

# Risk, Vulnerability, Resistance, and Resilience Following Disaster

Christopher M. Layne, Ph.D.

UCLA National Center for Child Traumatic Stress

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Note: This is an annotated set of slides from an invited symposium I presented in 2004 at the International Society for Traumatic Stress Studies. Herein I present ideas that I have further developed in later publications. If you use any part of these slides, please be respectful by properly citing it (see citation on cover slide above). If these ideas are of interest, you may also find the following publications to be useful:

1. Layne, C. M., Warren, J. S., Saltzman, W. R., Fulton, J., Steinberg, A. M., & Pynoos, R. S. (2006). Contextual influences on post-traumatic adjustment: Retraumatization and the roles of distressing reminders, secondary adversities, and revictimization. In Schein, L. A., Spitz, H. I., Burlingame, G. M., & Muskin, P. R., (Eds.), *Group Approaches for the Psychological Effects of Terrorist Disasters* (pp. 235-286). New York: Haworth.

2. Layne, C. M., Warren, J., Watson, P., & Shalev, A. (2007). Risk, vulnerability, resistance, and resilience: Towards an integrative model of posttraumatic adaptation. In M. J., Friedman, T. M., Kean, & P. A. Resick (Eds.), *PTSD: Science & practice-A comprehensive handbook*. New York: Guilford.

3. Layne, C. M., Beck, C. J., Rimmasch, H., Southwick, J. S., Moreno, M. A. & Hobfoll, S. E. (2009). Promoting “resilient” posttraumatic adjustment in childhood and beyond: “Unpacking” life events, adjustment trajectories, resources, and interventions. In D. Brom, R. Pat-Horenczyk, & J. Ford (eds). *Treating traumatized children: Risk, resilience, and recovery* (pp. 13-47). New York: Routledge.

4. Layne, C. M., Warren, J. S., Hilton, S., Lin, D., Pasalic, A., Fulton, J., Pasalic, H., Katalinski, R., & Pynoos, R. S. (2009). Measuring adolescent perceived support amidst war and disaster: The Multi-Sector Social Support Inventory. In B. K. Barber, (Ed.), *Adolescents and Violence*. Oxford University Press (pp. 145-176).

5. Layne, C. M., Olsen, J. A., Baker, A. Legerski, J. P., Isakson, B., Pašalić, A., Duraković-Belko, E., Đapo, N., Čampara, N., Arslanagić, B., Saltzman, W. R., & Pynoos, R. S. (2010). Unpacking Trauma Exposure Risk Factors and Differential Pathways of Influence: Predicting Post-War Mental Distress in Bosnian Adolescents. *Child Development, 81*, 1053-1075.

6. Steinberg, J.R., Layne, C.M., & Steinberg, A.M. (2012). Ceteris paribus laws in scientific inquiry. *Journal of Theoretical and Philosophical Psychology, 32*(3): 180-190.


7. Layne, C.M., Steinberg, J.R., & Steinberg, A.M. (2012). Causal reasoning skills training for mental health practitioners: Promoting sound clinical judgment in evidence-based practice. Manuscript submitted for publication.



# Co-Authors: Alan Steinberg, Ph.D. Jared Warren, Ph.D.

## Undergraduate Contributors:

- Bradley Cohn
- Nicole Niebaur
- Benjamin Carter
- Jacob Tanner
- Paul McClaren
- Richard Hagen
- Callie Beck
- Brendan Rowlands
- Sarah Turner
- Benjamin Walser
- Joshua Downs
- John Paul Legerski
- Kristy Money
- Marko Moreno
- Stephanie Donnely
- Ryan Curtis



# 10-Year Flashback: Garmezy's Rebuke and Challenge

## ISTSS Keynote address

- Developmental psychopathology (DP) pioneer Norman Garmezy critiqued concepts, terminology, methodology, and findings of the traumatic stress literature.
- Strongly rebuked us for our simplistic theoretical, methodological, clinical approaches, and for not learning from DP's 15+ years' experience.
- Urged trauma researchers to study and adopt concepts, methods, findings from DP.

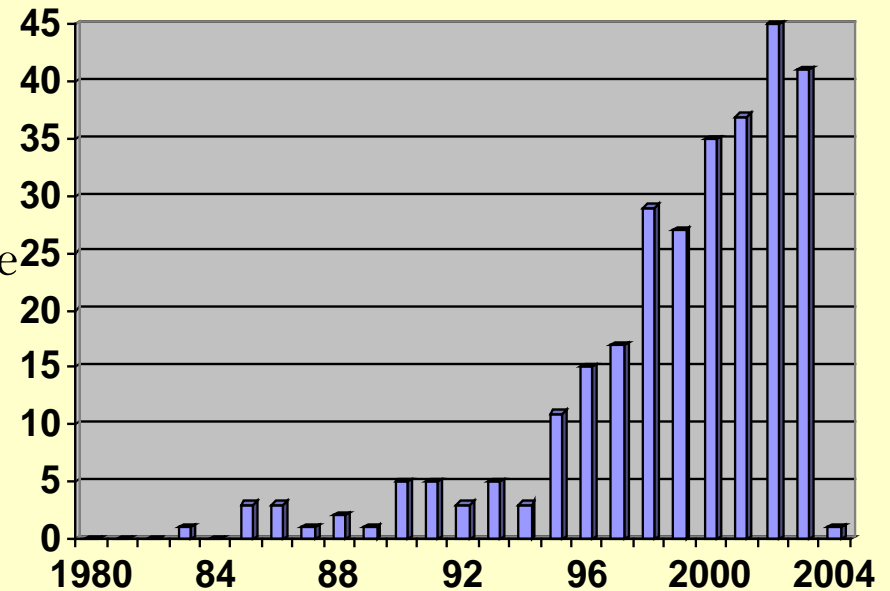
# 10 Year Checkup: An Explosion in the Literature

