PREDICTING PERCEIVED WELLNESS FOR CISGENDER WOMEN UTILIZING THE SOCIAL DETERMINANTS OF HEALTH MODEL: TESTING GROUP DIFFERENCES BETWEEN SEXUAL MINORITIES AND HETEROSEXUAL RESPONDENTS

By

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DISSERTATION

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ABSTRACT

PREDICTING PERCEIVED WELLNESS FOR CISGENDER WOMEN UTILIZING THE SOCIAL DETERMINANTS OF HEALTH MODEL: TESTING GROUP DIFFERENCES BETWEEN SEXUAL MINORITIES AND HETEROSEXUAL RESPONDENTS

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The purpose of this investigation was to bridge a gap in the literature about health disparities experienced across the intersection of multiple identities of women in the United States. Through the theoretical frameworks of the Structural Determinants of Health (SDH; Solar & Irwin, 2010) and Minority Stress Theory (Meyer, 2003), the researcher conducted a cross-sectional anonymous online survey to test the multifaceted SDH statistical model with the Perceived Wellness Survey (PWS) as an outcome indicator for perceived health for sexual minority and non-sexual minority women. A great collection of research reveals increased rates of mental health problems, rates of victimization, and some physical health disparities among the sexual minority population (Plöderl & Tremblay, 2015; Simoni, Smith, Oost, Lehavot, & Fredriksen-Goldsen, 2017). With an estimated population of over 5.5 million sexual minority women in the U.S. (Gates, 2017), it is critical to understand the full extent of health disparities by sexual minority women. The hypotheses of this study are: (1) The PWS will become more reliable for heterosexual, lesbian, and bisexual women once sexuality concerns are added to the

survey; and (2) The Intermediary Determinants of Health (a component within the SDH) will mediate the PWS between heterosexual, lesbian, and bisexual women. The researcher developed the statistical model to test the integration of the SDH and MST frameworks by creating composite scores for each of the health-predicting factors. The model supported the SDH framework for all white women grouped, with white millennial women fitting the SDH model most accurately. The models for minority women, regardless of age cohort or sexual orientation, did not meet all criteria for partial mediating mediation. The theoretical, research and practice implications are discussed.

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Introduction

Background

The health of women in the U.S. has a rippling effect on the entire country. In a systematic international review of women's health, Onarheim, Iverson, and Bloom (2016) stated, "how nations develop and perform depends upon how the country educates and provides opportunities for its women" (p. 15). Sexual minority women, in particular, may be at an increased risk for mental health problems, victimization, and some physical health disparities (see Plöderl & Tremblay, 2015; Johnson, Matthews & Napper, 2016; Simoni, Smith, Oost, Lehavot, & Fredriksen-Goldsen, 2017). An estimated 55% of the lesbian, gay, bisexual and transgender community in the U.S. are women, representing over 5.5 million individuals (Gates, 2017). The purpose of this investigation was to embark on the first stage of a multifaceted research endeavor to reveal the numerous factors leading to health disparities among women in the United States.

There was increased awareness of the needs of the lesbian, gay, bisexual, and transgender population in recent years. In early October of 2016, Pérez-Stable, the Director of the National Institute on Minority Health and Health Disparities (NIMHD), formally announced National Institutes of Health's (NIH) commitment to the investigation of health disparities among sexual minorities individuals (SM) (Pérez-Stable, 2016). The U.S. Department of Health and Human Services [DHHS] (2014b) also appealed to researchers to continue exploring the needs of the SM community. This call for action was part of a 10-year initiative, Healthy People 2020, to increase health and well-being across the United States (DHHS, 2014a).

Statement of the Problem

In 2010, The World Health Organization (WHO) published the Social Determinants of Health (SDH) Framework outlining the multifaceted approach to understanding health inequities (Solar & Irwin, 2010). Although research and public awareness of health disparities across the U.S. gained increasing recognition, the intersection of women's health and SM identities has yet to be investigated (Cho, Crenshaw, and McCall 2013; Crenshaw 1989).

Sexual minority (SM) individuals report higher frequencies of microaggressions, discrimination, and social exclusion than non-SM individuals (D'Augelli & Grossman, 2001; Herek, 2007, Herek, Gillis, & Cogan, 1999). Research points to these experiences of microaggressions, discrimination, and social exclusion as the pivotal triggers of health disparities between SM and non-SM individuals (Meyers, 2003; 2005; Hatzenbuehler & Pachankis, 2016). An example of the lasting effect of a microaggression that occurs in a health setting would be when a doctor requires a pregnancy test for a client who may not have verbally identified as lesbian and has never had sex with a man. The woman may thus be reluctant to return to the doctor for routine check-ups to avoid the awkwardness of performing like a heterosexual or coming out of the closet to receive appropriate medical attention. Neglecting annual PAP tests and breast examinations could have serious consequences, and may be more prevalent among racial sexual minorities (Agénor, Austin, Kort, Austin & Muzny, 2016).

Past research supported varying degrees of health disparities between and within SM and non-SM women. Blosnich, Farmer, Lee, Silenzio, and Bowen (2014), for example, revealed that lesbians were 91% more likely to be a current smoker than heterosexual women and more likely to engage in binge drinking behaviors. Additionally, lesbians were 50% more likely to be diagnosed with asthma than heterosexual women, but equally as likely to be diagnosed with

diabetes, cardiovascular disease symptoms, and as overweight or obese. Kim and Fredriksen-Goldsen (2012) discovered several significant differences between lesbians and heterosexual women concerning Hispanic identity (Hispanic, Non-Hispanic White) and health conditions and behaviors. Lifetime asthma occurred less frequently for Non-Hispanic lesbians and Hispanic heterosexual women. Hispanic heterosexual women were also less likely to have a disability than Hispanic lesbians. The odds of being obese, having arthritis, engaging in acute drinking, and a lack of exercise were equally as likely for Hispanic and Non-Hispanic lesbians. The only health behavior that differed significantly was smoking; Hispanic lesbians smoked at a higher rate than Hispanic heterosexual women. Although previous literature supported a generalized gap in SGM health disparities (Lick et al., 2013), the more complex studies become (e.g., Lehavot et al., 2016) the more discrepancies were exposed, forcing researchers to rethink the intricacies of the minority stress process. As discrepancies in health disparities research prevail across studies, the goal of this investigation was to begin the first step in a multifaceted research endeavor to uncover the various components that led to differences in health and well-being among women in the United States.

Objectives. The first objective of this investigation was to explore the validity of the Perceived Wellness Survey (PWS; Adams, Bezner, Garner, & Woodruff, 1998) across the three groups of women (heterosexual, lesbian, and bisexual women). The second objective was to modify the PWS by adding a seventh subscale of sexuality to their 6-subscale model and testing the modified-PWS for validity among the three groups. The third objective of this investigation was to examine components of the SDH framework across groups of women (SM, non-SM, minority SM, non-minority SM, etc.). As this is a preliminary study, only three of the various components of the SDH were be modeled (See Intermediary Determinants in Figure x). Future

studies will expand the SEM to include additional sections of the SDH among various sample groups.

Definitions

Women in this investigation refer to women who were assigned the female sex at birth. *Cisgender women* refer specifically to non-transgender women. *Sexual minorities* (SM) were individuals who identify other than heterosexual. This included but was not limited to lesbian, gay, and bisexual identities. The term *sexual minority women* (SMW) referred specifically to women who identified with a sexual orientation other than heterosexual. The term *sexual and gender minorities* (SGM) included transgender, gender variant, and gender non-conforming individuals. *Microaggressions* are subtle, often unbeknownst by the aggressor, acts of discrimination based on sexual or gender minority identity that may happen in the workplace, among friends, and family. *Health* referred to the physical health of an individual, not including mental health unless specifically mentioned. *Wellness* implied the mental and physical wellbeing of an individual. *Health disparity* indicates the disproportionate experience of a negative health outcome between groups of people.

Significance

The inconsistencies in previous research (e.g., Lehavot et al., 2016) called the researcher to rethink theoretical frameworks for health and wellness. The SDH provided a comprehensive international perspective through which to understand the complexities surrounding health disparities. This study was the first to attempt to build a survey to collect aspects of the SDH framework, statistically test components of the suggested model, and test the model across multiple identities of women. The survey, statistical model, and a validated framework will provide health professionals with a method for collecting detailed information about women's

health and produce a tool for working with women to reduce health behavior risks. Additionally, the findings of this investigation will open a multitude of opportunities for health researchers, service providers, and policy developers to make evidence-based decisions about women's health in the future.

Theoretical Frameworks

The researcher tackled health disparities through the double lens of the Social Determinants of Health (SDH) Framework (Solar & Irwin, 2010) and Minority Stress Theory (Meyers, 2003) to produce a comprehensive and synthesized theoretical framework for this study. The SDH framework provided a method to understand the critical and holistic factors contributing to health, while Minority Stress Theory offered a basis for conceptualizing the health disparities between SM and non-SM women in the United States. These theoretical frameworks worked simultaneously throughout this research to guide the development of research questions, measurement tools, sampling method, data analysis, and discussion.

Social Determinants of Health Framework

Social Determinants of Health framework (SDH) grew from research conducted mainly by Diderichsen, Evans, and Whitehead (2001) and Dahlgren and Whitehead (1991; 2007), who hold doctorates in public health and are leaders within the World Health Organization. Diderichsen and colleagues (2001) published Figure 2. Pathways from social context to health outcomes laid the foundation for the SDH framework (Solar & Irwin, 2010). This model explained how pathways from social context (culture, structure, and function), policy context of the broader environment and individual components influence disparities in health outcomes. An individual's social positions may inform differing levels of exposure to health risks. Those risks influenced the development or avoidance of diseases and injuries, which direct the social consequences, such as exclusion and isolation, for individuals (Diderichsen, Evans, & Whitehead, 2001).

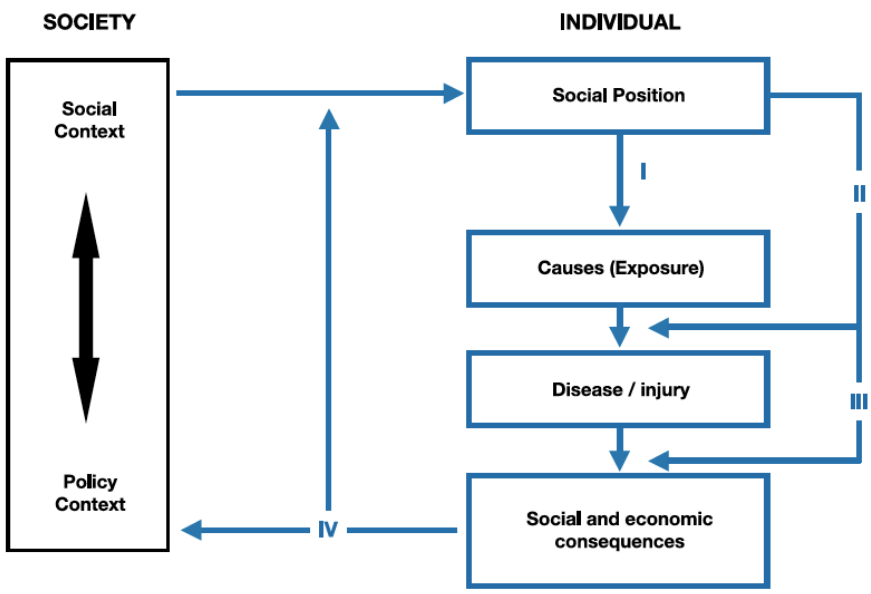

Figure 1. Pathways from social context to health outcomes in *The Social Basis for Disparities in Health* by Diderichsen et al., 2001, p. 15

Dahlgren and Whitehead (2007) added to Diderichsen and colleagues' work (2001) by developing a model of the main determinants of health). These layers represented added critical components to the framework from which the final SDH emerged. In this model, the overall culture and environment framed the network of health determinants. Living and working conditions (e.g., unemployment, water, sanitation, and housing) contextualized an individual's social and community networks. Individual lifestyle factors such as exercise and nutrition, as well as biological factors like genetic makeup, age, and sex (Dahlgren & Whitehead, 2007) influenced health. See Figure 2 below.

The final SDH framework merged these models into a multidimensional framework explaining the impact of various factors on health and well-being. The SDH consisted of two major sections: Structural Determinants and Intermediary Determinants (Solar & Irwin, 2010). Socioeconomic and Political Context and Socioeconomic Position are two sections of the

Structural Determinants. Solar and Irwin (2010) stated that the coined term structural determinants "refer specifically to the interplay between the socioeconomic-political context, structural mechanisms generating social stratification and the resulting socioeconomic position of individuals" (p. 28). Socioeconomic and political contexts were defined by factors that are outside of an individual's control yet they exhibit a powerful influence on health outcomes (Solar & Irwin, 2010). For example, a major change to the Affordable Health Care Act would significantly influence access to health care for many individuals in the United States.

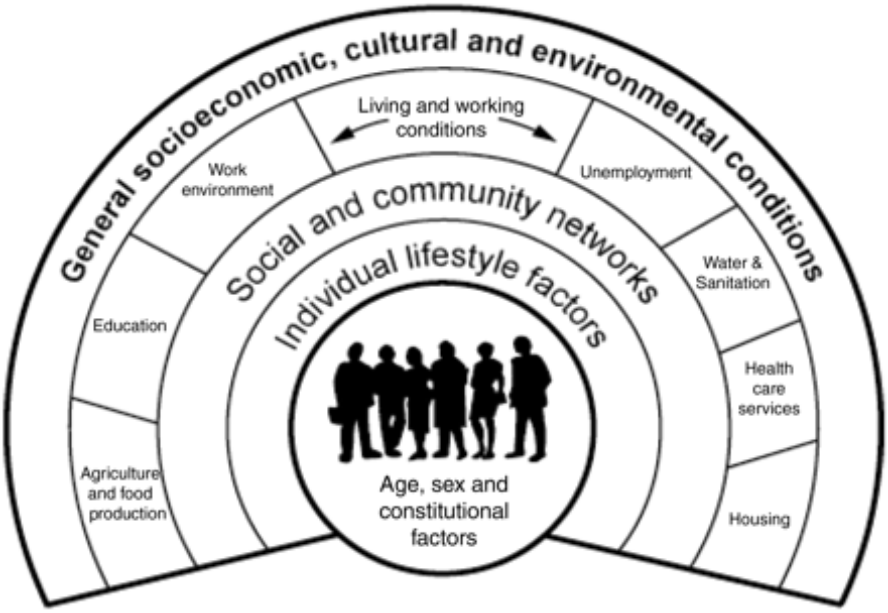

Figure 2. Main Determinants of Health from *Policies and Strategies to Promote Social Equity in Health*, Dalgreen & Whitehead, 2007, p. 11.

The second component of structural determinants was the Socioeconomic Position. One's gender, education level, ethnicity, occupation, and income all contribute to health outcomes (Solar & Irwin, 2010). A woman with a high level of education and income, for example, may have different health and well-being outcomes than a woman who is unemployed and never completed high school education. The intersection of health outcomes and income level are often

experienced differently based on gender and race (Kennedy, Paeratakul, Ryan & Bray, 2007; Umberson, Williams, Thomas, Liu & Thomeer, 2014). Black and Hispanic racial group as well as women, in general, are often found to have lower levels of socioeconomic status (SES; frequently calculated by education and income) and experience disproportionate burdens of health problems (Kennedy et al., 2007). Although there is a litany of research in this area, a few examples of research on this pathway are SES and cardiovascular disease (Winkleby, Jatulis, Frank & Fortmann, 1992), SES, racism, and health (Williams, 1999; Stepanikova & Oates, 2016), and education level and health (Rueden, Gosch, Rajmil, Bisegger, & Ravens-Sieberer, 2006; Chen, Martin, & Matthews, 2006). The intersection of race and sexual orientation may also influence women's health (Trinh, Agénor, Austin & Jackson, 2017). Stoke, cancer, and health risk behaviors such as smoking and obesity may be more severe among sexual minorities (Trinh et al., 2017).

The Intermediary Determinants of Health consisted of Material Circumstances, Behavioral and Biological Factors, Psychosocial Factors, and Health System. The social determinants influenced intermediary determinants. These intermediary determinants informed levels of exposure and vulnerability to health risks (Solar & Irwin, 2010).

Living and working conditions, food availability, and financial stability represent Material Circumstances. The varying levels of exposure to health risks are seen in this section when an individual struggles to eat if they do not have enough money to buy food (Price, Choi & Vinokur, 2002). Those with enough money to buy basic needs or those with enough money to buy a wealth of fresh, healthy fruits and vegetables will have lower levels of exposure to health risks. If an individual is working in an unsafe work environment, the potential for injuries or stress will have a different impact on health outcomes than for an individual who is part of a safe

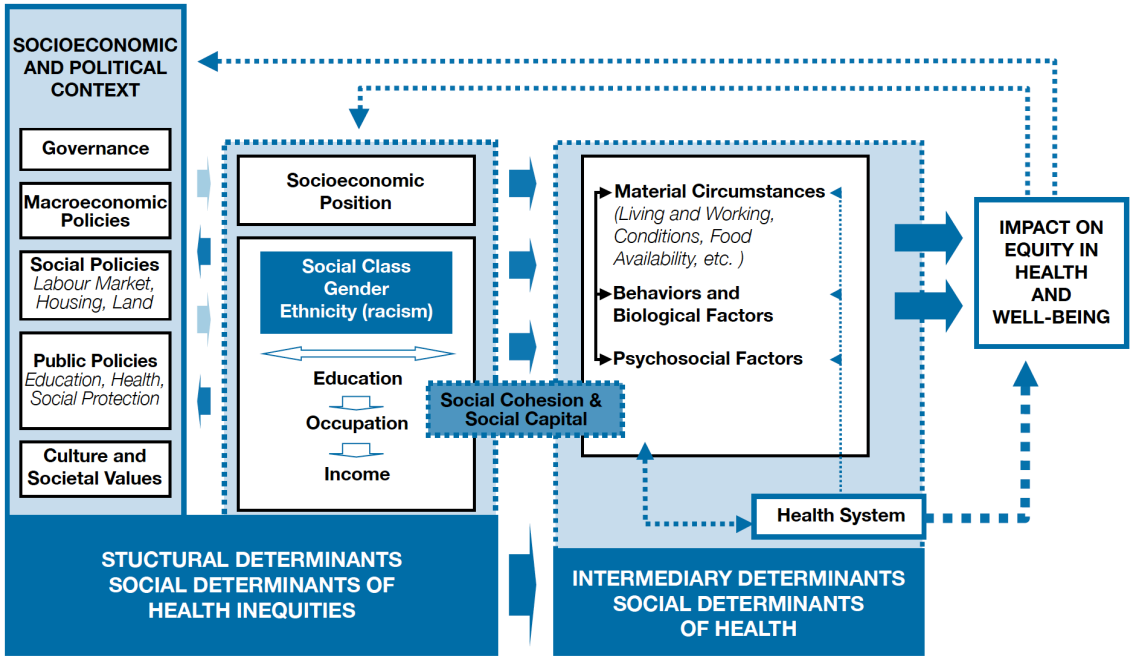

Figure 3. The Structural Determinants of Health Framework. This figure illustrates the multidimensional structure of factors influencing health and well-being. *The final form of the CSDH conceptual framework*, by Solar & Irwin, 2010, p. 6.

workplace (Beus, McCord & Zohar, 2016; Danna & Griffin, 1999). The condition of one's home and neighborhood also contribute to differing levels of exposures to health risks (Hale, Hill & Burdette, 2010; Kruger, Reischl, & Gee, 2007; Meyer, Castro-Schilo & Aguilar-Gaxiola, 2014). An individual who can be active in a clean, safe neighborhood will have less exposure to risks and vulnerabilities than an individual who may not feel safe exercising outside and lives in a decaying area.

Behavioral and Biological Factors signified personal involvement with exercise, proper nutrition, and diagnoses and diseases (such as high blood pressure or cancer). Behavioral factors that influence the risks of health outcomes include, but are not limited to tobacco (Abraham et al., 2017; Leonardi-Bee, Smyth, Britton & Coleman, 2008) and alcohol consumption (Laramée et al., 2015; Liu, 2016), the frequency and intensity of exercise (Batacan, Duncan, Dalbo, Tucker

& Fenning, 2017; Conn, Phillips, Ruppar & Chase, 2012), and daily intake of fruits and vegetables (Aune et al., 2012; Grosso et al., 2017). How an individual behaves around the factors contributes to higher or lower levels of exposure to health risks. Biological factors, many of which are out of an individual's control, could be maternal and paternal cancer rates, any diagnoses, BMI levels, and other biologically based issues that may have an impact on one's health. If an individual had a chronic childhood illness, for example, and was an adult smoker, he or she may face very different risks of adverse health outcomes compared to someone who may have had a chronic childhood illness, but did *not* smoke as an adult.

Negative life experiences and stressful living circumstances characterize Psychosocial Factors (Solar & Irwin, 2010). Being exposed to traumatic events may play a critical role in long-term health (Alisic, Jongmans, van Wesel & Kleber, 2011; Norman et al., 2012). Witnessing a violent crime, domestic abuse, traumatic war exposures, or other life-changing events play a crucial role in increasing an individual's stress and vulnerability levels. Studies reported, for example, that individuals with Post Traumatic Stress Disorder (PTSD) experience greater health problems than those without PTSD (Pacella, Hruska & Delahanty, 2012). PTSD may be more likely to occur among women and individuals of low SES (Tang, Deng, Glik Dong & Zhang, 2017) adding to the increased burden of adverse health outcomes for specific populations. Additionally, individuals who experience adverse childhood experiences may be at a greater risk for mental health problems, greater use of alcohol and tobacco, and lower life satisfaction in adulthood (Mersky, Topitzes & Reynolds, 2013).

The Intermediary Determinants work in concert, accumulating or reducing risks and vulnerabilities at every level. While the published model was comprehensive, it did not explicitly account for sexual identity. After the 2010 publication of the SDH model, Logie (2012)

published a call to action for the WHO to include sexual orientation in their model. Logie (2012) suggested incorporating sexual orientation into the socioeconomic position, alongside gender, race, income, education, and occupation. A minority sexual identity may be as significant to health as any socioeconomic position or intermediary determinant.

Minority Stress Theory

The researcher incorporated Minority Stress Theory into this investigation to understand how sexual identity impacts health. Meyer (2003) conceptualized the Minority Stress Theory (MST) to explain how the sexual minority (SM) specific-experiences affect the individual. Meyer formulated minority stress in terms of "distal-proximal" experiences. Distal (distant from) experiences may be the social impact of SM identity, the stigma experienced in society, or events in society that impact the SM individual, such as a widely publicized SGM-based hate crime. Learning about these distant stressors affects the SM community internally (proximal). An individual may experience fear, for example, in going out to an SGM event when they learn about the violence committed against SGM individuals in a nearby or distant location. Beyond the experience of fear, another proximal experience of these events may be the internalization of homophobic and biphobic mindsets.

Meyer (2003) identified three stress processes as (1) external stressful events; (2) expectations of stressful events and the accompanying vigilance of those events; and (3) the internalization of negative social attitudes (p. 676). See Figure 4. Minority Stress Process in lesbian, gay, and bisexual populations for a visual of the pathway to mental health outcomes. Of importance, Meyer's (2003) model focuses on mental health outcomes, specifically. Although the MST began as a mental health model, researchers have also tested how it applies to physical health outcomes (Frost, Lehavot & Meyer, 2015; Lick, Durso & Johnson, 2013). Lick and

colleagues reported that SGM stress may negatively impact the physiological pathways that regulate the immune system, blood pressure, and hormone regulation. This research emphasized that many individuals experience varying stressors on these pathways; however, sexual minorities experience SGM-specific and continuous stressors that may cause more physical health problems over time as these systems become overstressed.

MST begins with one's situation within the environment (living environment, financial status, education level, etc.) and the non-SGM specific stressors they experience, and how that influences mental health (A to C to I). Holman (2018) underscored the importance of capturing non-SGM specific stressors alongside SGM specific stressors as these add to the understanding of the full individual. It is at the intersection of the multiple identities an individual juggles that a more profound understanding can be attained.

Overlapping with one's place in the environment is minority status (sexual orientation, race, and gender). This status informs one's experience with distal stress processes, such as discriminatory events (victimization and bullying, racially motivated hate crimes, anti-abortion protests at a women's clinic, KKK marches, terrorist attacks, etc.). An individual's minority identity influences their responses to learning about these distant stressors; that stress then theoretically affects their mental health outcomes (B to D to I). Numerous studies empirically support this causal pathway, as previously discussed (Alisic et al., 2011; Norman et al., 2012). The MST pulls sexual orientation into another path to explore more closely. If an individual identifies as a sexual minority, they may experience proximal stressors that are unique to the SM identity. Research supports the idea that SGM specific stressful events, such as SGM-specific victimization, may be more harmful to SGM individuals than a stressor unrelated to SGM identity (Frost, Lehavot & Meyer, 2015; Goldbach, Tanner-Smith, Bagwell & Dunlap, 2014).

Expectations of rejection, concealment of SM identity, and internalized homophobia/biphobia are all examples of proximal SM stressors. SM individuals face the stress of "coming out of the closet" not only to family and friends as a solitary experience but a daily repeated event (casual workplace conversations about weekend experiences, talking to a doctor, talking to people on the train ride home, etc.). Internally, SM individuals may juggle the options of concealing their identity and performing like a heterosexual (Butler, 1988) or facing the possibility of rejection and discrimination. This internal stress and shame process may lead people to modify their behaviors, create a self-victimization process, and contribute to internalizing homophobic/biphobic attitudes (Baams, Grossman & Russell, 2015; Mason & Lewis, 2016). Homophobic/biphobic attitudes are, for example, thinking identities other than heterosexual are negative, that it is wrong or abnormal to be an SM. This process from SM identity to proximal stressors affects mental health outcomes (E to F to I).

Additionally, the characteristics of one's sexual identity may influence mental health. The performance of gender links an individual's identity, and his or her performance may moderate the impact of proximal stressors on mental health (E to G to I). This indicates that as an individual's expression moves further away from the heteronormative representation of their sex, she or he may experience additional stressors. Studies support that gender nonconformity may be a stronger predictor of adverse health outcomes than sexual orientation (Plöderl & Fartacek, 2009; Rieger & Savin-Williams, 2012).

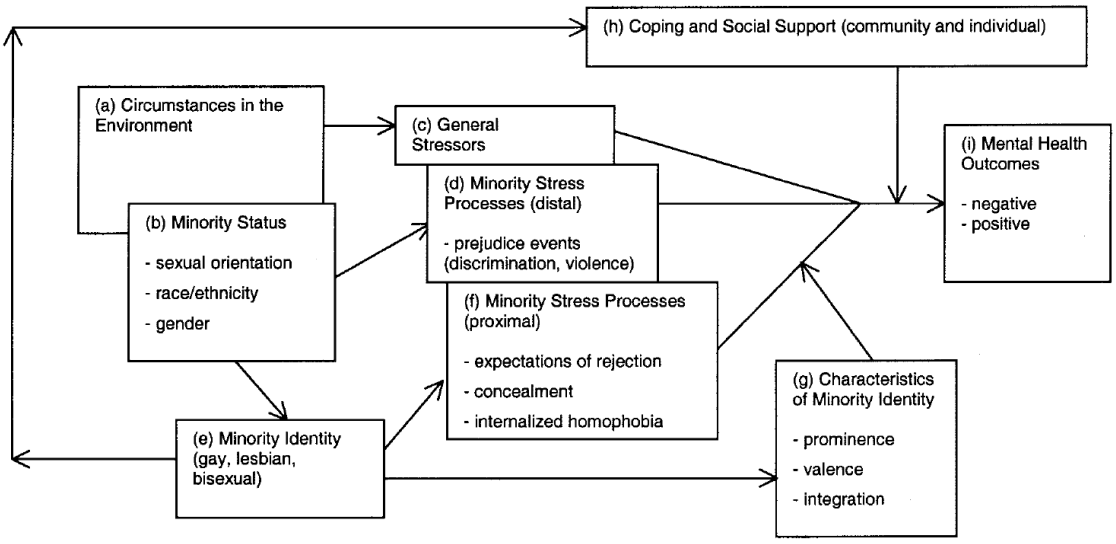

Figure 4. Minority Stress Process in lesbian, gay, and bisexual populations from *Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence*, Meyer, 2003, p. 679.

Community and social support is another factor in the process of mental health outcomes (E to H to I). The bond within the SM community can be a strong protective factor against adverse health outcomes (Doty, Willoughby, Lindahl & Malik, 2010). For many, the SM community can mean a new family if their biological family has rejected them due to their identity. However, if an individual's expression of his or her identity does not fit within the gender expression norms (feminine lesbians, masculine gay men, to oversimplify), they may not be met with immediate acceptance. The SM community reports similar heteronormative gender stereotypes as heterosexual samples (Clarke & Arnold, 2017). In addition, bisexual individuals are not always met with approval and may face added stressors of rejection from all areas of community support (Balsam & Mohr, 2007; Mereish, Katz-Wise & Woulfe, 2017). The ever-growing network of online communities, however, increasingly allows for individuals with

myriad identities to find communities of like-minded individuals (Craig & McInroy, 2014; Green, Bobrowicz & Ang, 2015).

Empirical Support for Theories and Conclusions

The theoretical frameworks of SDH and MST describe the various pathways to diverging and disparate health experiences and examine why some individuals are at a greater or lesser risk for adverse health outcomes. Although these models were empirically tested in sections, the researcher was unable to find a full model analysis to validate the theories. For SDH, few research endeavors address confirming a path from socioeconomic status, through the various intermediary determinants, to a final health outcome as designed by the WHO's SDH framework. Researchers with the WHO provided a published a guide on how researchers and policymakers can build the evidence base to support the SDH theoretical model (Bonnefoy, Morgan, Kelly, Butt, and Bergman, 2007). There is a wealth of knowledge concerning the path from Socioeconomic Position to health outcomes, and the various factors within the Intermediary Determinants to health outcomes. Bonnefoy and colleagues (2007) verified that more research is needed to tie together the long researched causal pathways described by the SDH.

Walker, Gebregziabher, Martin-Harris and Egede (2014) came closest to testing the SDH model when investigating a path analysis to validate the path from socioeconomic position (income, education, and employment) through psychological variables, several which included diabetes distress, access to care, and social support, to the outcome variable of glycemic control among Type 2 Diabetes participants. Their study supported a section of the overall SDH framework (SEP→Psychological→Health outcome) and accounted for 76% of the variance in glycemic control. Although many factors within intermediary determinants were not addressed,

and age, gender, and race were used as covariates, this article came closest to the method proposed in this research.

As aforementioned, there is ample empirical support that SM individuals are at increased risks for adverse health outcomes due to the more detrimental SM-specific stressors and life experiences than the heterosexual community. Although the model suggested by Meyer (2003) has not been empirically validated as a whole, similar to SDH research, research supports causal pathways across sections of the model. For example, Calabrese, Meyer, Overstreet, Haile, and Hansen (2015) reported that discrimination bases (the number of identities discrimination was credited to) mediated the relationship between race and mental health, with Black SM women facing the strongest effect of the model.

This investigation used these theoretical frameworks to conceptualize research questions, review previous literature, and develop a comprehensive survey to test for the various factors involved in these models, data analysis, and interpretation. The MST adds to the multilayered understanding of the SDH by providing insight into the specific SM stressors that may contribute to different experiences of health outcomes across women in the United States. The theories work in tandem to explore and explain the social aspects of health, the intersection of different identities, and the formation of an SM specific understanding of health disparities.

Combining Logie's (2012) conceptual suggestion to incorporate sexual orientation into the SEP section of the model and the need to test a statistical model of the SDH, the researcher developed a series of models that pulled sexual orientation, race, and age cohorts outside of the model. This process enabled the researcher to see if the statistical model worked across intersecting identities. The SDH model, for example, was tested on White heterosexual women and on Non-white heterosexual women to see how the model fit each group. This comparison

allowed the researcher to interpret whether the proposed model of health accurately captured the health outcomes across multiple identities of women.

Literature Review

The National Center for Health Statistics (NCHS, 2016) reported census trends to estimate the state of public health concerns in the United States. Women in the U.S. have a life expectancy of 81.2 years, 4.8 years higher than men, which ranks the U.S. at 27 out of the 31 compared Organization for Economic Co-operation and Development (OECD) countries (NCHS, 2016). Although the NCHS (2016) reported a decline in rates of stroke (29%), heart disease (27%), diabetes (21%), and cancer (13%) among women from 2004 to 2014, there was an increase in deaths related to Alzheimer's disease (15%) and unintentional injuries (11%; NCHS, 2016). The rates of teenage pregnancy have declined in this timeframe: 50% decline for ages 15-17 and 36% decline for ages 18-19 (NCHS, 2016). As obesity is a significant risk factor for health problems and mortality, the NCHS (2016) also reported that levels of overweight women and obese women with a BMI between 30-35 remained unchanged, but the percentage of women with a BMI of 40 or more increased.

It is critical not to homogenize women into a singular category. Minority Stress Theory supports that SM women may experience additional stressors that impact the physical body more severely than heterosexual women (Meyers, 2003, Lick et al., 2013). While the census reports do not delineate the disparities between SGM and non-SGM women, the following review bridges this gap in the literature and brings to light the methodological and statistical problems of analyzing health disparities among women today.

Sexual Minority and Heterosexual Women's Health Review

Lesbian. Blosnich, Farmer, Lee, Silenzio, and Bowen (2014) explored data from the Behavioral Risk Factor Surveillance System (BRFSS) across 12 states to analyze 615 lesbians and 51,639 heterosexual women. Lesbians were 50% more likely to be diagnosed with asthma

than heterosexual women (adjusted odds ratio [AOR]=1.50, [1.04, 2.16], $p<0.05$), but equally as likely to be diagnosed with diabetes, cardiovascular disease symptoms, as overweight or obese (p. 343). Among health-risk behaviors, lesbians were 91% more likely to be a current smoker than heterosexual women, AOR=1.91, 95% CI [1.26, 2.91], $p<0.05$. Lesbians were also more likely to engage in binge drinking behaviors, AOR=1.64, [1.04, 2.61], $p<0.05$.

