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Intergenerational Resilience in Response to the Stress and Trauma of Enslavement and Chronic Exposure to Institutionalized Racism

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Abstract

There is evidence of a link between intergenerational epigenetic trauma, environmental adversity, and resilience. Resiliency is an adaptive response associated with lower psychopathology and a suite of specific physiological changes including alterations in cortisol levels regulating the inflammatory immune response and resistance to telomere shortening in response to stress. The feedback loops linking environment and human genomes are modified by resilient behaviors. In Legacy African Americans, resilience has emerged as a continuum of responses within the context of family, community, and religious beliefs as a consequence of Intergenerational exposures to 250 years of chattel slavery followed by 150 years of systemic discrimination. This resilience has ameliorated but not eliminated the impact of this trauma over approximately 16 generations of exposure. We suggest that resilience can exhibit a range of sustainability with protracted resilience involving deep behavioral modifications and concomitant physiochemical changes whereas superficial resilience may also show surface behavioral adjustments but is skin-deep and lacks the consistent physiochemical alterations of successful long term adaptation.

Keywords: Legacy African Americans, Immune function; Adapting coping mechanisms

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Introduction

Stress is a normal part of life and few individuals escape exposure to some level of stress. It has been suggested that as many as 84% of the general population will experience at least one potentially traumatic event during the course of their life [1]. In some cases, acute or chronic stressors result in psychopathology, yet there is also a great deal of evidence for resilience to such deleterious effects in many. A case in point was Omar ibn Said. This historic figure was a writer and Islamic scholar, born around 1770 in Futa Toro (near the border with Mauritania). He was educated for 25 years in what is now Senegal (West Africa), enslaved, and transported to the United States in 1807. Omar ibn Said wrote his autobiography as an enslaved person. He starts his account with his birth in Futa Toro but discusses the events at the time of his enslavement, describing his capture by "a large army, who killed many men", his crossing of "the great sea" (the Atlantic Ocean) for a month and a half, the explicit and raw violence of the Transatlantic slave trade, and the terrors of the Middle Passage [2]. In spite of the trauma and stress Omar ibn Said was exposed while enslaved, he maintained a cheerful and pleasant disposition throughout his long life, in spite of the adversity of enslavement. His autobiography as well as historical reports suggests that Said relied heavily on his religious beliefs and intellectual savvy as sources of resilience. This suggests that his resilience was deep-seated, positive adaptations, and likely highly integrated at both behavioral and physiochemical levels.

What is Resilience?

In the physical sciences, resilience describes the ability of a material to absorb energy when struck, and then return to its original form. In agriculture, the concept of resilience is considered to be a universally applicable and fundamentally important criterion of health across taxa and systems [3]. Psychologically, resilience is regarded as the capacity to cope with an onslaught of stress and adversity, bouncing back from it or steeling oneself against it such that one's ability to function returns to approximately normal levels. Resilience

has been conceptualized as a dynamic developmental process encompassing the attainment of positive adaptation within the context of significant threat, severe adversity, or trauma [4]. In clinical medicine, resilience is the ability to adapt successfully in the face of stress and adversity and is mediated by adaptive changes encompassing several environmental factors, neural circuits, numerous neurotransmitters, and molecular pathways [1]. Resilience is a psychobiological factor which determines individual's response to adverse life events. It is the human capacity to adapt swiftly and successfully to stressful/traumatic events and manage to revert to a positive state [5]. At a recent international conference on traumatic stress, experts agreed that most of the proposed definitions for resilience included a concept of healthy, adaptive, or integrated positive functioning over the passage of time in the aftermath of adversity [6].

A Context for Assessing Historical and Contemporary Resilience

In North America, enslaved African Americans lived through acute and prolonged suffering for the 250 years they were held legally as human chattel and the subsequent 150 years of structured discrimination and exposure to bias. The descendants of those who survived these conditions are known as Legacy African Americans. Approximately half a million Africans were brought to North America, a small fraction of the 11 million Africans transported over 400 years to the Western Hemisphere [7]. In North America, this period represents approximately 11 generations of legal enslavement and multigenerational bondage. To this we add approximately 5 generations of post-emancipation disenfranchisement in the Jim Crow South, where enslavement was not legal, but racism was institutionalized, and discrimination was state-sanctioned. These kinds of exposure are hypothesized to have altered the epigenome of vulnerable individuals and provoked in many, adaptive responses leading to resilience to the more deleterious gene expression changes.