- Trauma Field

- Articles with key words: resilience and trauma

- 1980-2004

- Total Articles-289

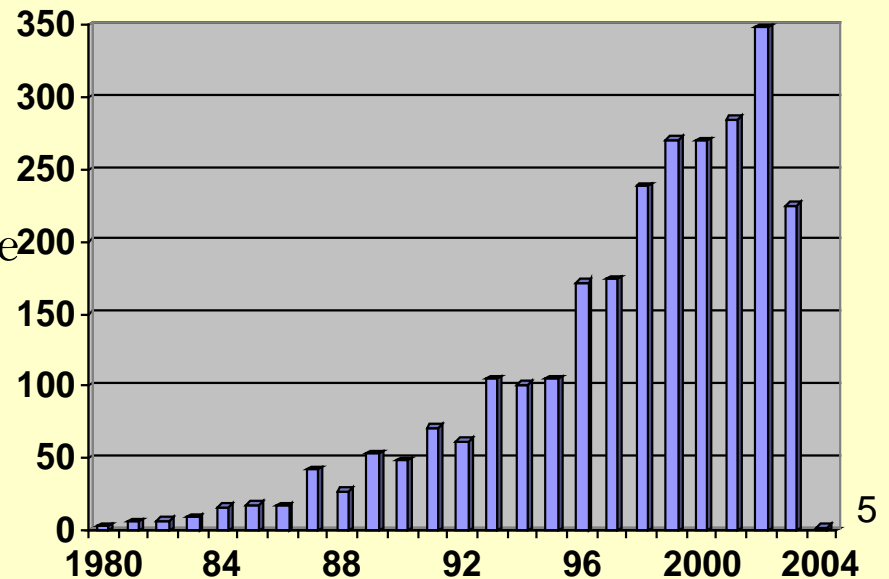



- DP Field

- Articles with key word: Resilience

- 1980-2004

- Total Articles-2,673

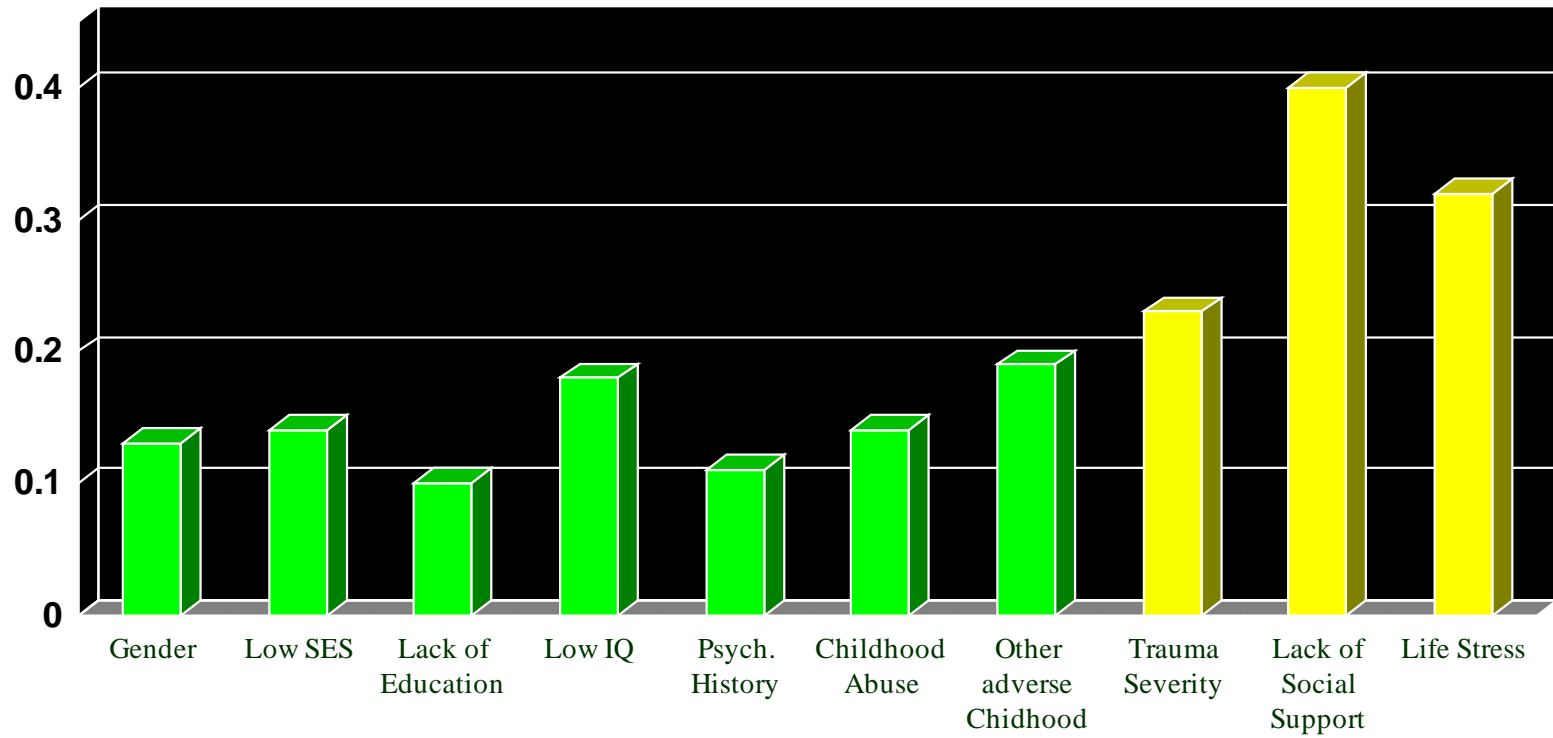





# How “Prophetic” and Relevant Was Garmezy’s Counsel?

- Increased focus in literature on *childhood risk variables* and *intervening variables* (e.g., vulnerability and protective factors) other than characteristics of trauma exposure per se (e.g., proximity, severity).
- Brewin et al.’s (2002) meta-analytic review identified several major risk indicators:
  - absence of social support
  - life stress (adversities)
  - trauma exposure

# Brewin et al.'s Findings





Why This Current Highlight on  
Contextual Variables?

*Why are Risk and Protective  
Variables So Relevant  
for All Shareholders?*





# Why are Risk & Protective Variables Relevant for Everyone? (cont.)

## Task 1: *Promote theory-building efforts*

- Require studying focal variables in *context* (e.g., families, peers, physical environment, development)
- Explicates how the influences of traumata and their aftermath are conveyed, exacerbated, or mitigated over time & throughout the ecology
- Protect against scientific hubris
  - Fad variables & concepts
  - Unfounded, untested assumptions re: causal mechanisms
  - Presuming that *your* square meter of the meadow is “where all the action is”, where the most influential mechanisms are found; where the majority of the variance in the outcomes that *really* matter is explained. (Rather than seeking to understand where and how your work fits into, and contributes to, the broader ecological context.)



