

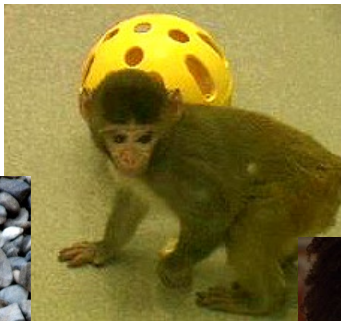
Neurobiological Mechanisms Underlying Stress Susceptibility and Resilience

Lessons Learned from Studies with Nonhuman Primates and Young Children

Judy L. Cameron, PhD

Departments of Psychiatry, Neuroscience, Behavioral & Community Health,
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Timing of Stress



**Timing of
Intervention**



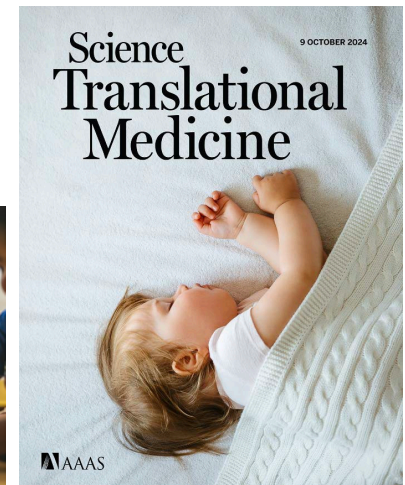
Support



Gender



Sleep



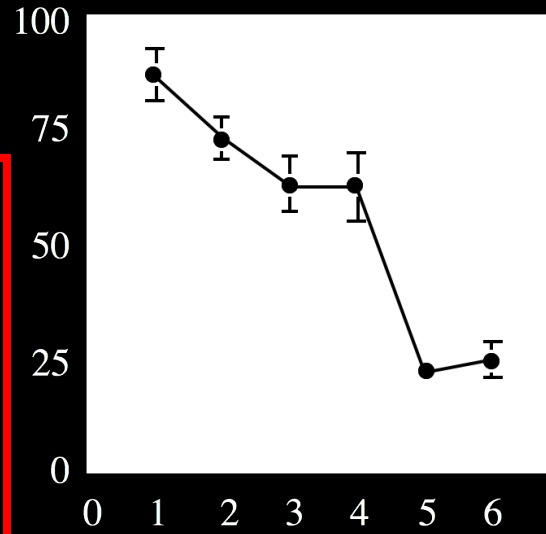
Judy Cameron is CEO of Working For Kids Building Skills LLC



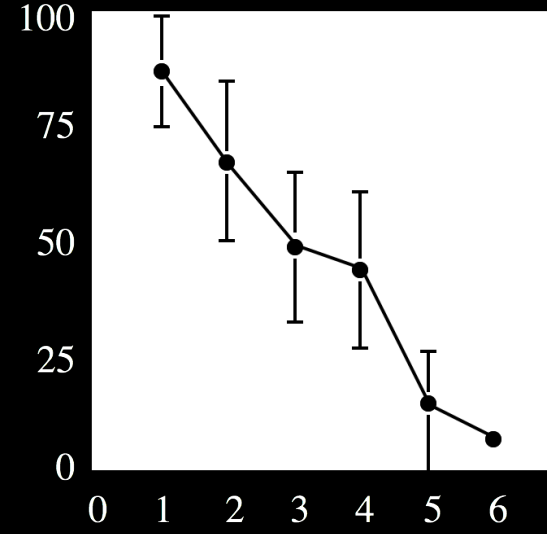
0:23:26:1

Ventral Contact (percent time)