Chen et al. (2014) investigated the association between sexual orientation and polycystic ovary syndrome (PCOS)-related indicators among 97 diagnosed women in Taipei, Taiwan, eight of whom self-identified as lesbian. A group of 75 women without PCOS were the control group. Blood assays collecting hormone levels and body mass index (BMI) were measured (BMI<25=normal, BMI 25-29=overweight, BMI ≥ 30=obese). Results indicated that lesbians with PCOS had significantly higher BMI than heterosexual women with PCOS (26.5 vs. 22.5, $p=0.042$) and the control group of women without PCOS (26.5 vs. 22.4, $p=0.043$) (p. 544). The remaining outcome variables related to clinical or biochemical characteristics of PCOS were not significant between lesbians and heterosexual women.

Kim and Fredriksen-Goldsen (2012) explored risks for health disparities among Hispanic lesbians ($n=41$), non-Hispanic white lesbians ($n=936$), and Hispanic heterosexual women ($n=4,506$) through a secondary analysis of the Washington BRFSS survey. Results indicated that lifetime asthma occurred less frequently for Non-Hispanic lesbians (AOR=0.28; 95% CI [0.11, 0.73], $p<0.05$) and Hispanic heterosexual women, AOR=0.24, [0.09, 0.63], $p<0.01$. Hispanic heterosexual women were also less likely to have a disability than Hispanic lesbians, AOR=0.20, 95% CI [0.07, 0.56], $p<0.01$. The odds of being obese, having arthritis, engaging in acute drinking, and a lack of exercise were equally as likely for Hispanic and Non-Hispanic lesbians.

The only health behavior that differed significantly was smoking; Hispanic lesbians smoked at a higher rate than Hispanic heterosexual women, AOR=0.38; 95% CI [0.16, 0.93], $p<0.05$ (p. 12).

In 2012, Fredriksen-Goldsen, Kim, and Barkan investigated disability and disability covariates in a secondary analysis of the BRFSS Washington state data. Lesbians (n=626) were 97% more likely to have a disability (AOR=1.97, $p<0.001$), 55% more likely to suffer from arthritis (AOR=1.55, $p<0.001$), 60% more likely to be obese (AOR=1.60, $p<0.001$), and 96% more likely to be a smoker than heterosexual women (n=49,092), AOR=1.95, $p<0.001$ (p. 18). These differences remained significant even after controlling for demographic variables (age, education, and income) and health-related covariates of disability (asthma, obesity, arthritis, smoking, lack of exercise, and mental distress). The final multivariate logistic regression model revealed that lesbians were 71% more likely to have a disability than heterosexual women, $p<0.001$ (p. 19).

Among 347 lesbians sampled from the Oregon BRFSS survey, Garland-Forshee, Fiala, Ngo, and Moseley (2014) revealed that lesbians were twice as likely to have arthritis (AOR=2.0, 95% CI [1.2, 3.3], p=0.005) and 90% more likely to have a disability than heterosexual women (n=25,602), (AOR=1.9, [1.3, 2.6], $p<0.001$) after adjusting for age, education, relationship status, and urban and rural residency. Additionally, lesbians were 60% more likely to be obese (AOR=1.6, [1.2, 2.1], p=0.002) and 60% more likely to be a smoker, AOR=1.6, [1.1, 2.3], p=0.02. Lesbians and heterosexual women were equally as likely to have cardiovascular disease, high blood pressure, high cholesterol, diabetes, asthma, and to engage in binge drinking.

Bisexual. Kim and Fredriksen-Goldsen (2012) uncovered several differences between Hispanic bisexual (n=60) and heterosexual women (n=4,506), but no significant differences among non-Hispanic bisexual women (n=795). Hispanic heterosexual women were at a lower

risk for lifetime asthma, (AOR=0.40, 95% CI [0.20-0.82], $p<0.05$), disability (AOR=0.33, [0.15, 0.72], $p<0.01$), and arthritis (AOR=0.25, [0.08-0.76], $p<0.05$) than Hispanic bisexual women (p. 13). For health behaviors, Hispanic heterosexual women were less likely to be smokers (AOR=0.12, [0.06, 0.25], $p<0.05$) and to be an acute drinker (AOR=0.18, [0.08, 0.38], $p<0.001$) than were Hispanic bisexual women (p. 13). Hispanic and non-Hispanic white bisexual women were at equal odds of being obese and not engaging in physical exercise.

Blosnich et al. (2014) found that bisexual women (n=451) were less likely to have diabetes (AOR=0.75, [0.44, 1.29]) but 68% more likely to report asthma than heterosexual women (n=51,639), AOR=1.68, [1.07, 2.63], $p<0.05$ (p. 343). Bisexual women (n=451) were also limited in physical activity due to physical, mental, or emotional problems at greater odds than heterosexual women, OR=2.15, 95% CI [1.46, 3.18], $p<0.05$. Women in both groups were equally as likely to be overweight, obese, or suffer from cardiovascular disease symptoms. Among at-risk behaviors, bisexual women were also 2.13 times as likely to be current smokers [1.33, 3.42], and 71% more likely to binge drink, OR=1.71, [1.02, 2.87], $p<0.05$.

Fredriksen-Goldsen et al.'s (2012) investigation of disability disparities revealed that bisexual women (n=536) were more than twice as likely to have a disability (AOR=2.83, $p<0.001$), 2.17 times as likely to have asthma ($p<0.001$), 54% more likely to have arthritis (AOR=1.54, $p=0.002$), and more than twice as likely to be a smoker as heterosexual women (n=49,092), AOR=2.30, $p<0.001$ (p. 18). Bisexual women continued to be more than twice as likely to have a disability after controlling for demographic and health-related variables, AOR=2.24, $p<0.001$ (p. 19).

Garland-Forshee et al. (2014) reported that bisexual women (n=322) were more than twice as likely to have asthma (AOR=2.4, 95% CI [1.5, 3.6], $p<0.001$), 2.3 times as likely to

have a disability ([1.7, 3.2], $p<0.001$), and 70% more likely to have a disability that required specialized equipment, such as a cane, than heterosexual women (n=25,602), AOR=1.7, [1.1, 2.7], p=0.03. Bisexual women were also 2.8 times as likely to be a smoker ([2.0, 3.9], $p<0.001$), 70% more likely to be obese (AOR=1.7, [1.2, 2.4], p=0.001), and more than twice as likely to engage in binge drinking as heterosexual women, AOR=2.5, [1.5, 4.1], p=0.001. Bisexual and heterosexual women were equally as likely to have cardiovascular disease, high blood pressure, high cholesterol, diabetes, and arthritis.

Grouped. Several articles grouped lesbian, bisexual, or same-sex partnered women for analyses. Lehavot and colleagues (2016) investigated mortality rates in postmenopausal women (M_{age}=60, SD=7) by SM and Veteran status (N=137,639). Led by minority stress theory and the biopsychosocial model, a complex model controlling for demographic (age, race/ethnicity, marital status, living alone, income, education, and level of employment), psychosocial (social support, social strain, trauma history, and depression), and health-risk behaviors (smoking status, alcohol intake), and health conditions (prevalence of asthma, arthritis, cardiovascular disease, cancer, and obesity) revealed group differences (p. 157). Findings indicated that death by any cause, all-cause mortality, was a significantly greater risk among SM women (n=1,884) than heterosexual women (n=135,755, HR=1.20, 95% CI [1.07, 1.36]) in the fully adjusted model. All-cause mortality was also a significant risk for Veterans (n=3,433) than non-Veterans (n=134,206, HR=1.14, [1.06, 1.22]. While there was not a significant interaction effect, cancer-specific mortality revealed stronger risks for SM veteran women (n=133), HR=1.70, [1.01, 2.85].

Lehavot et al. (2016) also modeled within-group differences while controlling for all other variables. SM non-Veterans (n=1,751) whoever had arthritis were at an increased risk for all-cause mortality than those who never had arthritis, HR=1.14, [1.10, 1.85]. Similarly, SM non-

Veterans were at an increased risk for all-cause mortality if they ever had cardiovascular disease (HR=1.44, [1.09, 1.90]), were obese (HR=1.45, [1.12, 1.89]), or were ever a smoker, HR=1.39, [1.06, 1.84]. Trauma-exposed SM Veterans (excluding verbal and physical abuse) were at 4.3 times the risk of all-cause mortality than SM Veterans not exposed to other traumas, [1.38, 13.47].

Blosnich et al. (2013) investigated lifetime and current diagnosis of asthma among same-sex partnered (*n*=433) or opposite-sex partnered women (*n*=53,875) from the BRFSS national dataset. Same-sex partnered women were 2.09 times as likely to report current asthma as opposite-sex partnered women (95% CI [1.30, 3.36]) as well as higher odds of lifetime diagnosis of asthma, AOR=1.72, [1.11, 2.65] (p. 85). Of women reporting current asthma, same-sex partnered women were more than seven times as likely to be overweight or obese as opposite-sex partnered women, AOR=7.13, [2.18, 23.31]. Women with lifetime diagnosis and in a same-sex relationship were 3.06 times as likely to be overweight or obese, [1.22, 7.70] (p. 86).

Fredriksen-Goldsen et al. (2013) reported health outcomes and chronic conditions between lesbian/bisexual women (*n*=853) and heterosexual women (*n*=57,466) from the BRFSS Washington data for women over 50 years of age. After controlling for age, income, and education, SM women were 47% more likely to have a disability (AOR=1.47, 95% CI [1.22, 1.77], $p<0.001$), 42% more likely to be obese (AOR=1.40, [1.07, 1.81], $p<0.05$), and 37% more likely to have cardiovascular disease than heterosexual women, AOR=1.37, [1.00, 1.86], $p<0.05$ (p. 1805). Additionally, SM women were 57% more likely to be smokers (AOR=1.57, [1.22, 2.00], $p<0.001$), and 43% more likely to engage in excessive drinking, AOR=1.77, [1.02, 2.00], $p<0.05$ (p. 1806). Women were equally as likely to have arthritis, asthma, diabetes, high blood pressure, and high cholesterol.

Cochran and Mays's (2012) study on mortality statistics from a national sample from the NHIS survey investigated breast cancer-related mortality and all-cause mortality. Findings revealed that same-sex partnered women (n=693) were at a significantly higher risk for fatal breast cancer than the comparison group of opposite-sex partnered women (n=136,174; risk ratio [RR]=3.2, 95% CI [1.01, 10.21], p<0.05). All-cause mortality, however, did not significantly differ (hazard ratio [HR]=1.23, 95% CI [0.66, 2.32], p. 531).

Grouped women and men. Some studies look at groups by combining genders and evaluating SM versus heterosexual groups. Juster and colleagues (2013) collected primary data from 87 individuals to explore sexual orientation and disclosure of sexual orientation among biological measures. Their analyses included between-group comparisons for sexual minorities (n=46) and heterosexuals (n=42) and within-group differences for disclosed (n=31) or non-disclosed sexual minorities (n=14) for diurnal cortisol levels (a biological measure of stress) and allostatic loads (measures damage caused by chronic stress). There were no statistically significant differences in diurnal cortisol levels (p > .30) between heterosexuals and sexual minorities or allostatic load (p > .05) for women.

Juster et al.'s (2013) within-group analyses of disclosed or non-disclosed sexual minorities (in the closet or out of the closet) revealed significant differences between disclosure groups for diurnal cortisol levels, F(1, 41)=9.27, p=0.004. Disclosure status accounted for 18.4% of the variance in cortisol levels. Cortisol levels were collected at five points during the day. Disclosed sexual minorities had significantly lower levels of cortisol than non-disclosed individuals 30 minutes after waking. Allostatic loads between disclosed and non-disclosed sexual minorities were not statistically different (p>.20).

Katz-Wise and colleagues (2015) explored chronic pain among adolescents and adults in the U. S. (N=8,319). Although men and women did not differ in reported stomachaches, lesbians (n=46) were more likely to report weekly or daily headaches (p=0.003) and bisexual women (n=105) were more likely to report weekly/daily muscle or joint pain (p<0.001). After controlling for child maltreatment, depressive symptoms, suicidal ideation, social support, and self-esteem, lesbians were 68% more likely to report daily/weekly headaches compared to heterosexual women, OR=1.68, 95% CI [0.79, 3.57]. Adding controls to the final model decreased the effect of sexual orientation by 11%. The effect of sexual orientation on daily/weekly muscle or joint pain experienced by bisexual women decreased by 10% in the final model (OR=1.68, [0.94, 3.01]), but increased by 7% for gay men, OR=0.26, [0.09, 0.69].

Matthews and Lee (2014) investigated chronic disabilities among a sample in North Carolina (N=9,876). SM men and women were no more or less likely to be diagnosed with hypertension, high cholesterol, diabetes, asthma, obesity, or be overweight than their heterosexual peers. SM women were less likely to be diagnosed with angina or heart disease than heterosexual women, AOR=0.19, 95% CI [0.04, 0.87]. SM women were more than twice as likely to have smoked 100 or more cigarettes in their life (AOR=2.92, [1.54, 5.54]), twice as likely to be a current smoker (AOR=2.01, [1.04, 3.87], and more than twice as likely to be a former smoker as heterosexual women, AOR=2.11, [1.09, 4.09].

Hatzenbuehler, McLaughlin, and Slopen (2013) explored cardiovascular biomarkers of young adults (N=12,451), including 307 SM women and 213 SM men. Cardiovascular variables collected in this study include systolic and diastolic blood pressure, pulse rates, and blood assays to analyze C-reactive protein (CRP) and glycosylate hemoglobin (HbA1c, blood glucose) (Hatzenbuehler et al., 2013). Indicators of future cardiovascular disease (CVD) include elevated

blood pressure, CRP levels, which measure the amount of inflammation, damage, and infection in the body (low risk <1, average risk 1-3, high risk >3), and HbA1c levels greater than 5.7% (Hatzenbuehler et al., 2013). SM women had significantly lower levels of CRP than heterosexual women, 2.28 vs. 2.53, B=-0.18, SE=0.09, p<0.05. Sexual orientation accounted for 24% of the variance in average levels. Systolic and diastolic blood pressure, pulse rate, and hemoglobin levels were not statistically significant for women in the final model.

Cochran and Mays (2007) explored health conditions among 2,272 individuals who completed the California Quality of Life Survey. Among women, lesbians (n=48) were twice as likely to report arthritis as heterosexual women, n=1,058; AOR=2.02, 95% CI [1.00, 4.08]. Bisexual women (n=38) were more than twice as likely to have digestive problems (ulcer, enteritis, colitis) (AOR=2.77, [1.06, 7.22]), 2.39 times as likely to have back problems [1.10, 5.20], and more than 3 times as likely to experience chronic fatigue syndrome as exclusively heterosexual women, AOR=3.30, [1.14, 9.55]. Homosexually experienced heterosexual women (n=28) were 2.88 times as likely to suffer from asthma [1.15, 7.19] and 3.05 times as likely to have back problems as exclusively heterosexual women [1.32, 7.04].

Boehmer, Miao, Maxwell and Ozonoff's (2014) ecological study explored the number of sexual minorities in a geographic area (SM density) with the rates of several types of cancer incidences in 58 California counties. Their findings suggested that as the population density of lesbians (M=0.66, SD=0.78, range=0 - 3.05) increased by one point, lung cancer incidence decreased by 5.1% (incidence rate ratio [IRR]=0.949, p<0.0001) and colorectal cancer decreased by 2.9% (IRR=0.971, p=0.0095) (p. 4). Breast cancer incidence, however, increased by 2.3% with each one-point increase in lesbian population density (IRR=1.023, p<0.0001). As the population density of bisexual women increased by one unit, lung cancer incidence increased by

11.3% (IRR=1.113, $p<0.0001$) and breast cancer decreased by 3.2% (IRR=0.968, $p<0.0001$, p. 4).

Synthesis of Results

Physical stress biomarkers. The odds of having hypertension did not differ significantly across sexual orientations in two studies (Cochran & Mays, 2007; Matthews & Lee, 2014). Sexual minority (SM) women were equally as likely to have high cholesterol compared to heterosexuals in three studies (Fredriksen-Goldsen et al., 2013; Garland-Forshee et al., 2014; Matthews & Lee, 2014). SM women were equally as likely to have high blood pressure in three studies (Fredriksen-Goldsen et al., 2013; Garland-Forshee et al., 2014; Hatzenbuehler et al., 2013).

Disclosed sexual minorities had lower levels of cortisol than non-disclosed minorities in one study (Juster et al., 2013). Allostatic loads between disclosed and non-disclosed sexual minorities were not statistically different (Juster et al., 2013). Higher levels of CRP were found among SM men, and lower levels among SM women were reported in one study (Hatzenbuehler et al., 2013). Cortisol levels and allostatic loads were not different among women in one study (Juster et al., 2013).

Medical diagnoses. The following studies review the medical diagnoses of arthritis, asthma, cancer, cardiovascular disease, chronic pain, diabetes, digestive problems, disability, migraines or headaches, and obesity.

Arthritis. Lesbians were more likely to suffer from arthritis than heterosexual women in three studies (Cochran & Mays, 2007; Fredriksen-Goldsen, 2012; Garland-Forshee et al., 2014), although, in one study examining race and SM status, Hispanic lesbians did not show this health disparity (Kim & Fredriksen-Goldsen, 2012). Bisexual women were more likely than

heterosexual women to have arthritis in two studies (Fredriksen-Goldsen et al., 2012; Kim & Fredriksen-Goldsen, 2012), but equally as likely in one (Garland-Forshee et al., 2014). In sum, SM women were more likely to suffer from arthritis in four studies (Cochran & Mays, 2007; Fredriksen-Goldsen, 2012; Garland-Forshee et al., 2014; Kim & Fredriksen-Goldsen, 2012) and equally as likely to have arthritis in one (Fredriksen-Goldsen et al., 2013).

Asthma. Compared to heterosexual women, higher rates of asthma were found in two studies for lesbians (Blosnich et al., 2014; Kim & Fredriksen-Goldsen, 2012, [Hispanic lesbians]) and equal odds in another (Garland-Forshee et al., 2014). Bisexual women were more likely than heterosexual women to have asthma in four studies (Blosnich et al., 2014; Fredriksen-Goldsen et al., 2012; Garland-Forshee et al., 2014; Kim & Fredriksen-Goldsen, 2012). In sum, SM women were more likely to have asthma in six studies (Blosnich et al., 2013; Blosnich et al., 2014; Cochran & Mays, 2007; Fredriksen-Goldsen et al., 2012; Garland-Forshee et al., 2014) and equally as likely to have asthma in two studies (Fredriksen-Goldsen et al., 2013; Matthews & Lee, 2014).

Cancer. Same-sex-partnered women were at a higher risk for fatal breast cancer or cancer-specific mortality than opposite-sex partnered women in two studies (Cochran & Mays, 2012; Lehavot et al., 2016). Breast cancer incidence increased in counties with more lesbians but decreased in counties with more bisexual women (Boehmer et al., 2014). Lung cancer and colorectal cancer incidence decreased as lesbian population increased (Boehmer et al., 2014). Lung cancer incidence increased as the population of bisexual women increased (Boehmer et al., 2014).

Cardiovascular disease. Lesbians and bisexual women were equally as likely to have cardiovascular disease symptoms compared to heterosexual women in two studies (Blosnich et

al., 2014; Garland-Forshee et al., 2014). SM women in total were equally as likely to have cardiovascular disease in three studies (Blosnich et al., 2014; Fredriksen-Goldsen et al., 2013; Garland-Forshee et al., 2014). One study found that SM women were less likely to be diagnosed with cardiovascular disease (Matthews & Lee, 2014).

Chronic pain. Bisexual women were more likely than heterosexual women to report frequent muscle or joint pain in one study (Katz-Wise et al., 2015). Homosexually experienced heterosexual women and bisexual women were more likely to have back problems in one study (Cochran & Mays, 2007).

Diabetes. Lesbians and heterosexual women were equally as likely to have diabetes in two studies (Blosnich et al., 2014; Garland-Forshee et al., 2014). Bisexual women were less likely to have diabetes in one study (Blosnich et al., 2014), but equally as like to have diabetes in another (Garland-Forshee et al., 2014). In total, SM women were no more or less likely to be diagnosed with diabetes than their heterosexual peers in four studies (Blosnich et al., 2014; Fredriksen-Goldsen et al., 2013; Garland-Forshee et al., 2014; Matthews & Lee, 2014).

Digestive problems. Lesbians were as equally as likely as heterosexuals to suffer from digestion problems in two studies (Cochran & Mays, 2007; Katz-Wise et al., 2015). Bisexual women were more likely to have digestive problems in one study (Cochran & Mays, 2007).

Disability. Lesbians were more likely than other women to have a disability in three studies (Fredriksen-Goldsen, 2012; Garland-Forshee et al., 2014; Kim & Fredriksen-Goldsen, 2012). Bisexual women were more likely to have a disability in four studies (Blosnich et al., 2014; Fredriksen-Goldsen et al., 2012; Garland-Forshee et al., 2014; Kim & Fredriksen-Goldsen, 2012). SM women were equally as likely to have a disability in two studies (Cochran & Mays,

2007; Fredriksen-Goldsen et al., 2013), but more likely in four studies (Blosnich et al., 2014; Fredriksen-Goldsen et al., 2012; Garland-Forshee et al., 2014; Kim & Fredriksen-Goldsen, 2012)

Migraines or headaches. Lesbians were more likely to report headaches than heterosexual women in one study (Katz-Wise et al., 2015) and equally as likely to report migraines or headaches in another (Cochran & Mays, 2007).

Obesity. Lesbians were more likely to have obesity or be overweight in three studies (Chen et al., 2014; Fredriksen-Goldsen et al., 2012; Garland-Forshee et al., 2014); however, two studies found no significant obesity differences (Blosnich et al., 2014; Kim & Fredriksen-Goldsen, 2012). Bisexual women were more likely to be obese in one study (Garland-Forshee et al., 2014) but at equal odds in two studies (Blosnich et al., 2014; Kim & Fredriksen-Goldsen, 2012). Connecting SM women, women were more likely to be obese or overweight in five studies (Blosnich et al., 2013, [women with asthma]; Chen et al., 2014; Fredriksen-Goldsen et al., 2013; Fredriksen-Goldsen et al., 2012; Garland-Forshee et al., 2014), yet no more or less likely be obese or overweight in three studies (Blosnich et al., 2014; Kim & Fredriksen-Goldsen, 2012; Matthews & Lee, 2014).

Health-risk behaviors. Binge drinking and smoking represent health-risk behaviors in the following studies. Lesbians were more likely to engage in binge drinking behaviors in one study (Blosnich et al., 2014) but not more or less likely in Garland-Forshee et al.'s (2014) investigation, or among Hispanic lesbians (Kim & Fredriksen-Goldsen, 2012). Bisexual women were more likely to engage in binge drinking in three studies (Blosnich et al., 2014; Garland-Forshee et al., 2014; Kim & Fredriksen-Goldsen, 2012). Connecting SM women revealed four studies with increased rates of binge drinking (Blosnich et al., 2014; Fredriksen-Goldsen et al., 2013; Garland-Forshee et al., 2014; Kim & Fredriksen-Goldsen, 2012).

Lesbians were more likely to be smokers in four studies (Blosnich et al., 2014; Fredriksen-Goldsen, 2012; Garland-Forshee et al., 2014; Kim & Fredriksen-Goldsen, 2012). Bisexual women were more likely to be smokers in three studies (Blosnich et al., 2014; Fredriksen-Goldsen et al., 2012; Garland-Forshee et al., 2014). In sum, SM women were more likely than other women to be smokers in six studies (Blosnich et al., 2014; Fredriksen-Goldsen, 2012; Fredriksen-Goldsen et al., 2013; Garland-Forshee et al., 2014; Kim & Fredriksen-Goldsen, 2012; Matthews & Lee, 2014).

Summary of Evidence

This review of medical diagnoses and biomarkers of physical health disparities and risks across sexual minorities in fifteen studies revealed the complexities of measuring health. Repeatedly found were significant differences among SM identities; however, arthritis, asthma, cancer, cardiovascular disease, chronic pain, diabetes, digestive problems, disability, and migraines, and biomarker disparities were less frequent. SM women had notably frequent obesity rates. Unfortunately, smoking and binge drinking was frequent between the lesbian and bisexual samples.

Although previous literature suggested a generalized gap in SM health disparities (Lick et al., 2013), complex models, such as the one tested by Lehavot et al. (2016), exposed variations that force researchers to rethink the intricacies of the minority stress process. For example, SM women were at a higher risk for CVD than heterosexual women until all minority stress components were controlled in the model; yet, Veterans remained at statistically significant risk (Lehavot et al., 2016). Additionally, Juster et al.'s (2013) investigation established a decrease in allostatic load among SM men in their controlled model, contrary to minority stress theory. The uniqueness of reviewed models compels further investigation into the methodological design of

minority stress research. Further research is needed to delineate the critical variables contributing to health disparities.

Limitations. There are limitations when reviewing articles based on variables of interest and not the method or theoretical underpinnings of selected articles. It is difficult to compare findings across studies that vary widely in design, sample size and characteristics, and statistical analyses. As noted by past research, investigating sexual orientations in national datasets can be impossible if demographics do not include sexual orientation-related variables (DHHS, 2014d; Institute of Medicine, 2011; Lick et al., 2013). Consensus must be established on required variables and the method of conducting minority stress research to aid in building a comprehensive meta-analysis of SM health disparities.

Due to the lack of an established method, physical health disparities are frequently investigated on a self-report Likert-scale from good to poor health ratings (Institute of Medicine, 2011; Lick et al., 2013). Although this self-reflection is essential to explore, countless articles rely heavily on self-report to convey overall physical health disparities of the SM population (Fredriksen-Goldsen et al., 2010; Lick et al., 2013; Przedworski, McAlpine, Karaca-Mandic, & VanKim., 2014). Additionally, many studies aim to investigate health disparities; yet they gather information on sexual health, such as sexually transmitted infections and diseases (Institute of Medicine, 2011; Lick et al., 2013; Operario et al., 2015).

Further, the lack of a standardized method to gather sexual orientation data creates various categories, which are difficult to connect across studies (DHHS, 2010; Institute of Medicine, 2011). Although past researchers have simplified sexual orientation to a dichotomous level (See Andersen, Zou, & Blosnich, 2015, and Jabson, Farmer, & Bowen, 2015), this method was not exclusively found among the reviewed studies. Most SM groupings combined

lesbian/bisexual or gay/bisexual to compare to heterosexual men and women. Future endeavors would benefit from larger sample sizes to avoid grouping SM individuals as a singular group.

Gaps in Literature

Findings from only two of the reviewed articles were based on primary data, and all of the studies were cross-sectional. Longitudinal designs, while more difficult, maybe a more appropriate study design for capturing health disparities. As previously mentioned, secondary databases available today may not have sexual orientation measures, or, if they do, they have not been incorporated into the data collection long enough for a longitudinal design. Researchers must begin preparations and discussions for strategic methods to analyze minority stress, as national datasets will soon be reporting sexual orientation-related variables (DHHS, 2014d).

Utilizing a more cohesive framework to understand the complexities of public health will significantly improve evidence of health disparities. The SDH framework can provide this structure. Irwin and Solar (2010) stated that a complete SDH framework must be able to fulfill the following requirements (p. 20):

1. Identify the social determinants of health and the social determinants of inequities in health;
2. Show how major determinants relate to each other;
3. Clarify the mechanisms by which social determinants generate health inequities;
4. Provide a framework for evaluating which SDH are the most important to address;
5. Map specific levels of intervention and policy entry points for action on SDH.

With these aspects in mind, the researcher focuses this study on the SDH framework with the goal of providing a cohesive application of the complexities of health and wellness to bridge the gap in the current literature.

Methods

Study Design

The researcher conducted a cross-sectional study utilizing an anonymous online survey. The survey was developed by the researcher to collect a variety of data capturing the complex Social Determinants of Health (SDH) framework. The survey items, selected validated scales, and data analysis process reflect an innovative procedure to understand health disparities among women in the U.S. The hypotheses of this study were: (1) The PWS will become more reliable for heterosexual, lesbian, and bisexual women once sexuality concerns are added to the survey; and (2) The Intermediary Determinants of Health will mediate the relationship between Socioeconomic Position and the PWS score.

Population and Sample

Criteria for inclusion. Adult women (18 and over) who live in the U.S. were recruited through online methods. Participants, who self-identified as assigned male at birth or less than 18 years of age, were immediately removed from the survey. Each participant was asked if she lived in the United States. Those who lived outside of the U.S. were excluded from the analysis. Additionally, several individuals (n=17) were excluded from the analysis because they identified as transgender.

Sampling and recruitment procedures. An online survey was distributed across social media websites (Facebook and Twitter), advertised on Internet discussion boards on Reddit.com, and the University of Texas at Arlington School of Social Work's Bachelors, Masters, Doctorate, and Faculty listserv groups. There were no incentives available for participants. The researcher did not place an age cap on recruitment text. The recruitment text advertised for 18 and over, allowing the maximum to be determined for later analysis. A recent investigation into online use

indicated the following rates of internet usage: 95% of Millennials (born 1977-1992, 25-40 years), 86% of Generation X (1965-1976, 41-52 years), 81% of Young Boomers (1955-1964, 53-62 years), 76% of Older Boomers (1946-1954, 63-71 years), and 58% of the Silent Generation (1928-1945, 72-89 years) (Perrin, 2015). With the widespread use of the Internet and the researcher's expertise in online recruitment, the investigator was confident that a large sample of women ranging across age cohorts could be recruited for this analysis.

On a weekly basis, the researcher posted an announcement on Reddit to recruit participants. See Appendix A for samples of recruitment text. Access to Reddit was free and open to the public. There are sub-Reddits where particular groups meet to discuss topics they are interested in. For example, r/lgbt and r/actuallesbians are subReddits specifically for the LGBT or lesbian individual. Posts will be made to each of the related subReddits as relevant. See Appendix B for a list of all subReddits where posts were made and the average number of subscribers to each page. To capture a range of participants, the posts were made at varying times of the day. Although demographic characteristics vary widely across subReddits, overall 56% of Reddit visitors are from the U.S., 69% are male, and 58% are between the ages of 18-29 (Mediakix, 2017).

Twitter posts must be shorter in length due to the limit of 140 characters or less. An example post included: "Health Disparities study for lesbian, bisexual, and heterosexual women! 18 and older. Responses anonymous. Follow link to survey: *survey link*." Twitter posts were dispatched bimonthly at varying times of the day.

A Facebook page was also created for recruitment. A Facebook page was available free and could be used to provide general announcements similar to the Reddit text. Bimonthly announcements were posted through this page. Several private Facebook groups were contacted

to obtain permission to post the survey announcement with few giving permission: Academic Mamas (12,500 members), LGBT (8,500 members), The Bisexual Zone (3,600 members), and Black Lesbians (9,000 members). Two posts were made to these pages, one initial announcement, and one reminder.

Data Collection Procedures

The researcher hosted the survey on Qualtrics, a survey development tool supported by the University of Texas at Arlington. The survey launched along with website advertisements and remained opened from October of 2017 to January of 2018. Once the survey was closed, the researcher analyzed the data using SPSS-24, Amos-25 (IBM, 2016), and SPSS add-on's G*Power (Faul, Erdfelder, Buchner, & Lang, 2009), and PROCESS 3.0 (Hayes, 2018) to assess the hypotheses. The survey was completely anonymous with no identifiable information collected. The IP addresses of the participants was used to check for duplicate surveyors and then discarded.

The survey included 76 questions and three questionnaires [PWS (36 questions), LEC (17 questions), and PTSD (6 questions)]. The questions were displayed to the participants in random block order. All questions related to health, for example, were grouped as one block. There were a total of 11 randomized blocks with less than 20 questions per block: basic demographics, tobacco/alcohol usage, doctor visits, health, sexuality concerns, living conditions, pregnancy and children, family history, transportation, the PWS survey, and the PTSD Checklist. This randomization allowed the researcher the ability to maximize the randomness of missing data due to testing fatigue. See Appendix C for the full survey.

Informed consent. When an individual clicked on the recruitment link, they were brought to the Informed Consent page. Each participant had to select "I consent" to enter the

survey. If they selected “I do not consent,” they were exited to the final page of the survey where participants were thanked for their time and offered several hotlines to contact if they had experienced any stress during the survey.

Data Management and Storing

Only the primary researcher had full access to the data. Once the data were pulled from the Qualtrics platform, the data were stored and analyzed on a secure encrypted laptop. As the informed consents were reviewed and consented by the participants on the primary page of the survey, no informed consents needed storing.

Ethical Considerations and Study Approval

This study was designed to minimize ethical issues through an anonymous online survey. The researcher did not collect explicit identifying information (i.e. first and last name) or location information (zip codes or county) that could lead to identifying the participants. The researcher asked participants to self-report specific health diagnoses through the question: Has a medical professional ever diagnosed you any of the following conditions? It was possible that this question and additional questions about mental health conditions and selecting stressful life events from a list could cause feelings of stress. The researcher, therefore, concluded the survey with an information page thanking participants for their time and described how to contact medical professionals if any stress did occur. The UTA Institutional Review Board approved the study before any steps were taken to begin recruitment for this survey. All participants were required to review the consent form before entering the survey. The participants were also able to exit the survey at any time without consequence. No financial incentives were given to individuals for completing the survey.

During the course of data collection, a complaint was submitted to the IRB regarding the researcher's terminology in the recruitment text. The complainant identified that using "women" was inappropriate because the survey was designed to exit any women assigned-male at birth from the survey, indicating that transgender individuals may experience disappointment for entering the survey and not being able to complete the questions. The researcher acknowledged this drawback and changed the recruitment text to call for "cis-gender women." The researcher launched the survey once the IRB accepted the new text in hopes that the new dialogue would clarify and ease any confusion about the sample being recruited.

Variables

Demographics. The researcher collected a variety of demographic questions to better understand the characteristics of the sample. Age, race, and sexual orientation were used in the analyses and described below. Information about marital status, sample location, and where participants learned about the survey were described in the results section, but not used in analyses. Variables were transformed due to sample size issues if the variance of perceived health between categories were not significantly different. See Table 1. Demographic Variables included in Analyses for more details.

Age. Age was measured as a continuous variable and recoded into a nominal variable for age cohorts: *Centennial* (18-24 years), *Millennial* (25-40 years), *Generation X* (41-52 years), and *Boomers-Silent Generation* (53-89 years).

Race. Race and ethnicity was captured through two questions by asking if they identified as Latina, Hispanic, or Spanish origin, as well as asking for them to identify their race or ethnicity: *White, Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific, Islander, or Multiple ethnicity/Other*. If participants identified as

Latina, Hispanic or Spanish origin, they were recoded as Latina within the race/ethnicity question. Due to small sample sizes race was then recoded as White, Black and Latina or White and Other, depending on the analysis.