# Why are Risk & Protective Variables Relevant for Everyone? (cont.)

- **Task 2: *Promote the use of sophisticated, highly informative research methodologies***
  - Longitudinal designs (delineate pathways of influence, test causal mechanisms, elucidate processes through which mechanisms operate)
  - Statistical analyses:
    - Structural equation modeling
    - Latent growth curve modeling
  - Encourage use of broad-spectrum assessment batteries spanning multiple ecological levels
    - Cell
    - Organ/Organ Systems
    - Organism
    - Group
    - Community
    - Organization
    - Society



# Why are Risk & Protective Variables Relevant for Everyone? (cont.)

## **Task 3: *Promote Effective, Efficient Interventions***

- Mediating/moderating variables are highly informative:
  - Markers of risk/protection
  - Vulnerability-enhancing variables/processes
  - Protection-enhancing variables/processes
  - Helps us discriminate between etiological, maintenance, and (inert) risk/vulnerability/protection marker variables
- Identify subgroups placed at elevated risk for specific adverse outcomes via specific mechanisms, processes, and pathways of influence, as they operate within pre-trauma, peri-trauma, and post-trauma time periods



# Why are Risk & Protective Variables Relevant for Everyone? (cont.)

## Task 3: Promote Effective, Efficient Interventions (cont.)

- Identify foci for assessment and intervention
  - Mediating variables are “relay stations” that convey influences over time
  - Moderating variables assist in identifying protection- and vulnerability-enhancing factors
  - Provide valuable information that assists in risk identification, treatment triage, case conceptualization, treatment planning, monitoring/surveillance, program evaluation
- *Without this information we are confined to less informative “shopping lists” of risk and protective variables*
  - Identify variables that discriminate between groups (e.g., “resilient” vs. “non-resilient”)
  - Lack theoretical richness or coherence
    - Cannot explain mechanisms and processes




# Beyond a Simple Approach to Resilience: *How Can DP Concepts Enrich Our Own?*

- Mechanisms
- Processes
- Risk factors
- Protective factors
- Vulnerability factors
- Stress resistance
- Resilience
- Pathways of influence
- Domain-specific adaptation
- Developmental tasks and milestones
- Developmental trajectory
- Multifinality
- Equifinality
- *Distinguishing between markers (static or causally inert indicators) and causal processes (dynamic)*

In Summary:

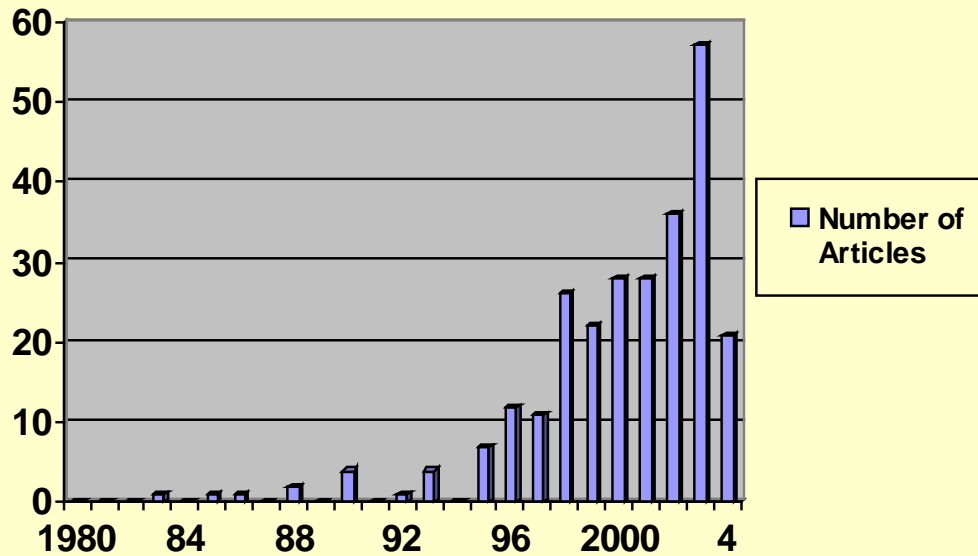
*How Well Have We Followed  
Dr. Garmezy's Counsel?*



# Taking a Close Look at Ourselves as a Field


- The Good News:
  - We are looking at intervening variables
  - Studies increasingly include the terms “risk” and “resilience.”