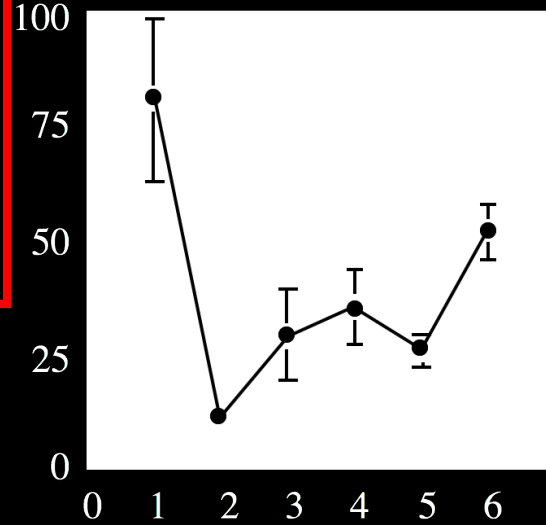
6 month separated



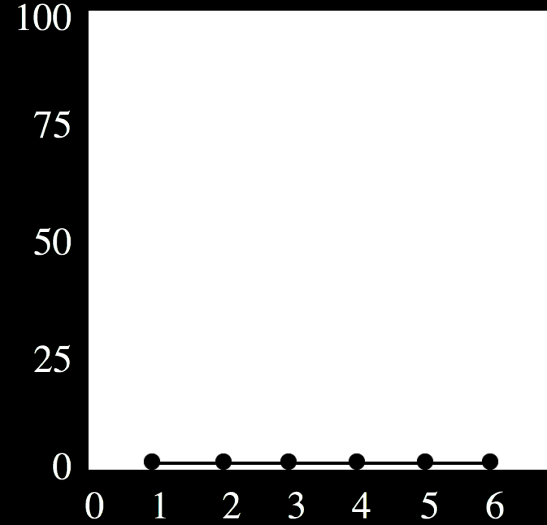
3 month separated



1 month separated



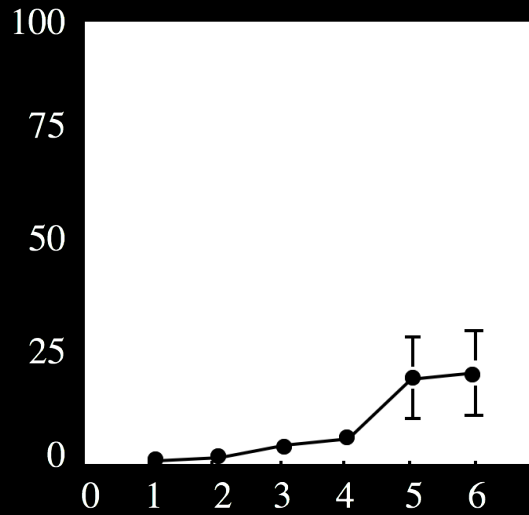
1 week separated



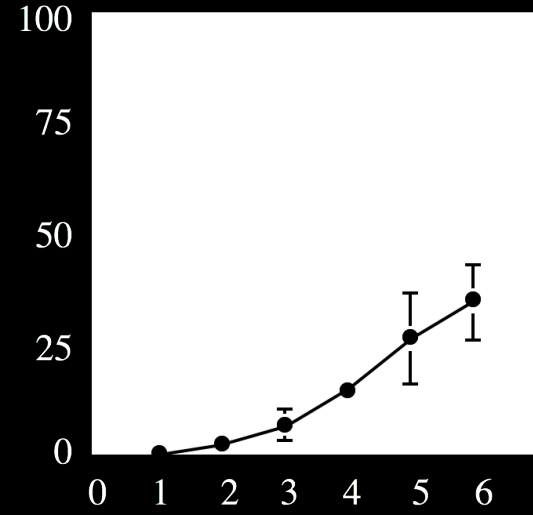
Age (months)

Sit Alone (percent time)