Sexual orientation. Sexual orientation was first measured as heterosexual, bisexual, lesbian/gay, and other. The variable was then transformed due to small sample sizes (excluding those identifying as other) to a binary variable: Heterosexual and Sexual Minority.

Table 1. Demographic Variables included in Analyses

Variables	**Variable Type**	**Values**	**Variable Transformed**	**Transformed Values**	**Missing Data (*n*)**
Age	Continuous	18-88	Nominal	Centennial, Millennial, Generation X, Boomers-Silent	0
Race	Nominal	White, Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific, Islander, Multiple ethnicity/Other	Binary	White, Non-white	54
Sexual Orientation	Nominal	Heterosexual, Bisexual, Lesbian	Binary	Heterosexual, Sexual Minority	0

Structural determinants of health. The three sections of the social determinants of health (SDH) framework are described below. Perceived health will be measured through the Perceived Wellness Survey (PWS), Socioeconomic Position will be captured through the total score of education, occupation, and income, and Intermediary determinants of health will

represent the combined factors of material circumstances, biological and behavioral factors, and psychological measures.

Perceived health. The Perceived Wellness Survey (PWS) (Adams, Bezner, Garner, & Woodruff, 1998) was utilized to test the perceived health. The 36-item survey contained six subscales with six questions per subscale: Psychological, emotional, social, physical, spiritual, and intellectual wellness. A 6-point Likert scale was available for each question (1, Very strongly disagree to 6, Very strongly agree). See Appendix D for a view of the PWS's questions by each subscale. Following Adams's (1997) recommendation to create a composite score for PWS, each subscale's questions were first added and divided by six to find each subscale mean. The means of the subscales were added together for a Wellness Magnitude variable and divided by 6. Then the subscale deviation is calculated, divided by five (due to the number of subscales minus one, n-1) to find the subscale variances. The Wellness Balance was then calculated for each subscale by taking the square root of the variance plus 1.25 (to prevent invalid error if a balance score was zero). Taking the Wellness Magnitude and dividing it by the Wellness Balance calculated the final PWS composite score (Adams, 1997). See Appendix E for the Adams's (n.d.) syntax.

Adams and colleagues (1998) found high levels of reliability among a convenience sample of 1077 (51% of which were women, α range=0.89-0.91). In 2016, Kaveh, Ostovarfar, Keshavari, and Ghahremani validated the PWS among a sample of 180 adult Iranians (78.1% of which were women (Total PWS α=0.87, subscales ranged from 0.68 to 0.85). Ketz and Israel (2002) conducted the only sexual minority investigation into the differences between 69 heterosexual, lesbian, and bisexual women and found no significant group differences (α=0.87).

Socioeconomic position. The Socioeconomic Position (SEP) score represents the first component of the SDH framework. See Table 2. Variables for more details. Socioeconomic Position (SEP) could be scored using multiple factors: Occupation, Income, Education Level, and Gender. As all participants are women, gender was null in this analysis. All variables were recoded to create a score for each factor and added together to form the SEP score.

Income. Income was measured as an ordinal variable: *Less than $20,000, $20,000 to $34,999, $35,000 to $49,999, $50,000 to, $74,999, $75,000 to $99,999, $100,000 to $149,999, $150,000 to $199,999, and $200,000 or more*. A continuous score was created from 0 ($200,000 or more) to 7 (less than $20,000).

Education. Education was measured as an ordinal variable: *Completed some high school, High school graduate, Completed some college, Associate degree, Bachelor's degree, Completed some postgraduate, Master's degree, Ph.D., law or medical degree, and Other advanced degree beyond a Master's degree.* A continuous score was created from 0 (Ph.D., law or medical degree /Other advanced degree beyond a Master's degree) to 6 (Completed some high school).

Occupation. Occupation was measured as a nominal variable by asking participants which variable best fit their employment status: *Retired; Employed, 40 or more hours a week; Employed, less than 40 hours a week; Homemaker; Not employed, looking for work; Student; Not employed, not looking for work; and Disabled, not looking for work.* The researcher sorted these values by PWS outcome to score each level of measurement. Values with low PWS scores were given higher scores than values with high PWS scores, ordered from 0-7.

Intermediary determinants of health score. The Intermediate Determinants Score was calculated by adding together the final scores for the Material Circumstances (MC), Biological/Behavioral Factors (BB), and Psychosocial Factors (PF) factors described below.

Material circumstances. Material Circumstances (MC) combines factors relating to housing and neighborhood quality and safety as well as participants ability to meet their basic needs. Five variables were combined as continuous scores to represent MC potentially ranging from 0-14.

Table 2. Socioeconomic Position Variables

	Variable Type	**Values**	**Missing Data (*n*)**
Income	Ordinal	Less than $20,000 (7), $20,000 to $34,999 (6), $35,000 to $49,999 (5), $50,000 to $74,999 (4), $75,000 to $99,999 (3), $100,000 to $149,999 (2), $150,000 to $199,999 (1), $200,000 or more (0)	12
Education	Ordinal	Completed some high school (7), High school graduate (6), Completed some college (5), Associate degree (4), Bachelor's degree (3), Completed some postgraduate (2), Master's degree (1), Ph.D., law or medical degree and Other advanced degree beyond a Master's degree (0)	0
Occupation	Nominal	Retired (0), Employed, 40+ (1), Employed, <40 (2), Homemaker (3), Not employed, looking for work (4), Student (5), Not employed, not looking for work (6), Disabled, not looking for work (7)	1
SEP Score	**Continuous**	**Sum 2 variables (0-21)**	

Quality of housing. Housing quality was captured through the values of *Excellent (mint condition, one minor fault), Good (good except minor isolated repairs), Mixed (mix of well and poorly maintained items), and Poor or very poor (obvious and significant neglect).* This variable was calculated as a continuous variable by scoring the participant with one point for each increasing risk from excellent (0) to Poor or very poor (3).

Neighborhood safety. Neighborhood safety was measured as Extremely safe (0), Very safe (1), Somewhat safe (2), Very unsafe (3), and Extreme unsafe (4).

Neighborhood condition. Neighborhood safety was measured as Excellent (mint condition, one minor fault, 0), Good (good except minor isolated repairs, 1), Mixed (mix of well and poorly maintained items, 2), and Poor or very poor (obvious and significant neglect, 3).

Neighborhood litter. Neighborhood litter captured as no litter (0), predominantly free of litter except for some small items (1), widespread distribution of litter with minor accumulations (2), and heavily littered with significant accumulations (3).

Enough money. Whether or not a participant was able to meet their basic needs was captured through a binary question: *In the last 12 months, was there at least one time when you didn't feel you had enough money to meet your basic needs?* Responses were captured as No (1) and Yes (0).

Enough food. Whether or not a participant went hungry due to a lack of financial means was captured through a binary question: *In the last 12 months, was there at least one time when you were hungry but didn't eat because you couldn't afford enough food?* Responses were captured as No (1) and Yes (0).

Table 3. Material Circumstances Variables

Variables	**Variable Type**	**Values**	**Missing Data (*n*)**
Quality of housing	Ordinal	Excellent (0), Good (1), Mixed (2), Poor or very poor (3)	15
Neighborhood safety	Ordinal	Extremely safe (0), Very safe (1), Somewhat safe (2), Very unsafe (3), Extreme unsafe (4)	13
Neighborhood condition	Ordinal	Excellent (0), Good (1), Mixed (2), Poor or very poor (3)	15
Neighborhood litter	Ordinal	No litter (0), Predominantly free of litter (1), Widespread distribution of litter (2), Heavily littered (3)	13
Enough money	Binary	Yes (0), No (1)	18
Enough food	Binary	Yes (0), No (1)	18
MC Score	**Continuous**	**Sum of 5 variables (0-14)**	

Behavioral and biological factors. Behavioral and biological factors were captured through 13 possible questions. Due to the multitude of potential factors related to wellness, only variables significantly related to the PWS score will be included in the final models.

Body Mass Index. Participants were asked for their weight and height. This information was utilized to compute their Body Mass Index (BMI) utilizing the standard adult BMI equation: weight (in pounds) / [height (in inches)] ^{2} x 703 (CDC, 2017). BMI was then transformed into CDC's (2017) classifications: Underweight (Below 18.5), Normal or Healthy Weight (18.5-24.9), Overweight (25.0-29.9), and Obese (30.0 and above). As recent research reports suggest that BMI is not a solitary strong indicator of health (Tomiyama, Hunger, Nguyen-Cuu, & Wells, 2016), the levels of BMI will be ordered by the mean value of PWS scores. Individuals with normal or healthy BMI's were coded as 0, overweight (1), obesity (2), and underweight (3), with each point indicating an increase in health risks.

Genetic risks. Asking participants to identify a list of genetic risks by paternal and maternal history assessed genetic risks. The list of options included: *Anxiety, Arthritis, Asthma, Breast Cancer, Cancer, Colon polyps, Depression, Diabetes Type I, Diabetes Type II, Fibromyalgia/myositis, Heart disease, High blood pressure (hypertension), High cholesterol, Hypothyroidism, Irritable Bowel Disease, Major depressive disorder, Obesity, Osteoarthritis, Stroke, and Other*. This variable was calculated as a continuous variable by scoring the participant with one point each time they identified a risk (0-40).

Moderate exercise. Moderate exercise was measured at an ordinal level through the question: 1) *In a typical week, on how many days do you do any MODERATE activities (causes small increases in breathing or heart rate) for AT LEAST 30 minutes such as brisk walking, bicycling at a regular pace, gardening, etc.?* The ordinal level values were then scored by risk [0

days a week (4), 1-2 days (3), 3 days (2), 4-5 days (1), 6-7 days (0)].

Vigorous exercise. Vigorous exercise was measured at an ordinal level through the question: *In a typical week, on how many days do you do any VIGOROUS activities for AT LEAST 20 MINUTES such as running, cross country skiing, aerobics, fast bicycling, heavy lifting, etc.?* The ordinal level values were then scored by risk [0 days a week (4), 1-2 days (3), 3 days (2), 4-5 days (1), 6-7 days (0)].

Childhood stressors. Childhood stressors were assessed by a series of questions regarding stressful experiences through the question: *Did you ever experience any of the following, at least once, during your childhood? Please check if yes: Death of a primary caregiver or parent, Death of a sibling, Death of a close friend, Another death, A divorce between your primary caregivers or parents, Placement in foster care, Lived with caregiver(s) with depression or severe mental illness, Lived with caregiver(s) with alcoholism, Lived with caregiver(s) who smoked tobacco, Lived with caregiver(s) who used hard drugs (heroin, methamphetamine, cocaine, etc.), Lived with caregiver(s) who abused prescription drugs*. One point was given for each childhood stressor.

Childhood risks. Childhood risks were measured through the question: *During your childhood, did you ever the following: Chronic Illness, Cancer, Mental health diagnosis, and other illness*. One point was given for each childhood risk to create a continuous variable.

Birth risk. Birth risks were measured at a nominal level: *No birth risk, Low birth weight, Exposed hard drugs in utero, Born premature, Born with a birth defect*. One point was given for each birth risk to create a continuous variable.

Tobacco use. Participants were asked if they currently used tobacco with four response options: *Yes, on a regular basis; Not anymore, I quit; Yes, but only once in a while; and No, I*

have never used tobacco. This variable was transformed into a score with non-users receiving zero points, past users receiving one point, infrequent users receiving two pints, and regular users receiving three points.

Alcohol score. Alcohol Score was measured utilizing the 3-question AUDIT-C measure (Saunders, Aasland, Babor, de la Fuente, & Grant, 1993; Reinert, Duane, & Allen, 2007): *How often did you have a drink containing alcohol in the past year?* (Never, Monthly or less, 2 to 4 times a month, 2 to 3 times per week, 4 or more times a week); *How many drinks containing alcohol did you have on a typical day when you were drinking in the past year?* (1 or 2 drinks, 3 or 4, 5 or 6, 7 to 9, and 10 or more); *How often did you have six or more drinks on one occasion in the past year?* (Never, Less than monthly, Monthly, Weekly, and Daily or almost daily). Values were coded from 0 to 4 and added together for a total score. A score of three indicated hazardous drinking and 4 or more indicated an alcohol disorder.

Hours of sleep. To capture adequate sleep habits, the researcher asked participants if they got less than 7 hours, 7-8 hours on average, or more than 8 hours on a typical night. The variable was transformed into a binary variable: Less than 7 hours (1) and 7+ hours of sleep (0).

Mouth condition. Participants were asked how they would describe the condition of their mouths. This was measured on a Likert scale: Excellent (0), Very good (1), Good (2), Fair (3), and Poor (4).

Fast food consumption. Participants were asked how many times in the past week they had consumed fast food or pizza: *0 times, 1 time, 2 times, 3+ times*. To create fast food scores a scale was computed: 0 times (0), 1 time (1), 2 times (2), 3+ times (3).

Fruit and vegetable consumption. Participants were asked how many servings of fruits and vegetables they had each day in the past week: *0 servings, 1 serving, 2 servings, 3+ servings*.

To create a score for fruit and vegetable consumption a scale was computed: 0 times (3), 1 time (2), 2 times (1), 3+ times (0).

Sweetened drink consumption. Participants were asked how many times in the past week they had consumed sodas and sugar-sweetened drinks (regular, not diet): 0 times, 1 time, 2 times, 3+ times. To create a score for sweetened drink consumption a scale was computed: 0 times (0), 1 time (1), 2 times (2), 3+ times (3).

Table 4. Biological and Behavioral Factors Variables

	Variable Type	**Values**	**Variable Transformed**	**Transformed Values**	**Missing Data (*n*)**
BMI	Continuous	15-65	Continuous	Normal/Healthy (0), Overweight (1), Obese (2), Underweight (3)	59
Childhood Stress	Nominal	Death of a primary caregiver or parent, Death of a sibling, Death of a close friend, Another death, A divorce between your primary caregivers or parents, Placement in foster care, Lived with caregiver(s) with depression or severe mental illness, Lived with caregiver(s) with alcoholism,	Continuous	Score	0

	Variable Type	Values	Variable Transformed	Transformed Values	Missing Data (*n*)
		Lived with caregiver(s) who smoked tobacco, Lived with caregiver(s) who used hard drugs, Lived with caregiver(s) who abused prescription drugs			
Childhood Risk	Nominal	No risk, Chronic Illness, Cancer, Obesity, other	Continuous	Score	0
Birth Risk	Nominal	No birth risk, Low birth weight, Exposed hard drugs utero, Premature, With birth defect	Continuous	Score	0
Hours of sleep	Ordinal	Less than 7 hours, 7-8 hours on average, More than 8 hours	Binary	Yes (0), No (1)	19
Genetic Risks	Continuous	1-29			25
Vigorous Exercise	Ordinal	0 days a week (4), 1-2 days (3), 3 days (2), 4-5 days (1), 6-7 days (0)			21
Moderate Exercise	Ordinal	0 days a week (4), 1-2 days (3), 3 days (2), 4-5 days (1), 6-7 days (0)			21
Tobacco Use	Ordinal	Yes, on a regular basis (3), Yes, but only once in a while (2), Not anymore, I quit (1), No, I have never used tobacco (0)			14
Alcohol Score	Continuous	0-12			13
Mouth condition	Ordinal	Excellent (0), Very good (1), Good (2), Fair (3), Poor (4)			20

	Variable Type	Values	Variable Transformed	Transformed Values	Missing Data (*n*)
Fast Food	Ordinal	0 (0), 1(1), 2 (2), 3+ (3)			19
Fruits & Vegetables	Ordinal	0 (0), 1(1), 2 (2), 3+ (3)			21
Sugar-sweetened drinks	Ordinal	0 (0), 1(1), 2 (2), 3+ (3)			19
BB Score	**Continuous**	**Sum of 13 variables (0-74)**			

Psychosocial factors. The Life Events Checklist (LEC; Weathers, Blake, Schnurr, Kaloupek, Marx, & Keane, 2013), and Posttraumatic Stress Disorder (PTSD) Checklist (PCL; Lang & Stein, 2005; Weathers, Litz, Herman, Huska, & Keane, 1993) were utilized to create a score for psychosocial factors. The score of the LEC and PTSD were totaled to create the psychosocial factor score.

LEC score. The LEC was made up of 17 different traumatic life events where participants can select the following options: 1) It happened to you personally; 2) You witnessed it happen to someone else; 3) You learned about it happening to a close family member or close friend; 4) You were exposed to it as part of your job (for example, paramedic, police, military, or other first responders); 5) You're not sure if it fits; or 5) It doesn't apply to you (Weathers et al., 2013). Although few studies have investigated the psychometric properties of the LEC, two studies have upheld its validity (Bae, Kim, Koh, Kim, & Park, 2008; Gray, Litz, Hsu, & Lombardo, 2004). Gray et al.'s (2004) study revealed a Cronbach alpha score of 0.67 in the Korean version of the LEC.

Participants were scored one point each time they selected that the event happened to them, they witnessed the event happening to someone else, they learned about it happening to a family member or friend, or if they were exposed to it as part of their job. This resulted in a continuous variable potentially ranging from 0 to 68.

PTSD score. The PTSD score was calculated by using the 6-question PTSD Checklist (Lang & Stein, 2005) measure on Likert scales ranging from 1 (not at all) to 5 (extremely). See Appendix C for the survey questions. A score of 14 or greater indicated a positive score for PTSD. This resulted in a continuous variable potentially ranging from 0 to 22.

The PTSD Checklist was frequently used in conjunction with the LEC to gain a deeper understanding into the level of PTSD experienced by individuals who have experienced traumatic events (Wilkins, Lang, & Norman, 2011; Gray et al., 2004). Wilkins et al. (2015) found high levels of validity for the PTSD Check List (internal consistency, α=0.80; test-retest reliability, r=0.70; convergent, r=0.79 to 0.90).

Table 5. Psychosocial Factors Variables

	Variable Type	**Values**	**Missing Data (*n*)**
LEC sum	Continuous	Sum of "it happened to me," "I witnessed it," "I learned about it," and "Part of my job" across 17 events, 0-68	53
PTSD score	Continuous	0-30	20
PS Score	**Continuous**	**Sum of two variables (0-98)**	

Sexuality concerns. The researcher utilized concepts from previous studies (e.g. D'Augelli & Grossman, 2001; Herek, 2007) to create a set of questions related to sexuality concerns that heterosexual, lesbian, and bisexual participants would be able to respond to. The following questions address issues of microaggressions, discrimination, and victimization in relation to sexuality issues: 1. *In the past year, how often have you been excluded from conversations or gatherings due to your sexual orientation?* (Labeled: Excluded SO). 2. *In the past year, how often have you been excluded from conversations or gatherings due to your bending of gender identity (looking more or less feminine than your peers)?* (Labeled: Excluded GI). 3. *In the past year, how often have you experienced bullying or overt aggression due to your*

sexual orientation? (Labeled: Bully SO). 4. *In the past year, how often have you experienced bullying or overt aggression due to your bending of gender identity (looking more or less feminine than your peers)?* (Labeled: Bully GI). 5. *In the past year, how often have people of professional standing incorrectly assumed your sexual orientation (medical professionals, bosses, social service providers, etc.)?* (Labeled: Incorrect Assumption SO). These 5-items were computed to give each individual a composite score ranging from 0 to 25.

Table 6. Sexuality Concerns Variables

	Variable Type	**Values**	**Missing Data (*n*)**
Excluded SO	Ordinal	Never (0), very rarely (1), rarely (2), occasionally (3), very frequently (4), on a regular basis (5)	19
Excluded GI	Ordinal	Never (0), very rarely (1), rarely (2), occasionally (3), very frequently (4), on a regular basis (5)	23
Bullied SO	Ordinal	Never (0), very rarely (1), rarely (2), occasionally (3), very frequently (4), on a regular basis (5)	23
Bullied GI	Ordinal	Never (0), very rarely (1), rarely (2), occasionally (3), very frequently (4), on a regular basis (5)	26
Incorrect Assumption SO	Ordinal	Never (0), very rarely (1), rarely (2), occasionally (3), very frequently (4), on a regular basis (5)	24
SC Score	**Continuous**	**Sum 5 variables (0-25)**	

Diagnoses score. The variable capturing health conditions and diagnoses was used to test for convergent validity with the PWS. Each participant was asked to indicate if a medical professional had ever diagnosed them with the following conditions: Angina pectoris, Anxiety, Arthritis, Asthma, Breast Cancer, Cancer, Chronic bronchitis, Chronic heartburn/GERD, Chronic obstructive pulmonary disease (COPD), Colon polyps, Congestive heart failure, Depression, Diabetes Type I, Diabetes Type II, Fibromyalgia/myositis, Heart attack, Heart bypass surgery, Heart disease, High blood pressure (hypertension), High cholesterol, Hypothyroidism, Irritable Bowel Disease, Joint pain, Major depressive disorder, Obesity, Osteoarthritis, Stroke, or other.

For each condition the participant selected, they received one point. The average score for Health Diagnoses was 2.99 (SD=2.09), ranging from 1 to 14.

Data Analysis Procedures

To estimate recruitment numbers, an a-priori the sample size was calculated with an anticipated effect size of 0.15, statistical power set at 0.8, and a probability level of 0.05 utilizing the program, G*Power 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009). A total sample size of 68 participants was required with a critical *F*-value of 3.138.

The data cleaning process began with a review of survey duplicates and missing data. To check if individuals completed the survey more than once, the researcher sorted the IP addresses to identify duplicates. Surveys were deleted if duplicate IP addresses matched identical demographic characteristics. Missing data was then reviewed for surveys that were largely incomplete. If a participant did not complete any of the PWS survey, they were removed from the analysis.

The variables included in the SDH modeling were then analyzed for missing data patterns. The researcher conducted multiple imputations for missing data with 100 imputations as recommended by Graham, Olchowshi, and Gilreath (2007). Although 5 imputations are commonly used, Graham and colleagues (2007) suggested that 20 to 100 imputations would enable researchers to discern small and large effects. The only drawback to running many imputations is the time it takes for the SPSS program to run the analysis (Graham, Olchowshi, & Gilreath, 2007). The SDH framework analyses were then conducted with the pooled data.

The demographic variables were analyzed before investigating the two hypotheses. Age, in particular, was stratified by age-cohort to look at the distribution of age and mean differences across the cohorts. As the mean differences were not significant across several variables, all age-

cohorts were analyzed both together and as age-cohorts to further understand how age impacts the SDH framework.

First hypothesis. To address the first hypothesis, the researcher analyzed the Perceived Wellness Survey (PWS) for measurement model validity across the three groups (heterosexual, lesbian, and bisexual women) through a second-order Confirmatory Factor Analysis (CFA). This analysis was appropriate as previous research has established the validity of this survey and maintains a strong theoretical framework (Byrne, 2010). The researcher began this process by assessing the PWS through a second-order CFA. As shown in previous research, each subscale should load with high parameter estimates onto the overall PWS score. If the CFA upheld the theoretical framework, the research added in the seventh subscale to evaluate the modified PWS and reran the second-order CFA. See Appendix F for a diagram of the CFA of the PWS. As the Sexuality Concerns subscale did not fit the PWS CFA, the researcher pulled the subscale out of the PWS to test as a separate factor in the SDH framework in the second hypothesis. It was critical to keep the subscale in the framework to understand the specific experiences of discrimination the sample of women may face. The CFA's were analyzed by the three main factors of this investigation, racial category, sexual orientation, and age cohort to understand how the model fit each group.

Second hypothesis. A structural equation model (SEM) was created to address the second hypothesis that IDH will partially mediate the relationship between the SEP and the PWS score. The first step was to find the most relevant variables to represent the IDH and SEP scores. Variables were only kept in the model if they were significant predictors of the PWS score. Variables with low levels of correlation with the PWS could impact the Cronbach alpha score (Tavakol & Dennick, 2011). Reliability analyses were performed for each factor to understand

the internal consistency of the proposed representations of the SDH factors based on the SDH theoretical framework. The model was tested first with all statistically significant predictors of PWS scores within each scale, and then a second time with only the factors that revealed acceptable ranges of internal consistency.

Before running the mediation model, outliers were identified through a three-step process. First, the researcher ran a regression among the three factors and the distance measures for Mahalanobis distance, Cook's distance, and Leverage values distance (Abu-Bader, 2011; Vogt & Johnson, 2011). To detect outliers with Mahalanobis, values greater than or equal to the critical value of 13.82, a chi-square value with a df of 1, were identified (Abu-Bader, 2011). Leverage values are determined by the equation $2k/n$ where k was the number of independent variables plus 1 and n equals the number of participants in the analysis, 2*3/1031 (Vogt & Johnson, 2001). Cook's values ($4/n-k-1$) greater than or equal to 0.0039 and Leverage values greater than or equal to 0.0058 were identified as outliers. Cases were considered outliers for removal if two of the three distances identified the case as an outlier.

To test a mediation hypothesis, the researcher utilized the Process macro, an add-in function of SPSS developed by Hayes (2018). Process does not analyze imputed data but stacks all imputations so that it appears that there are additional cases. To not inflate the data, the researcher split the SPSS file by the first imputation. This resulted in an analysis with no missing data.

The conceptual model (See Figure 5) displays the pathways between these variables. In order for mediation to occur, three criteria must be met (Baron & Kenny, 1986): 1. SEP must significantly predict PWS score; 2. IDH must significantly predict PWS score, and 3. In the presence of the mediator IDH, SEP must no longer significantly predict PWS score (full

mediation), or SEP's predictive level must decrease (partial mediation), i.e. have a smaller beta. To test the complexities of the SDH framework, the researcher tested the model with several variations:

Original Mediating Model: The model was first tested with all participants grouped.

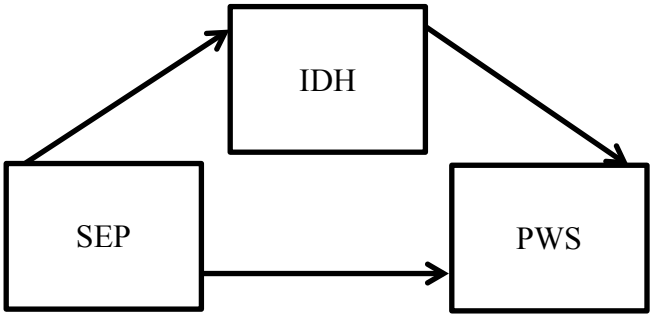

Figure 5. SDH Mediation Model

Mediating Mediation Model: If the first hypothesis was not supported, the next model would incorporate the Sexuality Concerns Score as a second mediator. See Figure 6. Mediating Mediation Model.

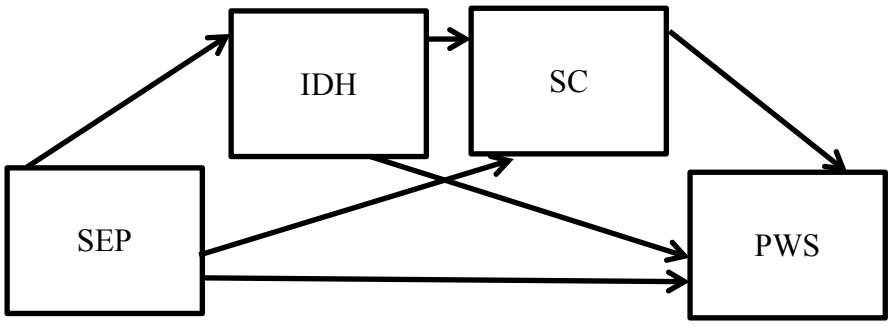

Figure 6. Mediating Mediation Model

The next set of analyses retested the model by subgroups to understand the intersection of PWS and intersecting identities: by race (White, Minority), by race and sexual orientation (White heterosexual, White Sexual Minority, Minority heterosexual, Minority Sexual Minority), by race and age cohort (White and Minority Centennials, White and Minority Millennials, White and Minority Generation X, and White and Minority Boomers/Silent Generations). The Modified Mediation Model repeated the previous models with the factors that continued to show high internal consistency after a series of item-analyses (i.e. a modified SDH framework).

Results

Initial Data Cleaning

Of the 49 IP address duplicates, 37 participants completed or entered the survey more than once. The survey that was either completed first or the survey that was most complete was retained, and the incomplete or second survey was discarded. A sample of 1,213 unduplicated participants was confirmed. The researcher then reviewed the data for any patterns of missing data across the PWS survey. The researcher identified 182 participants who did not complete any questions on the PWS survey. All 182 participants were thus removed from further analysis.

A missing data analysis revealed that data were not completely missing at random ($\chi^2(4740)=5181.13$, $p<0.001$). Seventy-eight percent of the data had less than 2% missing variables; 18% had between 2 and 3% missing data, and one variable had 6.3% missing data. Missing data (reported in the Tables 1-6 report the number of missing cases) were imputed with multiple imputation method and reported as pooled data in the analyses below.

Demographics

All 1028 participants identified as being assigned the female sex at birth. The majority (66%) identified as heterosexual (n=677), 16% identified as bisexual (n=164), 14% identified as lesbian (n=145), and 4% identified as other (n=42). Sexual minority women (SM) made up 34% (n=351) of the sample. See Table 7. Demographic Results for more details.

Table 7. Demographic Results

Variables	**Distribution across response options (*n, % or M, SD)***
Sexual Orientation	Heterosexual (677, 66), Bisexual (164, 16), Lesbian (145, 14), Other (42, 4)
Education	Completed some high school (10, 1), High school graduate (30, 2.9), Completed some college (244, 23.7),

Variables	**Distribution across response options (*n, % or M, SD)***
	Associate degree (0, 0), Bachelor's degree (245, 23.8), Completed some postgraduate (126, 12.3), Master's degree (192, 18.7), Ph.D., law or medical degree and Other advanced degree beyond a Master's degree (181, 17.6)
Age	33.22, 10.97
Age Cohort	Centennial [18-24, *(*232, 23)], Millennials [25-40 years, (580, 56.4)], Generation X [41-52 years, (150, 14.6)], Young Boomers [53-62 years, (50, 5)], Older Boomers [63-71 years, (10, 1)], Silent Generation [72-89 years, (6, 0.6)]
Race	White non-Hispanic (816, 79.5), Black or African American (69, 7), Hispanic/Latina (88, 9), Multiple ethnicities (26, 3), Asian (21, 2), American Indian or Alaskan Native (5, 0.9), Native Hawaiian or Pacific Islander (1, 0.1)
Income	Less than $20,000 (162, 15.9), $20,000 to $34,999 (137, 13.5), $35,000 to $49,999 (120, 11.8), $50,000 to $74,999 (150, 14.8), $75,000 to $99,999 (169, 16.7), $100,000 to $149,999 (152, 15), $150,000 to $199,999 (64, 6.3), $200,000 or more (62, 6.1)
Marital status	Single (357, 35), Married (425, 41.3), Living with a partner (131, 12.7), Divorced (88, 8.6), Separated (7, 0.7), Widowed (13, 1.3)
Recruitment	Reddit (518, 50.4), Facebook (319, 31), Twitter (1, 0.1), Other (190, 18.5)

Sample Location. Participants responded to the online survey from across the United States. Most likely due to the location of the researcher, 31.8% of the respondents lived in Texas

(*n*=327) and the remaining 701 participants were distributed fairly equally across the remaining states and U.S. territories, with no representation from South Dakota or Hawaii.

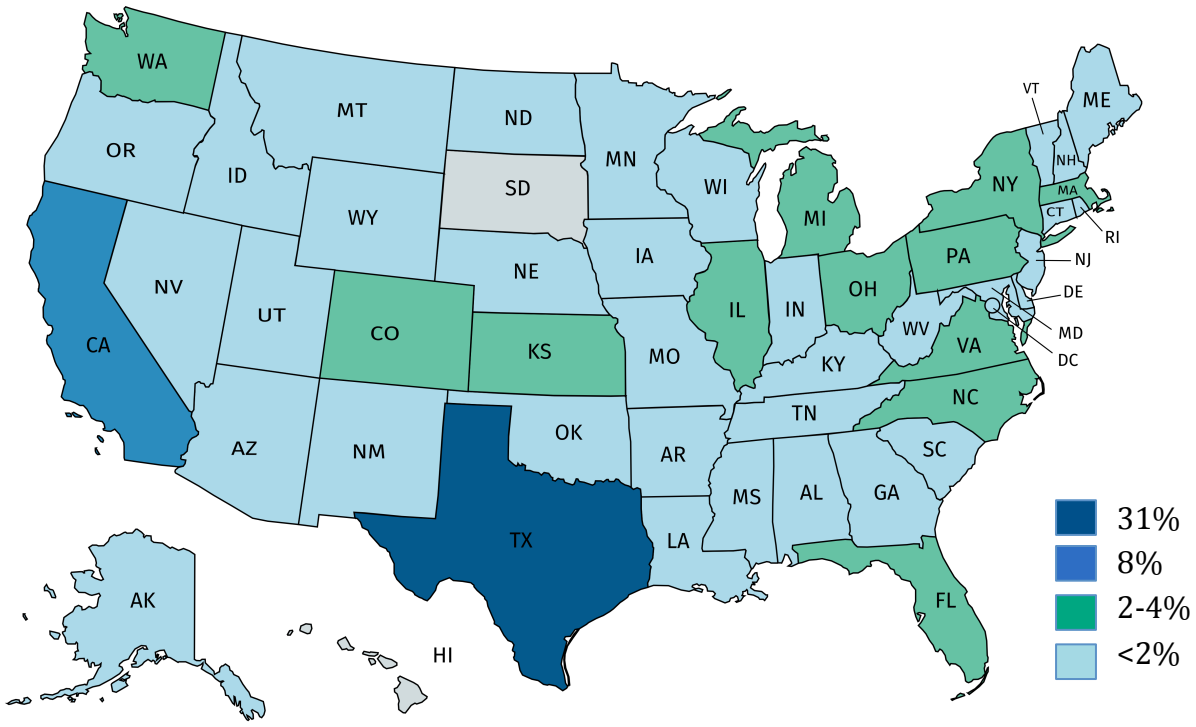

Figure 7. Sample Disbursement across the U.S.

Age. The average age of the sample was 33.22 years (*SD*=10.97), with a range between 18 and 84 years (*N*=1028). Twenty-three percent of the sample belonged to the Centennial generation (18-24, *n*=232). Millennials (25-40 years) made up 56.4% (*n*=580) of the sample. Generation X individuals (41-52 years) represented 14.6% (*n*=150) of the sample. Five percent of the sample was Young Boomers (53-62 years, *n*=50), 1% (*n*=10) was Older Boomers (63-71 years), and 0.6% (*n*=6) belonged to the Silent Generation (72-89 years). The oldest cohorts (Boomers through Silent Generation) were merged to conduct statistical analyses (*n*=66).