# How Often are the Basic (and Potentially Simple) Terms Used in Trauma Journals?



Trauma & Resilience  
1980-2004  
Articles: 261



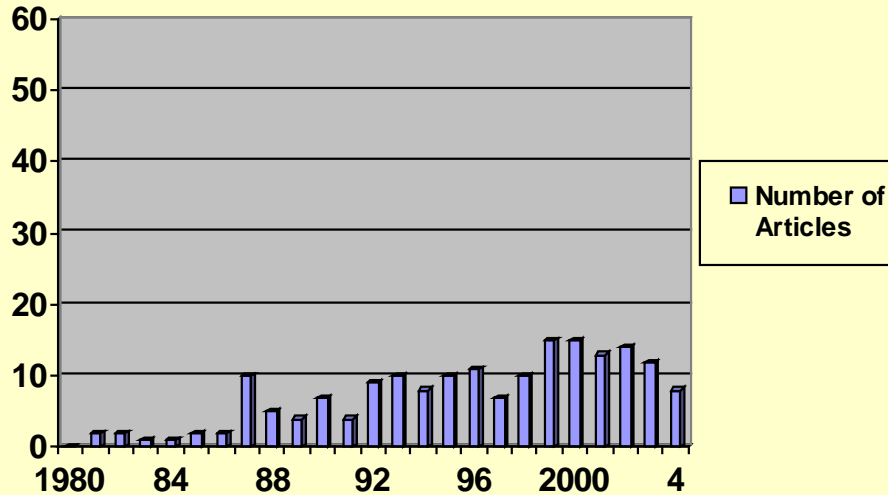


# Taking a Close Look (cont.)

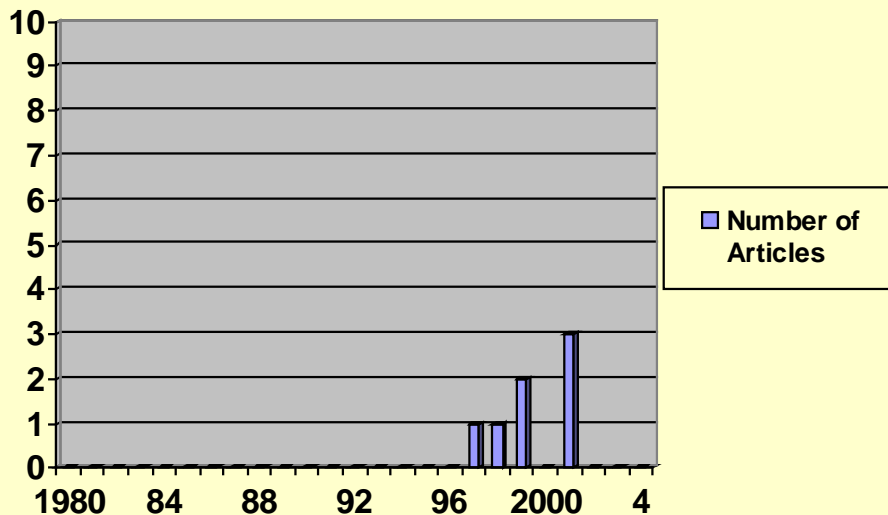
- The Bad News:
  - We appear to be using basic terms (e.g., *resilience*) *incorrectly, inconsistently, imprecisely,* and/or in an *oversimplified* way
  - We are using only basic concepts, terms, methods in unsophisticated ways that are not nearly as informative and useful as they could be for a wide variety of applications (theory-building, measurement, intervention)

## Terms in Articles (Cont.)

# Beyond “Resilience”: How Often Do We Use More Sophisticated Concepts & Terms?



Trauma & Resistance  
1980-2004  
Articles: 182



Trauma & Developmental  
Trajectory  
1980-2004  
Articles: 7



# Another Problem—Definitional Inconsistencies: Imprecise or Incorrect Use of Terms

- Potential Sorting Errors
  1. Using two different terms in reference to the same concept
  2. Using the same term in reference to two different concepts
  3. Using one distinct term to define another distinctly different term

# Examples of Definitional Problems

1. *Using two different terms to define the same concept*
  - (example) “**Resilient** individuals, although giving the impression of being somewhat Herculean in their **resistance** to stress, must also undergo struggles associated with this process”

# Examples of Definitional Problems

(cont.)

## 2. *Using the same term to define two distinct concepts*

(2 examples):

- 1: Resilience: “Ability to *maintain stability* after trauma”
- 2: Resilience: “Capacity for early, effective adjustment and notion of *restoration* and progression following exposure to stress”

# Examples of Definitional Problems (cont.)

## 3. *Using one distinct term to define another term*

- (example) “**Resilience** is a term used to describe **relative resistance** to psychosocial risk experiences”



# Definitional Problems (cont.)

- *What is the cost if we continue on our present course?*
  - Inefficient progress as a scientific field
  - Less effective, efficient theory, methods, interventions
  - Ongoing confusion over the meaning of essential “building block” terms (e.g., resilience, resistance)
  - Confusion about what we do & do not know
  - Scientific inquiry will lack clear vision, direction about how to learn what we don’t know




# An Important First Step: What We Currently Know

## Attributes of “Resilient” Children and Families


- Resilient children and adolescents are *optimistic*.
- Resilient children and adolescents have *self-efficacy*.
- Resilient children and adolescents have a sense of *mastery*.
- Resilient children and adolescents have *personal competencies*.
- The families of resilient children and adolescents are *cohesive* and *supportive*.
- The families of resilient children and adolescents use *effective coping skills* to deal with stress.
- The families of resilient children and adolescents are *hardy*.





# Our Problem and Challenge

- The Good News: “Shopping List”-type studies DO help to distinguish between “resilient” versus “non-resilient” groups
  - Help to identify risk, protective, vulnerability *markers*
  - Help to identify who is at risk for severe distress, functional impairment, and developmental disturbance
  - Help us to identify who is at lower risk



# Our Problem and Challenge

- The Bad News:

Attributes that empirically distinguish between “resilient” and “non-resilient” groups *may or may not* constitute “active ingredients” that *actually promote* stress resistance or resilience in a causal sense.

Instead, *these attributes may instead be markers, end products, or other “proxies” of other (neglected, misunderstood, or unknown) underlying processes.*



# Our Problem and Challenge (cont.)

The Bad News: Pervasive lack of effort at both conceptual and methodological levels to distinguish between:

- *Risk markers* (liberal concept: a variable that is significantly correlated with a given outcome, whose presence or level is associated with an increase in the probabilistic “risk” that the outcome is present);
- *Causal risk factors* (conservative concept: a variable that rigorous empirical study implicates as a causal contributor to the occurrence of an adverse outcome).
- *Most “risk factors” as identified and discussed in the literature only meet the lax standard of a risk marker.* <sup>27</sup>



# Our Problem and Challenge (cont.)

The Bad News: Pervasive lack of effort at both conceptual and methodological levels to distinguish between:


- *Risk markers* (a “value-neutral” statistical concept/term: a correlate of any focal outcome, whether negative or positive; e.g., buying a lottery ticket places you “at risk” for winning the lottery);
- *Causal risk factors* (carries a negative valence: a harmful causal contributor to an adverse outcome).
- *Promotive Factor* (neglected direct-effect counterpart to causal risk factor, carries a positive valence; often confused with “moderated effect” protective factor)

# Our Problem and Challenge (cont.)

Thus, “shopping list”-type studies (which typically involve the use of quasi-experimental between-group designs to differentiate between “resilient” and “non-resilient” groups, or alternatively, correlational designs) generally cannot distinguish between risk and protective *markers/proxies*, versus *causal risk* and *promotive* (and perhaps protective) factors.