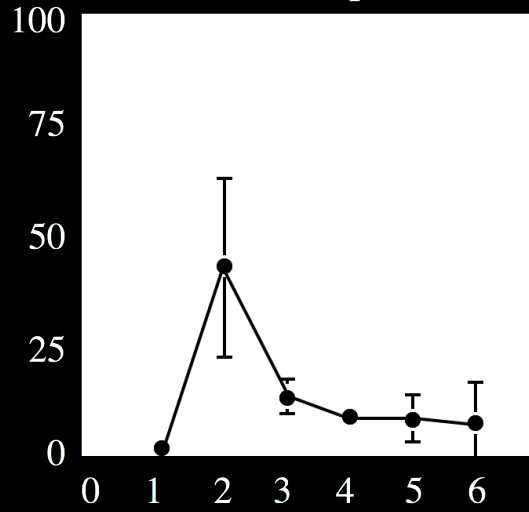
6 month separated



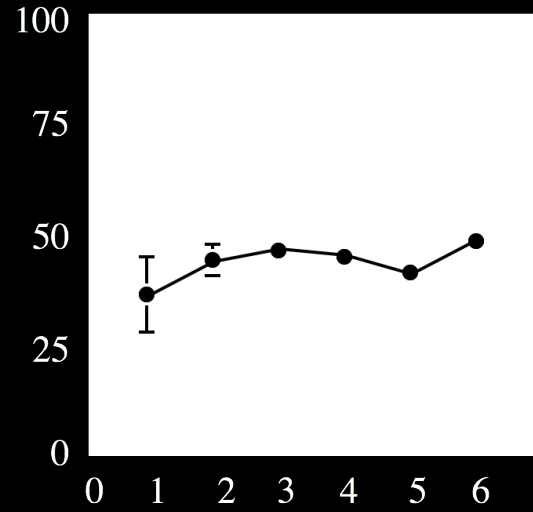
3 month separated



1 month separated

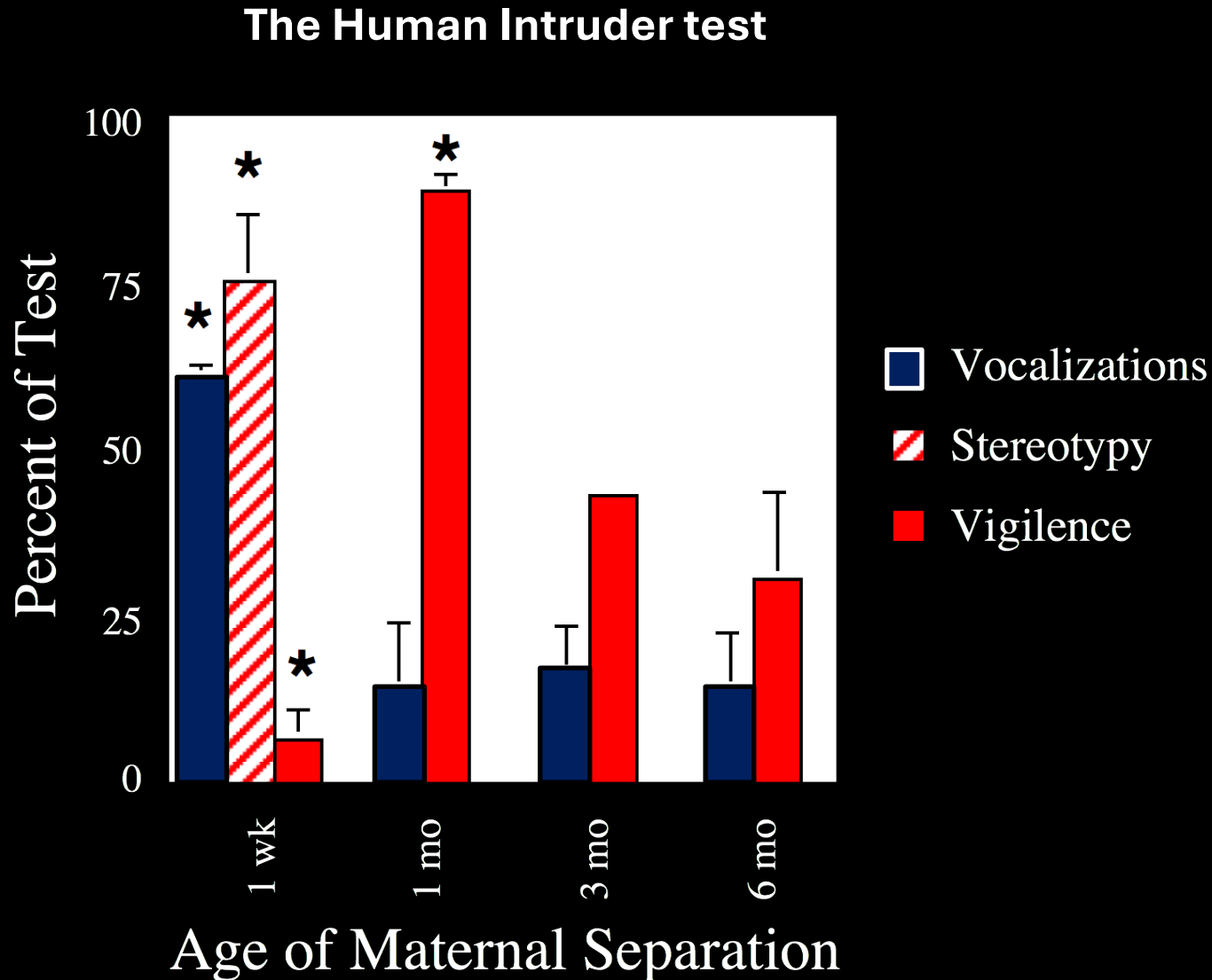