Troubling Evidence of Intergenerational Epigenetic Traumas

Substantial scientific evidence suggests that epigenetic changes in response to chronic stress have the tenacity to be transmitted and persist intergenerational. Patterns of brain activity associated with anxiety in monkeys are passed from parent to child. Scans of stressed monkeys' brains showed that two regions in the extended amygdala, the central nucleus and the bed nucleus of the stria terminalis, exhibited similar responses. Family studies revealed that this heightened connectivity was passed on from parent to child. The same brain regions have been implicated in anxiety in humans [8]. Perinatal transmission of elevated IgE levels in Legacy African American young women has been linked to allergy and asthma phenotypes in their offspring [9,10]. Infant neglect in Legacy African American households amplifies intergenerational disparities in health. Racial discrimination is significantly associated with PTSD symptoms with a small effect size, controlling for relevant sociodemographic variables [11].

Resilience to the Stress and Trauma of Slavery and Racism

Resilience is the process of recovering from adversity due to a stressful or trauma-causing event [12]. A resilient individual thrives when faced with adversity and continues to function socially and interpersonally in a healthy manner [13]. High levels of resiliency are associated with lower psychopathology, and low levels of resiliency are associated with higher psychopathology [13]. Seery et al. explored a link between adversity and resilience. Exposure to an adverse event can negatively affect an individual or a family's life, but it can also help develop resilience. Conversely, a lack of resilience may result in on-going psychological distress and eventually the development of mental illness. Gilbert et al. discussed a cognitive mechanism referred to as the psychological immune system, which encourages recovery and healing after exposure to an adverse event [14]. The immediate expectation after a catastrophic event is a negative response: psychological (e.g., depression) and physical (e.g., morbidity). Indeed, anxiety disorders directly impact the lives of nearly 1 in 5 people, accounting for substantial worldwide suffering and disability [8]. However, the psychological immune system may activate a 'toughening' effect to cope with past negative situations that individuals may not perceive [15]. Toughness is described as the individual's ability to perceive situations positively (i.e., more manageable). Individuals who maintain high resiliency are better equipped when responding to difficulties.

Resilience and Immune Function

Cortisol levels elevate in response to environmental stress. Cortisol can help control blood sugar levels, regulate metabolism, help reduce inflammation, and assist with memory formulation. It has a controlling effect on salt and water balance and helps control blood pressure. However, chronic psychological stress alters cortisol levels and leads to the loss of the body's ability to regulate its inflammatory immune response. This ultimately makes populations under chronic stress susceptible to contracting and accelerating disease progression. Normal cortisol levels decrease the release of a host of immune products that cause inflammation and signal healing. Long-term exposure to chronic stress makes cortisol tissues that should be cortisol sensitive into cortisol-resistant tissues, leading to uncontrolled inflammation responses in individuals [16]. By cortisol tissues we are referring to cortisol concentration in sound tissue [17]. Desensitization of these intact tissues to cortisol produces adverse responses including "adrenal fatigue". This uncontrolled chronic inflammation degrades the body's ability to mount acute immune responses where inflammation is needed to attract immune system players [18,19]. A series of studies were done among rural southern Legacy African American young adults with behaviors consistent with resilience to social adversity and environmental stress. Their cortisol levels paint a compelling, sober picture [20-22]. Results from these and other studies posit that resilience in these young people may be only skin-deep [23-25]. Here, skin-deep resilience implies that it is transient, superficial, and non-substantial.