Race/Ethnicity. The majority (79.5%, *n*=816) of the respondents were White non-Hispanic. Seven percent (*n*=69) identified as Black or African American, 9% (*n*=88) identified as

Hispanic/Latina, 3% (*n*=26) identified as having multiple ethnicities, 2% (*n*=21) identified as Asian, 0.9% (*n*=5) identified as American Indian or Alaskan Native, and 0.1% (*n*=1) identified as Native Hawaiian or Pacific Islander. Recoded variables established 83.9% (*n*=816) as White, 7.1% (*n*=69) as Black, and 9% (*n*=88) as Latina. Dichotomized, minority individuals made up 20.6% (n=212) of the sample.

Level of Education. One percent (*n*=10) of the participants completed some high school, 2.9% (*n*=30) were high school graduates, 16.2% (*n*=167) completed some college, 7.5% (*n*=77) attained an Associates degree, 23.8% (*n*=245) reached a Bachelor's degree, 12.3% (*n*=126) completed some postgraduate work, 18.7% (*n*=192) completed their Master's degree, 17% (*n*=175) received their PhD., law, or medical degree, and 0.6% (*n*=6) attained an advanced degree beyond a Master's degree other than a PhD., law, or medical degree.

Total Annual Household Income. Sixteen percent (*n*=162) earned less than $20,000, 13.5% (*n*=137) earned $20,000 to $34,999, 11.8% (*n*=120) earned $35,000 to $49,999, 14.8% (*n*=150) earned $50,000 to $74, 999, 16.65% (*n*=169) earned $75,000 to $99,999, 15% (*n*=152) earned $100,000 to $149,999, 6.3% (*n*=64) earned $150,000 to $199,999, and 6.1% (*n*=62) earned $200,000 or more.

Marital Status. Thirty-five percent (*n*=357) of the participants identified as single, 41.3% (*n*=425) identified as married, 12.7% (*n*=131) were living with a partner, 8.6% (*n*=88) identified as divorced, 0.7% (*n*=7) were separated, and 1.3% (*n*=13) were widowed.

Recruitment. The majority of the participants entered this survey through recruitment efforts on Reddit.com (50.4%, *n*=518), 31% (*n*=319) entered the survey through Facebook, 18.5% (*n*=190) through other efforts (mainly listserv recruitment), and only 0.1% (*n*=1) entered the survey through Twitter.

Study Variables

Proposed Sexuality Concerns subscale to modify the PWS survey. Five questions were tested as a subscale for the PWS survey: 1. In the past year, how often have you been excluded from conversations or gatherings due to your sexual orientation? (Labeled: Excluded SO). 2. In the past year, how often have you been excluded from conversations or gatherings due to your bending of gender identity (looking more or less feminine than your peers)? (Labeled: Excluded GI). 3. In the past year, how often have you experienced bullying or overt aggression due to your sexual orientation? (Labeled: Bully SO). 4. In the past year, how often have you experienced bullying or overt aggression due to your bending of gender identity (looking more or less feminine than your peers)? (Labeled: Bully GI). 5. In the past year, how often have people of professional standing incorrectly assumed your sexual orientation (medical professionals, bosses, social service providers, etc.)? (Labeled: Incorrect Assumption SO). See Table 8. Sexuality Concerns Distribution below for distribution information.

Table 8. Sexuality Concerns Distribution (*n, %*)

	Never	Very rarely	Rarely	Occasionally	Very frequently	On a regular basis
1. Excluded SO	736, 73.5	106, 10.6	75, 7.5	65, 6.5	15, 1.5	5, 0.5
2. Excluded GI	836, 83.8	71, 7.1	40, 4.0	39, 3.9	6, 0.6	6, 0.6
3. Bully SO	817, 81.9	65, 6.5	63, 6.3	44, 4.4	7, 0.7	2, 0.2
4. Bully GI	845, 84.9	68, 6.8	37, 3.7	29, 2.9	10, 1.0	6, 0.6
5. Incorrect Assumption SO	698, 70.0	44, 4.4	26, 2.6	82, 8.2	54, 5.4	93, 9.3

All five variables displayed significant levels of skewness and kurtosis due to the majority of the participants reporting infrequent discrimination. See Table 9. Normality of Sexuality Concerns for non-transformed values.

Table 9. Normality of Sexuality Concerns

	Mean	Std. Deviation	Skewness	Std. Error	Kurtosis	Std. Error
6. Excluded SO	0.53	1.03	1.98	0.08	3.14	0.15
7. Excluded GI	0.32	0.85	3.00	0.08	9.11	0.15
8. Bully SO	0.36	0.86	2.50	0.08	5.64	0.15
9. Bully GI	0.30	0.84	3.23	0.08	10.73	0.16
10. Incorrect Assumption SO	1.02	1.74	1.37	0.08	0.23	0.16

Note: Variable values: 0=never, 1=very rarely, 2=rarely, 3=occasionally, 4=very frequently, 5=on a regular basis

Dichotomous Transformation of Sexuality Concerns. Due to the severity of skewness and kurtosis, all five variables were transformed using log transformation. The results of this transformation revealed continued abnormality problems, i.e., skew and kurtosis values exceeding acceptable levels. The individual items were thus transformed into dichotomous variables and summed to compute a composite score, ranging from 0-5, with a score of 5 indicating all five concerns present, a score of 0 indicating no concerns present. The transformed variables revealed that 28.4% (n=292) had concerns about being excluded due to their sexual orientation or being excluded due to their gender identity (18.7%, n=192). Twenty percent also expressed concerns with being bullied due to their sexual orientation (n= 211) or due to their gender identity (17.8%, n=183). The most frequently reported concern was with people of professional standing incorrectly assuming the sexual orientation of the participant (32.1%, n=330). The composite score for sexuality concerns had a pooled mean of 1.18 with a mode and median of zero. Fifty-three percent (n=543) reported no concerns, 18% (n=184) expressed one concern, 9.6% (n=99) reported two concerns, 7.2% (n=74) reported three concerns, 3.5% (n=36) reported four concerns, and 8.9% (n=92) reported five concerns.

The researcher performed an interclass correlation to understand the how the five dichotomized questions work together as a scale. The scale displayed a high level of internal consistency (Cronbach's α=0.83). Table 10. Inter-Item Correlation Matrix of Sexuality Concerns

displays the inter-item correlations for the scale of sexuality concerns. The overall inter-item correlation with all five questions was 0.541.

Table 10. Inter-Item Correlation Matrix of Sexuality Concerns

	1	2	3	4	5
1. Excluded SO	–				
2. Excluded GI	.484	–			
3. Bully SO	.545	.480	–		
4. Bully GI	.406	.671	.576	–	
5. Incorrect Assumption SO	.468	.424	.553	.415	–

Results for PWS

Descriptive Statistics. The average score among participants was 12.93 (*SD*=3.22) ranging from 4.85 to 27.19 (*N*=1028). The average PWS score and subscales scores are displayed in Table 11. Subscale Descriptive Statistics.

Table 11. Subscale Descriptive Statistics

	Mean	SD	Variance	Skewness	SES	Kurtosis	SEK
Psychological	3.90	0.88	0.77	-0.15	0.08	0.43+	0.15
Social	4.03	0.86	0.73	-0.21+	0.08	0.12	0.15
Physical	3.61	0.92	0.84	-0.35+	0.08	0.22	0.15
Spiritual	3.84	1.04	1.10	-0.25+	0.08	-0.18	0.15
Intellectual	4.36	0.70	0.49	-0.01	0.08	-0.08	0.15
Emotional	3.70	0.95	0.91	-0.10	0.08	-0.08	0.15
PWS Score	**12.93**	**3.22**	**10.34**	**0.20+**	**0.08**	**0.28**	**0.16**

Notes: + indicates moderate skewness or kurtosis outside normality range.

Scale Performance. The survey displayed a good level of internal consistency (α=0.87). Table 12. Correlations of PWS Subscales displays the correlations between subscales. The PWS subscales are within a moderate range for correlation coefficients. Each subscale also displayed a good level of internal consistency: Psychological wellness (α=0.83), social wellness (α=0.75), physical wellness (α=0.85), spiritual wellness (α=0.89), intellectual wellness (α=0.75), and

emotional wellness (α=0.84). A thorough review of the items revealed that removing any questions from the subscales would not improve the alpha scores.

Table 12. Correlations of PWS Subscales

	1	2	3	4	5	6
1. Psychological	–					
2. Social	.606**	–				
3. Physical	.435**	.360**	–			
4. Spiritual	.769**	.558**	.391**	–		
5. Intellectual	.595**	.471**	.311**	.597**	–	
6. Emotional	.740**	.518**	.409**	.734**	.611**	–

Notes: N=1028; ** Correlation is significant at the 0.01 level (2-tailed).

Comparing the PWS score and the health diagnosis score through correlation coefficients tested convergent validity. Consistent with the SDH theory, as health diagnoses increase participant PWS scores decrease (r=-0.334, p<0.001, r^2=0.117).

Bivariate Analysis. One-Way ANOVA's were conducted to compare mean differences in PWS scores and sexuality concerns across race/ethnicity, sexual orientation, age cohort; the researcher also tested the correlation between PWS scores and sexuality concerns. These analyses revealed several significant differences among groups. See Table 13. Bivariate Analysis for PWS and Sexuality Concerns for details.

Black or African American respondents (n=69) scored highest in perceived wellness (M=13.97, SD=3.19), Hispanic/Latina respondents (n=88) scored an average of 13.53 (SD=2.80), Asian individuals (n=21) scored 13.06 (SD=3.32), White respondents (n=816) scored 12.80 (SD=3.20), and multiple ethnicities (n=23) scored the lowest average of 11.94 (SD=3.22). Post-hoc tests showed that these differences were statistically significant between White and Black participants, with White participants reporting significantly lower PWS, and between Black and multiple ethnicities with Black reporting significantly higher PWS than those with multiple ethnicities ($F_{(4,1015)}$=3.46, p=0.008).

Due to small sample sizes, race was recoded into two categories: White (n=816) and Other (n=212). An independent samples t-test, reconfirmed significant mean differences between White (M=12.81, SD=3.20) and other races (M=13.44, SD=3.10), [$t_{(1026)}$=-2.58, p=0.01, 95% CI=-1.12, -0.15]. This finding is similar to the findings with the convergent factor of health diagnoses; White women (n=816, M=2.39, SD=2.21) reported significantly more health diagnoses than minority women (n=211, M=1.89, SD=2.21), [t=2.88, p=0.003, 95% CI=0.17, 0.84].

Heterosexual respondents scored statistically significantly higher on PWS (n=677, M=13.47, SD=3.07) than bisexual (n=164, M=11.69, SD=3.01) and lesbian individuals (n=145, M=12.05, SD=3.44), [$F_{(2, 983)}$=28.79, p<0.001]. There was not a significant PWS score difference between lesbian and bisexual individuals. Due to the small sample sizes of sexual minority individuals and an insignificant difference between lesbian and bisexual respondents, a simplified variable was created: Heterosexual (n=677) and Sexual Minority (n=351). An independent samples t-test, reconfirmed significant mean differences between heterosexual (M=13.47, SD=3.07) and sexual minority individuals (M=11.90, SD=3.15), [$t_{(1028)}$=7.68, p<0.001, 95% CI=1.16, 1.97]. The comparison of health diagnoses, however, found that sexual orientation was not a significant factor for health diagnoses ($F_{(2, 985)}$=1.54, p=0.218).

There was a significant difference in PWS scores among age cohorts. Post-hoc tests showed that the Centennial (ages 18-24, n=232, M=12.24, SD=3.05) individuals scored significantly lower than the Millennial (ages 25-40, n=580, M=13.15, SD=3.21) and oldest cohorts (Boomers through Silent Generation, ages 53-89, n=66, M=13.96, SD=3.36), [$F_{(3,1027)}$=6.95, p<0.001]. Generation X (ages 41-52, n=151, M=12.83, SD=3.05) individuals were not significantly different from the other cohorts.

In comparison to health diagnoses, Centennial women (n=232, M=1.79, SD=1.79) report significantly less health diagnoses than Generation X (n=150, M=3.26, SD=3.26) and Boomers and Silent Generation women (n=66, M=3.98, SD=3.98), ($F_{(3,1027)}$=31.37, p<0.001). The difference between Centennial women and Millennial women was not statistically significant (n=580, M=2.03, SD=2.03). Millennial women reported significantly lower health diagnoses than the two older age cohorts.

Sexuality Concerns were not significantly different between White (M=1.14, SD=1.59) and other races (M=1.32, SD=1.74), [$t_{(307.64)}$=-1.47, p>0.05, 95% CI=-0.43, -0.06]. Sexuality Concerns were significantly different between heterosexual (M=0.59, SD=1.23) and sexual minority individuals (M=2.30, SD=1.69), [$t_{(545.46)}$=-16.84, p<0.001, 95% CI=-1.91, -1.52]. Centennial individuals (M=1.67, SD=1.76) expressed statistically more sexuality concerns than Millennial (M=1.14, SD=1.60), Generation X (M=0.77, SD=1.36), and Boomers/Silent Generation (M=0.68, SD=1.36), [$F_{(3,1027)}$=12.75, p<0.001]. No other groups were significantly different.

Finally, the researcher assessed the Pearson's correlation coefficient and scatterplot between PWS scores and sexuality concerns. There was a statistically significant linear correlation between PWS scores and sexuality concerns (r=-0.217, p<0.001). A simple linear regression revealed that for every one-point increase in the PWS score, there was a 0.42 decrease in sexuality concerns (t=112.19, p<0.001). Sexuality concerns accounted for 4.5% of the variance in PWS scores ($F_{(1, 1029)}$=48.86, p<0.001).

Table 13. Bivariate Analysis for PWS and Sexuality Concerns

		PWS Score			Sexuality Concerns Score	
		N	M	SD	M	SD
White		819	12.81	3.2	1.14	1.59
Black or African American		69	13.88	3.19	1.13	1.75
Hispanic/Latina		88	13.68	2.8	1.35	1.75
Multiple Ethnicities		26	13.03	3.22	1.46	1.72
Asian		21	13.05	3.32	1.52	1.75
	Other	212	13.49	3.1	1.32	1.74
Heterosexual		677	13.47	3.07	0.59	1.23
Bisexual		164	11.70	3.01	1.98	1.56
Lesbian		145	12.05	3.44	2.95	1.66
	Sexual Minority	351	11.90	3.15	2.30	1.69
Centennial		232	12.24	3.05	1.67	1.76
Millennial		580	13.15	3.21	1.14	1.60
Generation X		151	12.83	3.05	0.77	1.36
Boomers-Silent		66	13.96	3.36	0.68	1.36

Results for Social Determinants of Health Scores

Socioeconomic position. Summing income, education, and occupation scores created a score to represent the socioeconomic position (SEP) factor of the SDH framework. See Table 14. Socioeconomic Position Distribution Results for details. This score, however, revealed poor internal consistency (α=0.55). A thorough review of the items revealed that removing any questions from the subscales would not lead to higher alpha scores.

The reported the means of the PWS score by the level of each variable in the SEP factor is located in Table 15. SEP items by PWS Mean and Corresponding Score. An ANOVA revealed that income and PWS were significantly related ($F_{(7, 1020)}$=3.63, p=0.001). A post hoc analysis revealed that participants whose income was less than $20,000 had significantly lower PWS scores (M=11.96, SD=3.21) than those with incomes from $200,000 or more ($M$=13.63, SD=3.72), $150,000-$199,999 (M=13.84, SD=3.16), $100,000-$149,999 (M=13.30, SD=3.34),

and $75,000-$99,999 (*M*=13.15, *SD*=2.94). No other income ranges were significantly different from another.

Table 14. Socioeconomic Position Distribution Results

Variables	**Distribution (*n, %*)**	**Distribution of Transformed Values (*M, SD*)**
Income	Less than $20,000 (162, 15.9), $20,000 to $34,999 (137, 13.5), $35,000 to $49,999 (120, 11.8), $50,000 to $74,999 (150, 14.8), $75,000 to $99,999 (169, 16.7), $100,000 to $149,999 (152, 15), $150,000 to $199,999 (64, 6.3), $200,000 or more (62, 6.1)	3.97, 2.10
Education	Completed some high school (10, 1), High school graduate (30, 2.9), Completed some college (167, 16.2), Associate degree (77, 7.5), Bachelor's degree (245, 23.8), Completed some postgraduate (126, 12.3), Master's degree (192, 18.7), Ph.D., law or medical degree and Other advanced degree beyond a Master's degree (181, 17.6)	2.58, 1.91
Occupation	Retired (17, 1.7), Employed, 40+ (535, 52.1), Employed, <40 (157, 15.3), Homemaker (43, 4.2), Not employed, looking for work (40, 3.9), Student (193, 18.8), Not employed, not looking for work (21, 2), Disabled, not looking for work (21, 2)	2.31, 1.79
SEP Score		**8.73, 4.17**

Occupation and PWS were significantly related ($F_{(7, 1020)}$=10.68, p<0.001). A post hoc analysis revealed that participants who were disabled and not looking for work had significantly lower PWS scores (*M*=9.61, *SD*=2.19) than participants who were retired (*M*=13.60, *SD*=2.58), employed 40 or more hours (*M*=13.53, *SD*=3.18), employed less than 40 hours (*M*=13.01, *SD*=3.10), a homemaker (*M*=12.75, *SD*=3.41), those not employed and looking for work

(*M*=12.13, *SD*=3.03), and students (*M*=11.97, *SD*=2.95). Those who were not employed and not looking for work (*M*=11.05, *SD*=3.52) had significantly lower PWS scores than those working 40 or more hours a week. Additionally, students had significantly lower scores than those working 40 or more hours a week and those working less than 40 hours a week.

Table 15. SEP Values by PWS Mean and Corresponding Score

		N	Mean	SD	Score
Income					
	Less than $20,000	162	11.96	3.21	7
	$20,000-$34,999	137	12.62	3.03	6
	$35,000-$49,999	120	13.00	3.05	5
	$50,000-$74,999	150	13.01	3.26	4
	$75,000-$99,999	169	13.15	2.94	3
	$100,000-$149,999	152	13.30	3.34	2
	$150,000-$199,999	64	13.84	3.16	1
	$200,000 or more	62	13.63	3.72	0
Occupation					
	Retired	17	13.60	2.58	0
	Employed, 40+	535	13.53	3.18	1
	Employed, <40	157	13.01	3.10	2
	Homemaker	43	12.75	3.41	3
	Not employed, looking for work	40	12.13	3.03	4
	Student	193	11.97	2.95	5
	Not employed, not looking for work	21	11.05	3.52	6
	Disabled, not looking for work	21	9.61	2.19	7
Education					
	Completed some high school	10	9.11	1.41	0
	High school graduate	30	**12.05**	3.04	1
	Completed some college	167	11.47	3.06	2
	Associate's degree	77	**12.95**	3.08	3
	Bachelor's degree	245	12.81	3.20	4
	Completed some postgraduate	126	13.38	3.15	5
	Master's degree	192	13.53	2.97	6
	Ph.D., law, or other medical degree	181	13.88	3.21	7

**Note: Means in education were bolded as they were greater than the following mean. Due to the ordinal level of measurement of this variable, the score was not changed to account for this difference in mean. This is different from occupation, which is hypothetically nominal and ordered by mean size.*

Education and PWS were significantly related ($F_{(7, 1020)}$=11.96, p<0.001). A post hoc analysis revealed that participants who had completed some postgraduate work (n=126) had a significantly higher average PWS score (M=13.38, SD=3.15) than those who had completed some high school (M=9.11, SD=1.41), were a high school graduate (M=12.05, SD=3.04), completed some college (M=11.47, SD=3.06), an Associate's degree (M=12.95, SD=3.08), and a Bachelor's degree (M=12.81, SD=3.20). Those with a Ph.D., law, or other medical degree had significantly higher PWS scores (M=12.81, SD=3.20) than the group of individuals who had completed some high school through Bachelor's degree (0-4). Additionally, those with an Associate's degree had statistically higher PWS scores than those who had completed some high school.

Intermediary Determinants of Health.

Material circumstances score. Summing the variables quality of housing, neighborhood safety, neighborhood condition, neighborhood litter, enough money, and enough food created a score to represent the material circumstances score of the SDH framework. See Table 16. Material Circumstances Results for details.

The combined MAT score revealed a good level of internal consistency (α=0.76). A thorough review of the items revealed that removing any questions from the subscales would not lead to higher alpha scores. Table 17. MAT Values by PWS Mean and Corresponding Score display the means of each variable by PWS score. A series of ANOVA and post hoc tests were conducted and revealed that each variable was significantly related to PWS.

Quality of housing and PWS were significantly related ($F_{(3, 1025)}$=25.98, p<0.001). A post hoc analysis revealed that participants living in an excellent quality of housing (M=13.95, SD=3.33), had significantly higher PWS scores than those in good quality of housing (M=12.95,

SD=3.11), mixed quality of housing (*M*=11.56, *SD*=2.84), and poor quality of housing (*M*=9.65, *SD*=1.49). Those with good quality of housing were also significantly higher than those with the mixed or poor quality of housing. There were no significant differences between the mixed and poor quality of housing.

Table 16. Material Circumstances Results

Variables	**Distribution (*n, %*)**	**Distribution of Transformed Values (*M, SD*)**
Quality of housing	Excellent (271, 26.9), Good (545, 54.1), Mixed (178, 17.7), Poor or very poor (14, 1.4)	0.93, 0.71
Neighborhood safety	Extremely safe (308, 30.5), Very safe (452, 44.8), Somewhat safe (239, 23.7), Very unsafe (10, 1), Extreme unsafe (1, 0.1)	0.95, 0.77
Neighborhood condition	Excellent (243, 24.1), Good (506, 50.2), Mixed (247, 24.5), Poor or very poor (12, 1.2)	1.03, 0.73
Neighborhood litter	No litter (325, 32.2), Predominantly free of litter (604, 59.8), Widespread distribution of litter (78, 7.7), Heavily littered (3, 0.3)	0.76, 0.60
Basic needs	Yes (671, 65.3), No (357, 34.7)	0.35, 0.48
Enough money	Yes (872, 84.8), No (156, 15.2)	0.15, 0.36
MAT Score		**4.17, 2.50**

Neighborhood safety and PWS were significantly related ($F_{(3, 1025)}$=17.80, p<0.001). A post hoc analysis revealed that participants living in extremely safe neighborhoods (*M*=13.61, *SD*=3.52) had significantly higher PWS scores than those in somewhat safe neighborhoods (*M*=11.87, *SD*=3.01) and very unsafe neighborhoods (*M*=9.70, *SD*=1.96). There was not a significant difference between PWS scores for those in extremely safe and very safe neighborhoods (*M*=13.11, *SD*=2.98). Those in very safe neighborhoods had significantly higher PWS scores than those in somewhat safe and very unsafe neighborhoods.

Neighborhood conditions and PWS were significantly related ($F_{(3, 1025)}$=14.88, p<0.001). A post hoc analysis revealed that participants living in excellent neighborhood conditions (*M*=13.94, *SD*=3.22), had significantly higher PWS scores than those in good conditions

(*M*=12.84, *SD*=3.26), mixed conditions (*M*=12.21, *SD*=2.90), and poor conditions (*M*=10.66, *SD*=2.21). Those with good conditions were also significantly higher than those with mixed neighborhood conditions. There were no significant differences between the mixed and poor quality of housing.

Table 17. MAT Values by PWS Mean and Corresponding Score

		N	Mean	SD	Score
Housing Quality					
	Excellent	271	13.95	3.33	0
	Good	545	12.95	3.11	1
	Mixed	178	11.56	2.84	2
	Poor	14	9.65	1.49	3
Neighborhood Safety					
	Extremely safe	308	13.61	3.52	0
	Very safe	452	13.11	2.98	1
	Somewhat safe	239	11.87	3.01	2
	Very unsafe	10	10.19	1.96	3
	Extremely unsafe	1	9.70	-	4
Neighborhood Condition					
	Excellent	243	13.94	3.22	0
	Good	506	12.84	3.26	1
	Mixed	247	12.21	2.90	2
	Poor	12	10.66	2.21	3
Neighborhood Litter					
	No litter	325	13.57	3.34	0
	Predominantly free	604	12.69	3.14	1
	Widespread	78	12.24	3.02	2
	Heavily Littered	3	12.21	4.30	3
Enough Money					
	Yes	872	13.15	3.21	0
	No	156	11.75	3.01	1
Enough Food					
	Yes	671	13.30	3.19	0
	No	357	12.25	3.15	1

**Note: Not all variables in table add to the total N=1028 due to factional numbers of imputed data. Data in the table are simplified for visual ease.*

An independent samples t-test revealed that those with enough money to cover their basic needs (*M*=13.15, *SD*=3.21) had significantly higher PWS scores than those did not have enough

money (M=11.75, SD=3.01), [$t_{(1026)}$=5.07, p<0.001, 95% CI=0.64, 1.45]. Additionally, those who reported having enough food to eat (M=13.30, SD=3.21) had significantly higher PWS scores than those did not have enough money (M=12.25, SD=3.15), [$t_{(1026)}$=5.11, p<0.001, 95% CI=0.86, 1.94].

Neighborhood litter and PWS were significantly related ($F_{(3, 1025)}$=6.48, p<0.001). A post hoc analysis revealed that participants living in neighborhoods with no litter (M=13.57, SD=3.34) had significantly higher PWS scores than those in neighborhoods predominantly free of litter (M=12.69, SD=3.14), and widespread litter (M=12.24, SD=3.02). There were no other significant relationships.

Biological and behavioral factors score. Table 18. Biological and Behavioral Factors Results displays the distribution of the variables for the BB score, the average score for each variable, and the total mean for the BB score with all variables included.

Table 19. Biological/Behavioral Values by PWS Mean and Corresponding Score display the means of each variable by PWS score. An ANOVA revealed that BMI and PWS were significantly related ($F_{(3, 959)}$=6.38, p<0.001). A post hoc analysis revealed overweight individuals (M=13.54, SD=3.28) had significantly higher PWS scores than obese (M=12.63, SD=2.93) and underweight individuals (M=11.86, SD=3.51). Participants with normal or healthy BMI (M=12.93, SD=3.39) did not have PWS scores that were significantly different from another group. Summing the four childhood risk factors (chronic illness, cancer, obesity, and other illnesses) created the one variable within the BB score. This factor, however, revealed inadequate internal consistency (α=0.46). An item-analysis revealed that removing 'birth defect' as a scale item would increase the internal consistency to 0.54 and this step was taken. A second-item analysis indicated that removing 'exposure to drugs' would increase the alpha to 0.68,

within a reasonable range for a scale, and this step was taken. Childhood risk score and PWS were not significantly correlated (r=-0.05, p=0.052). Childhood risk score only accounted for 0.3% of the variance in PWS score with an insignificant linear relationship ($F_{(1, 1027)}$=2.64, p=0.105).

Table 18. Biological and Behavioral Factors Results

	Distribution (*n, %)*	**Distribution of Transformed Values (*M, SD*)**
BMI	Normal/Healthy (387, 40.2), Overweight (237, 24.6), Obese (300, 31.2), Underweight (39, 4.0)	27.73, 7.48
Childhood Stress	Death of a primary caregiver or parent (119, 11.6), Death of a sibling (37, 3.6), Death of a close friend (183, 17.8), Another death (198, 19.3), A divorce between your primary caregivers or parents (333, 32.4), Placement in foster care (19, 1.8), Lived with caregiver(s) with depression or severe mental illness (336, 32.7), Lived with caregiver(s) with alcoholism (216, 21.0), Lived with caregiver(s) who smoked tobacco (328, 31.9), Lived with caregiver(s) who used hard drugs (47, 4.6), Lived with caregiver(s) who abused prescription drugs (61, 5.9)	1.83, 1.68
Childhood Risk	Chronic Illness (121, 11.8), Cancer (5, 0.5), Obesity (122, 11.9), Other (95, 9.2)	0.33, 0.55
Birth Risk	Low birth weight (95, 9.2), Exposed hard drugs utero (7, 0.7), Premature (92, 8.9), With birth defect (22, 2.1)	0.21, 0.54
Hours of sleep	Less than 7 hours (418, 41.7), 7-8 hours on average (492, 49.1), More than 8 hours (92, 9.2) Yes (584, 58.3), No (418, 41.7)	0.42, 0.49
Genetic Risks		8.50, 4.86
Vigorous Exercise	0 days a week (547, 54.8), 1-2 days (243, 24.3),	3.23, 1.04

	Distribution (*n, %)*	**Distribution of Transformed Values (*M, SD*)**
	3 days (114, 11.4), 4-5 days (77, 7.7), 6-7 days (18, 1.8)	
Moderate Exercise	0 days a week (212, 21.2), 1-2 days (291, 29.1), 3 days (203, 20.3), 4-5 days (197, 19.7), 6-7 days (97, 9.7)	2.32, 1.27
Tobacco Use	Yes, on a regular basis (74, 7.3), Yes, but only once in a while (81, 8.0), Not anymore, I quit (185, 18.3), No, I have never used tobacco (669, 66.3)	0.56, 0.92
Alcohol Score		2.57, 2.08
Mouth condition	Excellent (215, 21.5), Very good (347, 34.7), Good (298, 29.8), Fair (100, 10.0), Poor (40, 4.0)	1.40, 1.05
Fast Food	Servings: 0 (222, 22.2), 1 (359, 35.8), 2 (241, 24.1), 3+ (180, 18.0)	1.38, 1.02
Fruits & Vegetables	Servings: 3+ (362, 36.2), 2 (326, 32.6), 1 (261, 26.1), 0 (50, 5.0)	1.00, 0.91
Sugar-sweetened drinks	Drinks: 0 (674, 67.3), 1 (211, 21.1), 2 (55, 5.5), 3+ (61, 6.1)	0.50, 0.85
BB Score		**24.83, 7.31**

Birth risk score and PWS were significantly, yet very weakly, correlated (r=-0.06, p=0.038). Birth risk score only accounted for 0.5% of the variance in PWS score with an insignificant linear relationship ($F_{(1, 1027)}$=2.98, p=0.085). Additionally, the genetic risk score and

PWS were not significantly correlated (r=0.02, p=0.313). Genetic risk score accounted for 0% of the variance in PWS score.

An ANOVA revealed that sleep and PWS were significantly related ($F_{(2, 999)}$=5.44, p=0.004). A post hoc analysis revealed that individuals who get 7-8 hours of sleep per night (M=13.27, SD=3.27) had significantly higher levels of PWS score than those with less than 7 hours (M=12.73, SD=3.20) and those with more than 8 hours (M=12.18, SD=3.06). There was not a significant difference between those with less than 7 hours or more than 8 hours of sleep per night.

Moderate exercise and PWS were significantly related ($F_{(4, 949)}$=7.25, p<0.001). A post hoc analysis revealed that individuals who do not get any moderate exercise each week (M=12.00, SD=3.10) have significantly lower PWS scores than those with 1-2 days per week (M=13.08, SD=3.02), 3 days per week (M=13.31, SD=3.36), 4-5 days per week (M=12.99, SD=3.24), and 6-7 days per week (M=13.77, SD=3.47). There were no other significant relationships.

Vigorous exercise and PWS were significantly related ($F_{(4, 949)}$=13.12, p<0.001). A post hoc analysis revealed that individuals who do not get any vigorous exercise per week (M=12.30, SD=3.10) have significantly lower PWS scores than those with 1-2 days per week (M=13.59, SD=3.27), 3 days per week (M=13.62, SD=3.16), 4-5 days per week (M=14.03, SD=3.21), and 6-7 days per week (M=14.63, SD=2.63). There were no other significant relationships.

Tobacco score and PWS were not significantly correlated (r=-0.03, p=0.211). Tobacco score only accounted for 0.1% of the variance in PWS score with an insignificant linear relationship ($F_{(1, 1027)}$=0.64, p=0.422).

Alcohol score and PWS were not significantly correlated (r=-0.05, p=0.053). Alcohol score only accounted for 0.3% of the variance in PWS score with an insignificant linear relationship ($F_{(1, 1027)}$=2.60, p=0.107).

Mouth condition and PWS were significantly related ($F_{(4, 950)}$=21.41, p<0.001). A post hoc analysis revealed that individuals with excellent mouth condition (M=13.90, SD=3.60) have significantly higher PWS scores than good mouth conditions (M=12.72, SD=2.92), fair mouth conditions (M=11.47, SD=2.85) and poor mouth conditions (M=10.06, SD=2.81); there was not a significant difference between excellent mouth conditions and very good mouth conditions (M=13.32, SD=3.04). Those with very good mouth conditions also had significantly higher PWS scores than good, fair, and poor mouth conditions. Those with good mouth conditions had significantly higher PWS scores than fair and poor mouth conditions. There was not a significant difference between fair and poor mouth conditions on PWS scores.

Fast food consumption and PWS scores were not significantly related ($F_{(3, 952)}$=1.63, p=0.182). PWS scores did not significantly differ between individuals who consume fast food 0 times a week (M=13.02, SD=3.39), 1 time a week (M=13.13, SD=3.33), 2 times a week (M=13.02, SD=3.00), or 3 or more times a week (M=12.39, SD=3.14).

Sweetened drink daily consumption in the past week and PWS scores were not significantly related ($F_{(3, 952)}$=1.69, p=0.167). PWS scores did not significantly differ between individuals who consume sweetened drinks 0 times a day (M=13.06, SD=3.36), 1 time a day (M=12.11, SD=2.82), 2 times a day (M=13.37, SD=2.72), or 3 or more times a day (M=12.20, SD=3.57).

Fruit and vegetable daily consumption in the past week and PWS scores were significantly related ($F_{(3, 951)}$=9.50, p<0.001). Those who do not consume any daily fruits and

vegetables (*M*=11.23, *SD*=3.08), have significantly lower PWS scores than those who have fruits and vegetables 1 serving per day (*M*=12.44, *SD*=2.92), 2 servings per day (*M*=13.19, *SD*=3.18), and 3 or more servings per day (*M*=13.35, *SD*=3.41). Those who only consume one serving a day have significantly lower PWS scores than those with 2 or 3+ servings. There was no significant difference between those with 2 or 3+ servings a day.

