding statistically significant interaction effects and the likely instability of these effects when found? Rutter (1990) anticipated some of these issues when he described the difficulties of identifying interactive effects of interest to resilience, especially if one relies solely on statistical interaction effects. Rutter described several interactive processes that would not be identifiable using the analysis of variance or regression approaches that predominate in resilience research. Quite simply, the most commonly used research designs may not be appropriate for identifying some important interactions. The challenges involved in generating useful research on resilience, however, (e.g., the need to use larger samples or different re-

search designs) do not by themselves undermine the value of the construct. Similarly, if results from the research designs most commonly used by resilience researchers are unstable, this may be a research design issue, not necessarily a problem with the construct. Such a problem can be resolved by improving measurements, tightening the definition of resilience (Luthar et al., 2000), increasing sample sizes, conducting multiple replications, or some combination of these and other improvements.

Prevention and other applied scientists have learned to appreciate the value of identifying moderators (and mediators) that increase our understanding of the processes by which risk factors do or do not impact children's development (Roosa, Wolchik, & Sandler, 1997; Wyman et al., in press). Such processes, when modifiable, can provide the foundation for the development of preventive interventions (Coie et al., 1993). Resilience researchers have identified numerous moderators of risk factors (Luthar et al., 2000) and replications of these findings provide both validity for the results and support for the value of these processes as targets in prevention programs. Continued progress in identifying moderators, in increasing our understanding of the complexity of the influences of risk factors on development, and eventually in developing a theory of resilience would be invaluable to prevention researchers. Resilience, however, will not be of much interest to developmental researchers in general or prevention scientists in particular unless this concept is clearly defined and provides a unique perspective on influences on human development, thereby going beyond the familiar linear models that dominate developmental research.

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