This biological response to stress is seen as well in relative telomere length assessments in contemporary Legacy African Americans who experience day-to-day institutionalized racism-as measured by the use of racist language from Google searches. Telomeres are repetitive sequences at the terminal ends of chromosomes. Each time a chromosome is copied; slight errors in the replication process truncate these telomeres. The cumulative shortening of telomeres is associated with cellular aging in humans Chae et al. found that relative telomere length, a measure of the molecular age of an individual, was shortened in individuals exposed to chronic racial trauma and animus [26]. Racial animus is considered highest in the South where internet searches of racial epithets were most frequently searched [26]. This finding suggests that not only are the descendants of enslaved African Americans exposed to chronic racial and social adversity; they are also more likely to develop chronic inflammation as a consequence. Their bodies may be prematurely aging in comparison to individuals who are not exposed to these same systemic environmental stressors. Furthermore, women who live in troubled neighbourhoods have shorter telomeres drawing a direct connection between environment and cellular age [26,27].

Epigenetics is at the heart of a series of feedback loops linking the environment to the human genome in a way that allows crosstalk between the genome and the environment. It offers the potential for modification of adverse epigenetic states resulting from events/exposures at earlier life stages [28]. Researches on the descendants of enslaved African Americans have demonstrated that they have considerable coping mechanisms or resilience for maintaining mental well-being. However, this coping has not been perfect; there are areas where coping has not been successful. The Post Traumatic Slave Syndrome covers these areas [29].

In our assessment of 557, 18-25-year-old African American young adults from the Washington DC area, emotional state, coping and resilience were compared to immune stress as measured by seven immune stress biomarkers [22]. A critical feature of this analysis was the examination of the role of resilience in this population that has been exposed to high levels of violent victimization, based on the economically and socially segregated communities in which they live. We found that individuals who experience violence have significantly elevated levels of IgE and Epstein-Barr virus and viral capsid antigen (EBV VCA). Stress related elevations in IgE levels have been shown to be transmitted perinatally from stressed mothers to their children [30,31]. Elevated IgE is associated with increased risk for allergy and asthma.

Our analyses of these young adults found that their current emotional state is correlated to both recent past and distant past emotional states. This support our previous finding that those individuals who experience depression and high levels of rumination of adverse conditions are more highly correlated to elevated IgE and EBV VCA levels than those exposed to violence alone. Given the legacy of oral historical tradition and rearing in the absence of one or both parents, grandparents appear to be a key feature of resilience. Where grandparents can provide longitudinal perspective to the immediacy of social adversity, they can help to mitigate the impact of acute environmental crises. This suggests that understanding the benefits of intergenerational nurturing associated with grandparental rearing may be a key intervention point for young adults in socially adverse environments [32].

Poor emotional state is correlated to increased drug usage. This suggests that drugs are used to medicate the emotional state of these young adults. While study participants appear to have experience with tobacco, alcohol, and marijuana, there does not appear to be a significant correlation between violence and heroine/cocaine in this population. We take this to mean that even in high violence victimization environments; there is not a natural progression to the most addictive of illicit substances. Further work needs to be undertaken to better understand whether resilience underlies this trait. Finally, past trauma is modestly but positively correlated to elevated stress biomarker levels, positively correlated to repression, and iterations of violence from both community and family sources.

Resilience to Psychological Stress *via* Adaptive Coping Mechanisms

Environmental exposure and internal experience provide the individual with the circumstance to develop resilience as a coping mechanism [33]. Resilience protects against the challenging demands of life and protection against societal prejudice and racism [34]. Higher levels of resiliency and the ability to overcome adversity are associated with a positive social, environmental support from family, community, and religious life [35]. Walsh focused on exploring three factors in the familial support system; they are belief, organization, and communication systems within a family [36]. These three factors are essential to resilience building. Dawn et al. [37] researched coping methods after violent and non-violent deaths and found religious beliefs and participation were essential factors in dealing with non-violent deaths for African American participants. In another study, Walker et al. collected daily diaries of participants from 3 months to one year. When the participants were asked to recall memories from the diaries, they recalled positive and negative events that occurred [38]. However, the emotions attached to the negative event faded almost wholly compared to the positive event memories. The outcome showed that through autobiographical recollection, one can focus on the positive memories and overcome most of the emotions attached to negative ones [38].