Table 19. Biological/Behavioral Values by PWS Mean and Corresponding Score

		N	**M**	**SD**	**Score**
BMI					
	Normal/Healthy	387	12.93	3.39	0
	Overweight	237	13.54	3.28	1
	Obese	300	12.63	2.93	2
	Underweight	39	11.86	3.51	3
Childhood Risk					
Chronic Illness	No	907	13.19	3.14	0
	Yes	121	11.04	3.11	1
Cancer	No	1023	12.93	3.22	0
	Yes	5	**14.89**	2.87	1
Obesity	No	906	13.04	3.24	0
	Yes	122	12.18	2.93	1
Other Illness	No	933	13.02	3.22	0
	Yes	95	12.13	3.07	1
Childhood Risk Score	0	723	13.39	3.14	0
	1	270	11.96	3.21	1
	2	32	11.19	2.53	2
	3	3	**11.63**	3.00	3
Childhood Birth Risk					
Premature	No	936	12.96	3.19	0
	Yes	92	12.72	3.50	1
Birth Defect	No	1006	12.95	3.22	0
	Yes	22	12.43	3.17	1
Low Birth Weight	No	933	13.00	3.20	0
	Yes	95	12.30	3.33	1
Drug Exposure	No	1021	12.95	3.22	0
	Yes	7	12.00	2.42	1
Childhood Birth Risk Score	0	872	13.00	3.20	0
	1	101	12.85	3.13	1
	2	51	12.17	3.63	2

		N	M	SD	Score
	3	3	11.36	3.57	3
	4	1	13.77	-	4
Sleep					
	Less than 7 hours	418	12.73	3.20	***2***
	7-8 hours	492	13.27	3.27	***0***
	More than 8 hours	92	12.18	3.06	***1***
Moderate Exercise					
	6-7 days	97	13.77	3.47	0
	4-5 days	197	**12.99**	3.24	1
	3 days	203	13.31	3.36	2
	1-2 days	291	13.08	3.02	3
	0 days a week	212	12.00	3.10	4
Vigorous Exercise					
	6-7 days	18	14.63	2.63	0
	4-5 days	77	14.03	3.21	1
	3 days	114	13.62	3.16	2
	1-2 days	243	13.59	3.27	3
	0 days a week	547	12.30	3.10	4
Tobacco Use					
	No, never	669	12.98	3.26	0
	Quit	185	**13.13**	3.24	1
	Yes, once in awhile	81	12.77	3.09	2
	Yes, regular	74	12.51	3.07	3
Mouth Condition					
	Excellent	215	13.90	3.60	0
	Very Good	347	13.32	3.04	1
	Good	298	12.72	2.92	2
	Fair	100	11.47	2.85	3
	Poor	40	10.06	2.81	4
Fast Food					
	0 times	222	**13.02**	3.39	0
	1 time	359	13.13	3.33	1
	2 times	241	13.02	3.00	2
	3+ times	180	12.39	3.14	3
Sweetened Drink					
	0 times	674	13.06	3.36	0
	1 time	211	**12.11**	2.82	1
	2 times	55	**13.37**	2.72	2
	3+ times	61	12.20	3.57	3
Fruits & Vegetables					

		N	M	SD	Score
	3+ servings	362	13.35	3.41	0
	2 servings	326	13.19	3.18	1
	1 serving	261	12.44	2.92	2
	0 servings	50	11.23	3.08	3

**Note: Means were bolded if they were greater than the following mean. Due to the ordinal level of measurement of these variables, the scores were not changed to account for this difference in mean. Sleep, however, was reordered to reflect PWS mean size.*

Only variables that were significant predictors of PWS were summed to create the BB score (BMI score, sleep score, moderate exercise score, vigorous exercise score, mouth condition, and fruit and vegetable score). This factor revealed a low level of internal consistency (α=0.51). A series of item-analyses were conducted to reveal the variables that best fit together as a scale. The following items were removed step-by-step until the Cronbach alpha no longer increased: Sleep score (α increased to 0.56), mouth condition score (α increased to 0.59), BMI score (α increased to 0.64), and fruit and vegetable score (α increased to 0.73). The final BB score revealed a good level of internal consistency (α=0.73) with two variables: vigorous exercise score and moderate exercise score.

Psychosocial score. Summing the LEC and PTSD values created the psychosocial score of the SDH framework. This score, however, revealed inadequate internal consistency (α=0.36). A simple linear regression revealed a significant relationship between PWS and LEC scores; for every one-point increase in the PWS score, there was a 0.06 decrease in LEC scores. LEC scores, however, only accounted for 1.9% of the variance in PWS scores ($F_{(1, 1027)}$=18.27, p<0.001). The PTSD scores performed slightly better; for every one-point increase in the PWS score, there was a 0.25 decrease in PTSD scores. PTSD scores only accounted for 2.2% of the variance in PWS scores ($F_{(1, 1027)}$=265.60, p<0.001).

Table 20. Psychosocial Factors Results

	Distribution (*M, SD*)
LEC Score	12.47, 8.03
PTSD Score	8.03, 5.96
PS Score	**20.49, 11.03**

Intermediary determinants of health score. The original framework means and modified IDH framework means are displayed in Table 21. Intermediary Determinants of Health Score Results. To run the internal consistency analyses, the research inputted the individual factors from the MAT, BB, and PS. The nine variables revealed an inadequately low score and a series of item-analyses were conducted (α=0.32). The following items were removed systematically until the Cronbach alpha no longer increased: PTSD score (α increased to 0.65), moderate exercise score (α increased to 0.68), and vigorous exercise score (α increased to 0.76). The final modified IDH score revealed a good level of internal consistency (α=0.76) with six variables: quality of housing, neighborhood safety, neighborhood condition, neighborhood litter, enough money, and enough food.

Table 21. Intermediary Determinants of Health Score Results

	Original Framework Distribution (*M, SD*)	**Modified Framework Distribution (*M, SD*)**
MAT Score	4.17, 2.50	4.17, 2.50
BB Score	24.83, 7.31	-
PS Score	20.49, 11.03	-
IDH Score	**49.49, 15.33**	**4.17, 2.50**

Hypothesis 1: Confirmatory Factor Analysis of the PWS Survey

Data preparation. The researcher thoroughly explored the unmodified PWS model with a CFA and built on model specifications to improve model fit. Appendix F Hypothesized CFA model of PWS illustrates the hypothesized CFA of the PWS model and Appendix G reveals the standardized estimates of the CFA.

The preliminary CFA results for the PWS model revealed a poor model fit ($\chi^2_{(588)}$=3497.37, p<0.001). The standardized parameter estimates can be viewed in Appendix G Unmodified CFA of PWS with Standardized Estimates. The researcher reviewed the modification indices to explore model building to create a better fitting model. For covariances greater than 30, the researcher fixed the covariances to free parameters. After each freed parameter, the CFA estimates were recalculated.

Following the freeing of 17 parameters, the χ^2 value for the resulting model remained significant ($\chi^2_{(571)}$=2159.06, p<0.001). See Appendix H Re-specified PWS Model. Due to the influence of sample size on a χ^2 analysis, the RMSEA, CFI, and GFI model fit indices were also assessed. The RMSEA reflected a good model fit at 0.052, as did the CFI (0.912); GFI (0.887) was only slightly below the preferred estimate of 0.9 or more. With two out of three model fit indices (RMSEA and CFI) reflecting a good fit, and one index (GFI) indicating acceptable fit, the researcher concluded that the theoretically based PWS model fit the observed data.

Between Group Differences for Re-specified PWS Model

The re-specified model was then tested for between group differences for model fit. When comparing models between White women and women of other races, the model fit better to White women ($\chi^2_{(571)}$= 1810.80, p<0.001, RMSEA=0.052, GFI= 0.884, CFI= 0.918) than to women of other races ($\chi^2_{(571)}$= 1088.27, p<0.001, RMSEA=0.066, GFI= 0.775, CFI= 0.843). The model fit adequately to both heterosexual women ($\chi^2_{(571)}$= 1295.12, p<0.001, RMSEA=0.055, GFI= 0.867, CFI= 0.894) and sexual minority women ($\chi^2_{(571)}$= 1114.762, p<0.001, RMSEA=0.060, GFI= 0.819, CFI= 0.890). The model poorly fit Centennial (ages 18-24) individuals ($\chi^2_{(571)}$= 1085.003, p<0.001, GFI=0.797, CFI=0.878, RMSEA=0.062), Generation X (ages 41-52) individuals ($\chi^2_{(571)}$= 1054.202, p<0.001, GFI=0.724, CFI=0.836, RMSEA=0.075)

and the Boomers through Silent Generation (ages 53-89) ($\chi^2_{(571)}$= 1060.824, p<0.001, GFI=0.563, CFI=0.674, RMSEA=0.115). Good model fit was found with the Millennial (ages 25-40) group ($\chi^2_{(571)}$= 1574.515, p<0.001, GFI=0.859, CFI=0.900, RMSEA=0.055).

Age Specification. The Millennial age group was pulled for closer analysis due to the CFA model fit. White Millennials were the only group that closely fit the specified model ($\chi^2_{(571)}$= 1351.046, p<0.001, GFI=0.856, CFI=0.910, RMSEA=0.054). Non-White Millennials ($\chi^2_{(571)}$= 1046.545, p<0.001, GFI=0.655, CFI=0.739, RMSEA=0.088), heterosexual Millennials, ($\chi^2_{(571)}$= 1319.909, p<0.001, GFI=0.832, CFI=0.879, RMSEA=0.058), and SM Millennials ($\chi^2_{(571)}$= 1137.725, p<0.001, GFI=0.738, CFI=0.853, RMSEA=0.073) did not fit the model.

Hypothesis 2: Partial Mediation Model of Social Determinants of Health Framework

Before testing the mediation model, outliers were assessed and 9 were removed from the analysis. The researcher found no significant patterns among the outliers. Five of the 9 were White and 5 of the 9 were heterosexual. Using Process Macro, several regression analyses (N=1019) tested the hypothesis that IDH partially mediates the effect of SEP on PWS. The first set of models, models A-F, represent the unmodified variables of the SDH framework. The second set of models, models G-K, represent the modified variables of the SDH framework.

Original Mediating Model. The first model, testing all participants grouped, met all three criteria for partial mediation. See Figure 8. Original Mediating Model Results for a visual. SEP was a significant predictor of IDH (β=0.82, SE=0.11, t=7.43, p<0.001). IDH was a significant predictor of PWS (β=-0.07, SE=0.006, t=-10.88, p<0.001). SEP was not as strong of a predictor of PWS after adding in IDH as a mediator decreasing from β=-0.23 to β=-0.17 (SE=0.02, t=-7.81, p<0.001), consistent with partial mediation. SEP and IDH account for approximately 18% of the variance in PWS (r^2=0.18, F=114.88, p<0.001). The indirect effect was tested using a bootstrap estimation

approach with 5000 samples. These results indicated the indirect coefficient was significant (b=-0.05, SE=0.009, 95% CI = -0.072, -0.038). SEP score was associated with approximately .05 points lower PWS scores as mediated by IDH. A Sobel test was conducted and supported the mediation model (z=-6.28, p<0.001).

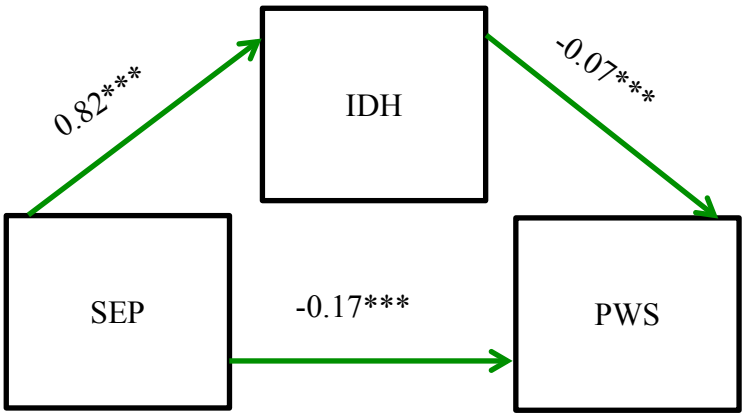

Figure 8. Original Mediating Model Results

Mediating Mediation Model. The fourth model, testing all participants grouped and sexuality concerns (SC) as a second mediator, met all three criteria for partial mediating mediation. See Figure 9. Mediating Mediation Model Results for a visual. SEP was a significant predictor of IDH (β=0.82, SE=0.11, t=7.43, p<0.001). SEP was also a significant predictor of SC (β=0.08, SE=0.01, t=6.84, p<0.001). IDH was also a significant predictor of SC (β=0.02, SE=0.003, t=5.64, p<0.001). IDH was a significant predictor of PWS (β=-0.06, SE=0.006, t=-10.16, p<0.001). SC was a significant predictor of PWS (β=-0.201, SE=0.06, t=-3.49, p=0.005). SEP was not as strong of a predictor of PWS after controlling for the mediators, IDH and SC, decreasing from -0.23 to -0.16, (SE=0.02, t=-6.95, p<0.001), consistent with partial mediation. SEP, IDH, and SC account for approximately 19% of the variance in PWS (r^2=0.194, F=81.49, p<0.001).

The total indirect effect of predictors was significant (β=-0.07, *SE*=0.01, 95% CI = -0.092, -0.052). SEP score was associated with approximately .07 points lower PWS scores as mediated by IDH and SC.

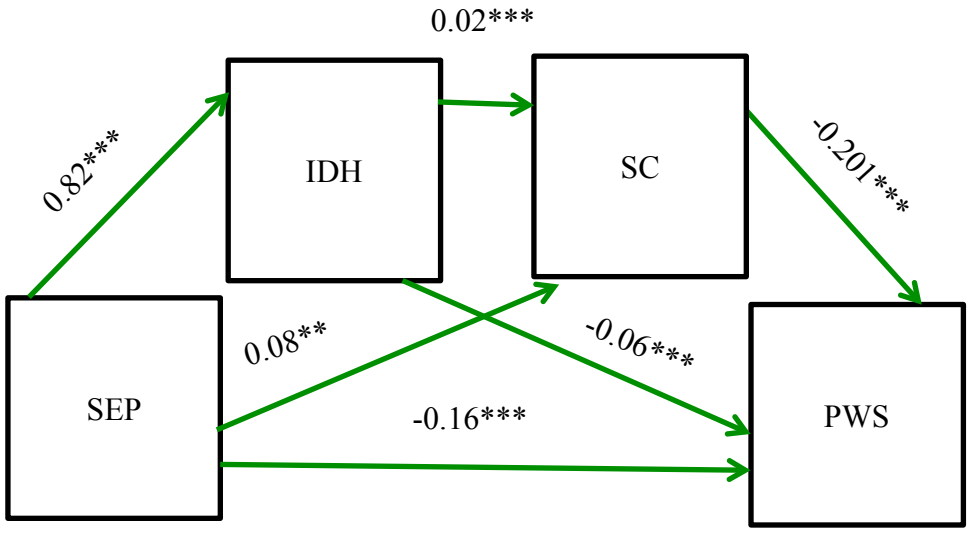

Figure 9. Mediating Mediation Model Results

Mediating Mediation Model by Race. The researcher separated the participants by race category (White and Other) to better understand how the final model may predict PWS differently for White women compared to minority women.

White women. The Mediating Mediation Model met all three criteria for partial mediating mediation among White women (*n*=812). See Figure 10. Mediating Mediation Model Results for White Women for a visual. SEP was a significant predictor of IDH (β=0.92, *SE*=0.12, *t*=7.69, *p*<0.001). SEP was also a significant predictor of SC (β =0.079, *SE* =0.013, *t* =6.10, *p*<0.001). IDH was a significant predictor of SC (β=0.02, *SE* =0.004, *t*=5.23, *p*<0.001). IDH was a significant predictor of PWS (β=-0.06, *SE*=0.007, *t*=-9.39, *p*<0.001). SC was a significant predictor of PWS (β=-0.22, *SE*=0.065, *t*=-3.40, *p*<0.001). SEP was not as strong of a predictor of PWS after controlling

for the mediators, IDH and SC, decreasing from -0.25 to -0.17, (*SE*=0.02, *t*=-7.04, *p*<0.001), consistent with partial mediation. SEP, IDH, and SC account for approximately 23% of the variance in PWS (r^2=0.226, *F*=78.41, *p*<0.001).

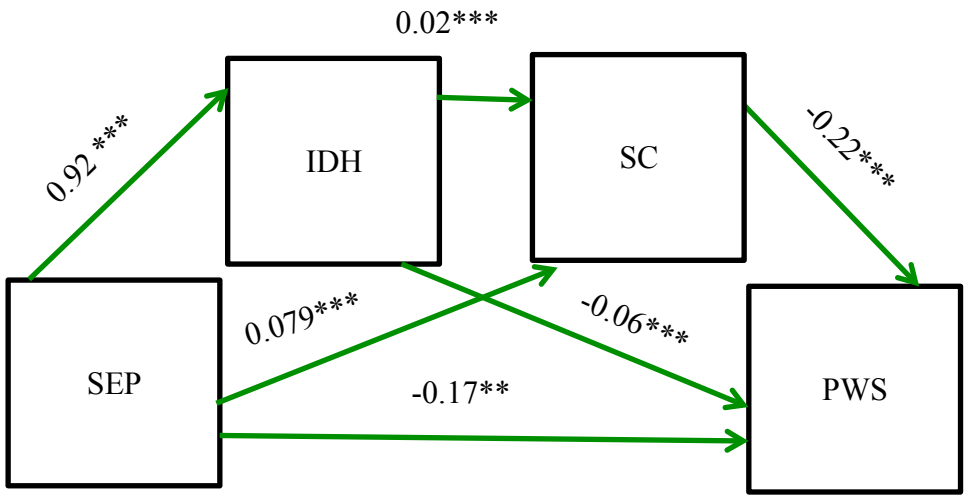

Figure 10. Mediating Mediation Model Results for White Women

Minority women. The Mediating Mediation Model did not meet the criteria for partial mediating mediation among minority women (*N*=207). See Figure 11. Mediating Mediation Model Results for Minority Women for a visual. SEP was not a significant predictor of IDH (*β*=0.25, *SE*=0.28, *t*=0.91, *p*=0.365). SEP was a significant predictor of SC (*β*=0.09, *SE*=0.03, *t*=2.87, *p*=0.005). IDH was a significant predictor of SC (*β*=0.02, *SE*=0.008, *t*=2.20, *p*=0.029). IDH was a significant predictor of PWS (*β*=-0.05, *SE*=0.013, *t*=-4.07, *p*<0.001). SC was not a significant predictor of PWS (*β*=-0.15, *SE*=0.12, *t*=-1.30, *p*=0.20). SEP was not as strong of a predictor of PWS after controlling for the mediators, IDH and SC, decreasing from -0.14 to -0.11, (*SE*=0.05, *t*=-2.14, *p*=0.034). SEP, IDH, and SC account for approximately 12% of the variance in PWS (r^2=0.12, *F*=9.25, *p*<0.001).

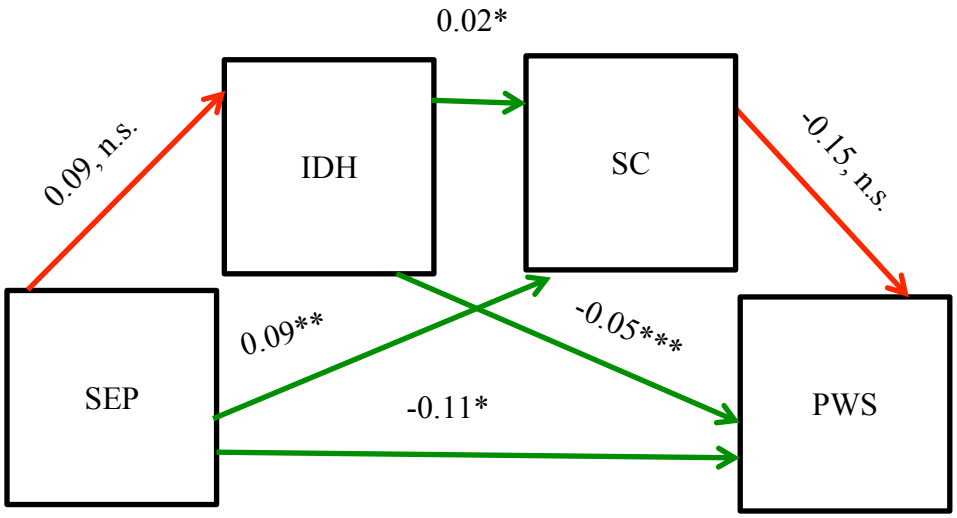

Figure 11. Mediating Mediation Model Results for Minority Women

White heterosexual women. The Mediating Mediation Model did not meet all three criteria for partial mediating mediation among White heterosexual women (n=535). See Figure 12. Mediating Mediation Model Results for White Heterosexual Women for a visual. SEP was a significant predictor of IDH (β=0.92, SE=0.15, t=6.20, p<0.001). SEP was not a significant predictor of SC (β =0.02, SE =0.01, t =1.61, p=0.107). IDH was a significant predictor of SC (β=0.01, SE =0.004, t=3.20, p=0.002). IDH was a significant predictor of PWS (β=-0.06, SE=0.009, t=-7.20, p<0.001). SC was a significant predictor of PWS (β=-0.21, SE=0.11, t=-2.00, p=0.045). SEP was not as strong of a predictor of PWS after controlling for the mediators, IDH and SC, decreasing from -0.20 to -0.13, (SE=0.02, t=-4.32, p<0.001), consistent with partial mediation. SEP, IDH, and SC account for approximately 17% of the variance in PWS (r^2=0.165, F=34.97, p<0.001).

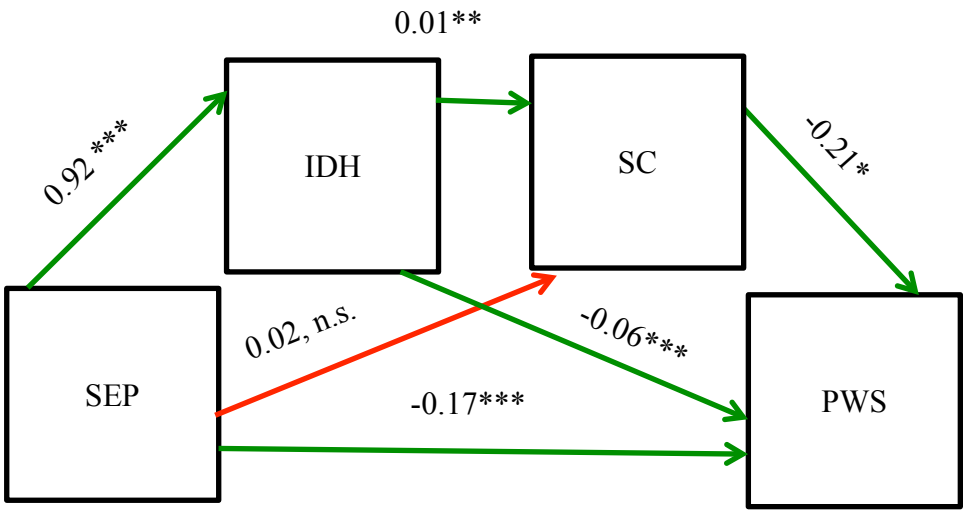

Figure 12. Mediating Mediation Model Results for White Heterosexual Women

White sexual minority women. The Mediating Mediation Model did not meet all three criteria for partial mediating mediation among White sexual minority women (n=277). See Figure 13. Mediating Mediation Model Results for White Sexual Minority Women for a visual. SEP was a significant predictor of IDH (β=0.56, SE=0.23, t=2.43, p=0.016). SEP was not a significant predictor of SC (β =0.04, SE =0.02, t =1.69, p=0.093). IDH was a significant predictor of SC (β=0.02, SE =0.006, t=3.00, p=0.003). IDH was a significant predictor of PWS (β=-0.07, SE=0.01, t=-6.12, p<0.001). SC was not a significant predictor of PWS (β=-0.09, SE=0.10, t=-0.89, p=0.376). SEP was not as strong of a predictor of PWS after controlling for the mediators, IDH and SC, decreasing from -0.26 to -0.22, (SE=0.04, t=-5.11, p<0.001), consistent with partial mediation. SEP, IDH, and SC account for approximately 23% of the variance in PWS (r^2=0.227, F=26.72, p<0.001).

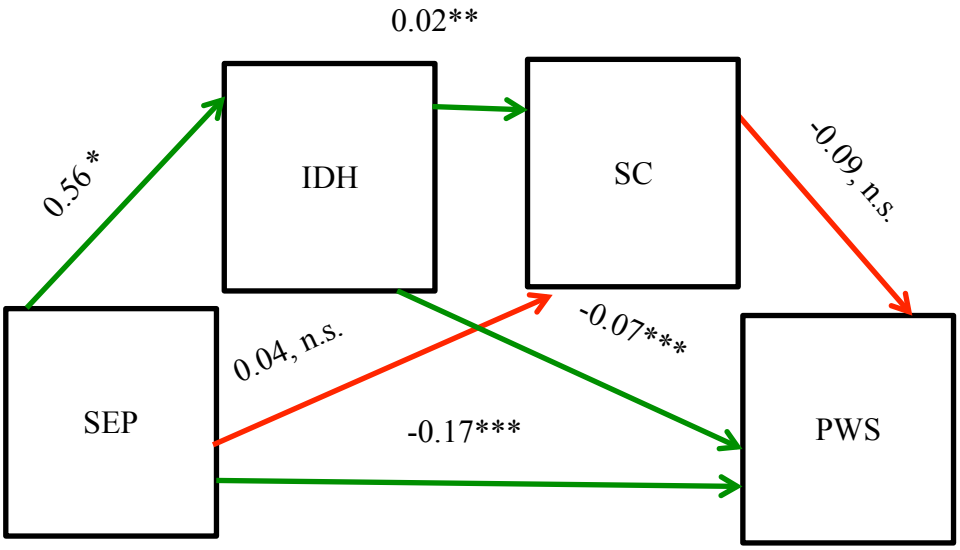

Figure 13. Mediating Mediation Model Results for White Sexual Minority Women

Minority heterosexual women. The Mediating Mediation Model did not meet the criteria for partial mediating mediation among minority women (N=137). See Figure 14. Mediating Mediation Model Results for Minority Heterosexual Women for a visual. SEP was not a significant predictor of IDH (β=0.30, SE=0.35, t=0.86, p=0.390). SEP was not a significant predictor of SC (β=0.03, SE=0.03, t=0.92, p=0.355). IDH was not a significant predictor of SC (β=0.002, SE=0.008, t=0.24, p=0.808). IDH was a significant predictor of PWS (β=-0.06, SE=0.02, t=-3.93, p=0.001). SC was not a significant predictor of PWS (β=-0.15, SE=0.16, t=-0.93, p=0.354). SEP was not a predictor of PWS before (β=-0.10, SE=0.07, t=-1.44, p=0.152) or after (β=-0.08, SE=0.07, t=-1.14, p=0.256) controlling for the mediators, IDH and SC. SEP, IDH, and SC account for approximately 12% of the variance in PWS (r^2=0.124, F=6.27, p<0.001).

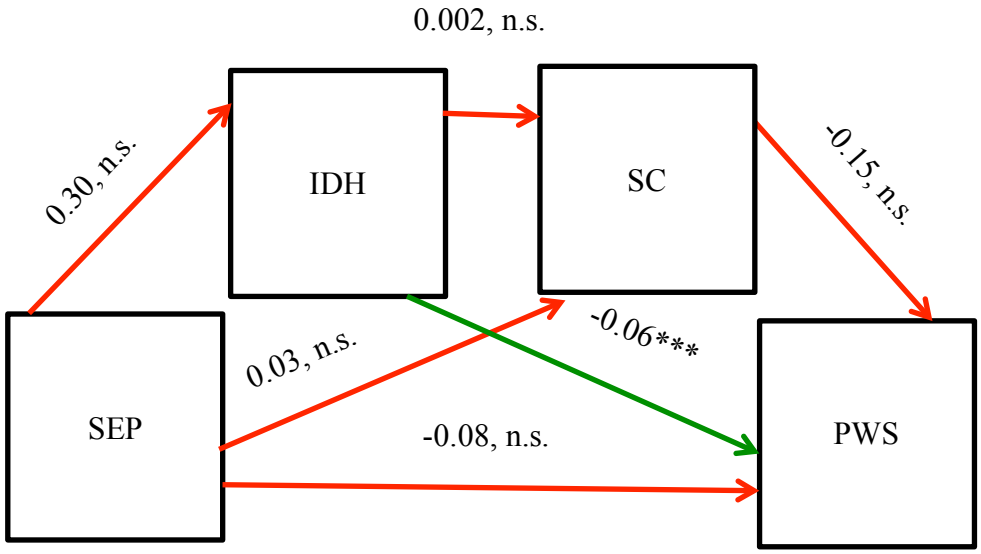

Figure 14. Mediating Mediation Model Results for Minority Heterosexual Women

Minority SM women. The Mediating Mediation Model did not meet the criteria for partial mediating mediation among minority SM women (*N*=70). See Figure 15. Mediating Mediation Model Results for Minority SM Women for a visual. SEP was not a significant predictor of IDH (*β*=0.24, *SE*=0.51, *t*=0.46, *p*=0.645). SEP was not a significant predictor of SC (*β*=0.05, *SE*=0.06, *t*=0.94, *p*=0.349). IDH was a significant predictor of SC (*β*=0.04, *SE*=0.01, *t*=2.77, *p*=0.007). IDH was not a significant predictor of PWS (*β*=-0.04, *SE*=0.02, *t*=-1.46, *p*=0.148). SC was not a significant predictor of PWS (*β*=-0.005, *SE*=0.21, *t*=-0.02, *p*=0.981). SEP was not a predictor of PWS before (*β*=-0.12, *SE*=0.10, *t*=-1.17, *p*=0.248) or after (*β*=-0.12, *SE*=0.10, *t*=-1.24, *p*=0.218) controlling for the mediators, IDH and SC. SEP, IDH, and SC account for approximately 5% of the variance in PWS (r^2=0.054, *F*=1.26, *p*=0.296), although the model was not significant.

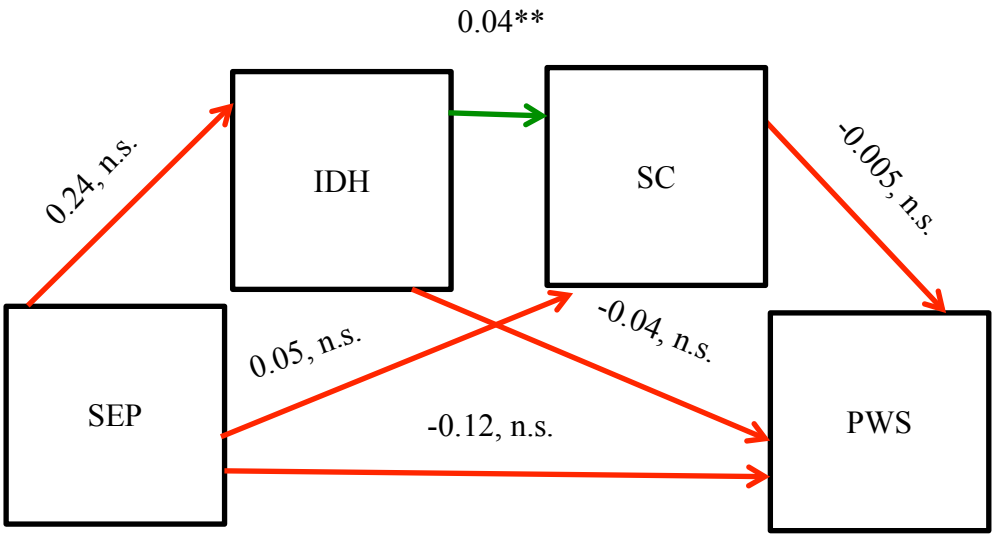

Figure 15. Mediating Mediation Model Results for Minority SM Women

Mediating Mediation Model by Age Cohort and Race. The next model tested age cohorts separated by race categories with sexuality concerns (SC) as a second mediator. All four age cohort groups were tested for White women, but only centennial and millennial minority women were tested for minority women due to small sample sizes for minority generation X women (n=26) and Boomers and Silent Generation minority women (n=13). Sexual minority status was not included due to decreasing sample sizes.

White centennial women. The Mediating Mediation Model did not meet all criteria for partial mediating mediation among White centennial women (n=167). See Figure 16. Mediating Mediation Model Results for White Centennial Women for a visual. SEP was not a significant predictor of IDH (β=0.43, SE=0.36, t=1.19, p=0.237). SEP was not a significant predictor of SC (β=0.06, SE =0.05, t =1.35, p=0.178). IDH was a significant predictor of SC (β=0.03, SE =0.01, t=2.76, p=0.006). IDH was a significant predictor of PWS (β=-0.05, SE=0.02, t=-3.01, p=0.003). SC

was a significant predictor of PWS (β=-0.25, *SE*=0.12, *t*=-2.05, *p*=0.042). SEP was not as strong of a predictor of PWS after controlling for the mediators, IDH and SC, decreasing from -0.27 to -0.23, (*SE*=0.07, *t*=-3.05, *p*=0.003), consistent with partial mediation. SEP, IDH, and SC account for approximately 15% of the variance in PWS (r^2=0.154, *F*=9.91, *p*<0.001).

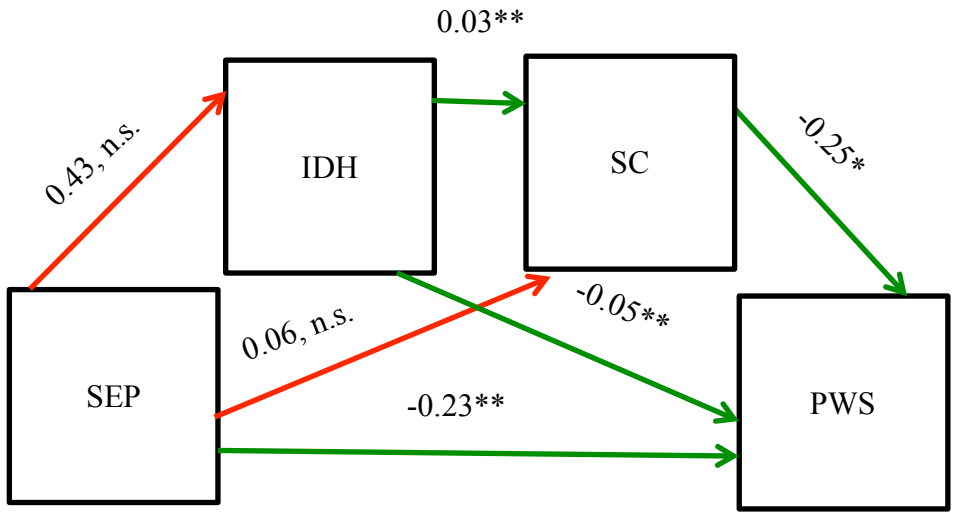

Figure 16. Mediating Mediation Model Results for White Centennial Women

White millennial women. The Mediating Mediation Model met all criteria for partial mediating mediation among White millennial women (*n*=469). See Figure 17. Mediating Mediation Model Results for White Millennial Women for a visual. SEP was a significant predictor of IDH (β=1.66, *SE*=0.17, *t*=9.61, *p*<0.001). SEP was a significant predictor of SC (β=0.07, *SE* =0.02, *t*=3.87, *p*<0.001). IDH was a significant predictor of SC (β=0.02, *SE* =0.005, *t*=4.72, *p*<0.001). IDH was a significant predictor of PWS (β=-0.07, *SE*=0.009, *t*=-7.23, *p*=0.003). SC was a significant predictor of PWS (β=-0.20, *SE*=0.09, *t*=-2.29, *p*=0.02). SEP was not as strong of a predictor of PWS after controlling for the mediators, IDH and SC, decreasing from -0.31 to -0.17, (*SE*=0.04, *t*=-4.65,

p<0.001), consistent with partial mediation. SEP, IDH, and SC account for approximately 25% of the variance in PWS (r^2=0.245, F=50.35, p<0.001).