# Our Problem and Challenge (cont.)

The resulting (methodologically weak) evidence base thus *does not necessarily justify the practice of therapeutically targeting and seeking to change those attributes that best distinguish “resilient” from “non-resilient” groups.*




# Our Problem and Challenge

## The Bad News (cont.):

*Even if* the attributes that differentiate “resilient” from “non-resilient” groups actually “cause” them to be resilient...


- How do we know how they work?
- Or how to harness, augment, or mitigate them?



# Our Problem and Challenge

- **The Problem**: Are we content with merely admonishing our clients to:
  - “be optimistic”
  - “be hardy”
  - “be resourceful”
  - “be intelligent”
  - “be likeable”
  - “have a sense of mastery and self-efficacy”
  - “be competent”
  - “have good social support”or to “cope effectively with your difficulties”?






# Our Problem and Challenge

- Problem: (cont.)

If not, then we must *increase our level of theoretical, methodological, and therapeutic sophistication.*


*-We must figure out how risk, vulnerability, protective, and promotive mechanisms actually work.*



# Our Problem and Challenge


This requires that we move away from a broad search for “resilient”-characteristic attributes, to a more specific focus on:

- *causal risk, protective, and promotive mechanisms,*
- *vulnerability and protective factors,*
- *and the processes through which they work and interconnect to form pathways of influence between causes and consequences.*



# Our Problem and Challenge

- **Problem:** (cont.)
- What makes risk and protective mechanisms increase or decrease? Become potent or inert? Turn on or off? Interact or exert direct effects?
- How can we facilitate naturally-occurring protective mechanisms, to *decrease* the number of individuals who require specialized interventions?
- How can we *harness* naturally-occurring protective mechanisms to *augment* our “specialized” interventions so as to *increase their effectiveness, efficiency, impact, and sustainability*?



# Our Problem and Challenge:

(cont.)

“Shopping list” study findings can only lead to “shopping list” interventions.

*(and by extension)*

“If we keep doing what we’re doing, we’ll keep getting what we’re getting.”



# A Potential Solution:

**“Nature, to be commanded,  
must be obeyed”**

**-Sir Francis Bacon**

- If we wish to create more effective, efficient prevention & intervention programs, we must *understand how risk-, protective-, and vulnerability-enhancing mechanisms and processes actually work.*

—We need to construct “instruction manuals” that hold direct relevance for theoreticians, interventionists, administrators, and policy makers.



# How Can We Move from the Steel Age to the Information Age?

*How Can We Get More “Bang” From Our Research Studies So That We Know What We Are Doing, When to Do It, How to Do It, and With Whom to Do It?*



# How Can We Move from the Steel Age to the Information Age? (cont.)

- Why can't we import DP concepts and methods directly, without modification?
- Two Caveats:
  - Cannot import, without modification, the conceptual frameworks from DP
    - Contains ambiguities and inconsistencies that will reduce precision and overall utility
  - Not entirely appropriate for our needs: Fundamental differences in the nature of problems/populations studied
    - DP: Primarily chronically stressed populations
      - E.g., poverty, marital discord, community violence...
    - Traumatic Stress: Acute, Chronic, and Serial or Sequential
      - E.g., natural disasters, terrorist attacks, war, sexual abuse, domestic abuse, etc.



# Differences Between DP and Trauma (cont.)


- The Pivotal Concept of *Time*
  - DP Research Methodology: Development over time
    - Developmental trajectories
  - Trauma Research Methodology:
    - Pre, peri, and post trauma (we deal with focal traumatic events, not just chronic adversities!)
    - *and* development over time (including developmental trajectories)





Are We Splitting Hairs  
or Advancing the Field?

*(Does making a distinction  
make a difference?)*



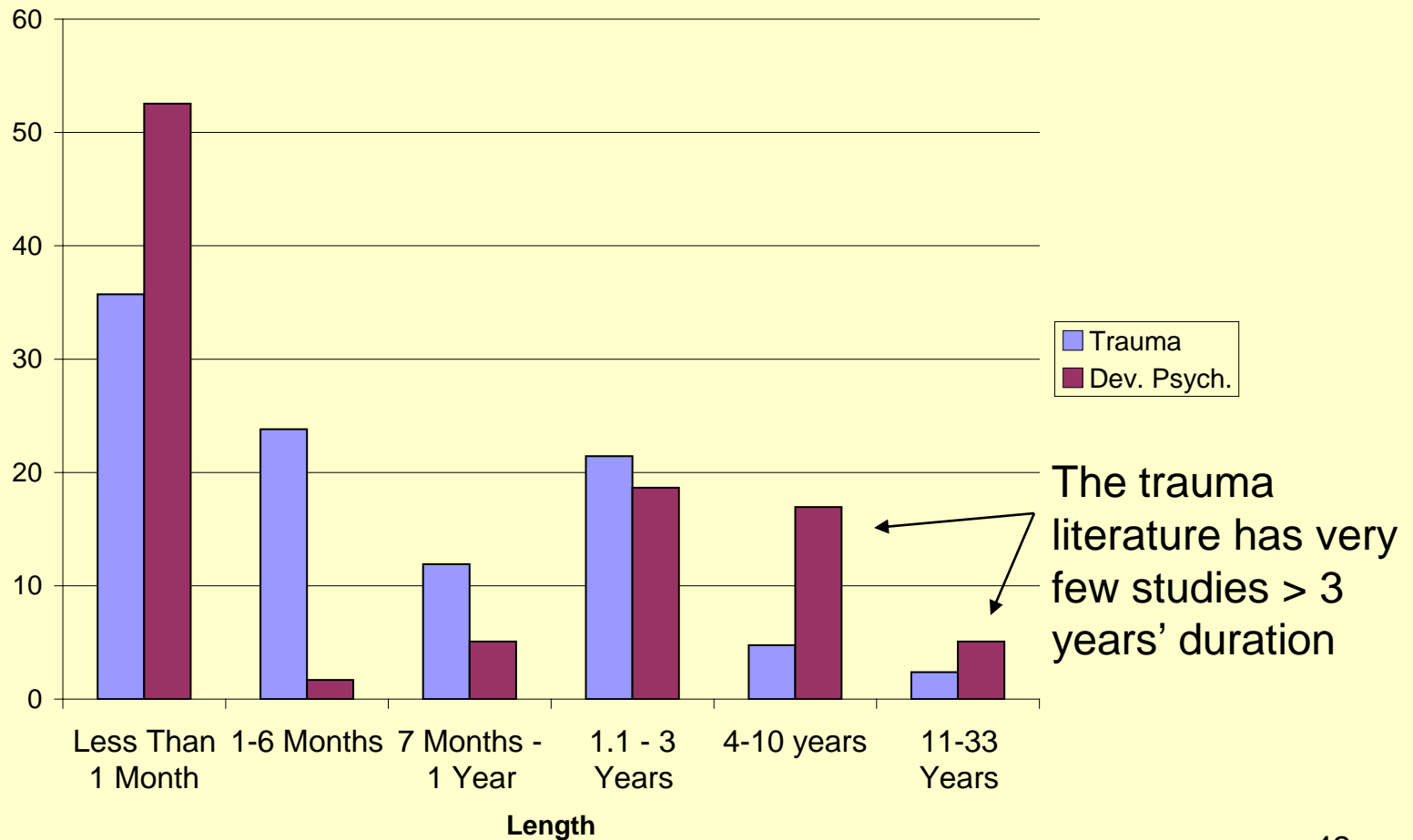
# Making a Distinction *Does Make a Difference!*

