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Review

Hispanic ethnicity, stress psychophysiology and paradoxical health outcomes: A review with conceptual considerations and a call for research

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ABSTRACT

It is not wise to generalize psychophysiological findings from WEIRD (Western, Educated, Industrialized, Rich, Democratic) samples to all people and yet this occurs frequently in research. Case-in-point is our understanding of psychophysiological responses to stress which suggest universality despite our knowledge that these pathways are moderated by factors such as ethnicity and culture. Here we discuss the epidemiological phenomenon commonly referred to as the Hispanic health paradox to illustrate the importance of culture in understanding stress. We posit that despite high stress exposure, Hispanics may experience relatively low levels of stress contributing to their paradoxical health advantages. Building on our prior work, we present a new, culturally-tailored stress theory model to illustrate how sociocultural factors may moderate the experience of stress (through appraisals) with downstream effects on psychophysiological mechanisms. We support the model with available data and end this paper with a call for research that more carefully considers cultural and ethnic factors in psychophysiological research.

"What is significant in one's own existence one is hardly aware… What does a fish know about the water in which he swims all of his life?" Albert Einstein.

We are often unaware of the environments in which we live. Just as the fish is unaware of the water in which it swims, we are often unaware of our cultural beliefs and practices and how they impact our daily lives. This is particularly important in psychological research, where the majority of studies are conducted in Western countries (Arnett, 2008; Henrich et al., 2010). Arnett (2008), in an analysis of top journal publications in the behavioral sciences between 2003 and 2007, discovered that 96% of research participants were from the United States and Western industrialized countries. Western countries only represent about 15% of the world's population (internetworldstats.com) and statements about how people think, feel, and act are made from this limited sampling. Henrich et al. (2010) present a detailed review analyzing samples taken from Western or WEIRD (Western, Educated, Industrialized, Rich, and Democratic) societies and found that in many areas of the behavioral sciences WEIRD results do not generalize to other countries or groups of people.

The same is true with psychophysiological research. The majority of research published uses Western samples, with findings often generalized to people regardless of country or culture. The Hispanic[1] Health Paradox, the epidemiological phenomenon documenting better health and lower mortality relative to non-Hispanic (NH) Whites despite greater risk and lower SES, provides a context from which to study this issue. Cultural beliefs and values clearly matter in psychophysiological research and our goal is to demonstrate how culture can impact psychophysiological research findings, such as cardiovascular reactivity to stress. To accomplish this goal, we will focus on Hispanic health generally and the Hispanic health Paradox specifically to examine how culture can play an important role in understanding psychophysiological processes. This paper expands on the sociocultural hypothesis of Hispanic health by focusing on how culture influences stress appraisals with implications for the experience and acute psychophysiological consequences of perceived stress with disease risk implications For future studies to adequately assess the impact of culture on psychophysiology, we need to consider how we conduct research at the level of conceptualization, measurement, and design. We therefore end this paper with a call for research that more carefully considers cultural and ethnic factors in psychophysiological research.

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[1] A number of umbrella terms including *Hispanic* and *Latino/a* are often used to collectively refer to people from Mexico, Central and South America, Spain, and Spanish-speaking or influenced countries. The use of one term over another has been the subject of long debate (see Delgado and Stefancic, 1998; Hayes-Bautista and Chapa, 1987) which we will not enter into here. To focus this review, we will use the term *Hispanic* as the central an organizing term of identity.

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1. Hispanics and the health paradox

With a population exceeding 56.6 million, Hispanics now account for 17.6% of the total U.S. population making them the nation's largest racial/ethnic minority group (U.S. Census Bureau, 2016). They represent over 22 countries of origin and with significant heterogeneity in behaviors, diet, and traditions. However, what often binds Hispanics together is a common language and values for collectivism and interpersonal harmony (Oboler, 1995). These cultural factors are increasingly hypothesized to play a role in the emerging picture of Hispanic health resilience.

Like other racial/ethnic minorities, Hispanics generally experience a disproportionate burden of socioeconomic (SES), psychosocial, and physical health challenges relative to the majority NH White population in the United States. For example, Hispanics adults are 6.5 times less likely to attain a high school diploma and 3 times less likely to attain a four-year college degree compared to NH Whites (Krogstad, 2016; U.S. Census 2016). Likewise, Hispanic's experience significant economic disparities including lower wage earnings, lower median household income, and a poverty rate that at 21.4% is more than twice that of NH Whites (9.1%: Parker et al., 2016). Strikingly, the median net household worth, a key marker of economic resources, is just $13,700 for Hispanics vs. $141,900 for NH Whites. Put another way, for every dollar of NH White household net worth Hispanic households are worth only 9.6 cents. These SES disparities contribute to significant social environmental stress exposure including living in higher crime neighborhoods, having fewer neighborhood resources such as healthy food options, exercise opportunities, or social services, and lower access to quality healthcare regardless of insurance status (Harrell et al., 2014; Patient Protection and Affordable Care Act, 2010).