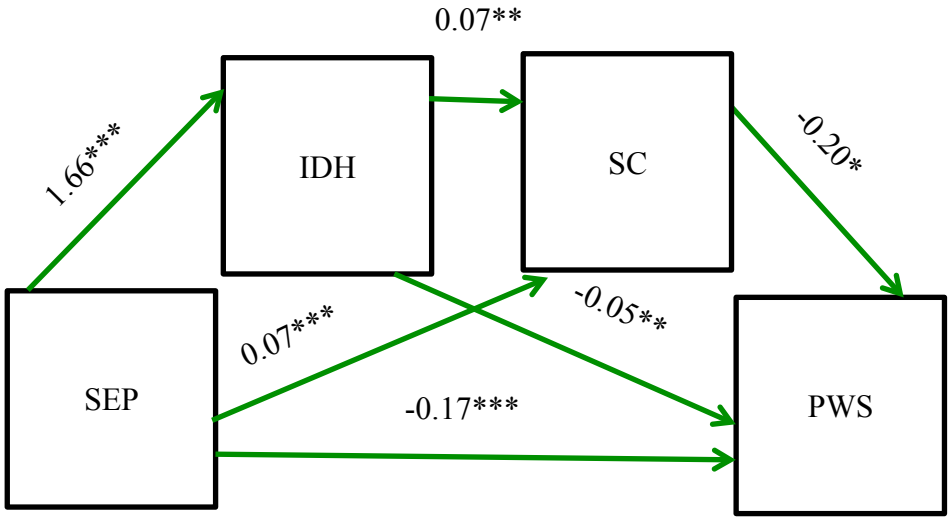

Figure 17. Mediating Mediation Model Results for White Millennial Women

White generation X women. The Mediating Mediation Model did not meet all criteria for partial mediating mediation among White generation X women (n=123). See Figure 18. Mediating Mediation Model Results for White Generation X Women for a visual. SEP was a significant predictor of IDH (β=1.02, SE=0.34, t=3.021, p=0.003). SEP was not a significant predictor of SC (β=0.01, SE =0.04, t=0.30, p=0.761). IDH was not a significant predictor of SC (β=-0.002, SE=0.009, t=-0.24, p=0.814). IDH was a significant predictor of PWS (β=-0.04, SE=0.02, t=-2.11, p=0.037). SC was not a significant predictor of PWS (β=-0.24, SE=0.19, t=-1.30, p=0.197). SEP was not as strong of a predictor of PWS after controlling for the mediators, IDH and SC, decreasing from -0.28 to -0.23, (SE=0.07, t=-3.21, p=0.002), consistent with partial mediation. SEP, IDH, and SC account for approximately 15% of the variance in PWS (r^2=0.153, F=7.16, p<0.001).

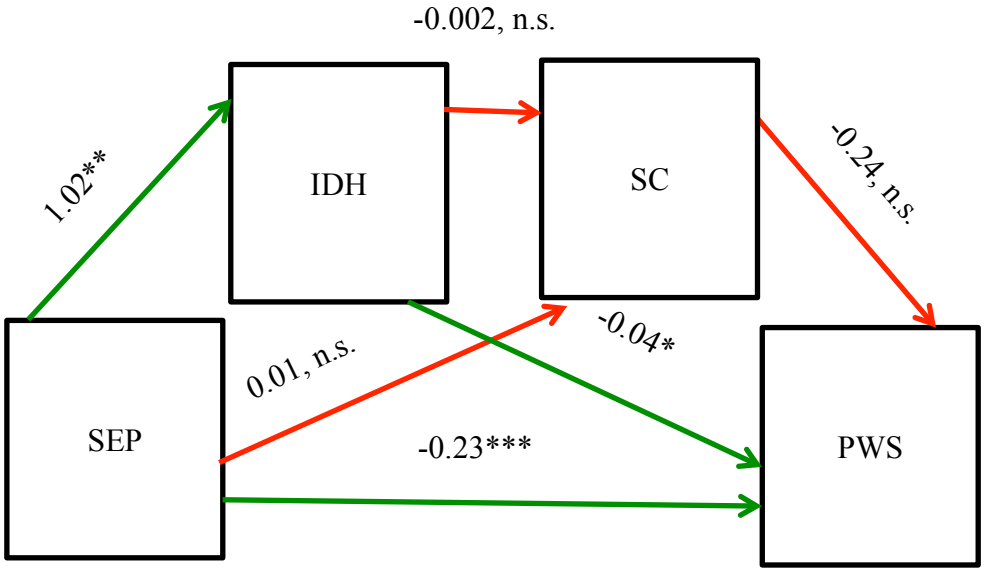

Figure 18. Mediating Mediation Model Results for White Generation X Women

White boomers women. The Mediating Mediation Model did not meet all criteria for partial mediating mediation among White boomers and silent generation women (n=53). See Figure 19. Mediating Mediation Model Results for White Boomers and Silent Generation Women for a visual. SEP was not a significant predictor of IDH (β=0.60, SE=0.49, t=31.23, p=0.223). SEP was not a significant predictor of SC (β=-0.02, SE=0.04, t=-0.43, p=0.666). IDH was a significant predictor of SC (β=0.02, SE=0.01, t=2.17, p=0.035). IDH was a significant predictor of PWS (β=-0.13, SE=0.03, t=-4.49, p<0.001). SC was not a significant predictor of PWS (β=-0.04, SE=0.34, t=-0.11, p=0.911). SEP was not a significant predictor of PWS before (β=-0.14, SE=0.11, t=-1.29, p=0.202) or after (β=-0.07, SE=0.09, t=-0.71, p=0.482) controlling for the mediators, IDH and SC. SEP, IDH, and SC account for approximately 34% of the variance in PWS (r^2=0.335, F=8.23, p=0.002).

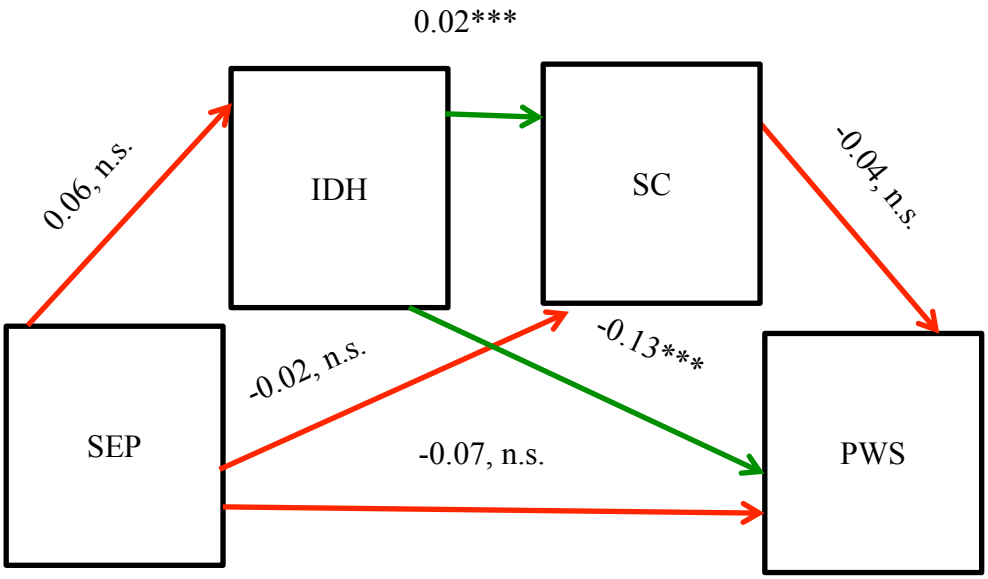

Figure 19. Mediating Mediation Model Results for White Boomers and Silent Generation Women

Minority centennial women. The Mediating Mediation Model did not meet all criteria for partial mediating mediation among minority centennial women (n=63). See Figure 20. Mediating Mediation Model Results for Minority Centennial Women for a visual. SEP was not a significant predictor of IDH (β=-0.21, SE=0.66, t=-0.32, p=0.749). SEP was a significant predictor of SC (β=0.18, SE=0.08, t=2.43, p=0.018). IDH was a significant predictor of SC (β=0.05, SE=0.01, t=3.27, p=0.002). IDH was not a significant predictor of PWS (β=-0.04, SE=0.03, t=-1.09, p=0.281). SC was not a significant predictor of PWS (β=-0.25, SE=0.26, t=-0.94, p=0.353). SEP was not a significant predictor of PWS before (β=-0.18, SE=0.15, t=-1.15, p=0.255) or after (β=-0.14, SE=0.16, t=-0.89, p=0.378) controlling for the mediators, IDH and SC. SEP, IDH, and SC account for approximately 7% of the variance in PWS (r^2=0.074, F=1.57, p=0.206), although the final model was not statistically significant.

Minority millennial women. The Mediating Mediation Model did not meet all criteria for partial mediating mediation among minority millennial women (n=105). See Figure 21. Mediating Mediation Model Results for Minority Millennial Women for a visual. SEP was not a significant predictor of IDH (β=0.53, SE=0.45, t=1.20, p=0.235). SEP was not a significant predictor of SC (β=0.06, SE=0.05, t=1.24, p=0.217). IDH was also not a significant predictor of SC (β=0.02, SE=0.01, t=31.65, p=0.101). IDH was a significant predictor of PWS (β=-0.04, SE=0.02, t=-2.31, p=0.023). SC was not a significant predictor of PWS (β=-0.20, SE=0.15, t=-1.32, p=0.189). SEP was no longer a predictor of PWS after controlling for the mediators, IDH and SC, decreasing from -0.17 to -0.13, (SE=0.08, t=-1.65, p=0.103), consistent with full mediation had the other criteria for mediation been met. SEP, IDH, and SC account for approximately 11% of the variance in PWS (r^2=0.113, F=4.29, p=0.007).

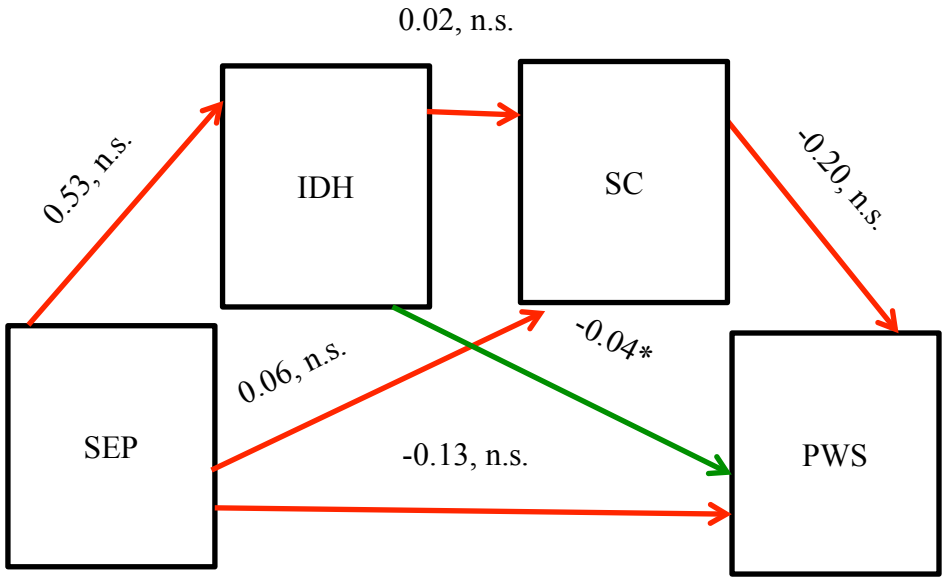

Figure 21. Mediating Mediation Model Results for Minority Millennial Women

Modified Mediation Model. The Modified Mediation Model, testing all participants grouped with Modified IDH variables, met all three criteria for partial mediation. See Figure 22. Modified Mediation Model Results for a visual. SEP was a significant predictor of IDH (β=0.20, *SE*=0.02, *t*=11.28, *p*<0.001). Modified IDH was a significant predictor of PWS (β=-0.29, *SE*=0.04, *t*=-7.36, *p*<0.001). SEP was not as strong of a predictor of PWS after adding in Modified IDH as a mediator decreasing from β=-0.23 to β=-0.17 (*SE*=0.02, *t*=-7.16, *p*<0.001), consistent with partial mediation. SEP and Modified IDH account for approximately 14% of the variance in PWS (r^2=0.135, *F*=79.69, *p*<0.001). The indirect effect was tested using a bootstrap estimation approach with 5000 samples. These results indicated the indirect coefficient was significant (*b*=-0.06, *SE*=0.009, 95% CI = -0.078, -0.041). SEP score was associated with approximately .06 points lower PWS scores as mediated by Modified IDH. A Sobel test was conducted and supported the mediation model (*z*=-5.87, *p*<0.001).

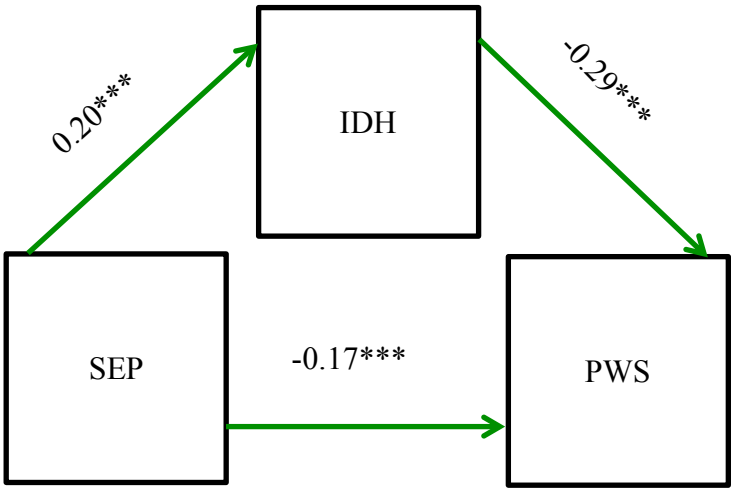

Figure 22. Modified Mediation Model Results

Modified Mediating Mediation Model. The Modified Mediating Mediation Model, testing all participants grouped and sexuality concerns (SC) as a second mediator, met all three criteria for partial mediating mediation. See Figure 23. Modified Mediating Mediation Model Results for a visual. SEP was a significant predictor of Modified IDH (β=0.20, *SE*=0.02, *t*=11.48, *p*<0.001). SEP was also a significant predictor of SC (β=0.07, *SE*=0.01, *t*=5.94, *p*<0.001). Modified IDH was also a significant predictor of SC (β=0.12, *SE*=0.02, *t*=5.62, *p*<0.001). Modified IDH was a significant predictor of PWS (β=-0.26, *SE*=0.04, *t*=-6.61, *p*<0.001). SC was a significant predictor of PWS (β=-0.23, *SE*=0.06, *t*=-3.97, *p*<0.001). SEP was not as strong of a predictor of PWS after controlling for the mediators, Modified IDH and SC, decreasing from -0.23 to -0.15, (*SE*=0.02, *t*=-6.36, *p*<0.001), consistent with partial mediation. SEP, Modified IDH, and SC account for approximately 15% of the variance in PWS (r^2=0.148, *F*=59.16, *p*<0.001).

The total indirect effect of predictors was significant (β=-0.08, *SE*=0.01, 95% CI = -0.097, -0.056). SEP score was associated with approximately .08 points lower PWS scores as mediated by IDH and SC.

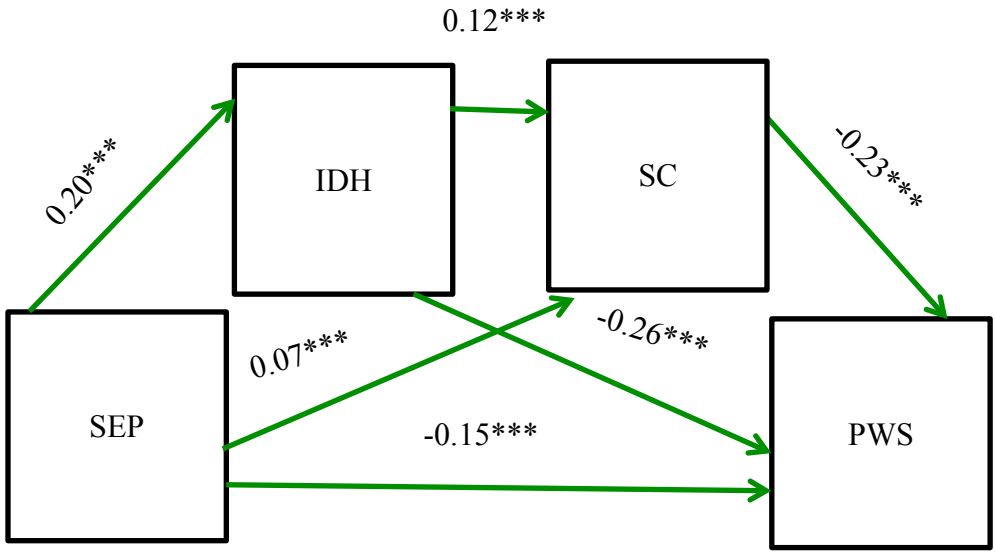

Figure 23. Modified Mediating Mediation Model Results

Modified Mediating Mediation Model by Race. The researcher separated the participants by race category (White and Other) to better understand how the final model may predict PWS differently for White women compared to minority women.

White women. The Modified Mediating Mediation Model met all three criteria for partial mediating mediation among White women (n=812). See Figure 24. Modified Mediating Mediation Model Results for White Women for a visual. SEP was a significant predictor of Modified IDH (β=0.20, SE=0.02, t=10.37, p<0.001). SEP was also a significant predictor of SC (β =0.07, SE =0.013, t=5.10, p<0.001). Modified IDH was a significant predictor of SC (β=0.15, SE =0.02, t=6.49, p<0.001). Modified IDH was a significant predictor of PWS (β=-0.27, SE=0.04, t=-6.10, p<0.001). SC was a significant predictor of PWS (β=-0.24, SE=0.07, t=-3.55, p<0.001). SEP was not as strong of a predictor of PWS after controlling for the mediators, Modified IDH and SC, decreasing from -0.25 to -0.17, (SE=0.03, t=-6.83, p<0.001), consistent with partial mediation. SEP, Modified IDH, and SC account for approximately 18% of the variance in PWS (r^2=0.178, F=58.63, p<0.001).

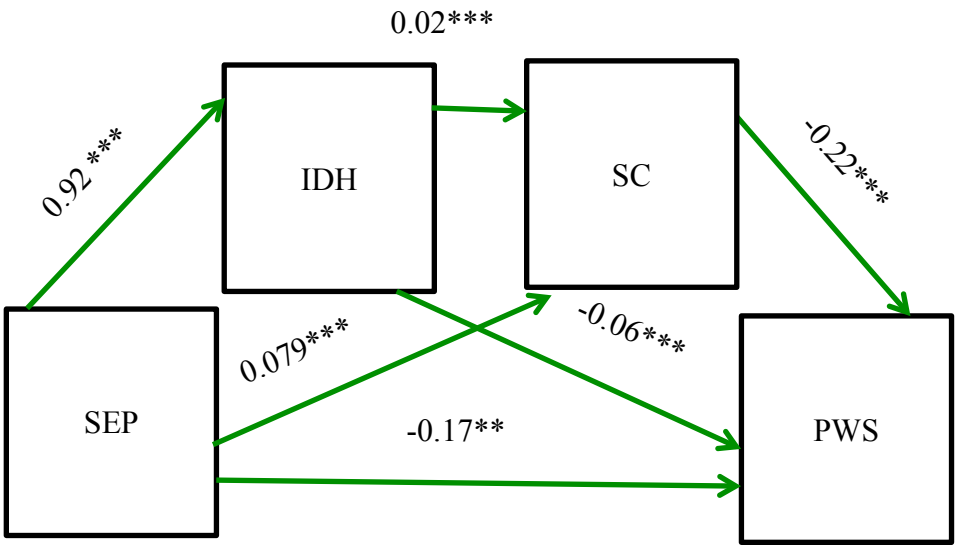

Figure 24. Modified Mediating Mediation Model Results for White Women

Minority women. The Modified Mediating Mediation Model did not meet the criteria for partial mediating mediation among minority women (N=207). See Figure 25. Modified Mediating Mediation Model Results for Minority Women for a visual. SEP was a significant predictor of Modified IDH (β=0.25, SE=0.04, t=5.10, p<0.001). SEP was a significant predictor of SC (β=0.09, SE=0.03, t=2.77, p=0.006). Modified IDH was not a significant predictor of SC (β=0.006, SE=0.05, t=0.12, p=0.903). Modified IDH was a significant predictor of PWS (β=-0.20, SE=0.08, t=-2.32, p=0.021). SC was not a significant predictor of PWS (β=-0.22, SE=0.12, t=-1.87, p=0.063). SEP was no longer a predictor of PWS after controlling for the mediators, Modified IDH and SC, decreasing from -0.14 to -0.07, (SE=0.08, t=-1.33, p=0.186). SEP, Modified IDH, and SC account for approximately 7.3% of the variance in PWS (r^2=0.073, F=5.33, p=0.001).

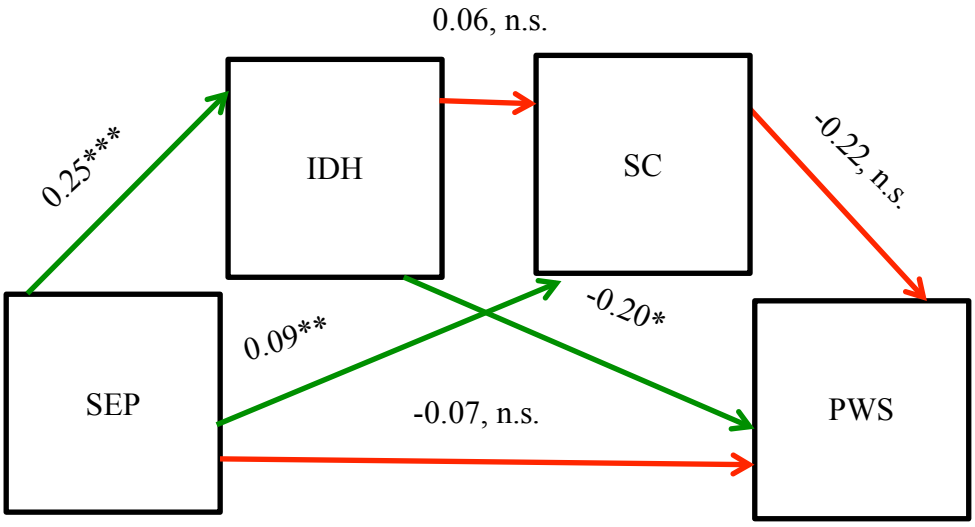

Figure 25. Modified Mediating Mediation Model Results for Minority Women

White heterosexual women. The Modified Mediating Mediation Model did not meet all three criteria for partial mediating mediation among White heterosexual women (n=535). See Figure 26. Modified Mediating Mediation Model Results for White Heterosexual Women for a visual. SEP

was a significant predictor of Modified IDH (β=0.19, *SE*=0.02, *t*=7.97, *p*<0.001). SEP was not a significant predictor of SC (β=0.01, *SE*=0.01, *t*=1.16, *p*=0.249). Modified IDH was a significant predictor of SC (β=0.08, *SE*=0.02, *t*=3.74, *p*=0.002). Modified IDH was a significant predictor of PWS (β=-0.26, *SE*=0.06, *t*=-4.55, *p*<0.001). SC was a significant predictor of PWS (β=-0.23, *SE*=0.11, *t*=-2.14, *p*=0.033). SEP was not as strong of a predictor of PWS after controlling for the mediators, Modified IDH and SC, decreasing from -0.20 to -0.14, (*SE*=0.03, *t*=-4.38, *p*<0.001), consistent with partial mediation. SEP, Modified IDH, and SC account for approximately 12% of the variance in PWS (r^2=0.118, *F*=23.65, *p*<0.001).

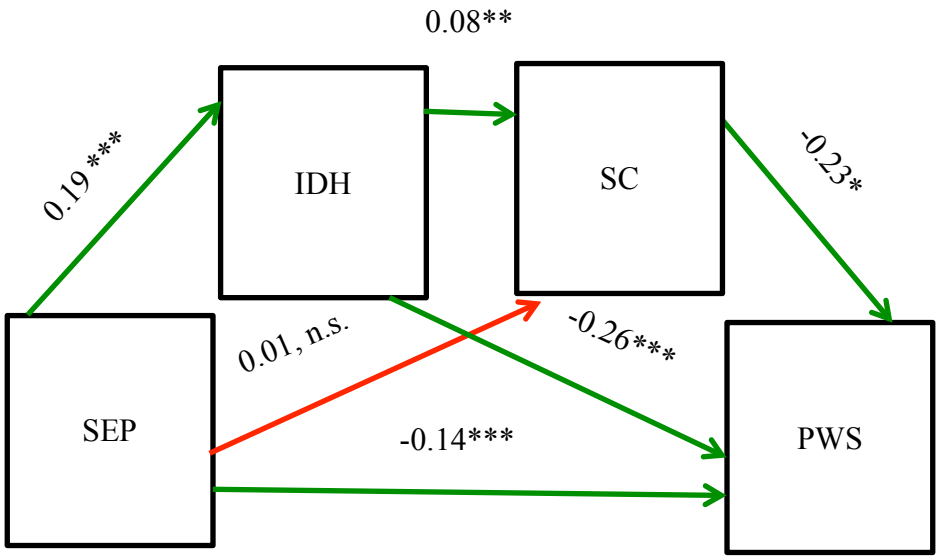

Figure 26. Modified Mediating Mediation Model Results for White Heterosexual Women

White sexual minority women. The Modified Mediating Mediation Model did not meet all three criteria for partial mediating mediation among White sexual minority women (*n*=277). See Figure 27. Modified Mediating Mediation Model Results for White Sexual Minority Women for a visual. SEP was a significant predictor of Modified IDH (β=0.15, *SE*=0.04, *t*=3.90, *p*=0.001). SEP

was not a significant predictor of SC (β =0.03, *SE*=0.03, *t*=1.29, *p*=0.198). Modified IDH was a significant predictor of SC (β=0.14, *SE* =0.04, *t*=3.54, *p*<0.001). Modified IDH was a significant predictor of PWS (β=-0.29, *SE*=0.07, *t*=-4.05, *p*<0.001). SC was not a significant predictor of PWS (β=-0.11, *SE*=0.11, *t*=-1.05, *p*=0.294). SEP was not as strong of a predictor of PWS after controlling for the mediators, IDH and SC, decreasing from -0.26 to -0.21, (*SE*=0.04, *t*=-4.74, *p*<0.001), consistent with partial mediation. SEP, IDH, and SC account for approximately 17% of the variance in PWS (r^2=0.171, *F*=18.72, *p*<0.001).

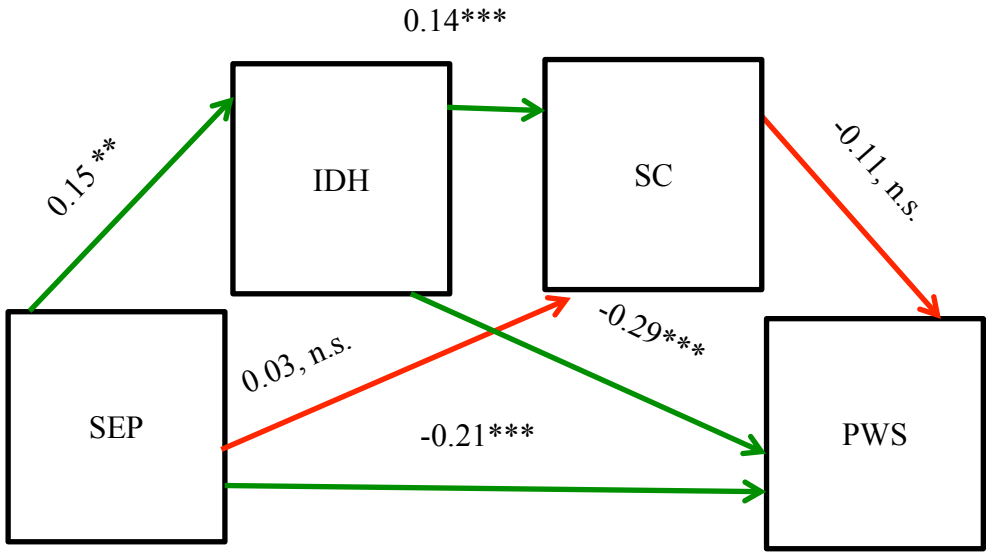

Figure 27. Modified Mediating Mediation Model Results for White Sexual Minority Women

Minority heterosexual women. The Modified Mediating Mediation Model did not meet the criteria for partial mediating mediation among minority women (*N*=137). See Figure 28. Modified Mediating Mediation Model Results for Minority Heterosexual Women for a visual. SEP was a significant predictor of Modified IDH (β=0.03, *SE*=0.05, *t*=05.11, *p*<0.001). SEP was not a significant predictor of SC (β=0.04, *SE*=0.04, *t*=1.08, *p*=0.280). Modified IDH was not a significant

predictor of SC (β=0.03, *SE*=0.06, *t*=0.53, *p*=0.595). Modified IDH was a significant predictor of PWS (β=-0.22, *SE*=0.11, *t*=-2.02, *p*=0.045). SC was not a significant predictor of PWS (β=-0.18, *SE*=0.17, *t*=-1.06, *p*=0.290). SEP was not a predictor of PWS before (β=-0.10, *SE*=0.07, *t*=-1.44, *p*=0.152) or after (β=-0.03, *SE*=0.08, *t*=-0.44, *p*=0.662) controlling for the mediators, Modified IDH and SC. SEP, Modified IDH, and SC account for approximately 5% of the variance in PWS (r^2=0.051, *F*=2.38, *p*=0.073), although the model was not significant.

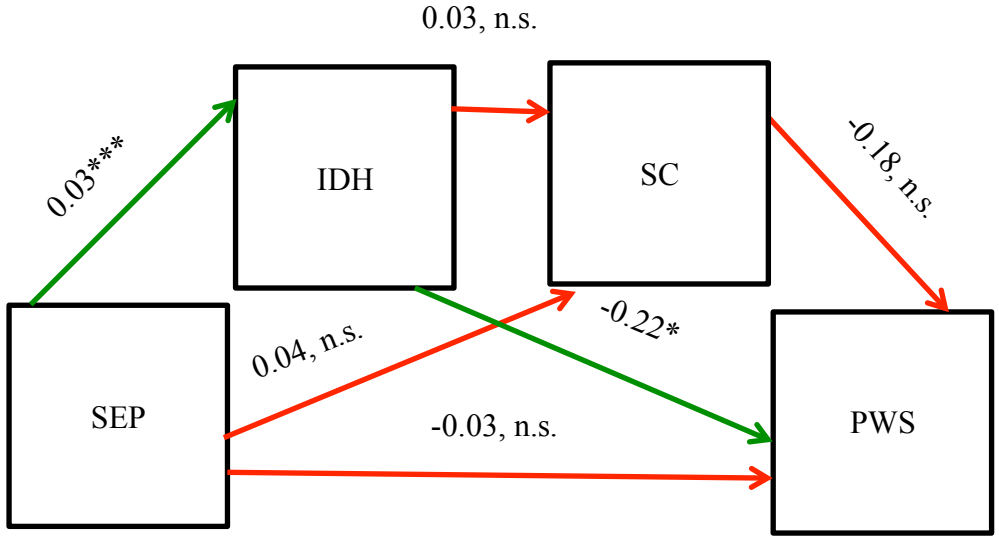

Figure 28. Modified Mediating Mediation Model Results for Minority Heterosexual Women

Minority SM women. The Modified Mediating Mediation Model did not meet the criteria for partial mediating mediation among minority SM women (*N*=70). See Figure 29. Modified Mediating Mediation Model Results for Minority SM Women for a visual. SEP was not a significant predictor of Modified IDH (β=0.09, *SE*=0.09, *t*=1.00, *p*=0.321). SEP was not a significant predictor of SC (β=0.04, *SE*=0.06, *t*=0.70, *p*=0.487). Modified IDH was not a significant predictor of SC (β=0.03, *SE*=0.08, *t*=0.37, *p*=0.716). Modified IDH was not a significant predictor of PWS (β=-0.15,

SE=0.13, *t*=-1.13, *p*=0.263). SC was not a significant predictor of PWS (*β*=-0.09, *SE*=0.20, *t*=-0.46, *p*=0.644). SEP was not a predictor of PWS before (*β*=-0.12, *SE*=0.10, *t*=-1.17, *p*=0.248) or after (*β*=-0.10, *SE*=0.10, *t*=-0.97, *p*=0.334) controlling for the mediators, Modified IDH and SC. SEP, Modified IDH, and SC account for approximately 4% of the variance in PWS (r^2=0.042, *F*=0.96, *p*=0.416), although the model was not significant.