The inherent complexity of trauma and its aftermath *requires increased sophistication and precision in theory, terminology, methodology, and interventions relative to investigations of the effects of chronic hardships alone.*



# Does Time Matter?

## Length of Study Duration in the Two Literatures





Conclusion: *We Should Adapt and Refine  
DP Concepts for Our Own Populations,  
Questions, and Problems*

Question: *How Can We Enrich Our  
Conceptual Framework So That We Learn  
More From Our Own Studies?*

# Recommendation 1: Distinguish Between Resistance, Resilience, and Related Terms





We need to understand differences in these terms at the level of their etymologic roots:

- **Resistance (n)**: (c. 1350) from Latin resistere “to make a stand against, oppose, stand back, withstand” from *re* (against) + *sistere* (take a stand, stand firm)
  - Resistance thus means “withstand, stand firm against.”
  - Related to the word “insist” (to take a stand upon)
  - Manifest by a stable trajectory of functioning in the aftermath of a stressor.



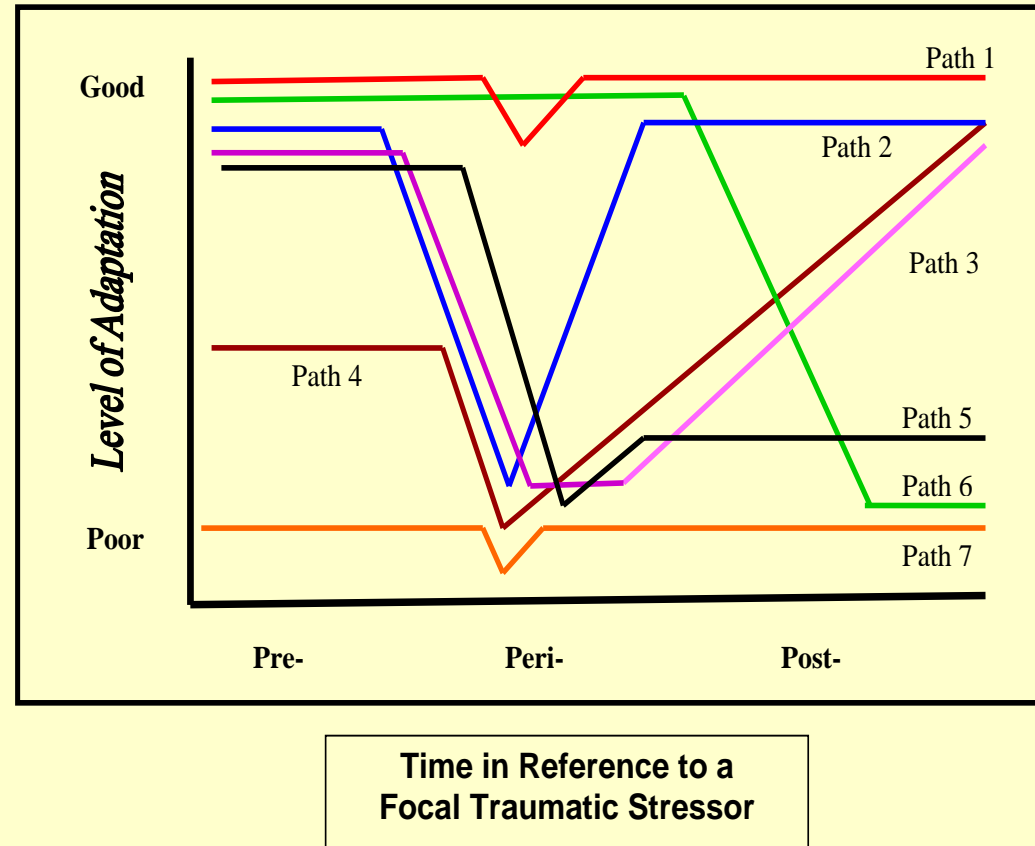
We need to understand differences in these terms at the level of their etymologic roots:

**Resilience (n)**: (c. 1620s) “rebouncing,” from Latin resilire “to rebound, recoil,” from *re-* “back” + *salire* “to jump, leap”.

- Resilience thus means “to bounce or jump back”
- Related to word “salient” (to leap or jump out)
- Manifest by a “V-shaped” trajectory of a (time-limited) decrement in functioning followed by “bouncing back” to prior functioning.