Despite these disadvantages, Hispanics experience better health and live longer than non-Hispanics including NH Whites: an epidemiological phenomenon commonly known as the *Hispanic health paradox*. Robust and replicated data document Hispanic advantages in infant mortality, lower incidence of most major diseases, longer survival in the context of disease, lower all-cause mortality, and longer life expectancy (American Cancer Society, 2016; Benjamin et al., 2017; Centers for Disease Control and Prevention, 2017). A meta-analysis of 58 longitudinal studies involving more than 4.6 million participants found a 17.5% mortality advantage for Hispanic relative to non-Hispanics including NH Whites (Ruiz et al., 2013; see also a meta-analysis by Cortes-Bergoderi et al., 2013, analyzing 17 cohort studies that found similar results). These health trends contribute to Hispanics having a life expectancy that is 3.3 years greater than NH Whites (82.0 years vs. 78.7 years, respectively) and more than 6.9 years greater than NH Blacks (75.1 years; Centers for Disease Control, 2017). Older hypotheses questioning the validity of the phenomenon as a result of sample biases (i.e., healthy migrant and salmon bias hypotheses) and data errors have been debunked by direct evidence and better methodologies (Abraido-Lanza et al., 1999; Arias et al., 2010; Ruiz et al., 2013). Indeed, the field has largely moved on from the question of whether the phenomenon is real to searching for the causes of such resilience.

2. The sociocultural hypothesis of Hispanic health resilience

Hispanic advantages in physical health incidence and outcomes may reflect a constellation of factors, including but not limited to genetic/biological advantages, behavioral differences (e.g., smoking, diet), risk overestimation, and/or offsetting resilience factors. The dominant hypothesis to explain the broad Hispanic health advantages focuses on resilience connoted by cultural factors facilitating health-promoting social processes (Campos et al., 2008; Gallo et al., 2009; Hovey, 2000; Riosmena and Dennis, 2012; Ruiz et al., 2016). A common iteration of this idea is that collectivism facilitates social integration and support with downstream health benefits. It is important to note that collectivism is a broad term referring to social interdependence yet the practice of collectivism varies substantially within collectivistic groups which may have importance for understanding variations in health among collectivistic societies. In an excellent review, Campos and Kim (2017) argue that there are at least two types of collectivism. *Harmony collectivism* practiced among East Asian populations, is characterized by the salience of mismanaging social relationships and concern for creating disharmony. By implication, maintaining social relationships in harmony collectivism is motivated by a desire to avoid conflict and negative emotions. In contrast, *convivial collectivism* which is more prevalent among Hispanics/Latinos is characterized by building and maintaining relationships through positive emotions, socializing, and enjoyment of social respect for self and others.

Within this conception of convivial collectivism, Hispanic cultural values for family (familismo), interpersonal harmony (simpatía), and valuing of elder community members (respeto) facilitate greater social integration (Campos and Kim, 2017) with tighter connections between members, leading to a wealth of social capital/ resources, and communal coping (Ruiz et al., 2016 for a full description). Social integration is among the most robust psychosocial predictors of health including disease morbidity and mortality (Holt-Lunstad et al., 2010). In this “sociocultural hypothesis”, social integration serves as a key health-promoting process which affects health through social mechanisms (see Fig. 1).

Although we know of no studies that yet directly test the full model, there is ample evidence to support each of the key pathways. Consistent with Pathway A, Hispanic households tend to be larger and more likely inclusive of multiple generations compared to non-Hispanics (U.S. Census Bureau, 2013; Stepler and Brown, 2016; Taylor et al., 2010). The relationship between social networks and health (Pathway B) is well-established with prospective studies and meta-analyses supporting the positive causal impact between structural and functional measures of social networks and lower disease vulnerability and better outcomes (Berkman et al., 2000; Cohen, 2004; Martire and Franks, 2014; Ruiz et al., 2008). Pathway C represents both the ethnic differentiation of Hispanics vs. non-Hispanics as well as within-group variations in cultural identity. As noted, Hispanic ethnicity is associated with a broad range of health advantages. In addition, less acculturated Hispanics including foreign-born Hispanics experience lower disease, better outcomes, and greater longevity than more acculturated and U.S. born Hispanics (Borrell and Lancet, 2012; Holmes et al., 2015; Martinez et al., 2016). Moreover, Hispanic as well as non-Hispanic residents living in ethnically-dense Hispanic neighborhoods or enclaves experience better physical health and lower mortality than those living in less ethnically dense neighborhoods, supporting a more social rather than purely biological explanation of the phenomenon (Eschbach et al., 2004; Patel et al., 2013; Schupp et al., 2014; Shaw and Pickett, 2013).

At its core, the sociocultural hypothesis of Hispanic health resilience posits cultural moderation of social networks with downstream implications (mediation) on health. Although a review of the mechanisms linking social networks to health is beyond the scope of this review, we focus attention on potential ethnic differences in the experience of stress (sociocultural moderation of stress pathways) in the next section.

3. Stress exposure, stress buffering, and coping diffusion

On first glance, Hispanics may be expected to experience significantly greater stress-related health vulnerabilities than NH Whites. The challenges of disproportionate SES burden (e.g., economic, education, resource disparities; Proctor et al., 2016) coupled with pervasive social marginalization/discrimination (NPR, 2017; Pew Research Center, 2016) likely present chronic sources of stress. Indeed, survey data show that Hispanics, like other racial/ethnic minorities and lower SES populations, endorse *exposure* to a greater number of stressors in general and in numerous life domains relative to NH Whites (Mulia et al., 2008; Williams, 2000).