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How should we study intergenerational trauma? Reflections on a 30-year birth cohort study in Soweto, South Africa

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My parents immigrated to the United States from South Korea in the late 80's in search of political stability and socioeconomic opportunity. While they did not come with much money or many belongings, as children of survivors of Japanese colonialism and the Korean War, my parents brought with them the heavy burdens of historical trauma from militarized occupation and their memories of growing up in a precarious and rapidly transitioning post-war society. As I grew older and became aware of such violent histories, I wondered how the phantoms of my family's past could continue to haunt us in the future. How did my ancestors, grandparents, and parents endure and overcome such oppressive conditions, and could the cumulative trauma they embodied overtime reverberate across multiple generations and affect me?

These life-long reflections have motivated my current dissertation research, which asks: How is trauma biologically inherited across generations? In the past two decades, scientists have taken growing interest in the possibility that human physiological mechanisms may underlie the transmission of stress and trauma across generations (Carey 2018; Pember 2015). Major recent scientific breakthroughs, such as the epigenetic inheritance of maternal care in rats (Weaver et al. 2004) and the consonance of biological and psychiatric trauma phenotypes between Holocaust survivors and their "unexposed" children (Yehuda & Brier 2007), shed light on the possibility that the effects of trauma may be intergenerationally transmissible through hormonal and epigenetic processes (Yehuda & Brier 2007, Fish et al. 2004; Weaver et al. 2004). In particular, the intergenerational transmission of trauma has been widely theorized to manifest during fetal development as a result of maternal exposures to social adversity (Kuzawa & Sweet 2009; Weinstock 2008).

Though scientists have only recently documented the intergenerational impacts of trauma on human biology and health, communities across the globe have long witnessed the lingering impacts of historical traumas on the health and well-being of subsequent generations (Andermahr 2016;

Gobodo-Madikizela 2016; Schwab 2010). These intergenerational manifestations of trauma have been described as feelings of collective “loss” in various Native American groups, (Whitbeck et al. 2004) and discordant family relationships in Alaska Native communities (Evans-Campbell 2008). The effects of intergenerational trauma are also understood to affect the development of a variety of stress-related illnesses such as depression, post-traumatic stress disorder (PTSD), cardiovascular diseases, among others. They also manifest in higher rates of diagnosis of mental illness, particularly in systematically marginalized groups (Yehuda et al. 2008; Mai et al. 2010; Gone 2009). Overtime, greater recognition of the long-term consequences of historical trauma has proven to give meaning to various complex family dynamics such “generational curses,” (Ajatnoah-Gyadu 2004; Vuong 2019; Yoon 2018) “intergenerational cultural dissonance” (Choi et al. 2008; Kane et al. 2019), and other cyclical patterns of family-based violence.

A large body of scholarship in public health and the social sciences has framed these cases of intergenerational trauma through deficit models of health and the theoretical lens of social suffering (Butt 2002; Kleinman et al. 1997; Morgan & Ziglio 2007; Robbins 2013). Some communities have reclaimed scientific evidence of intergenerational trauma in order to raise awareness about the legacies of embodied oppression (Dubois & Guaspere 2020; Grossi 2020). For example, Native American, Australian Aboriginal, and African and African diasporic groups have used scientific studies of intergenerational stress transmission to push for reparative action and redistributive justice in their respective communities (Bombay et al. 2014; ICC 2017; Rothstein et al. 2009; Warin et al. 2020).

Birth cohort studies have become the gold-standard method for tracing the intergenerational transmission of stress primarily due to the major focus on the developmental origins of health and disease framework in public health (Barker et al. 1989). Epidemiologists and public health officials have held birth cohort studies in high regard to elucidate the biological mechanisms underlying intergenerational trauma, as stress-related diseases such as depression and hypertension are understood to largely originate from intrauterine exposures to maternal trauma and social adversity (Entringer et al. 2015). And after twenty years of research using birth cohort studies to assess the DOHaD hypothesis, anthropologists have entered these research conversations with much-needed critical discussions of the social and political consequences of the current course of research on intergenerational trauma. Given the rapid pace at which scientific knowledge about the biology of intergenerational trauma from birth cohort studies is moving as well as the deep political and ethical implications of such biosocial research, we must take pause to critically reflect on how scientific knowledge about intergenerational trauma is produced and its potential social implications.

Tracing three generations in a longitudinal birth cohort study in Soweto, South Africa

I bring these reflections to my dissertation work in South Africa where I've studied the intergenerational mental health impacts of stress and trauma from apartheid across three generations of black South African families living in the Soweto township of Johannesburg. In the early 1990s, thousands of expectant mothers (first generation) across race and class lines were enrolled into what is now a 30-year ongoing birth cohort study, the "Soweto Community Study" (SCS) (a pseudonym).

SCS began enrolling pregnant women during a pivotal period in South African history, which included the release of Nelson Mandela and the beginning of negotiations to formally end apartheid. Political and community violence, however, continued to ensue in Soweto, fueled by strict militarized political repression of resistance movements, covert government efforts to instigate interethnic violence in black communities, and community violence over scarce resources in informal settlements (Beinhart 2001). It is estimated that approximately half the people who died due to political violence during the apartheid regime died in the last four years (1990-1994) (Beinhart 2001; Hickel 2015).