# Recommendation 2: Approach Resistance, Resilience, Recovery, & Chronic Distress as *Distinct, Ongoing Processes that are Distinguished by Different Trajectories*

- **Path 1**: *Stress resistance* (stable adaptive functioning)
- **Path 2**: *Resilience* (temporary perturbation in functioning followed by full recovery)
- **Path 3**: *Protracted recovery* (major perturbation followed by gradual return to positive adaptation)
- **Path 4**: *Posttraumatic growth* (perturbation followed by growth)
- **Path 5**: *Chronic severe distress* (persisting decrement in functioning)
- **Path 6**: *Decline* (initial resistance followed by decompensation)
- **Path 7**: *Stable maladaptive functioning* (persisting pre- and post-traumatic poor functioning)



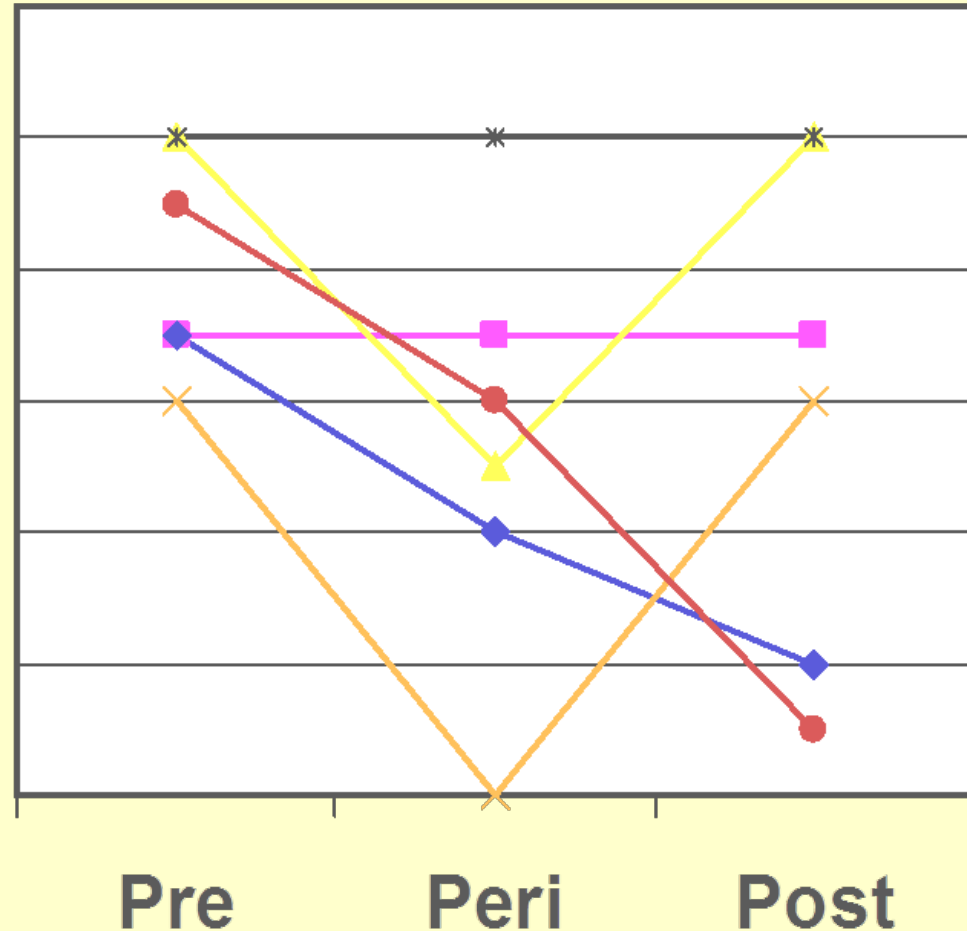
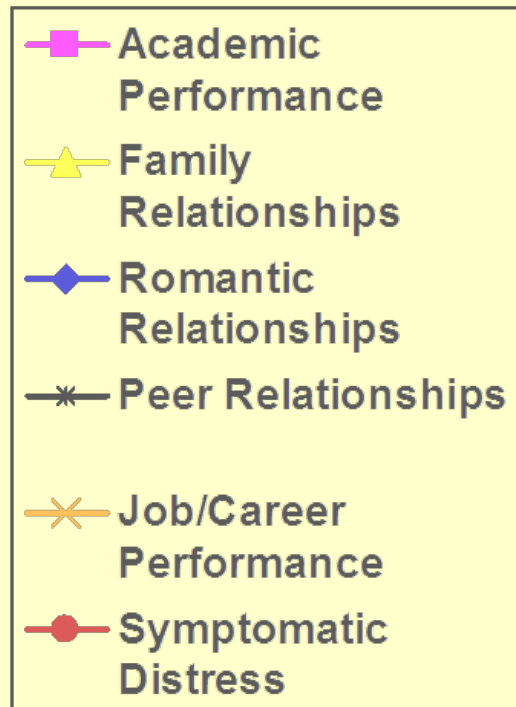
Adapted from: Compas, B.E., Gerhardt, C.A., and Hinden, B.R. 1995. Adolescent Development: Pathways and processes of risk and resilience. *Annual Review of Psychology*. 46: 265-293.





# Recommendation 3: Approach Resistance, Resilience, Recovery, & Chronic Distress as *Domain-Specific* Phenomena

**Psychosocial Domain:**



## Recommendation 4: Incorporate the Concepts of Equifinality and Multifinality Into Our Models

- Equifinality: A number of different antecedent risk events/circumstances may eventuate in the same outcome (i.e., *equal endpoint*).
  - In other words, *a given adverse outcome may be the consequence (via direct effects, interactive effects, or both) of multiple causal risk factors and vulnerabilities as they operate through different pathways of influence.*