Studies of suicide among Legacy African American females show that they are more likely to contemplate and attempt suicide compared their male counterparts and other groups [39]. However, the outcomes also suggest that, in general, for this particular group, death from of suicide is low. Social and cultural support, optimism, and spirituality appear as reasons for this resilience preventing successful suicide among African American women [39]. Also, resiliency was shown to be a protective factor for a group of 290 African American women in a community-based primary health care center who suffered from symptoms of depression [40]. High resilience levels implicated less severe

depressive symptoms, while low resilience levels indicated higher depressive symptoms from significant life stressors such as unemployment. Women who scored high on resilience were better able to cope with depressive symptoms. Resilience was assessed using The Connor-Davidson Resilience Scale (CD-RISC), assessing spirituality, relationships, trust, acceptance, competence, and other factors in a 35-item self-administered measurement tool [13,40]. In another study focusing on high-risk Legacy African American mothers with lower SES, spirituality and existential well-being were crucial factors that reduced parental stress [41]. Religious, spiritual, and family support was also everyday stress-reducing factors that increased resiliency for African American [42]. In a sample of 295 African American men, 92 per cent of them reported spirituality and family support promoted their resilience and response to stress-related sources such as unemployment, poverty, discrimination, and racism [42]. Another project focused on older African American women who experienced depression. Ironically, their resilience and spirituality response to adversity became a barrier when seeking mental health care on a professional level [43]. Some of their depressive symptoms began in childhood or adolescence and continued throughout adulthood. However, the women normalized depression and were not aware of the symptoms. They believed the only coping strategy to the symptoms were to express optimism and engage in their religious practices [43]. Resilience for this group was a lifelong coping challenge. Poverty, adversity, feelings of worthlessness, and other psychological struggles the women experienced throughout their lives led them to believe that chronic depression was a normal response to their hardship; therefore, they felt that it was unnecessary to use professional mental health services.

Miller et al. discussed the concept of skin-deep resilience. The concept is illustrated when a group of Legacy African American youths from disadvantaged backgrounds, who displayed high levels of conscientiousness, were found to be more vulnerable to infections than were their European American peers [44]. The contemporary vernacular term for such high level conscientiousness is “woke”. Woke is a political term of Legacy African American origin that refers to a perceived awareness of issues concerning social justice and racial justice. It is derived from the African American Vernacular English expression "stay woke", whose grammatical aspect refers to a continuing awareness of these issues. For Legacy African American disadvantaged youths, achieving upward mobility is extremely challenging and may lead to biological (i.e., cardio metabolic risk) effects [44]. The reason for this difference is that achieving upward mobility requires disadvantaged youths to tackle social issues such as racial stereotyping and discrimination as personal challenges. Furthermore, Miller et al. found that such superficial, skin-deep resilience is evident across the Northern United States, and is not limited to Legacy African Americans in the Southern regions of the country where chattel slavery and institutional racism were most entrenched.

The setting within which resilience can occur matters. Neglected mothers had considerably higher levels of parenting empathy when they had frequent access to social support than when they had less frequent support. The protective effect of social support was not as strong for non-maltreated mothers. Research has also shown that positive postnatal experiences, particularly high levels of responsive parenting, may protect children against the deleterious effects of biomedical risks (such as prenatal/birth complications) on social cognition in offspring [45]. Even transient resilience can exhibit positive intergenerational effects. Grandparents who raise grandchildren within a community context are significantly better at family functioning, social support, nurturing and attainment than those who do not have community connections [46]. The grandparent-grandchild relationship is modulated by relationship closeness to the primary grandparent, with measured outcomes including decreased proximal life stress, broad psychopathology, and the interaction between distal and proximal life stress on broad and externalizing psychopathology [47]. Ethnic minority families have been suggested to have increased grandparental, and grand-maternal in particular, contributions to child rearing both in the US and Canada and this has tended to increase resilience in children and adults [48].