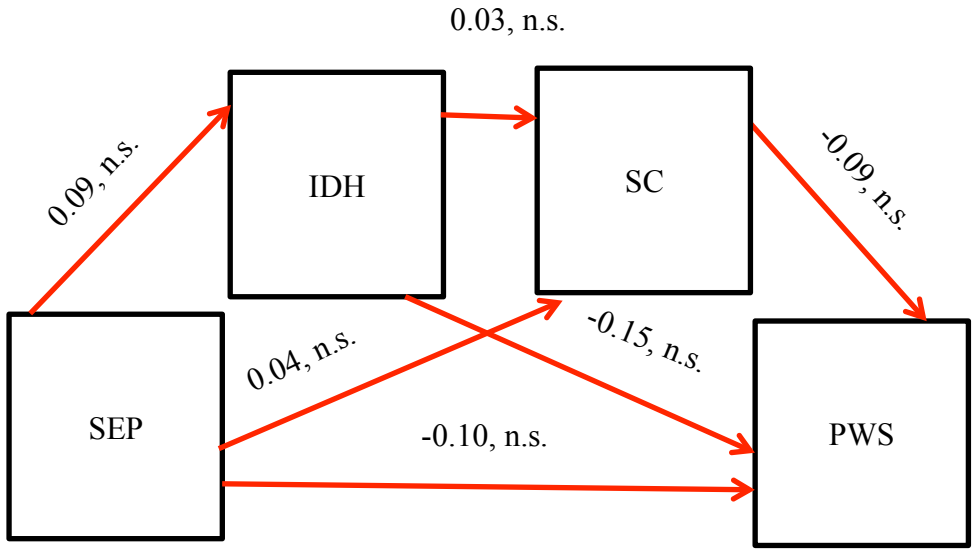

Figure 29. Modified Mediating Mediation Model Results for Minority SM Women

Modified Mediating Mediation Model. The sixth model tested age cohorts separated by race categories with sexuality concerns (SC) as a second mediator. All four age cohort groups were tested for White women, but only centennial and millennial minority women were tested for minority women due to small sample sizes for minority generation X women (n=26) and Boomers and Silent Generation minority women (n=13).

White centennial women. The Modified Mediating Mediation Model did not meet all criteria for partial mediating mediation among White centennial women (*n*=167). See Figure 30. Modified Mediating Mediation Model Results for White Centennial Women for a visual. SEP was

not a significant predictor of Modified IDH (β=0.09, *SE*=0.07, *t*=1.147, *p*=0.143). SEP was not a significant predictor of SC (β=0.06, *SE* =0.05, *t* =1.35, *p*=0.178). Modified IDH was a significant predictor of SC (β=0.12, *SE* =0.06, *t*=2.07, *p*=0.04). Modified IDH was not a significant predictor of PWS (β=-0.11, *SE*=0.09, *t*=-1.21, *p*=0.226). SC was a significant predictor of PWS (β=-0.31, *SE*=0.12, *t*=-2.45, *p*=0.015). SEP was not as strong of a predictor of PWS after controlling for the mediators, Modified IDH and SC, decreasing from -0.27 to -0.23, (*SE*=0.08, *t*=-3.06, *p*=0.003), consistent with partial mediation. SEP, Modified IDH, and SC account for approximately 12% of the variance in PWS (r^2=0.115, *F*=7.07, *p*<0.001).

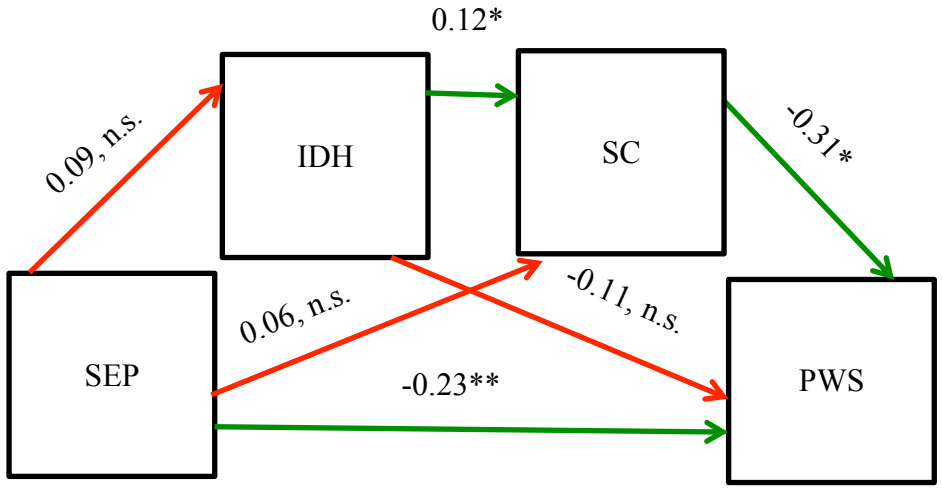

Figure 30. Modified Mediating Mediation Model Results for White Centennial Women

White millennial women. The Modified Mediating Mediation Model met all criteria for partial mediating mediation among White millennial women (*n*=469). See Figure 31. Modified Mediating Mediation Model Results for White Millennial Women for a visual. SEP was a significant predictor of Modified IDH (β=0.26, *SE*=0.03, *t*=9.78, *p*<0.001). SEP was a significant predictor of SC (β=0.06, *SE* =0.02, *t*=3.23, *p*=0.001). Modified IDH was a significant predictor of SC (β=0.19,

SE =0.03, *t*=6.43, *p*<0.001). Modified IDH was a significant predictor of PWS (*β*=-0.29, *SE*=0.06, *t*=-4.60, *p*<0.001). SC was a significant predictor of PWS (*β*=-0.22, *SE*=0.09, *t*=-2.33, *p*=0.02). SEP was not as strong of a predictor of PWS after controlling for the mediators, Modified IDH and SC, decreasing from -0.31 to -0.21, (*SE*=0.04, *t*=-5.39, *p*<0.001), consistent with partial mediation. SEP, Modified IDH, and SC account for approximately 20% of the variance in PWS (r^2=0.196, *F*=37.98, *p*<0.001).

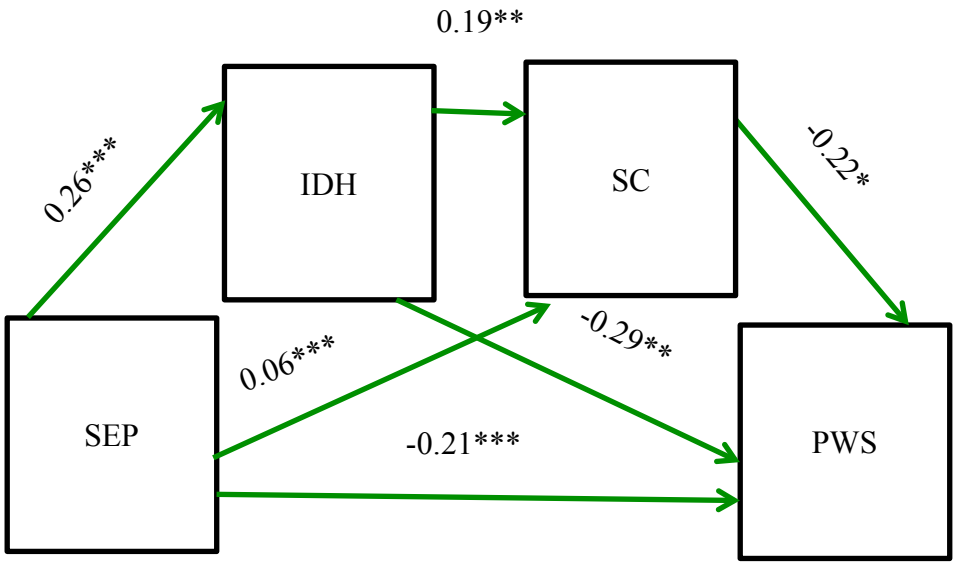

Figure 31. Modified Mediating Mediation Model Results for White Millennial Women

White generation X women. The Modified Mediating Mediation Model did not meet all criteria for partial mediating mediation among White generation X women (*n*=123). See Figure 32. Modified Mediating Mediation Model Results for White Generation X Women for a visual. SEP was a significant predictor of Modified IDH (*β*=0.27, *SE*=0.06, *t*=4.66, *p*<0.001). SEP was not a significant predictor of SC (*β*=-0.002, *SE*=0.04, *t*=-0.06, *p*=0.950). Modified IDH was not a significant predictor of SC (*β*=0.04, *SE*=0.05, *t*=0.75, *p*=0.452). Modified IDH was a significant predictor of PWS (*β*=-0.26, *SE*=0.11, *t*=-2.36, *p*=0.02). SC was not a significant predictor of PWS

(β=-0.20, *SE*=0.19, *t*=-1.09, *p*=0.277). SEP was not as strong of a predictor of PWS after controlling for the mediators, Modified IDH and SC, decreasing from -0.28 to -0.20, (*SE*=0.08, *t*=-2.69, *p*=0.008), consistent with partial mediation. SEP, Modified IDH, and SC account for approximately 16% of the variance in PWS (r^2=0.161, *F*=7.59, *p*=0.001).

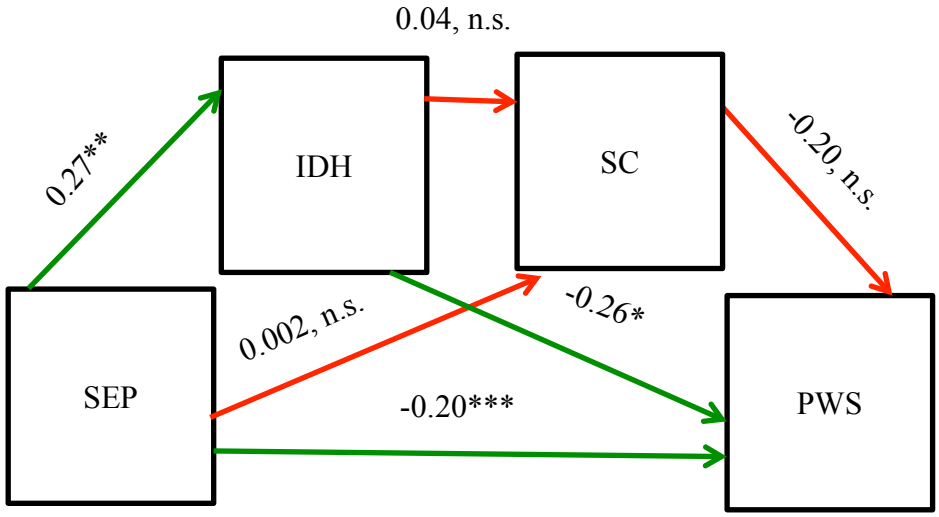

Figure 32. Modified Mediating Mediation Model Results for White Generation X Women

White boomers women. The Modified Mediating Mediation Model did not meet all criteria for partial mediating mediation among White boomers and silent generation women (*n*=53). See Figure 33. Modified Mediating Mediation Model Results for White Boomers and Silent Generation Women for a visual. SEP was a significant predictor of Modified IDH (β=0.17, *SE*=0.08, *t*=2.15, *p*=0.037). SEP was not a significant predictor of SC (β=-0.03, *SE*=0.04, *t*=-0.76, *p*=0.448). Modified IDH was a significant predictor of SC (β=0.16, *SE*=0.07, *t*=2.43, *p*=0.019). Modified IDH was a significant predictor of PWS (β=-0.59, *SE*=0.18, *t*=-3.22, *p*=0.002). SC was not a significant predictor of PWS (β=-0.10, *SE*=0.37, *t*=-0.26, *p*=0.796). SEP was not a significant predictor of PWS

before (β=-0.14, SE=0.11, t=-1.29, p=0.202) or after (β=-0.03, SE=0.11, t=-0.38, p=0.707) controlling for the mediators, Modified IDH and SC. SEP, Modified IDH, and SC account for approximately 23% of the variance in PWS (r^2=0.226, F=4.76, p=0.005).

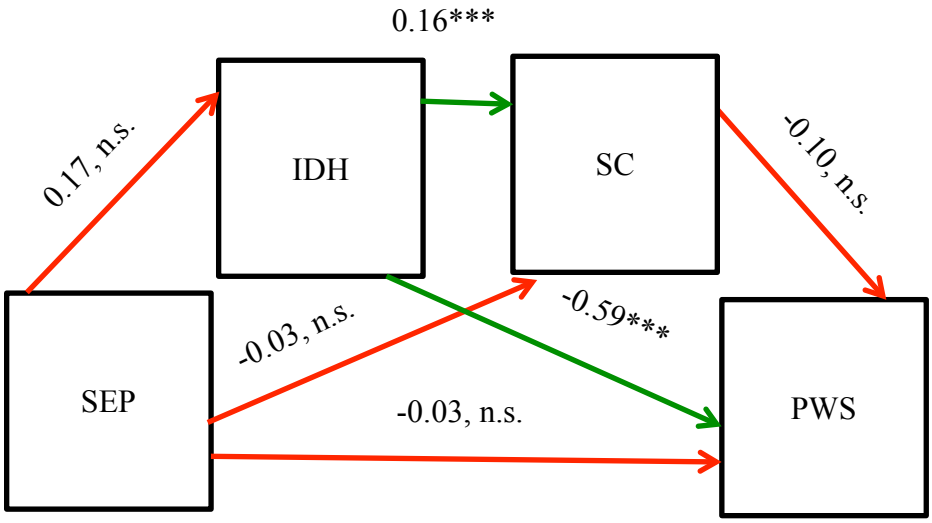

Figure 33. Modified Mediating Mediation Model Results for White Boomers and Silent Generation Women

Minority centennial women. The Modified Mediating Mediation Model did not meet all criteria for partial mediating mediation among minority centennial women (n=63). See Figure 34. Modified Mediating Mediation Model Results for Minority Centennial Women for a visual. SEP was not a significant predictor of Modified IDH (β=0.11, SE=0.13, t=0.87, p=0.387). SEP was a significant predictor of SC (β=0.16, SE=0.08, t=2.00, p=0.05). Modified IDH was not a significant predictor of SC (β=0.10, SE=0.08, t=1.16, p=0.25). Modified IDH was not a significant predictor of PWS (β=-0.14, SE=0.16, t=-0.92, p=0.362). SC was not a significant predictor of PWS (β=-0.32, SE=0.24, t=-1.32, p=0.192). SEP was not a significant predictor of PWS before (β=-0.17, SE=0.15, t=-1.15, p=0.255) or after (β=-0.11, SE=0.16, t=-0.66, p=0.51) controlling for the mediators,

Modified IDH and SC. SEP, Modified IDH, and SC account for approximately 7% of the variance in PWS (r^2=0.074, F=1.57, p=0.206), although the final model was not statistically significant.

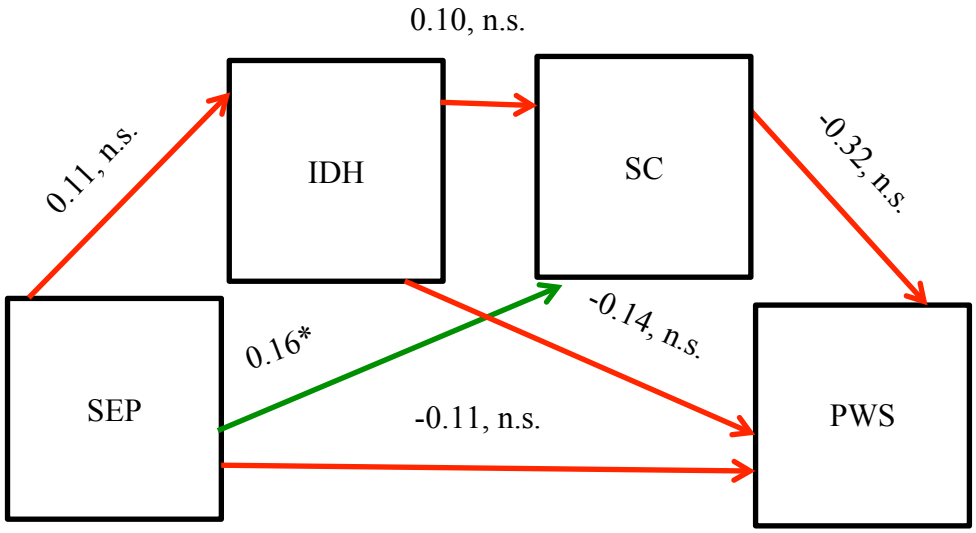

Figure 34. Modified Mediating Mediation Model Results for Minority Centennial Women

Minority millennial women. The Modified Mediating Mediation Model did not meet all criteria for partial mediating mediation among minority millennial women (n=105). See Figure 35. Modified Mediating Mediation Model Results for Minority Millennial Women for a visual. SEP was a significant predictor of Modified IDH (β=0.32, SE=0.07, t=4.79, p<0.001). SEP was not a significant predictor of SC (β=0.09, SE=0.06, t=1.67, p=0.10). Modified IDH was also not a significant predictor of SC (β=-0.07, SE=0.08, t=-0.88, p=0.383). Modified IDH was a significant predictor of PWS (β=-0.25, SE=0.12, t=-2.15, p=0.034). SC was not a significant predictor of PWS (β=-0.29, SE=0.15, t=-1.89, p=0.061). SEP was no longer a predictor of PWS after controlling for the mediators, Modified IDH and SC, decreasing from -0.17 to -0.06, (SE=0.09, t=-0.75, p=0.454), consistent with full mediation had the other criteria for mediation been met. SEP, Modified IDH, and SC account for approximately 11% of the variance in PWS (r^2=0.106, F=4.02, p=0.01).

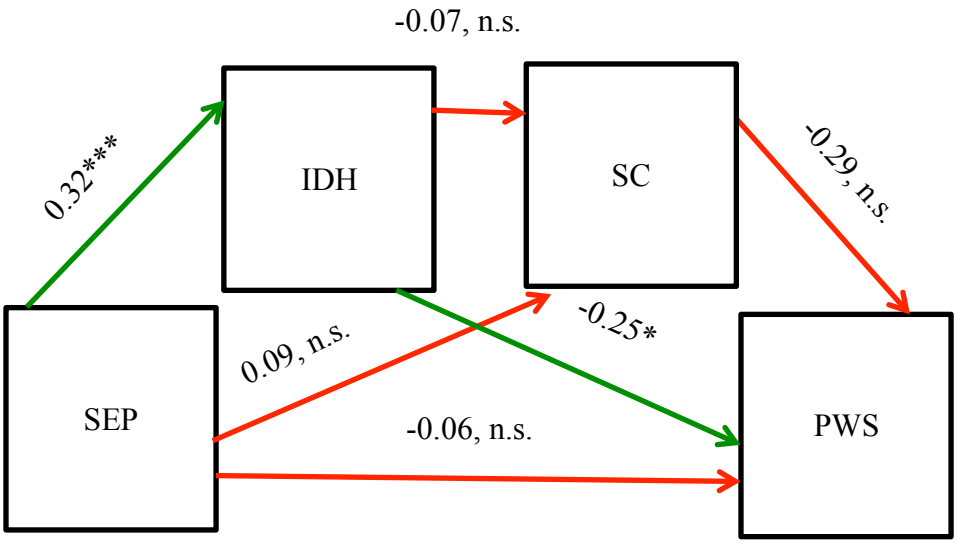

Figure 35. Modified Mediating Mediation Model Results for Minority Millennial Women

Discussion and Conclusions

Summary of Findings

The overall finding of this investigation was that the SDH framework, represented by the survey and analysis method developed by the researcher, captured the experiences of White women's perceived health; variability across the models revealed a lower model fit among sexual minorities, minorities, and some age cohorts. Examined in this chapter are the results of the leading hypotheses and their convergence or divergence with past literature. The limitations of the analysis and next steps will be discussed to improve the SDH framework for future research.

First Hypothesis

The first hypothesis that the PWS would become a stronger measure of perceived wellness for women after adding in the proposed seventh subscale regarding sexuality concerns (SC) was not supported. The SC subscale performed well independently from the PWS as a second mediator. The PWS, a sophisticated measure of wellness, held up to convergent validity without the proposed sexuality concerns (SC) subscale.

Explanation of finding. The proposed SC items did not vary greatly among participants, leading to the high levels of skewness and kurtosis. The majority of women in this sample reported low levels of sexuality concerns, which was why the subscale only contributed to 4.5% of the variance in PWS scores. Although this was statistically significant, the addition of the seventh component to the PWS did not increase the survey's reliability. This finding suggested that the SC subscale should be tested within the SDH model as an independent risk factor, not as a component of the wellness score.

Convergence or divergence with past literature. During preliminary analyses, PWS appeared to work contrary to past research revealing that White women displayed lower levels of perceived health scores. Numerous studies and the SDH framework upheld that individuals of minority status have a disproportionate burden of health problems (Stepanikova & Oates, 2016; Umberson et al., 2014; Williams, 1999), particularly among minority women (Kennedy et al., 2007; Kwate & Goodman, 2014). Theoretically, White women should report higher levels of PWS scores. Minority women reported higher PWS scores but the variability within this group was higher than White women's scores indicating a less reliable outcome. This finding led to broader questions about the successfulness of the PWS to accurately capture perceived wellness.

Upon closer inspection of the convergent validity factor, health diagnoses, data revealed that White women in this sample reported higher levels of health diagnoses than minority women. This finding could clarify why White women had significantly lower levels of perceived wellness had previous research not reported broken relationships between non-White women and the healthcare system. African American women, in particular, reported feeling discriminated against by their physicians when their symptoms were ignored or discredited (Cuevas, O'Brien & Saha, 2016). African American women referred to the healthcare system as a "white" system noting their distrust of the medical structure and the discrimination they faced when seeking medical attention (Nicolaidis et al., 2010). This increased stigma from providers could impact perceived access to quality healthcare.

White women could be more involved with their health care than Black and Latina women in this sample. The researcher investigated level of involvement by testing the sample's frequency of routine medical checkups to see if White women sought check-ups more frequently, possibly explaining the higher levels of health diagnoses. There were no statistically significant

differences between routine health check-ups ($\chi 2(5,1)=5.09$, $p>0.05$) or emergency care ($\chi 2(5,1)=3.60$, $p>0.05$) based on racial categories. Chronic healthcare visits ($\chi 2(5,1)=10.69$, $p=0.035$), however, were statistically more frequent for White woman than Black and Latina women. This converges with the SDH framework that chronic health problems may contribute to different experiences of wellness. Further investigations are needed to understand if chronic healthcare visits are vital to PWS score differences.

Although age is not a factor within the theoretical SDH framework, age played a crucial role in PWS score variations across groups. Health diagnoses were consistent with age cohort (increasing health diagnoses with increasing age), the PWS scores also increased with age. This finding could be due to the dynamic nature of the PWS to measure wellness by accounting for a holistic range of experiences. Consider the following subscales: spiritual, intellectual, emotional, social, psychological, and physical wellness. Each subscale captured a dimension of perceived wellness. Within the current sample, emotional, intellectual, spiritual and psychological subscales significantly increased with age. Physical and social wellness did not display the same pattern (Centennial and Generation X had significantly lower levels of physical and social wellness than Millennial and Bloomers-Silent Generation participants). It is difficult to summarize the findings of past literature by the subscales of wellness due to the varying methods of measurement and definitions. Spiritual wellness, for example, is difficult to measure with the lack of consensus on the definition of spirituality. Psychological wellness, however, may interact with age. Stone, Schwartz, Broderick and Deaton (2010) discovered a curvilinear relationship with psychological wellbeing decreasing toward middle age and then increasing after age 50. Additional studies found that spiritual and emotional wellness may increase across the lifespan (Strout & Howard, 2012). Foster & Levitov (2012) investigated the PWS alongside Erikson's

lifespan theory and concluded that wellness was perceived differently from middle and late adulthood. Different interpretations of the PWS questions may account for contradictory findings.

The five proposed SC variables independently upheld the assumptions made by previous research. Sexual minority women reported significantly lower wellness scores than heterosexual women and significantly higher levels of SC scores. This finding converged with research framed within Minority Stress Theory (MST; Meyer, 2003) that suggested that sexual minorities might experience more stressors due to sexuality that heterosexuals do not experience. Sexuality concerns were not significantly different among race categories but did emerge as an important factor among age cohorts. Centennial participants (ages 18-24) reported significantly higher levels of SC and statistically lower PWS. As age increased for this sample, concerns about sexuality issues decreased. This finding, however, revealed a potential limitation to the conceptualization of the SC scale. The SC may not be adequately measuring how older women experience sexuality concerns.

Limitations related to the findings. There are limitations to the SC findings, as the majority of the sample reported no sexuality concerns. Those who did have concerns reported relatively low levels of concern. The SC scale was conceptualized through the MST lens, focusing on capturing microaggressions and victimization due to sexual orientation and gender identity or expression. Meyer (2003) highlighted the increased vigilance that SM might face in navigating themselves in a heteronormative society. Previous research supported the heightened experiences of these microaggressions and the impact it has on the internal stress process of the SM individual (Baams, Grossman & Russell, 2015; Mason & Lewis, 2016). Heterosexual women, on the other hand, may not notice or even experience subtle microaggressions related to

these sexuality concerns in the general population. Future investigations are needed to understand how heterosexual women conceptualize sexuality concerns if these concerns significantly influence their perceived health, and how that differs from sexual minority women.

Second Hypothesis

The second hypothesis supported that the intermediary determinants of health partially mediated the relationship between socioeconomic status and wellness with all women grouped. After adding the second mediator of Sexuality Concerns, the model supported the partial mediating mediation. To inspect the Mediating Mediation model across intersecting identities, the researcher tested the model between white and minority women, white heterosexual and SM women, minority heterosexual and SM women, and white and minority women across age cohorts (centennial and millennial only due to small sample sizes). The model supported the SDH framework for all white women grouped, with white millennial women fitting the SDH model most accurately. The models for Minority women regardless of age cohort or sexual orientation, as well as the models for White women grouped by sexual orientation, did not meet all criteria for partial mediating mediation. These findings, contrary to both theoretical frameworks, are discussed below.

Explanation of finding. With all women grouped, the Original Mediating Model accounted for 18% of the variance in PWS scores and 19% after adding the second mediator of SC. Although this is only a one-percent increase in accounted for variation, SC significantly contributed to the model and remained in the model comparisons of intersecting identities of race, sexual orientation, and age. The addition of the SC factor was also a critical component to the integration of the MST and the SDH framework. The Mediating Mediation Model comparison between White and Minority women revealed that the model worked very well for

the white women, accounting for 23% of the variance in PWS, whereas the model only accounted for 12% of the difference in PWS scores for minority women. The insignificant predictors in the Mediating Mediation model for Minority women, seen in Figure 11, indicated that the model did not meet all required criteria for mediation (Baron & Kenny, 1986).

The researcher recognized the significance of the model not fitting with Minority women's experiences. The SDH is a global framework that should accurately capture the experiences of women across the multitude of variables included in the analyses. This finding suggests that factors not included in this analysis may more strongly measure minority women's perceived health. Another plausible explanation is that the surveys and questions used may not work accurately for Minority women. The PWS confirmatory factor analysis, for example, indicated the model fit White women better than Minority women. An additional possibility is that homogenizing minority individuals into a singular group brought too much variability into the group to detect meaningful differences among racial and ethnic identities. Future research may benefit from oversampling racial and ethnic minorities to uncover how this model works across minority identities.

The researcher tested the mediating mediation model among SM and heterosexual white women and SM and heterosexual minority women. Although sample size might be a factor in the model's ability to detect significant predictors, all models did not support sexuality concerns as a significant predictor in the model. Both SM and heterosexual women's models supported the mediating model of SEP and IDH on PWS scores. However, both SM and heterosexual minority women's models failed to uphold significant predictors across the model. The model appeared to support the experiences of white women, regardless of sexual orientation, and was unable to support the experiences of any minority women. The primary issue influencing the lack of

success with SC in these models may relate back to the low level of sexuality concerns reported by the samples. The SC scale may need to be revised in a future investigation to understand better how women of intersecting identities experience and report sexuality concerns.

The next model explored the specific age cohorts by minority status to understand if age made an impact on model success. The model supported the full mediating mediation model for white millennial women (25-40 years). This finding was not odd considering that the CFA found the best fit of the PWS among millennial women. It has to be considered, however, that this group of women made up the most substantial portion of the subsamples explored in this manner. Although a-priori analyses supported the model's sample size as adequate, the larger sample of millennial white women could have allowed the analysis to detect significant small effects. Similar to models comparing sexual orientation, white generation X women fit the mediated model without the addition of sexuality concerns as a second mediator. This finding may be due to issues with the sexuality concerns construct to which most women in the sample responded similarly.

The Cronbach alpha levels of the proposed IDH factors created the modified models. After removing variables to improve alpha levels, the remaining variables only represented one aspect of the IDH theoretical framework, the material circumstances. The questions regarding the quality of housing, neighborhood safety, neighborhood condition, neighborhood litter, enough money, and enough food thus represented the entire IDH component. All modified models indicated lower levels of variance accounted for and similar model pathways for white women.

The Modified Mediating Mediation Model (Modified Model) worked differently for minority women. The SEP was a significant predictor of IDH, contrary to the unmodified model. This finding indicated that education, income, and occupation significantly predicted the levels

of IDH concerns experienced by minority women, confirming one of the pathways supported by the SDH framework. IDH, however, was no longer a significant predictor of Sexuality Concerns in the Modified Model. The original factors, with the low levels of internal reliability, therefore performed as stronger predictors of SC. The primary relationship of SEP to PWS was no longer significant in the Modified Model. See side-by-side comparison in Figure 36 below. If the modified version of this framework represented a more precise framework of the SDH, the researcher would have been able to suggest the revised version as a stronger model. However, the comparison between all groups did not support this finding, indicating that removing variables to improve internal consistency influenced the strengths of relationships in the models. In the future, researchers need to return to the conceptualization stage of the SEP, IDH, and SC factors to revise and clarify what accurately captures the essence of these components.

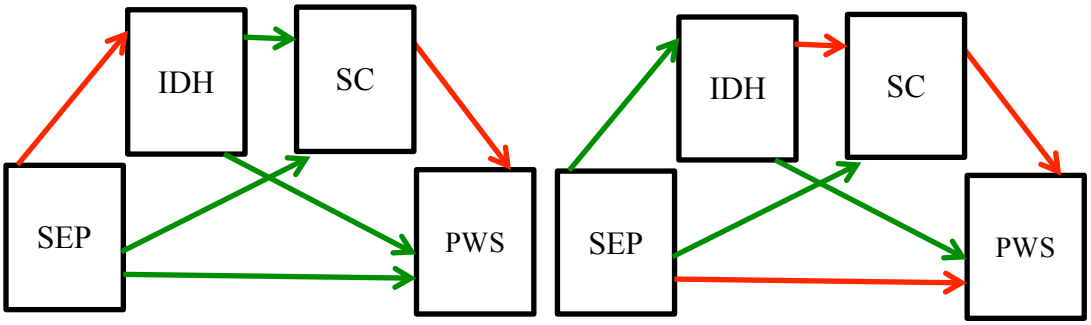

Figure 36. Mediating Mediation (Left) and Modified Model (Right) Comparison: Before and After Revising the IDH Factors

Convergence or divergence with past literature. The mediating mediation may not work as well for minority women for a few reasons. As previously mentioned, having a smaller sample of minority women made it impossible to run the framework by individual categories of racial identities, as well as sexual minority identities. Although bivariate analyses showed PWS

variation among minority categories, they were all significantly higher than white women's scores. Merging the groups was a necessary but unfortunate step. Doing so, the variation across all the variables in the model may have negatively affected the framework's ability to capture significant factors. Past research supports the varying experiences of health disparities between racial and sexual identities (Trinh et al., 2017). The variation among minority experiences is critical to explore in future research. Additionally, minority women may experience different health risks than white women. Although the SDH framework is an international framework, the questions utilized to capture SDH variables for this analysis may not have adequately captured critical items for minority women.

Limitations related to finding. The primary restriction of the second hypotheses is the limited pool of minority women who responded to the survey. Had there been a more substantial sample of SM and racial minority women, the complex analyses may have been able to capture the SDH framework more effectively.

Specific research needed to clarify or extend finding. Differences in age cohorts rose as significant factors in determining the success of the SDH framework model. Future research would benefit from larger sample sizes of specific groups to understand the real significance of age as a factor in this complex model. There are numerous factors that may be significant contributors to health among aging women that are not yet experienced by younger generations, such as social isolation (Lubben, 2018; Rubinstein, Lubben, & Mintzer, 1994), the impact of early childhood trauma across the lifespan (Clarke & Griffin, 2008; Ladson & Bienenfeld, 2007), and even merely the increase in likelihood to experience diseases as one ages. The SDH and MST frameworks both support an increase in health problems across the lifespan due to SGM-

specific stressors compounding and stressing the body's systems and the impact of the risks and exposures of the intermediary determinants of health.

An additional avenue of future exploration is to incorporate the critical component of biomarkers of health into this investigation to truly explore SDH as a viable method for understanding health disparities across gender, age, culture, and other identities. Evaluating allostatic load and diurnal cortisol levels, similarly to Juster and colleagues' (2013) research, for example, will provide future analyses the ability to triangulate self-prescribed levels of health with standardized biomarkers of health. Allostatic load and diurnal cortisol levels are biological measures of how stress is affecting the body's systems and would be a strong fit for the SDH model. With this additional information, researchers may be able to understand any differences between scientifically measured levels of physical health and perceived health reports of participants.

General Implication of Findings

Although the limitations of homogenizing samples of minority identity and the sample size issues may be influencing the researcher's ability to detect significant predictors of health, several theoretical, research, and social work practice implications emerged from these findings.

Theoretical implications. The findings of this investigation solicit a look into the foundation of the SDH and MST theoretical frameworks. Due to varying levels of statistical success among groups of women and age cohorts, some critical theoretical implications must be explored. Both the SDH framework and MST do not define a statistical model to test their conceptual frameworks. Researchers must continue to test statistical models with the guidance of the theories to develop a comprehensive model to predict health outcomes.

Minority women may have different factors determining their health that may require an alteration of the SDH model or the addition of new variables or scales (such as surveys capturing discrimination based on race and age) to the proposed model. Once larger samples of minority women can be measured, restructuring prominent factors within the IDH predictor may strengthen the model. For example, trauma, financial burdens, racism or sexual identity specific victimization experiences may need to be statistically weighted to capture the SDH conceptual framework accurately.

Minority Stress Theory posits that SGM specific stressors negatively affect SM mental and physical health (Meyer, 2003). The model did not fit sexual minority and minority women more accurately with the integration of MST and the sexuality concerns mediator. The theoretical framework of the proposed SC scale may need to be revised. Different identities of women grouped by age, sexual orientation, and racial categories reveal that a stronger measure of these concerns may more accurately capture the sexuality concerns women experience in the U.S. today.