1 week separated

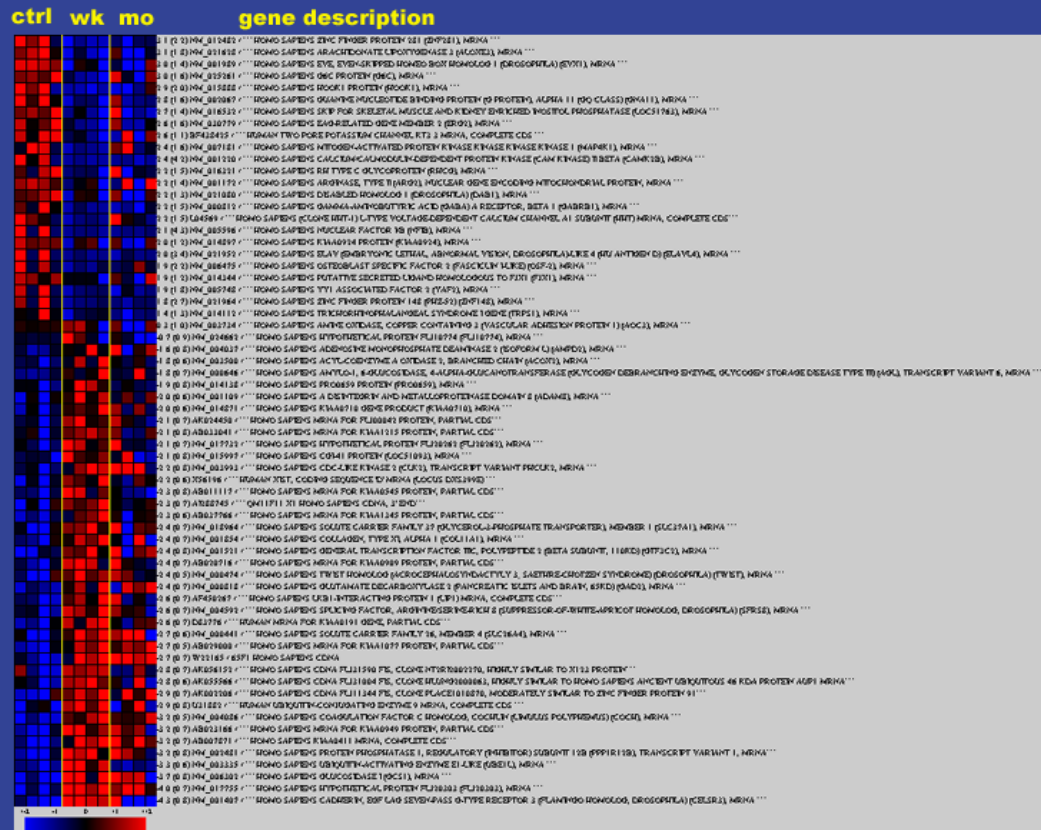


Age (months)

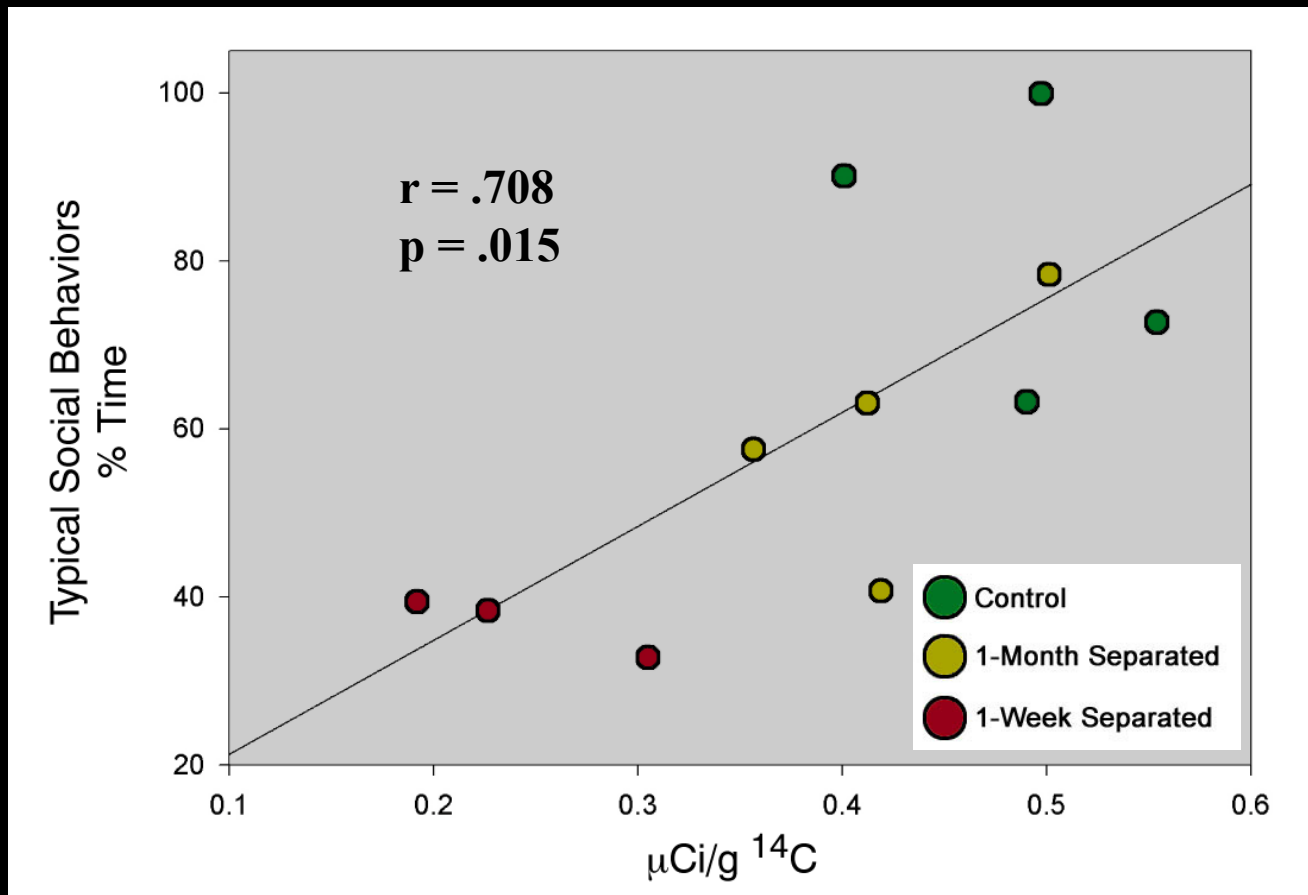
Social Anxiety Differs Depending on *Timing of Stress*