Conclusions on Resilience in Legacy African Americans

The forced trauma and subordination of enslaved persons for two centuries strengthened the development of a collective cultural identity for Legacy African Americans today. Eyerman noted that this identity continued to develop post-slavery, and the traumas along the way were recollected through stories, books, art, and politics [49]. To repair the social fabric of a traumatized group, a collective sense of identity was necessary, which is a form of resilience. This sense of identity provided a liberation roadmap for African American communities [50]. However, where resilience failed, there is Post Traumatic Slave Syndromes (PTSS). The syndrome is based on traumatic memories (long forgotten) and once successful coping behaviors practiced over generations. These practices are now dysfunctional. The psychological disorders related to PTSS are evident in the African American experience today-black-on-black violence, colorism, racist socialization (internalized racism), and ever-present anger [51]. For example, higher incidences of depression anxiety and other mental disorders occur in Legacy African American communities compared with other groups in America, including African immigrants, who have not experienced multigenerational slavery and institutionalized racism.

Figure 1 illustrates the multiple effects of resilience mechanisms on the human body. Resilience is seen as a continuum of responses affecting an array of organs and organ systems with differential effects on the phenotype based upon the intensity and duration of the stressors. Intergenerational resilience, at various levels of intensity, is an expected pattern in response to multigenerational exposures to the systematic trauma of chattel slavery and state-enforced racial discrimination.

To promote long term resilience, we must look to modifications that alter the brain since it is the master regulator of behavior

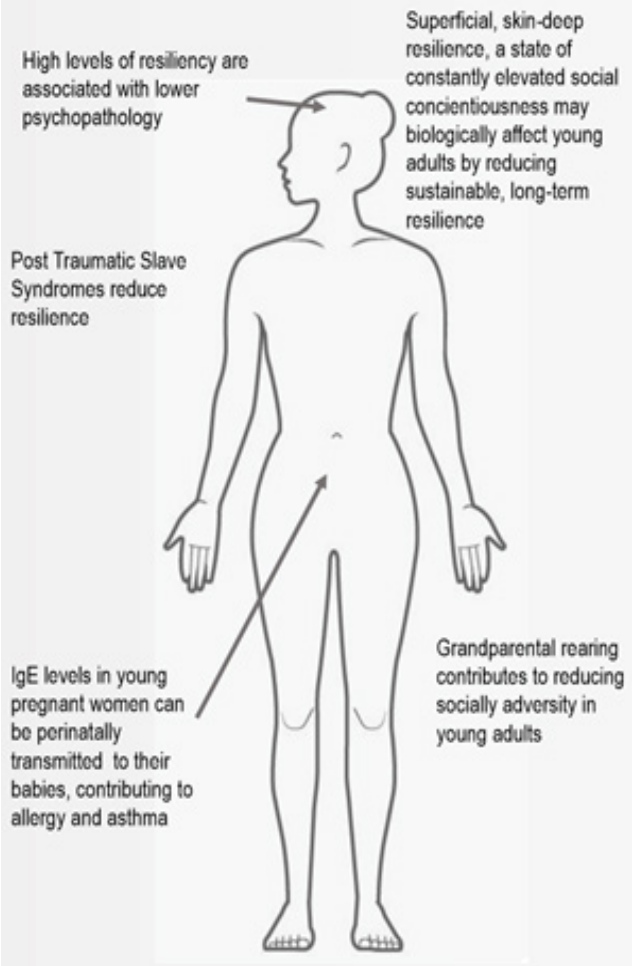

Figure 1 An array of resilience effects.

[52]. The healthy brain has a considerable capacity for resilience and has a pronounced ability to respond to interventions that make use of existing “windows of plasticity" and redirect these functions toward better health. As a result, plasticity-facilitating treatments should be developed within the framework of a positive behavioral intervention; mindfulness-based stress reduction and meditation are emerging as useful tools. Training individuals from marginalized and disfranchised groups to develop more sustainable resilience is essential to their survival and as protective strategy. Resiliency is a multidimensional process that ranges from individuals to groups who face adversity. It exists as a spectrum of responses. Successful resilience provides meaning for life, confers trust in a higher power, develops faith in a higher understanding of the world, and promotes community and family support systems [53]. Successful resilience enhances daily functioning and interpersonal communication. Methods that have been used to increase resilience include social support, optimism, posttraumatic growth, healthy coping strategies, and living life with purpose [50].

