

Synergy: Why Two Can Be Greater than Four or More What Mental Health Providers Should Know



In research on risk and resilience, the term “synergy” refers to a mathematical value that quantifies how much additional risk occurs when certain pairs of risk factors co-occur and interact. Understanding synergy for children who experience trauma is important because it tells us how much more powerful certain combinations of traumas and adversities are when they happen to the same individual. In other words, synergy describes how the combined effects of two traumas and/or adversities may be greater than the summed effects of the individual traumas and/or adversities on a given outcome. This study examined whether certain pairs of trauma and adversity have more additive synergy than others. It also investigated whether additive synergistic pairings differed by gender and/or age group.

What is the issue?

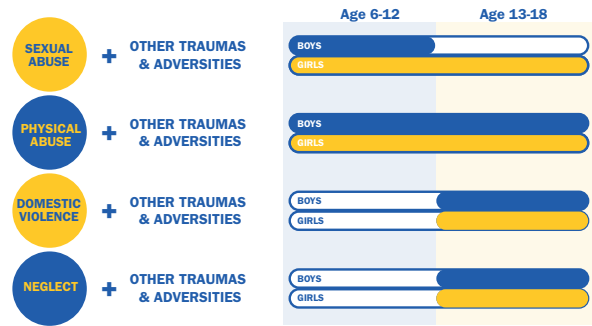
- A cumulative score of 4 or more (4+) Adverse Childhood Experiences (ACEs), on many ACE screeners, has become a de facto threshold for identifying elevated risk for a wide range of negative medical, mental health, and social outcomes.
- This 4+ assumption presumes that all ACEs are equal and that their cumulative effect is linear, or has the same effect for each type of ACE.
- There is growing evidence to suggest that all ACEs are NOT equal and they may vary in terms of their impacts by gender and age. As a result of synergy, a person with 2 ACEs may be at greater risk for negative outcomes and/or be more symptomatic than someone who has 4+ ACEs.

What are the findings?

- The study looked at 21 different pairings of 7 commonly assessed ACEs. Overall we found, in this diverse sample of 10,355 youth ages 1.5 – 18 years from the National Child Traumatic Stress Network Core Data Set, that not all traumas and ACEs examined were equal in their contribution to clinical level behavioral problems measured by the Child Behavior Checklist (CBCL).
- Sexual abuse, Physical Abuse, Neglect and Domestic Violence had the most synergistic pairs. This means that when any of these experiences occurred in conjunction with other traumas and adversities the effects of exposure were more powerful. In some cases, we saw the risk for behavioral and emotional problems on the Child Behavior Checklist for Children (CBCL) increase by 30-60%.
- Across genders (females and males), most synergies occurred in the 6-12 & 13-18 age groups. Interestingly, the synergistic effects of sexual abuse in males was confined to the 6-12 age group, whereas sexual abuse was synergistic across all of the female age groupings. Physical Abuse was synergistic in the both the 6-12 and 13-18 male and female age groups while Neglect and Domestic Violence were also broadly synergistic across male and female older age groups.

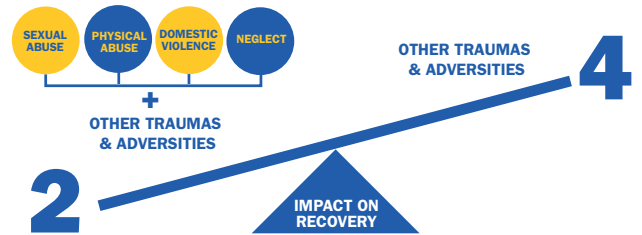


- Boys had more synergistic pairs than girls (16 vs. 7) which explained more of the variance in behavioral problems on the CBCL (42% vs. 36%).
- Sexual abuse was involved in 70% of female and 50% of male synergistic ACE pairs.
- The synergistic combination of sexual abuse and physical abuse was the most potent.



What can you do?

- Consider more than a simple count of the type of ACEs a child has experienced when conducting assessments. Children and adolescents who have experienced two specific ACEs can be equally or more symptomatic than those who have experienced four or more.
- Adopt a more nuanced approach to understanding how synergy between different traumas and adversities can have a significant impact on a child's outcomes. Children with trauma histories that include sexual abuse, physical abuse, neglect, or domestic violence are likely to have increased risk for negative outcomes.
- Relatedly, consider how sexual abuse in females may have a synergistic effect with other traumas and adversities regardless of age.
- Identify early intervention opportunities to reduce negative outcomes. Most synergistic interactions for behavioral problems occurred in the 6-12 and 13-18 age groups. However, younger children who experience the same pairings of certain traumas and adversities, may be asymptomatic in terms of clinical levels of behavioral problems.



Citations for Paper

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Briggs, E. C., Amaya-Jackson, L., Putnam, K. T., & Putnam, F. W. (2021). All adverse childhood experiences are not equal: The contribution of synergy to adverse childhood experience scores. *American Psychologist*, 76(2), 243–252. <https://doi.org/10.1037/amp0000768>

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The Core Data Set was developed as a central part of the mission and vision of National Child Traumatic Stress Network (NCTSN), which seeks to raise the standard of care for children who have experienced trauma. The NCTSN Core Data Set was the first collection of behavioral health data to include a set of forms and assessment measures designed to systematically capture important demographics, trauma exposure, client functioning, service use, and treatment information for youth and families affected by trauma. The Core Data Set includes information from 78 NCTSN sites that received referrals for 14,890 children who experienced trauma between the years of 2004 and 2010.

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