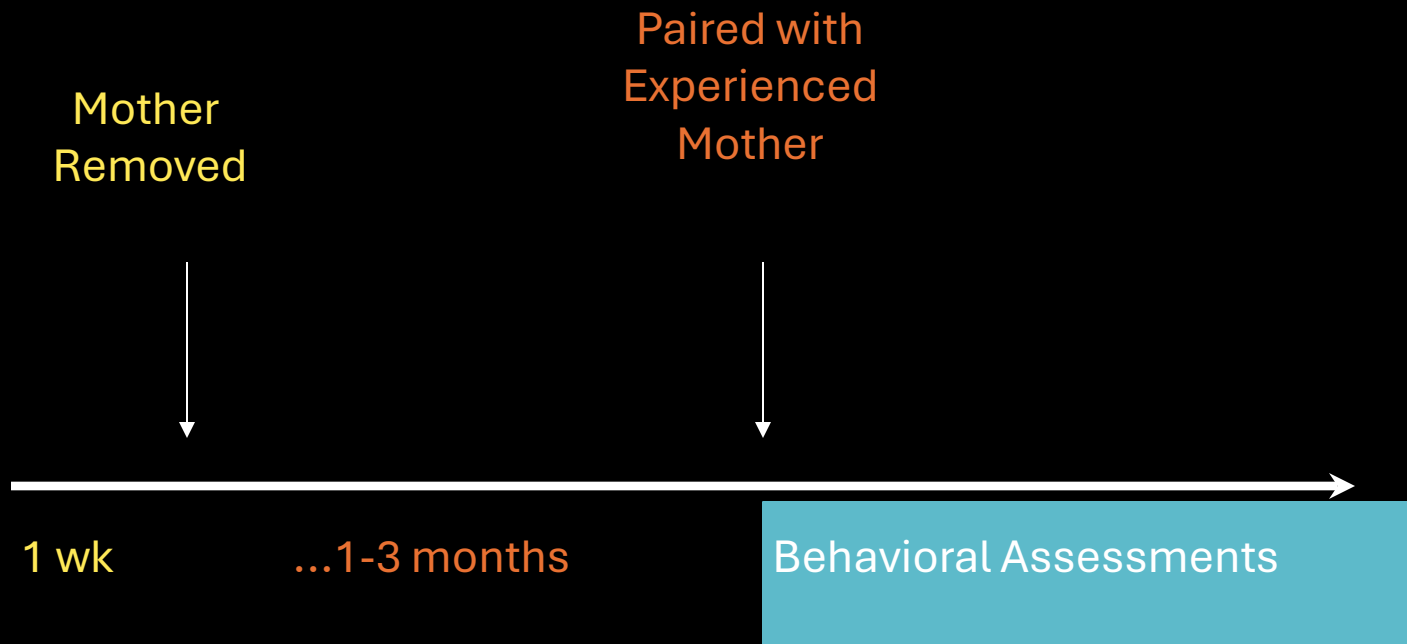
Amygdala Microarray Studies



Typical Social Behavior vs. Guanylate Cyclase 1 α 3

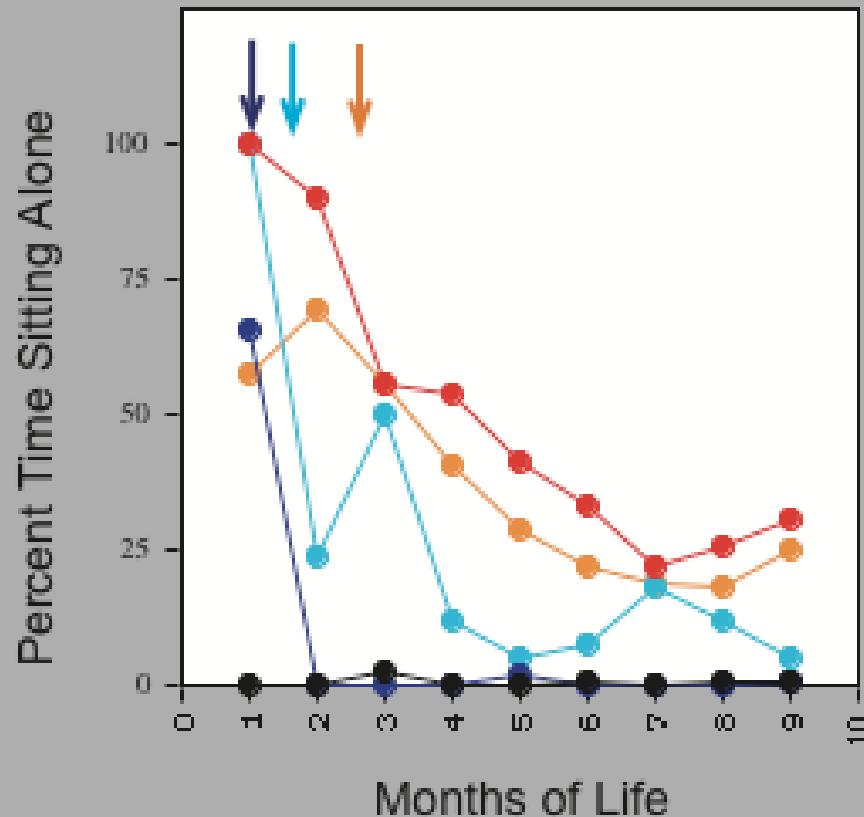


Intervention Design