The ability of communities and individuals to cope with current stressors may hinge on their resilience status, which is shaped by past events and circumstances. While the historical circumstances of past enslavement, denigration, and discrimination have resulted in clear evidence of trauma and stress in this population [54], there is also significant evidence for resilience, mediated through a variety of mechanisms that appear to buffer the effects of stress in Legacy African Americans [55,56]. As with Omar Ibn Said 212 years ago, religious beliefs, intellectual savvy, and inherent optimistic personality traits can provide some measure of psychological buffering to stress and trauma [57]. However, the potential for sustained resilience must be deduced at multiple levels of analysis, including evidence of physiochemical homeostasis (e.g., in cortisol levels), epigenetic stasis, and equilibrium normalized gene expression patterns. It is sustainable intergenerational resilience that improves the lifetime survival value of the individual and the biological fitness of the group.

References

1 Horn SR, Charney DS, Feder A (2016) Understanding resilience: New approaches for preventing and treating PTSD. Exp Neurol 284: 119-132.

2 Said OA (1925) Autobiography of Omar ibn Said, Slave in North Carolina, 1831. The American Historical Review 30: 787-795.

3 Döring TF, Vieweger A, Pautasso M, Vaarst M, Finckh MR et al. (2015) Resilience as a universal criterion of health. J Sci Food Agric 95: 455-465.

4 Cicchetti D (2010) Resilience under conditions of extreme stress: a multilevel perspective. World Psychiatry 9: 145-154.

5 Shrivastava A, Desousa A (2016) Resilience: A psychobiological construct for psychiatric disorders. Indian J Psychiatry 58: 38-43.

6 Southwick SM, Bonanno GA, Masten AS, Panter-Brick C, Yehuda R (2014) Resilience definitions, theory, and challenges: interdisciplinary perspectives. Eur J Psychotraumatol 5: 25338.

7 Heywood LM (2002) Central Africans and cultural transformations in the American diaspora. Cambridge University Press.

8 Fox AS, Oler JA, Birn RM, Shackman AJ, Alexander AL, et al. (2018) Functional connectivity within the primate extended amygdala is heritable and associated with early-life anxious temperament. J Neurosci 0102-18.

9 Hicks WB, Nageotte CG, Wegienka G, Haystad S, Johnson CC, et al. (2011) The association of maternal prenatal IgE and eczema in offspring is restricted to nonatopic mothers. Pediatr Allergy Immunol 2011 Nov; 22: 684-687.

10 Vergara C, Murray T, Rafaels N, Lewis R, Campbell M, et al. (2013) African Ancestry is a Risk Factor for Asthma and High Total IgE Levels in African Admixed Populations. Genet Epidemiol. 37: 393-401.

11 Brooks HS, Dubowitz T, Haas A, Ghosh DB, DeSantis A, et al. (2018) The Association between Discrimination and PTSD in African Americans: exploring the role of gender. Ethn Health 28: 1-15.

12 Seery MD, Holman EA, Silver RC (2010) Whatever does not kill us: cumulative lifetime adversity, vulnerability, and resilience. J Pers Soc Psychol 99: 1025-1041.

13 Connor KM, Davidson JR (2003) Development of a new resilience scale: The Connor-Davidson resilience scale (CD-RISC). Depress Anxiety 18: 76-82.

14 Gilbert DT, Pinel EC, Wilson TD, Blumberg SJ, Wheatley TP (1998) Immune neglect: a source of durability bias in affective forecasting. J Pers Soc Psychol 75: 617-638.

15 Dienstbier RA (1992) Mutual impacts of toughening on crises and losses. Life crises and experiences of loss in adulthood, Hillsdale, NJ, US: Lawrence Erlbaum Associates, Inc. pp. 367-384.

16 Morris MC, Rao U (2014) Cortisol response to psychosocial stress during a depressive episode and remission. Stress 17: 51-58.