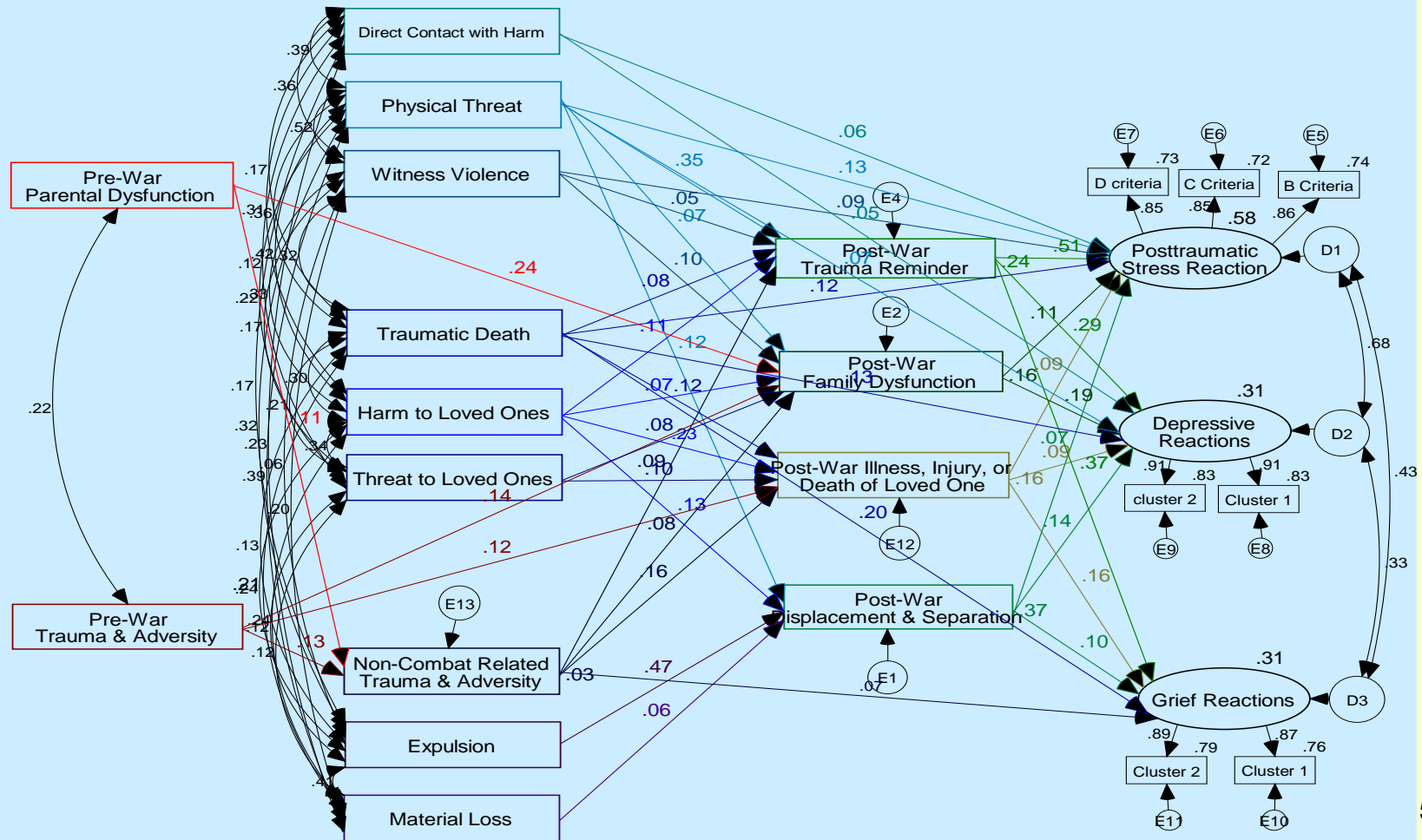
## Recommendation 4: Incorporate the Concepts of Equifinality and Multifinality Into Our Models (cont)


- Multifinality: The same antecedent risk may eventuate in a number of different outcomes (i.e., *multiple endpoints*)
  - In other words, *a given adverse event or circumstance may causally contribute to multiple adverse outcomes through different pathways of influence.*

# Illustration of Equifinality and Multifinality

(Layne et al.: Long-Term Post-War Adaptation in War-Exposed Bosnian Adolescents)

**Model C: Pre-War, War-Time, and Post-War Predictors of Long-Term Post-War Adjustment**





# Recommendation 5: Remember the Big Picture

*Aim: To Understand, Predict, and Control Behavior*

- **Understand**: Develop theory that explicates how risk factors, vulnerability factors, & protective factors intersect and interact to form *pathways of influence*.
- **Predict**:
  - *Which* risk and vulnerability factors place youths at increased risk for *which* maladaptive outcomes, and at decreased risk for *which* positive outcomes, via *which* pathways?
  - *Which* protective factors place youths at decreased risk for *which* maladaptive outcomes, and at increased likelihood for *which* positive outcomes, via *which* pathways?
  - How do risk, vulnerability, and protective factors combine or interact?
    - With which risk factor(s) is a given protective factor maximally protective?
    - With which risk factor(s) is a given vulnerability factor maximally influential?
    - Which risk factors increase the likelihood of which adverse outcomes?

## Recommendation 5: Remember the Big Picture (cont)


**Control:** Harness mechanisms, processes, and pathways of influence according to the following intervention algorithm:

- Harness and augment naturally occurring protective processes, & (as needed) use specialized, time-limited interventions to:
  1. Identify, prevent, or mitigate the influences of, *risk factors*
  2. Identify, reduce, or mitigate the influences of, *vulnerability factors*
  3. Identify, augment, and therapeutically harness the influences of, naturally existing *promotive* and *protective factors*
- As needed, supplement the above efforts with specialized interventions
- Conduct ongoing monitoring and surveillance activities
- Make “course corrections” as needed in objectives, strategies
- Systematically evaluate outcomes and impacts:
  - Increased likelihood of positive adaptation
  - Reduced likelihood of maladaptation



# The Bottom Line

- To develop a model we need to put the component parts together
- To put the parts together we need to *clearly define and distinguish them*
- To communicate how to use the model we need to standardize the definitions (a *Lingua Franca*)
- Clinicians, researchers, and theoreticians need to know what is meant by such terms as risk, vulnerability, protective, resistance, resilience, etc. in order to effectively apply them.
  - Notwithstanding our diversity and the complexity of the phenomena under study, can we clearly and efficiently communicate in a common tongue?



# Beyond Shopping Lists

- “Nature, to be commanded, must be obeyed.”
  - To command nature, one must *understand its governing laws*
- Mechanisms, processes, and pathways of influence *are* the forces that, *operating according to discoverable laws and principles*, govern the trajectories of posttraumatic adaptation and, more broadly, of ontogenetic development
  - In order to implement goal-oriented, coherent, effective, and efficient prevention and intervention programs, *we must understand the laws and principles of operation that govern and regulate developmental and recovery trajectories*





# Where Do We Go From Here?

“Far too much research into psychosocial risk factors has been content to stop at the point of identifying risk variables. There is no shortage of data on such variables and we know a good deal about the identification of risks. *What we know much less about is how these risk mechanisms operate. Inevitably, that means that we are in a weak position when designing interventions to prevent or treat disorders.*”

(Rutter, 1996, p. 365, italics added).



The End