During this time, expectant mothers participated in their first SCS visit and completed a series of surveys during their third trimester, one of which was a 16-question scale of apartheid-related stressful and traumatic events. The aim of SCS was to evaluate the long-term impacts of rapid urbanization and societal transition from apartheid on child health and well-being. And although SCS children were all *in utero* during the apartheid regime, they unexpectedly became among the first generations of children born into a democratic South Africa.

My current fieldwork follows up with a subset of now 30-year old adult mothers (second generation) and their own children (third generation) during a time of shifting societal conditions, 26 years after the legislative end of apartheid. My dissertation examines the possible intergenerational effects of prenatal stress on mental illness risk among second-generation adults and third generation children (e.g. depression, anxiety, PTSD) and the stress physiological mechanisms that may perpetuate the past embodied impacts of trauma across generations.

Over my four years of studying intergenerational trauma in Johannesburg, one reflection continues to revisit me.

Are we measuring what we say we're measuring? Ethnographic contextualization matters.

I share an entry from my field notes about my conversations with a SCS family earlier this year:

Thirty years after Hlengiwe took the SCS prenatal stress survey, we invited her back to SCS, this time with her 30-year old daughter, Thabile, and her 5-year old granddaughter, Thandi. The building is more than familiar to Hlengiwe and Thabile, who have been coming to our research site nearly every year for the past 30 years. When I tell them where the bathrooms are, they laugh and correct me, telling me that I pointed them to the men's room. "The ladies' is on the top floor, wena!"

Hlengiwe vividly described the neighborhood violence at the time. When I asked her how she thought these conditions affected her pregnancy, she responded: "Yoh... (*shakes head and looks forward*). They inherited tear gas and tires and they were burning people." She then continued to explain other stressors she faced during her pregnancy: her fear of gaining too much weight, being unable to work and save money for food and clothes for her newborn, and the stigma of single motherhood.

Operationalizing a measure of "stress" during an extremely complex time of political violence and societal transition is a difficult endeavor from the start, and researchers are faced with numerous issues. First, as with most epidemiological and demographic studies, researchers either utilize internationally or locally validated measures to assess what are usually very complex social constructs or, less commonly, create their own surveys if existing scales are inadequate, though efforts to adapt scales aren't always effective (Mendenhall & Kim 2019). Second, as anthropologists have previously argued, numbers and global health metrics can flatten the complexity of lived experience and social and political realities (Adams 2016; Sangaramoorthy & Benton 2012). Meaningful histories of segregation, stigma, and political violence get erased when research assistants check off a series of likert scale responses (1-5, not concerned to very concerned), and in the context of biological studies, become simplified as concentrations of stress hormone levels, body-mass index, and cognitive function, and opening the door for victim-blaming narratives. Third, the subjectivities of the researcher can also bias methods of data collection, statistical modeling, and what is seen as "traumatic," causing the researcher to privilege their own worldview over those of participants. Stressors and traumas that become biologically and socially embodied and transmitted between generations must first be appraised as stressful or traumatic, which is inherently a culturally-mediated process (Kohrt et al. 2009). Thus, poor assessment of psychosocial experiences like "stress" can obfuscate deep political dimensions, present missed opportunities for observing biological

responses to trauma, and ultimately biasing the search for empirical “truth.”

Better measurement never hurts, and for epidemiologists and public health researchers, this means engaging in deeper ethnographic theory and practice and producing reflexive scientists. Deeper ethnographic research on trauma and mental health, for example, can lead to the development of surveys that are more sensitive to the cultural realities of birth cohort study participants. For example, Kaiser et al. (2013) utilized a rigorous ethnographic approach consisting of long-term participant-observation, in-depth interviews, and focus groups to adapt existing depression and anxiety screeners and develop new mental health measures that better accounted for locally salient symptoms of distress and their negative sequelae in the Central Plateau of Haiti.

Stronger reflexive practice can also illuminate blind spots that previously obscured social or biological factors that may be involved in intergenerational stress transmission. Biocultural anthropologists are well-positioned to take the lead on practicing a reflexive anthropological process that begins with ethnography, informs epidemiological research, and in turn produces new questions for ethnographic research (Brown et al. 2009). And finally, a thorough and critical understanding of the social, political economic, and historical dynamics of intergenerational trauma can allow scientists to more substantially contribute to public discourse on social health inequities, remembrance and memorialization, and transitional justice.

Moving forward

Emerging research on the biology of intergenerational trauma poses exciting and unprecedented considerations on a wide array of cultural, political, ethical issues globally, and birth cohort studies have become a vital technology through which such biosocial knowledge and debates are being produced. Given the vast, ongoing legacies of structural violence and neocolonialism and the growing scientific investigation of intergenerational trauma, anthropologists and critical social scientists play a vital role in improving the scientific formation and biosocial impacts of research intergenerational trauma, with the hopes of improving societal well-being and facilitating intergenerational healing.

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historically marginalized communities. His current dissertation work examines the perceptions of trauma and mental illness in post-apartheid South Africa and traces the biosocial mechanisms underlining the intergenerational mental health effects of violence from apartheid in Soweto and Johannesburg, South Africa. This research is currently supported by the National Institutes of Health, the National Science Foundation, the Social Science Research Council, and the Wenner-Gren Foundation.

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