



Jacobs Center Research Seminar Series

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From Parents to Offspring: Unlocking Brain Development Through the “TRIO Study”

Intergenerational transmission refers to the process by which parental traits influence offspring's traits through genetic and/or non-genetic pathways. Although previous studies have attempted to investigate the mechanisms underlying intergenerational transmission, a critical limitation has been the underrepresentation of fathers. To address this gap, we launched a novel research project, the Transmit Radiant Individuality to Offspring (TRIO) study, which focuses on Japanese biological parent-offspring trios consisting of fathers, mothers, and offspring. As of August 2025, we have collected genomic data, environmental measures, cognitive assessments, and neuroimaging data from 289 trios.

Using these data, we have approached intergenerational transmission from two perspectives: parent-offspring brain similarity and the intergenerational effects of trauma. First, we found that similarities in brain structural features differ across parent-offspring sex combinations (i.e., father-son, father-daughter, mother-son, and

mother-daughter) Second, we found that there are differences in the associations of paternal and maternal experiences of childhood maltreatment with offspring brain structure. We believe that neuroimaging studies using samples from trios of fathers, mothers, and offspring will advance our understanding of how intergenerational transmission shapes radiant individuality in humans.

In this talk, I will introduce the TRIO project and highlight our recent findings. Understanding the mechanisms underlying intergenerational transmission may facilitate the development of interventions aimed at disrupting the cycle of maladaptive experiences, such as psychopathology and abuse, while also promoting the acquisition of adaptive traits, such as resilience and positive parenting. The TRIO study is an ongoing project, and I look forward to sharing insights and discussing opportunities for future collaboration.

Monday, December 15, 14:30 h

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