Pairing with an Experienced Mother is More Effective when Initiated Early

(arrows show introduction of experienced mother)



Lessons Learned from Studies with Young Children

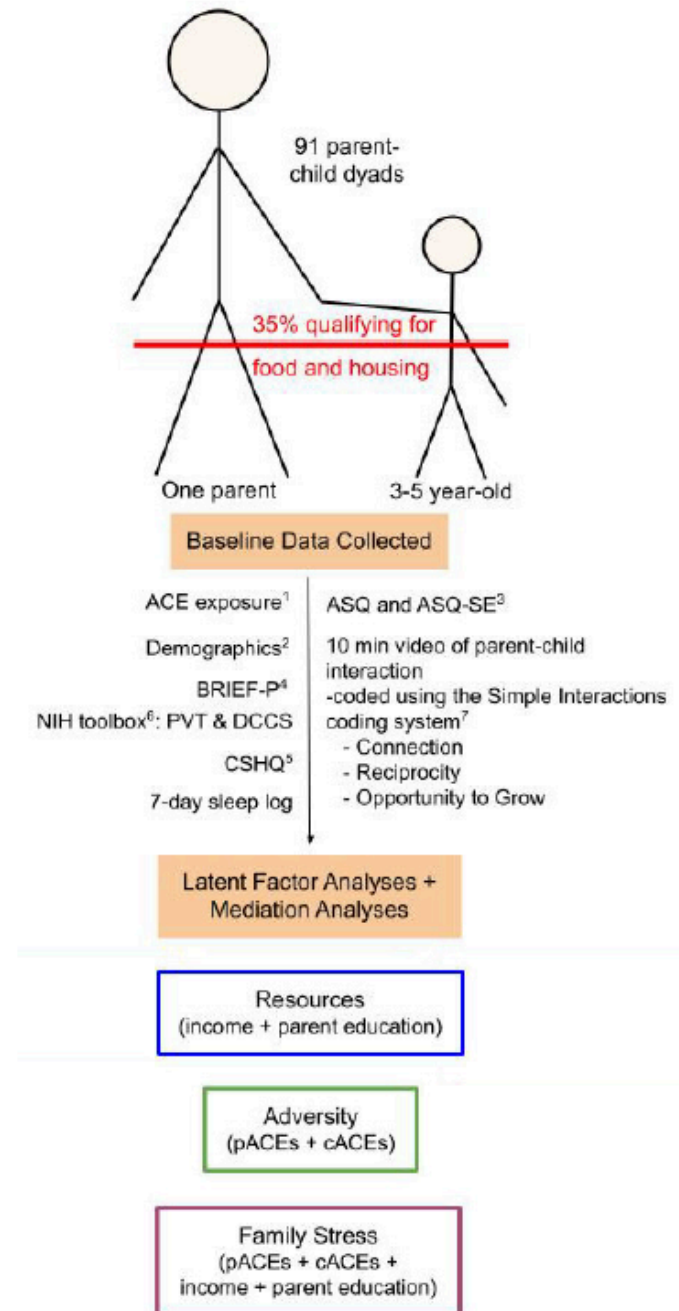
Life stresses are more complex:

Poverty

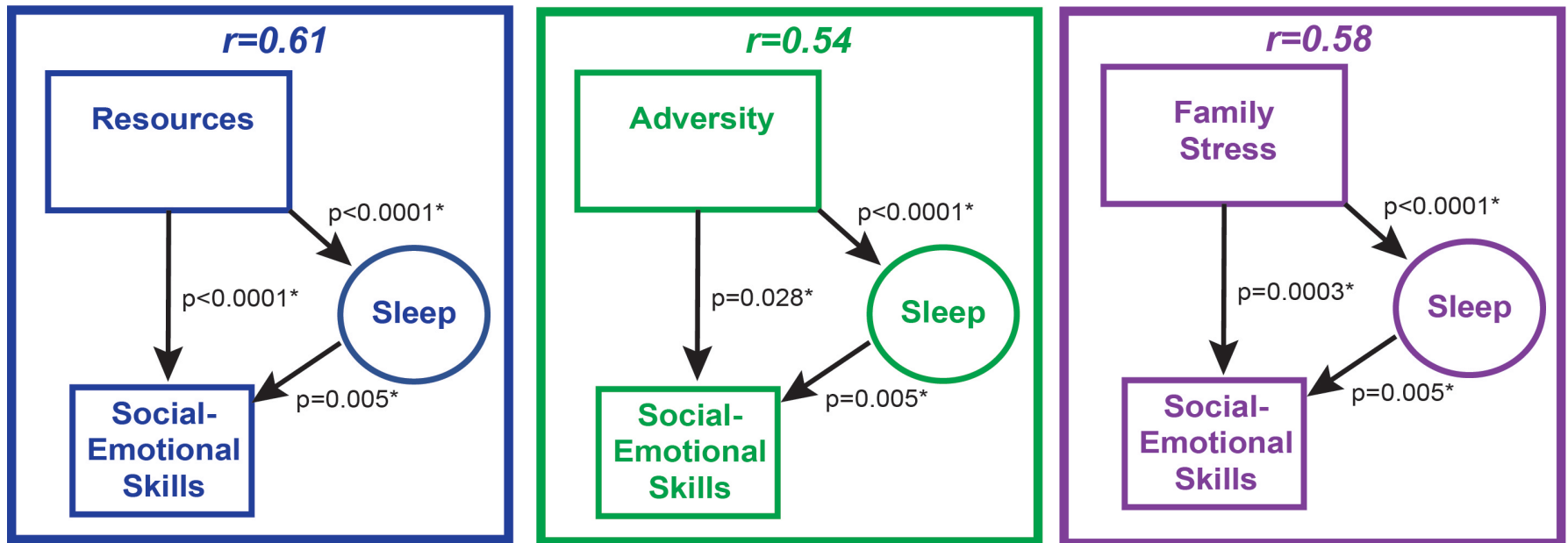
Parent Education

Adversities (faced by parents)

Adversities (faced by children)

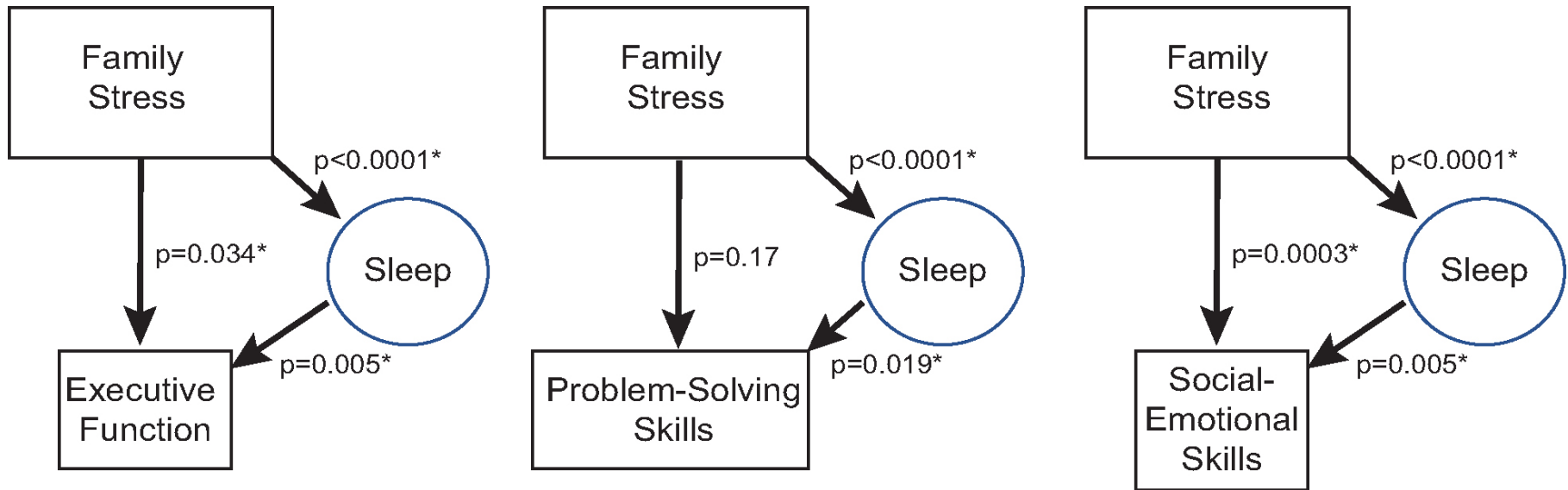


Social-Emotional skill development is similarly impacted by *adversity and low resources*