17 Costa A, Benedetto C, Fabris C, Giraudi GE, Testori D, et al. (1996) Cortisol in human tissues at different stages of life. J Endocrinol Invest 19: 463-471.

18 Desantis AS, Kuzawa CW, Adam EK (2015) Developmental origins of flatter cortisol rhythms: socioeconomic status and adult cortisol activity. Am J Hum Biol 27: 458-467.

19 Conradt E, Abar B, Lester BM, LaGasse LL, Shankaran S, et al. (2014) Cortisol reactivity to social stress as a mediator of early adversity on risk and adaptive outcomes. Child Dev 85: 2279-2298.

20 Aiyer SM, Heinze JE, Miller AL, Stoddard SA, Zimmerman MA (2014) Exposure to Violence Predicting Cortisol Response during Adolescence and Early Adulthood: Understanding Moderating Factors. J Youth Adolesc 43: 1066-1079.

21 Ruttle PL, Klein MH, Slattery MJ, Kalin NH, ArmstrongJM, et al. (2014) Adolescent adrenocortical activity and adiposity: Differences by sex and exposure to early maternal depression. Psychoneuroendocrinology 47: 68-77.

22 Jackson LF (2017) A Novel Bioinformatic Approach to Understanding Addiction. J Family Strengths 17: 1-26.

23 Brody GH, Yu T, Chen E, Miller GE, Kogan SM, et al. (2013) Is Resilience Only Skin Deep? Rural African Americans' Preadolescent Socioeconomic Status-Related Risk and Competence and Age 19 Psychological Adjustment and Allostatic Load. Psychol Sci 24: 1285-1293.

24 Brody GH, Yu T, Beach SR (2016) Resilience to adversity and the early origins of disease. Dev Psychopathol 28: 1347-1365.

25 Brody GH, Yu T, Chen E, Miller GE, Ehrlich KB, et al. (2018) John Henryism Coping and Metabolic Syndrome Among Young Black Adults. Psychosom Med 80: 216-221.

26 Chae DH, Nuru-Jeter AM, Adler NE, Brody GH, Lin J, et al. (2014). Discrimination, racial bias, and telomere length in African-American men. Am J Prev Med 46: 103-111.

27 Gebreab SY, Riestra P, Gaye A, Khan RJ, Xu R, et al. (2016) Perceived neighborhood problems are associated with shorter telomere length in African American women. Psychoneuroendocrinology 69: 90-97.

28 Haggarty P (2015) Genetic and metabolic determinants of human epigenetic variation. Curr Opin Clin Nutr Metab Care 18: 334-338.

29 Sule E, Sutton RM, Jones D, Moore R, Igbo I, et al. (2017) The Past Does Matter: a Nursing Perspective on Post Traumatic Slave Syndrome (PTSS). J Racial Ethn Health Disparities 4: 779-783.

30 Mann DL, Hamlin-Green G, Willoughby A, Landesman SH, Goedert JJ (1994) Immunoglobulin class and subclass antibodies to HIV proteins in maternal serum: association with perinatal transmission. J Acquir Immune Defic Syndr 7: 617-622.

31 Musazzi L, Marrocco J (2016) Stress Response and Perinatal Reprogramming: Unraveling (Mal)adaptive Strategies. Neural Plast Article ID 6752193.

32 Attar-Schwartz S (2015) Emotional closeness to parents and grandparents: A moderated mediation model predicting adolescent adjustment. Am J Orthopsychiatry 85: 495-503.

33 Rutter M (1993) Resilience: Some conceptual considerations. J Adolesc Health 14: 626-631.

34 Neville HA, Tynes BM, Utsey SO (Eds.) (2008) Handbook of African American psychology. Sage Publications.

35 Boyd FN (2003) Race, class, and poverty. Normal family processes: Growing diversity and complexity. New York, NY, US: Guilford Press pp. 260-279.

