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Epigenetic signatures of intergenerational exposure to violence

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Maternal trauma is known to impact fetal and adult health outcomes, possibly through epigenetic modifications such as DNA methylation (DNAm). In contrast to model organisms, research in humans on the intergenerational epigenetic transmission of maternal trauma effects is much more limited. In this study, we hypothesize that exposure to violence leaves intergenerational epigenetic marks. Thus, we assessed DNAm signatures of war-related violence, comparing germline, prenatal, and direct exposure to violence across three generations of Syrian refugees. We compared families in which the pregnant grandmother vs the pregnant mother was exposed to war violence and included a control group of Syrian refugees unexposed to war violence. We collected buccal swab samples and survey data from mothers and two children in each family (n=131 participants). Based on an epigenome-wide association study, we identified multiple DNAm marks that were associated with germline and direct exposure to violence. Identification of a germline epigenetic signature of violence in humans supports our hypothesis and highlights DNAm as a mechanism to preserve information about trauma exposures across generations. Most sites showed the same directionality in DNAm change across germline, prenatal, and direct exposures, suggesting a common epigenetic response to violence. Furthermore, in children, we identified epigenetic age acceleration in association with prenatal exposure to violence highlighting the critical period of *in utero* development. These results have profound implications for understanding how lived experiences become embedded in the genome and ongoing efforts to ameliorate multigenerational cycles of violence, abuse, and poverty.

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Trends in NAGPRA Literature

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Biological anthropology greatly contributed to the presence of Native American ancestral remains held in museum and university collections, and recently has been engaged in discussions about the ethical engagement with these collections. An important step in this discussion is to consider how the NAGPRA law, which has been in effect for over 30 years, has been incorporated in the discipline's primary literature. This study aims to understand the trends in the literature regarding mentions of NAGPRA. Keyword searches were conducted using Web of Science to generate a database of articles that referenced the law in any way. The search was restricted to journal articles published between 1990 and 2023, and returned only 103 articles with direct mention to NAGPRA. Title, authors, date of publication, publication title, and abstracts were collected. Journal descriptions were used to assign disciplines for each publication.

Results show that few journal articles discussed NAGPRA in the 1990s (N=15) and 2000s (N=22), and publications become more common in the 2010s (N=56). Museum Anthropology is the journal with the most articles (N=13), while the American Journal of Biological Anthropology only has 5 articles mentioning NAGPRA. The journals aimed at general anthropology disciplines contained 21 articles, archaeology journals had 14 articles, biological anthropology journals had 9 articles, and museum studies journals had 22 articles. This initial result demonstrates that, despite its importance, NAGPRA has not been significantly incorporated in bioanthropological literature, and that conversation is occurring primarily in museum and archaeology literature.

Semi-prehensile tail use in wild cercopithecid monkeys

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Prehensile tails are found across the globe as an adaptation for stability in arboreal environments. Among primates, only some platyrrhines have prehensile tails, but evidence of some caudal prehensile ability has been documented in cercopithecids. To document wild primate locomotion, we collected videos of eight species of cercopithecid monkeys from Kibale National Park, Uganda. Preliminary review of the sample has identified 31 videos with tail behavior classified as "semi-prehensile", e.g. the tail is partially or fully wrapped around a substrate. This behavior was identified in adult *Papio anubis*, *Cercopithecus mitis*, *Cercopithecus ascanius*, *Colobus guereza*, *Lophocebus albigena*, and *Chlorocebus aethiops* (N videos=18). Juvenile and infant *P. anubis*, *C. mitis*, *C. ascanius*, and *C. aethiops* also displayed semi-prehensile tail behavior (N=13). In adults, this behavior was typically associated with foraging for leaves or tree gums (N=17), and/or utilizing an "unstable" stance, defined by support of three or fewer limbs (N=16). Juvenile *P. anubis* used its tail in a semi-prehensile way to stabilize locomotion on a precarious substrate (N=3). Infant *C. mitis*, *C. ascanius*, and *C. aethiops* wrapped their tail around their mother's tail or hindlimb while clinging ventrally (N=10). This is the first time semi-prehensile tail behavior has been described in detail in wild cercopithecid monkeys. Quantification of semi-prehensile tail use in non-platyrrhine primates will provide a better understanding of the evolution of platyrrhine tail prehensility. It will also increase our understanding of the ways in which the tail facilitates stability in an arboreal environment.

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Longevity is a special kind of endurance

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Endurance can refer to an organism's capacity for physiological resilience in the face of environmental stressors. Research on the molecular basis of aging has elucidated ancient regulatory pathways that act as longevity circuits when properly stimulated including short periods of moderate physiological stress (a concept called hormesis).

Such stressors include moderate hyperthermia, exercise, or calorie restriction. In addition to the considerable energy females transfer to their offspring during gestation and breastfeeding, in many groups they must also effectively carry children, water, food, and fuel.

We believe the ability of females to cooperatively share energy likely allowed females across a wide age span to operate in a hormetic stress zone, enhancing their lifespans, although potentially at the cost of a slower preferred speed of walking due to habitual load carrying.

To learn whether older women had the physiological resiliency to walk faster again, in 27 women 55-88 years old we tested whether a novel mobility trainer – a 4-wheel, spring-loaded, upright pivoting frame designed to cue each step through timely proprioceptive feedback – could improve their preferred walking speed. After only nine 30-minute training sessions over three weeks, we found that the women who walked using the mobility trainer had increased their walking speed compared to their baseline values (p=0.03) and against a comparable group who walked the