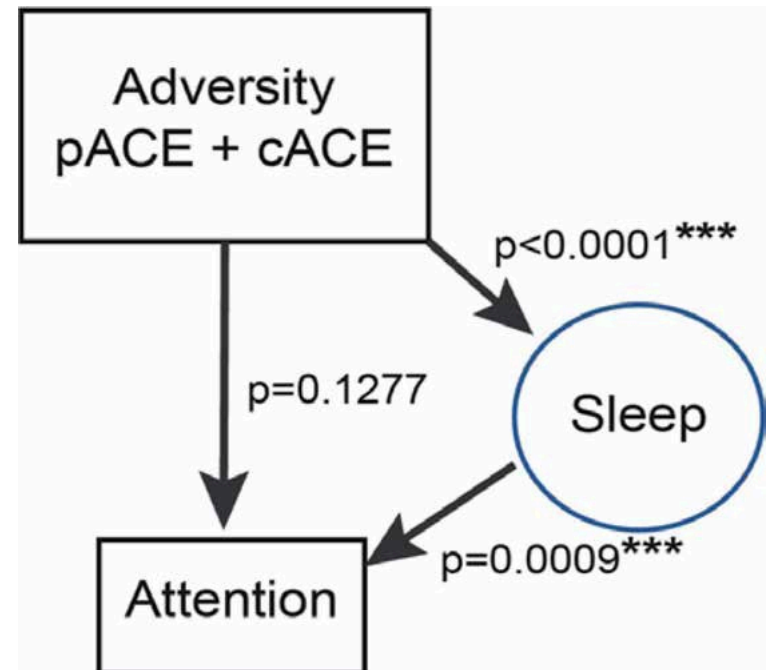
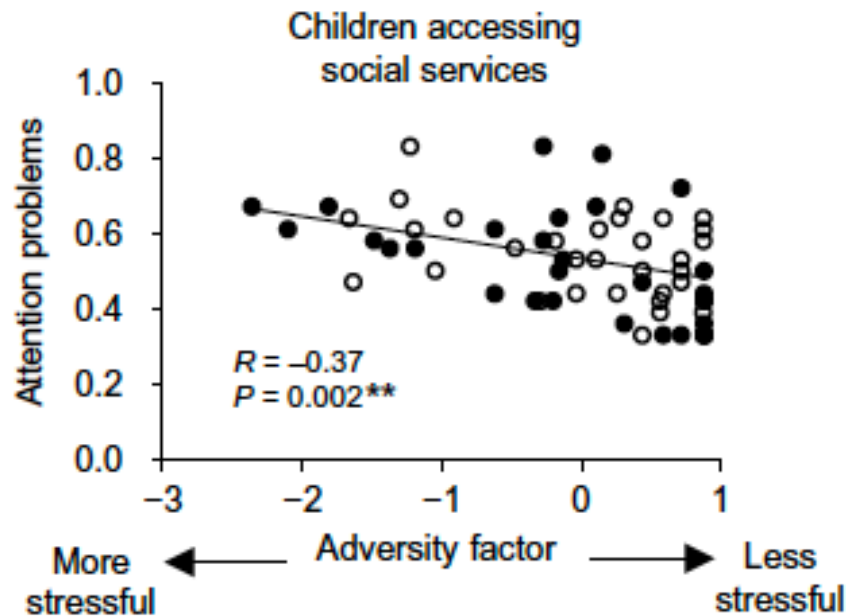
...and in all mediation models
Sleep is a significant mediator.

Sleep mediates the impact of stress on all of children's developmental skills



Gender also influences susceptibility to stress/resilience

Adversity is associated with attention problems in boys



Again...**Sleep** is a significant mediator

What Have We Learned?

- The ***developmental timing of stress exposure*** influences whether an individual is stress sensitive or stress resilient for specific outcomes.
- ***Social support improves resilience, but the timing of providing social support matters.***
- Early life stress leads to ***long-term changes in behavior, gene expression and neuroanatomy.***
- ***Sleep is an important mediator of the impacts of stress on developmental skills. Thus, sleep plays an important role in mediating the transition between stress sensitivity and resilience.***
- ***Gender*** can matter when considering stress sensitivity or stress resilience.



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