36 Walsh F (2015) Strengthening family resilience. Guilford Publications.

37 Dawn XH, Gary DB, Courtney JA, Walker WR (2015) This Too Shall Pass: Evidence of Coping and Fading Emotion in African Americans' Memories of Violent and Nonviolent Death. OMEGA - Journal of Death and Dying 71: 291-311.

38 Walker WR, Vogl RJ, Thompson CP (1997) Autobiographical memory: Unpleasantness fades faster than pleasantness over time. Appl Cogn Psychol 11: 399-413.

39 Flowers KC, Walker RL, Thompson MP, Kaslow NJ (2014) Associations between reasons for living and diminished suicide intent among African-American female suicide attempters. J Nerv Ment Dis 202: 569-575.

40 Holden KB, Bradford LD, Hall SP, Belton AS (2013). Prevalence and correlates of depressive symptoms and resiliency among African American women in a community-based primary health care center. J Health Care Poor Underserved 24: 79-93.

41 Lamis DA, Wilson CK, Tarantino N, Lansford JE, Kaslow NJ (2014) Neighborhood disorder, spiritual well-being, and parenting stress in African American women. J Fam Psychol 28: 769-768.

42 Chung B, Meldrum M, Jones F, Brown A, Daaood R, et al. (2014) Perceived Sources of Stress and Resilience in Men in an African-American Community. Prog Community Health Partnersh 8: 441-451.

43 Ward EC, Mengesha M, Issa F (2014) Older African American women's lived experiences with depression and coping behaviours. J Psychiatr Ment Health Nurs 21: 46-59.

44 Miller GE, Cohen S, Janicki-Deverts D, Brody GH, Chen E (2016) Viral challenge reveals further evidence of skin-deep resilience in African Americans from disadvantaged backgrounds. Health Psychol 35: 1225-1234.

45 Wade M, Madigan S, Akbari E, Jenkins JM (2015) Cumulative biomedical risk and social cognition in the second year of life: prediction and moderation by responsive parenting. Front Psychol 6: 354.

46 Pandey A, Littlewood K, Cooper L, McCrae J, Rosenthal M, et al.(2018) Connecting older grandmothers raising grandchildren with community resources improves family resiliency, social support, and caregiver self-efficacy. J Women Aging 6: 1-15.

47 Flouri E, Buchanan A, Tan JP, Griggs J, Attar-Schwartz S (2010) Adverse life events, area socio-economic disadvantage, and adolescent psychopathology: The role of closeness to grandparents in moderating the effect of contextual stress. Stress 13: 402-412.

48 Fuller-Thomson E (2005) Canadian First Nations grandparents raising grandchildren: a portrait in resilience. Int J Aging Hum Dev 60: 331-342.

49 Eyerman R (2001) Cultural trauma: Slavery and the formation of African American identity. Cambridge University Press.

50 Alim TN, Feder A, Graves RE, Wang Y, Weaver J, et al. (2008) Trauma, resilience, and recovery in a high-risk African-American population. Am J Psychiatry 165: 1566-1575.

51 deGruy FV (2006) A note on the partnership between psychiatry and primary care (editorial). Am J Psychiatry 163: 1487-1489.

52 McEwen BS (2016) In pursuit of resilience: stress, epigenetics, and brain plasticity. Ann N Y Acad Sci. 1373: 56-64.

53 Thomas CL (2012) Exploring resiliency factors of older African American Katrina survivors. J Evid Based Soc Work 9: 351-368.

54 Jackson F, Jackson L, Jackson ZE (2018) Developmental Stage Epigenetic Modifications and Clinical Symptoms Associated with the Trauma and Stress of Enslavement and Institutionalized Racism. J Clin Epigenet 4: 11.

55 Barton AW, Beach SRH, Bryant CM, Lavner JA, Brody GH (2018). Stress spillover, African Americans' couple and health outcomes, and the stress-buffering effect of family-centered prevention. J Fam Psychol 32: 186-196.

56 Dienstbier RA (1989) Arousal and physiological toughness: implications for mental and physical health. Psychol Rev 96: 84-100.

57 Rucker WC (2008) The river flows on: Black resistance, culture, and identity formation in early America . Baton Rouge, Louisiana LSU Press.