The findings of this research solicit the integration of a third theory: intersectionality (Crenshaw 1989; Bowleg, 2012; Cho, Crenshaw, and McCall 2013). Intersectionality considers the simultaneous intersection of identities individuals may experience (Crenshaw 1989). This means going beyond looking at gender differences to explore, for example, how African American millennial sexual minority women experience health disparities across the SDH framework. Past research explores how intersectionality may be utilized to capture the varying experiences across the intersection of racial and sexual identities (Bowleg, 2012; Trinh et al., 2017). Numerous health studies have utilized intersectionality to guide their research accomplishments (Cairney et al., 2014; Demant et al., 2018; King, Merrin, Espelage, Grant &

Bub, 2018; McPherson & McGibbon, 2010), but the method of statistically analyzing this theory is not yet fully developed (Hankivsky, 2012). Integrating this interdisciplinary framework may help the researcher develop a more accurate conceptual and statistical framework for the SDH model.

Research implications. The researcher developed the statistical model to test the integration of the SDH and MST frameworks. Creating a composite score for each of the factors enabled the researcher to examine numerous predictors of health simultaneously. This method, while unique and contributory to the field of health research, may need to be revised to capture the intersection of multiple identities of women. The statistical modeling capabilities of Process (Hayes, 2018) will enhance future studies with the unique modeling methods available. Process provides the ability to test mediating and moderating variables across complex statistical models in a user-friendly add-in on SPSS.

In future studies, the researcher will reevaluate the variables that best represent factors of the SDH and MST integrated framework (SEP, IDH, SC, and perceived health). An Exploratory Factor Analyses of the various factors, for example, may provide a sharper factor for each representing category. This method would yield data to inform the model's development rather than forcing the data to fit within the developed statistical model. Qualitative research would enable the researcher to explore what each participant considers the most influential health factors. This method could lead to a better understanding of the differences of health concerns between sexual and racial minority groups of women.

The measurement of perceived health should also be reexamined. If the PWS only fitted white millennial women most strongly, more research needs to be conducted within the community to understand a stronger method for capturing self-reported health that does not lose

the depth the PWS provided (spirituality, emotional, intellectual wellness, etc.). The researcher will utilize a triangulation method to build a stronger health measure in future research. Triangulating biomarkers of health, a medical professional's report, as well as self-reported health may provide the most accurate measure of a participant's current health status.

Sexuality concerns must also be reexamined through a qualitative methodology. With the low levels of SC reported, the researcher must examine the foundation of this concept through in-depth interviews with women from diverse backgrounds (varying ages, ethnicities, sexual orientation, etc.) to rebuild the theoretical foundation of sexuality concerns. Once this is grounded in the voices of women, the researcher will be able to create questions to test sexuality concerns. Additionally, SC was treated as a mediator in this investigation. Future work will explore SC as a moderator of health concerns. Different levels of SC may also be examined as separate models to understand if women with high, medium, and low SC experience varying pathways through the SDH framework.

To move beyond a cross-sectional design, the researcher will conduct longitudinal studies to understand how health changes over time, across intersecting identities, through the SDH framework. Longitudinal analyses provide a more accurate view of health concerns across the lifespan. With more precise measures to capture the SDH framework, triangulation of sources, and a longitudinal design, the researcher will be able to build robust research endeavors into the health disparities of women in the United States.

Practice implications. The social work practice implications of this research are the need to focus on the specific factors that impact minority health, a closer evaluation of sexual minority sexuality concerns, and the differences in perceived health among individuals seeking services. Social workers are in prime positions to assess and assist clients in the healthcare system. In

healthcare team settings, social workers must act as leaders, bring in the person-in-the-environment perspective to healthcare planning and policies, and utilize evidence-based practice research (McDermott & Bawden, 2017).

Social work researchers may strongly benefit from collaboration with medical service providers to navigate through future-identified factors that minority individuals report as critical to their health. A partnership may allow researchers not only with access to samples of women who may more readily respond to health research endeavors but also with more direct information from women who can inform the development of a minority-specific SDH framework. With the vast difference in expressed sexuality concerns between sexual minority and heterosexual women, it will be critical to explore this more thoroughly among clients. SM women may be able to assist in a qualitatively developed construct of sexuality concerns to retest within the SDH framework.

General Limitations of Study

A limitation of this study was the reliance on self-report from online participants. Reaching out to participants through the various recruitment methods should have enabled the researcher to reach a wide net of potential participants. Despite rigorous efforts, small sample sizes of minority women may have weakened the strength of the statistical analyses. Including physical biomarkers of health and financial incentives may combat recruitment problems and increase the robustness of the statistical analyses. Sampling procedures utilized for this research may have influenced the representativeness of this data to women in the United States. The researcher conducted previous research using Reddit, Facebook, and Twitter as recruitment sites (Hohn & Cronley, 2013a; Hohn & Cronley, 2013b; Hohn, Nagoshi & Nagoshi, 2016) and more effectively captured minority individuals; however, past research did not focus on health

specifically in the recruitment text. It was plausible that individuals were less likely to respond to this research project based on the context of the study.

Due to sampling dispersion, the researcher did not examine how a participant's location in the United States influenced her experiences. There may be geographic or regional differences that influenced the results as the majority of the participants were from Texas and California. The experiences of sexual minority or racial minority women may vary from urban to rural settings. Future research may benefit from location-specific recruitment efforts to explore this possibility.

An additional limitation of this study was the complicated nature of investigating health and wellness. The PWS proved to be a poor fit for measuring the complexities of the SDH framework among specific groups of women. Although exploring the PWS added significantly to the limited available literature on the PWS's effectiveness among sexual minority women, the CFA illuminated problems with the survey's performance. Further, the created variables and standardized questionnaires that were incorporated may need to be explored and analyzed in a variety of methods to find a stronger analytic method to test the SDH framework. Alternatively, a stronger measure of health could have led to a stronger overall SDH model.

This investigation also did not include all aspects of the SDH model (social cohesion, political context, and health system). Future studies should incorporate the remaining components of the model for more elaborate testing. This research marked the first of several studies the researcher will conduct to systematically integrate each aspect of the SDH model.

Conclusion

The researcher produced a more thorough understanding of the components of health and wellness that contribute to health disparities among women in the U.S. With mixed findings of

past health disparities research, this research and proposed future research may lead the medical field to a deeper understanding of the vulnerabilities of women in the United States. Perceived health, sexuality concerns, intermediary determinants of health, and socioeconomic status all play critical roles in determining a stronger model from which we can understand health disparities. It may be through the collaborations with medical professionals to incorporate biomarkers of health and the community to reconstruct perceived factors of health that this research may enhance the understanding of the Social Determinants of Health Framework among women in the U.S. today.

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Appendix A. Recruitment Text

Text for Listserv Announcements:

Kris Hohn, MSSW, Doctoral Candidate, is requesting your participation in a UT Arlington research study titled, "Predicting Perceived Wellness for Cisgender Women Utilizing the Social Determinants of Health Model: Testing Group Differences between Sexual Minorities and Heterosexual Respondents." The purpose of this study is to develop a stronger understanding of the health disparities experienced by cisgender women in the United States. Your contribution will be completely anonymous and no identifiable information is being collected. Your responses are valuable and may help develop stronger health policies in the future.

Thank you for your participation and support!
Click on the link below to go to the survey:
https://uta.qualtrics.com/jfe/form/SV_egS5Wtp7HlGNeDP

Facebook and Reddit biweekly recruitment text:

LGBT Specific Subreddits:

I am a doctoral candidate from the University of Texas at Arlington and have gained IRB approval to conduct research on cisgender women's health disparities.* I have been a part of Reddit for several years now and want to reach out to lesbian, bisexual, and heterosexual cisgender women to understand different health experiences. I have read the rules and comments about researchers on this page and want to be as respectful and transparent as possible. If you would like to participate in my survey, which takes about 20 minutes to complete, you will find my contact information on the first page of the survey. Your responses will be **completely anonymous and no identifiable information is being collected**. Your responses are valuable and may help develop stronger health policies in the future. Thank you for your participation and support! Click on the link below to go to the survey: https://uta.qualtrics.com/jfe/form/SV_egS5Wtp7HlGNeDP

* The purpose of this study is to develop a stronger understanding of the health disparities experienced by cisgender women in the United States. While the health experiences of transgender women are of critical importance to future research, the inclusion criterion of this survey is cisgender women. A cisgender woman is a woman who is not transgender, or, in other words, a woman who was born female and identifies or expresses the female gender. It is hoped that the results of this research will lead to stronger surveys for cisgender males and all transgender individuals in the future.

General Subreddits:

I am a doctoral candidate from the University of Texas at Arlington and have gained IRB approval to conduct research on cisgender women's health disparities. I have been a part of Reddit for several years now and want to reach out to lesbian, bisexual, and heterosexual women to understand different health experiences. If you would like to participate in my survey, which takes about 20 minutes to complete, you will find my contact information on the first page of the survey. Your responses will be **completely anonymous and no identifiable information is being collected**. Your responses are valuable and may help develop stronger health policies in

the future. Thank you for your participation and support! Click on the link below to go to the survey: https://uta.qualtrics.com/jfe/form/SV_egS5Wtp7HlGNeDP

Attention cisgender women! If you are 18 or over, please participate in this 20-minute online survey about health disparities. Your responses are valuable and may help other community members in the future. Your responses will be completely anonymous and no identifiable information is being collected. Thank you for your participation and support! Click on the link below to go to the survey: https://uta.qualtrics.com/jfe/form/SV_egS5Wtp7HlGNeDP

Your participation counts! Anonymous health disparities survey for cisgender women in the U.S. who are 18 and over. This 20-minute survey is **completely anonymous and no identifiable information is being collected**. Your responses are valuable and may help develop stronger health policies in the future. Thank you for your participation and support! Click on the link below to go to the survey: https://uta.qualtrics.com/jfe/form/SV_egS5Wtp7HlGNeDP

Twitter.com recruitment:

"Health Disparities study for cisgender lesbian, bisexual, and heterosexual women! 18 and older. Responses anonymous. Follow link to survey: https://uta.qualtrics.com/jfe/form/SV_egS5Wtp7HlGNeDP"

"Please participate in an anonymous health disparities survey! U.S. cisgender women 18 and over. https://uta.qualtrics.com/jfe/form/SV_egS5Wtp7HlGNeDP"

"Looking for participants in an anonymous health disparities survey! U.S. cisgender women 18 and over. https://uta.qualtrics.com/jfe/form/SV_egS5Wtp7HlGNeDP"

"Looking for participants in an anonymous health disparities survey for U.S. cisgender women 18 and over. https://uta.qualtrics.com/jfe/form/SV_egS5Wtp7HlGNeDP"

"Your participation counts! Anonymous health disparities survey for U.S. cisgender women 18 and over. https://uta.qualtrics.com/jfe/form/SV_egS5Wtp7HlGNeDP"

Appendix B. Subreddits and Subscribers

SubReddits	Number of Subscribers
R: ActualLesbians	85,000
R: AskWomenOver30	15,000
R: Bisexual	62,000
R: BiWomen	2,600
R: Black Ladies Fitness	200
R: Careerwomen	1,400
R: Diet and Health	6,700
R: LesbianActually	9,500
R: Over30Reddit	6,800
R: QueerWomenOfColor	1,000
R: RedditforGrownUps	32,000
R: TwoXChromosomes	11,400,000
R: Health	190,000
R: LGBT	182,000
R: SampleSize	182,000

Appendix C. Survey

1. What is your age in years?

_____

2. How do you describe yourself? Select all that apply.
Female
Male
Transgender
Gender Variant/Non-conforming
I do not identify as female, male, or transgender. Please specify:

_____

3. What sex were you assigned at birth, on your original birth certificate?
Male
Female

4. What is your sexual orientation?
Heterosexual or straight
Bisexual
Lesbian or gay
Other: _____

5. What is your marital or relationship status?
Single, never married
Married
Living with a partner
Divorced
Separated
Widowed
Other: _____

6. Are you of Hispanic, Latino, or Spanish origin?
Yes
No

7. Do you consider yourself:
Mexican
Puerto Rican
Cuban
Dominican
Costa Rican
Brazilian
Some other nationality. Please specify:

_____

8. What is your race? For purposes of this question, persons of Spanish/Hispanic/Latina origin may be of any race.
White
Black or African American
American Indian or Alaska Native
Asian
Native Hawaiian or Pacific Islander
Multiple ethnicity/Other. Please specify:
_____

9. What is your level of education?
Completed some high school
High school graduate
Completed some college
Associate degree
Bachelor's degree
Completed some postgraduate
Master's degree
Ph.D., law or medical degree
Other advanced degree beyond a Master's degree

10. Which of the following bests describes your employment status?
Employed, working 40 or more hours per week
Employed, working 1-39 hours per week
Not employed, looking for work
Not employed, Not looking for work
Student
Homemaker
Retired
Disabled, not able to work

11. What is your job title?
_____

12. Overall, how would you describe the safety of your work environment from extremely safe (very small potential for physical injury) to extremely unsafe (every workday is a safety risk)?
Extremely safe
Very safe
Moderately safe
Moderately unsafe
Very unsafe
Extremely unsafe

13. What was your total household income before taxes during the past 12 months?
Less than $20,000
$20,000 to $34,999

$35,000 to $49,999
$50,000 to $74, 999
$75,000 to $99,999
$100,000 to $149,999
$150,000 to $199,999
$200,000 or more

14. In the last 12 months, did you receive any of the following? Select all that apply.
TANF (Temporary Assistance to Needy Families)
SSI (Supplemental Security Income)
Social Security
Unemployment insurance
Food stamps
None of the above

15. Do you live in the United States?
Yes
No

16. What country to you live in?
_____

17. In what state or U.S. territory do you live?
▼ Alabama ... Wyoming

18. How did you learn about this survey?
Reddit
Facebook
Twitter
Other. Please Specify: _____

End of Block: Basic Demos
Start of Block: Tobacco/Alcohol

19. Do you currently use tobacco?
Yes, on a regular basis
Not anymore, I quit
Yes, but only once in a while
No, I have never used tobacco

20. How often did you have a drink containing alcohol in the past year?
Never
Monthly or less
2 to 4 times a month
2 to 3 times per week
4 or more times a week

21. How many drinks containing alcohol did you have on a typical day when you were drinking in the past year?
1 or 2 drinks
3 or 4
5 or 6
7 to 9
10 or more

22. How often did you have six or more drinks on one occasion in the past year?
Never
Less than monthly
Monthly
Weekly
Daily or almost daily

End of Block: Tobacco/Alcohol
Start of Block: Doctor

23. Please indicate you height and weight:
Your height: _____
Your weight: _____

24. Do you have any health problem that requires you to use special equipment, such as a cane, a wheel chair, a special bed, or a special telephone?
Yes
No
Prefer not to answer

25. Are you limited in any way in any activities because of a physical, mental, or emotional problem?
Yes
No
Prefer not to answer

26. When did you last go to your doctor for a routine well-woman exam?
Within this year
Last year
Two years ago
Three years ago
Four years ago
More than five years ago
Other (specify)
Don't know
Never

27. Have you ever had a mammogram?
Yes
No
I don’t know/don't remember

28. How long has it been since you had your last mammogram?
Within the past year
Within the past 2 years
Within the past 3 years
Within the past 5 years
More than 5 years ago
I don’t know

29. What was the reason for your mammogram?
Routine checkup
Breast problem other than cancer
I had breast cancer
I don’t know
Prefer not to answer

30. What is the main reason you have not had a mammogram?
Doctor never said it was needed
I had no reason to have a mammogram
Cost
No insurance to pay for it
Too painful
Don’t know
Other (specify) _____
Prefer not to answer

31. Have you ever had a Pap smear test?
Yes
No
I don’t know/don't remember

32. How long has it been since your last Pap test?
Within the past year
Within the past 2 years
Within the past 3 years
Within the past 5 years
More than 5 years ago
Don’t know/don't remember

End of Block: Doctor
Start of Block: Health

33. In general, my overall health is:
Excellent
Very Good
Good
Fair
Poor

34. In general, are you satisfied with your life?
Yes
Partly
No

35. Please indicate the current level of stress in your life:
Low
Medium
High

36. In general, I feel that:
I cope well with stress
I do not cope well with stress

37. Do any of the following medical conditions run in your family? Select all that apply.

	Maternal	Paternal
Anxiety		
Arthritis		
Asthma		
Breast Cancer		
Cancer		
Colon polyps		
Depression		
Diabetes Type I		
Diabetes Type II		
Fibromyalgia/myositis		
Heart disease		
High blood pressure (hypertension)		
High cholesterol		
Hypothyroidism		

Irritable Bowel Disease
Major depressive disorder
Obesity
Osteoarthritis
Stroke
None of these health problems
I don't know
Other (please list):

38. Has a healthcare provider informed you that you have any of the following health problems or diagnoses (currently or in the past)? Select all that apply:
Angina pectoris
Anxiety
Arthritis
Asthma
Breast Cancer
Cancer
Chronic bronchitis
Chronic heartburn/GERD
Chronic obstructive pulmonary disease (COPD)
Colon polyps
Congestive heart failure
Depression
Diabetes Type I
Diabetes Type II
Fibromyalgia/myositis
Heart attack
Heart bypass surgery
Heart disease
High blood pressure (hypertension)
High cholesterol
Hypothyroidism
Irritable Bowel Disease
Joint pain
Major depressive disorder
Obesity
Osteoarthritis
Stroke
None of these health problems
Other (please list): _____

39. In a typical week, on how many days do you do any MODERATE activities (causes small increases in breathing or heart rate) for AT LEAST 30 minutes such as brisk walking, bicycling at a regular pace, gardening, etc.?
1 – 2 days
3 days
4 – 5 days
6 – 7 days
I don't typically do any moderate exercise

40. In a typical week, on how many days do you do any VIGOROUS activities for AT LEAST 20 MINUTES such as running, cross country skiing, aerobics, fast bicycling, heavy lifting, etc.?
1 – 2 days
3 days
4 – 5 days
6 – 7 days
I don't typically do any vigorous exercise

41. How many hours of sleep do you typically get a night?
Less than 7 hours
7-8 hours on average
More than 8 hours

42. How would you describe the condition of your mouth and teeth, including false teeth or dentures?
Excellent
Very good
Good
Fair
Poor

43. Over the past 7 days:

	0	1	2	3 or more
How many times did you eat fast food or pizza?				
How many servings of fruits or vegetables did you eat each day?				
How many sodas and sugar sweetened drinks (regular, not diet) did you drink each day?				

End of Block: Health
Start of Block: Sexuality Concerns

44. In your lifetime, have you had sex with:
Men only

Women only
Both men and women
I have not had sex
Other (please specify): _____

45. People are different in their sexual attraction to other people. Which best describes your feelings? Are you:
Only attracted to females
Mostly attracted to females
Equally attracted to females and males
Mostly attracted to males
Only attracted to males
Not sure
Other (please specify): _____

46. In the past year, how often have:

You been excluded from conversations or gatherings due to your sexual orientation?	On a regular basis	Very frequently	Occasionally	Rarely	Very rarely	Never
You been excluded from conversations or gatherings due to your bending of gender identity (looking more or less feminine than your peers)?	On a regular basis	Very frequently	Occasionally	Rarely	Very rarely	Never
You experienced bullying or overt aggression due to your sexual orientation?	On a regular basis	Very frequently	Occasionally	Rarely	Very rarely	Never
You experienced bullying or overt aggression due to your bending of gender identity (looking more or less feminine than your peers)?	On a regular basis	Very frequently	Occasionally	Rarely	Very rarely	Never
People of professional standing incorrectly assumed your sexual orientation (medical professionals, bosses, social service providers, etc.)?	On a regular basis	Very frequently	Occasionally	Rarely	Very rarely	Never

47. How important is your sexual orientation in defining your personal identity?
Not at all important
Low importance

Slightly important
Moderately important
Very important
Extremely important

48. How comfortable are you with your sexual orientation?
Not at all comfortable
Barely comfortable
Moderately comfortable
Mostly comfortable
Very comfortable
Extremely comfortable

49. On a scale of 1-10, how open are you about your sexual orientation with others?
1 = No one knows about my sexual orientation
10 = Everyone knows what my sexual orientation is

End of Block: Sexuality Concerns
Start of Block: Living Questions

50. In the last 12 months, was there at least one time when you didn't feel you had enough money to meet your basic needs?
Yes
No
I don't know

51. In the last 12 months, was there at least one time when you were hungry but didn't eat because you couldn't afford enough food?
Yes
No
I don't know

52. Which statement best describes your current living arrangement?
I pay rent for my housing.
I own my home.
I live in housing where I do not pay rent.

53. Which of the following best describes the area you live in?
Urban
Suburban
Rural

54. Overall, how would you rate the quality of your housing?
Excellent (mint condition, one minor fault)
Good (good except minor isolated repairs)
Mixed (mix of well and poorly maintained items)

Poor or very poor (obvious and significant neglect)

55. Overall, how safe do you feel in your neighborhood?
Extremely safe
Very safe
Somewhat safe
Very unsafe
Extreme unsafe

56. What is the general condition of your neighborhood?
Excellent (mint condition, one minor fault)
Good (good except minor isolated repairs)
Mixed (mix of well and poorly maintained items)
Poor or very poor (obvious and significant neglect)

57. How littered are your neighborhood streets?
No litter
Predominantly free of litter except for some small items
Widespread distribution of litter with minor accumulations
Heavily littered with significant accumulations

End of Block: Living Questions
Start of Block: Pregnancy/children

58. Are there any children under the age of 18 living with you in your household?
Yes
No

59. How many children?
_____

60. Have you ever been pregnant?
Yes, I have been pregnant
Yes, I am currently pregnant
No, I have never been pregnant

61. How many children have you given birth to?
Number of children _____
I have not given birth

62. Did you breastfeed after giving birth?
Yes
No

63. How long did you breastfeed? (If you breastfed more than one child, please provide an overall estimate)

In months: _____

64. Select all types of childbirth you have experienced:
Vaginal Birth
Scheduled Cesarean
Unplanned Cesarean
Vaginal Birth after C-Section
Scheduled induction
Other: _____

65. How many of your children are living today?
_____

66. Please select all that apply. Have you ever:
Had a miscarriage
Had an abortion
Been forced or coerced to get pregnant
Gotten pregnant as a result of rape
Gotten pregnant as a result of incest
None of the above

End of Block: Pregnancy/children
Start of Block: Family history

67. Are you currently caring for a sick or disabled elderly family member, either in your own home or elsewhere?
Yes
No

68. Did you ever experience any of the following, at least once, during your childhood? Please check if yes:
Death of a primary caregiver or parent
Death of a sibling
Death of a close friend
Another death. Please specify: _____
A divorce between your primary caregivers or parents
Placement in foster care
Lived with caregiver(s) with depression or severe mental illness
Lived with caregiver(s) with alcoholism
Lived with caregiver(s) who smoked tobacco
Lived with caregiver(s) who used hard drugs (heroin, methamphetamine, cocaine, etc.)
Lived with caregiver(s) who abused prescription drugs
None of the above

69. During your childhood, did you ever have the following:
A chronic illness

Cancer
Obesity
Other illness. Please specify: _____
I don't know
None of the above

70. Please select all that apply. Were you born:
Premature
At a low birth weight
With a birth defect
Exposed to hard drugs (heroin, methamphetamine, cocaine, etc.) in utero
I don't know
None of the above

End of Block: Family history
Start of Block: Transportation

71. What is your primary means of transportation? (Please check all that apply.)
Personal automobile
Friend, relative, or neighbor
Public transportation
Medicaid transportation
Other

72. If you don't drive a car, why not? (Please check all that apply.)
Can't drive due to a medical/physical condition
Can't afford a car
Can't afford gas/insurance
Lost driver's license
No need, everything I need I can access without a car
Other _____
I drive a car

73. If you do not use public transportation regularly, why not? (Please check all that apply.)
No service where I am or where I want to go
Poor connections or transfers
I don't know how to ride the bus/train
Limited hours of operation
I don't feel safe on the bus/train
I can't afford it
I don't know about it
I don't need it
Other
I use public transportation

74. How difficult is it for you to get transportation to your medical care appointments?

	Extremely easy	Moderately easy	Slightly easy	Neither easy nor difficult	Slightly difficult	Moderately difficult	Extremely difficult
In-town appointments							
Out-of-town appointments							

75. In the past year, how many trips have you made to a healthcare facility?

	0	1-2	3-5	6-10	11-20	More than 20
Routine health checkups						
Chronic healthcare visits						
Emergency care						

76. In the past year, how many trips to a healthcare facility were missed or delayed because you could not drive or did not have a ride?

	0	1-2	3-5	6-10	11-20	More than 20
Routine health checkups						
Chronic healthcare visits						
Emergency care						

End of Block: Transportation

Start of Block: PWS

77. The following statements are designed to provide information about your wellness perceptions. Please carefully and thoughtfully consider each statement, then select the one response option with which you most agree.

	Very strongly disagree	Strongly disagree	Disagree	Agree	Strongly agree	Very strongly agree
I am always optimistic about my future.						
There have been times when I felt inferior to most of the people I knew.						
Members of my family come to me for support.						
My physical health has restricted me in the past.						
I believe there is a real purpose for my life.						
I will always seek out activities that challenge me to think and reason.						
I rarely count on good things happening to me.						
In general, I feel confident about my abilities.						
Sometimes I wonder if my family will really be there for me when I am in need.						
My body seems to resist physical illness very well.						
Life does not hold much future promise for me.						
I avoid activities that require me to concentrate.						
I always look on the bright side of things.						
I sometimes think I am a						

	Very strongly disagree	Strongly disagree	Disagree	Agree	Strongly agree	Very strongly agree
worthless individual.						
My friends know they can always confide in me and ask me for advice.						
My physical health is excellent.						
Sometimes I don't understand what life is all about.						
Generally, I feel pleased with the amount of intellectual stimulation I receive in my daily life.						
In the past, I have expected the best.						
I am uncertain about my ability to do things well in the future.						
My family has been available to support me in the past.						
Compared to people I know, my past physical health has been excellent.						
I feel a sense of mission about my future.						
The amount of information that I process in a typical day is just about right for me (i.e., not too much and not too little).						
In the past, I hardly ever expected things to go my way.						
I will always be secure with who I am.						
In the past, I have not always had friends with whom I could share my joys and sorrows.						
I expect to always be physically						

	Very strongly disagree	Strongly disagree	Disagree	Agree	Strongly agree	Very strongly agree
healthy.						
I have felt in the past that my life was meaningless.						
In the past, I have generally found intellectual challenges to be vital to my overall well-being.						
Things will not work out the way I want them to in the future.						
In the past, I have felt sure of myself among strangers.						
My friends will be there for me when I need help.						
I expect my physical health to get worse.						
It seems that my life has always had purpose.						
My life has often seemed void of positive mental stimulation.						

End of Block: PWS
Start of Block: Checklist PTSD

78. Listed below are a number of difficult or stressful things that sometimes happen to people. For each event check one or more of the boxes to the right to indicate that: (a) it happened to you personally; (b) you witnessed it happen to someone else; (c) you learned about it happening to a close family member or close friend; (d) you were exposed to is as part of your job (for example, paramedic, police, military, or other first responder; (e) you're not sure if it fits; or (f) it doesn't apply to you.

Be sure to consider your entire life (childhood through adulthood) as you go through the list of events.

	Happened to me	Witnessed it	Learned about it	Part of my job	Not sure	Doesn't apply
Natural disaster (for example, flood, hurricane, tornado, earthquake)						

	Happened to me	Witnessed it	Learned about it	Part of my job	Not sure	Doesn't apply
Fire or explosion						
Transportation accident (for example, car accident, boat accident, train wreck, plane crash)						
Serious accident at work, home, or during recreational activity						
Exposure to toxic substance (for example, dangerous chemicals, radiation)						
Physical assault (for example, being attacked, hit, slapped, kicked, beaten up)						
Assault with a weapon (for example, being shot, stabbed, threatened with a knife, gun, bomb)						
Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm)						
Other unwanted or uncomfortable sexual experience						
Combat or exposure to a war-zone (in the military or as a civilian)						
Captivity (for example, being kidnapped, abducted, held hostage, prisoner of war)						
Life-threatening illness or injury						
Severe human suffering						
Sudden, violent death (for						

	Happened to me	Witnessed it	Learned about it	Part of my job	Not sure	Doesn't apply
example, homicide, suicide)						
Sudden accidental death						
Serious injury, harm, or death you caused to someone else						
Any other very stressful event or experience						

79. The next questions are about problems and complaints that people sometimes have in response to stressful life experiences. Please indicate how much you have been bothered by each problem in the past month (30 days). For these questions, the response options are: “not at all,” “a little bit,” “moderately,” “quite a bit,” or “extremely.”

	Not at all	A little bit	Moderately	Quite a bit	Extremely
Repeated, disturbing memories, thoughts, or images of a stressful experience from the past?					
Feeling very upset when something reminded you of a stressful experience from the past?					
Avoided activities or situations because they reminded you of a stressful experience from the past?					
Feeling distant or cut off from other people?					
Feeling irritable or having angry outbursts?					
Difficulty concentrating?					

End of Block: Checklist PTSD

Appendix D. Perceived Wellness Survey Questions by Subscale

Psychological

1. I am always optimistic about my future.
2. I rarely count on good things happening to me.
3. I always look on the bright side of things.
4. In the past, I have expected the best.
5. In the past, I hardly ever expected things to go my way.
6. Things will not work out the way I want them to in the future.

Emotional

1. There have been times when I felt inferior to most of the people I knew.
2. In general, I feel confident about my abilities.
3. I sometimes think I am a worthless individual.
4. I am uncertain about my ability to do things well in the future.
5. I will always be secure with who I am.
6. In the past, I have felt sure of myself among strangers.

Social

1. Members of my family come to me for support.
2. Sometimes I wonder if my family will really be there for me when I am in need.
3. My friends know they can always confide in me and ask me for advice.
4. My family has been available to support me in the past.
5. In the past, I have not always had friends with whom I could share my joys and sorrows.
6. My friends will be there for me when I need of help.

Physical

1. My physical health has restricted me in the past.
2. My body seems to resist physical illness very well.
3. My physical health is excellent.
4. Compared to people I know, my past physical health has been excellent.
5. I expect to always be physically healthy.
6. I expect my physical health to get worse.

Spiritual

1. I believe that there is a real purpose for my life.
2. Life does not hold much future promise for me.
3. Sometimes I don't understand what life is all about.
4. I feel a sense of mission about my future.
5. I have felt in the past that my life was meaningless.
6. It seems that my life has always had purpose.

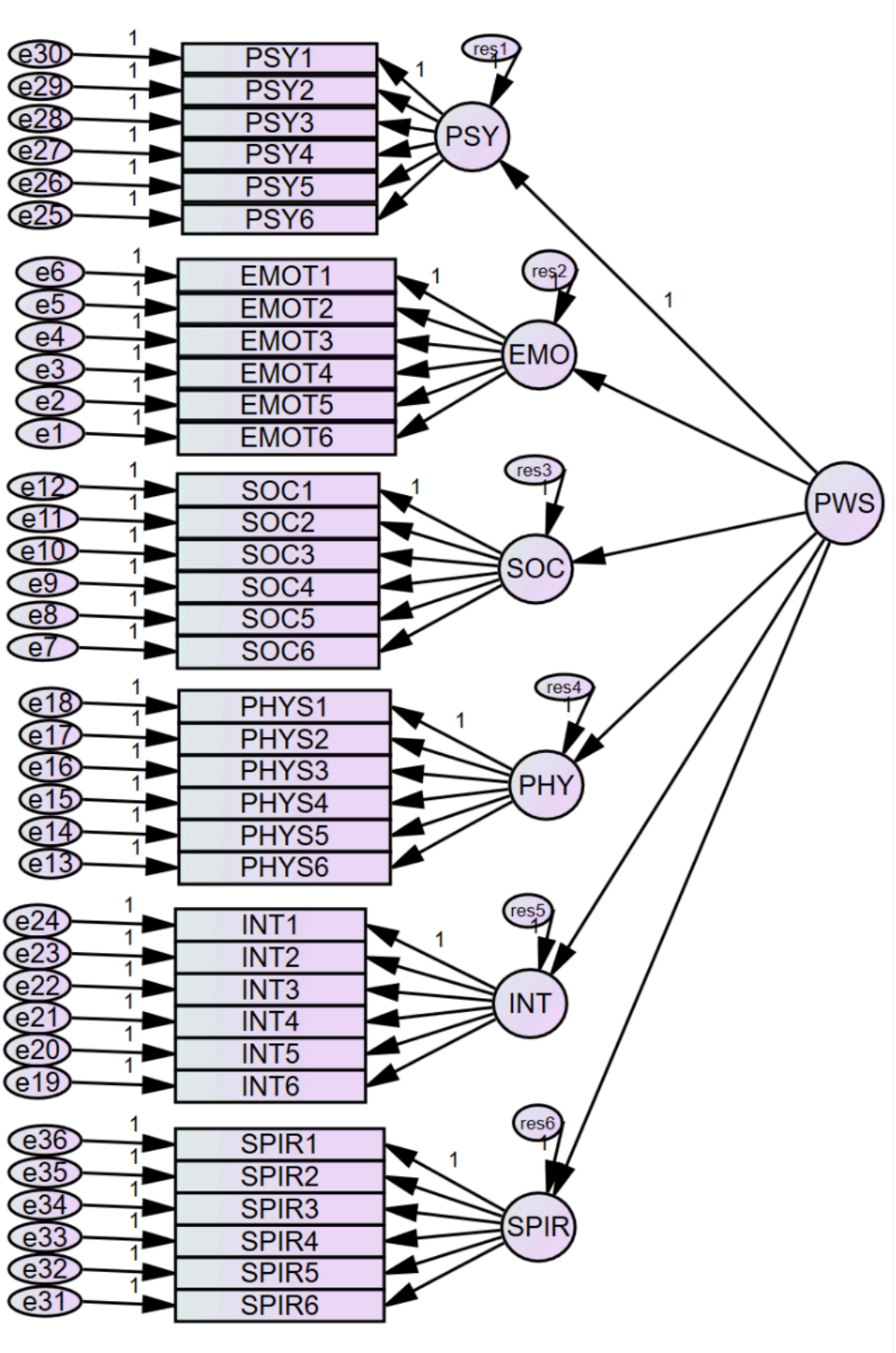
Intellectual

1. I will always seek out activities that challenge me to think and reason.
2. I avoid activities, which require me to concentrate.
3. Generally, I feel pleased with the amount of intellectual stimulation I receive in my daily life.
4. The amount of information that I process in a typical day is just about right for me (i.e., not too much, not too little).
5. In the past, I have generally found intellectual challenges to be vital to my overall well-being.
6. My life has often seemed void of positive mental stimulation.

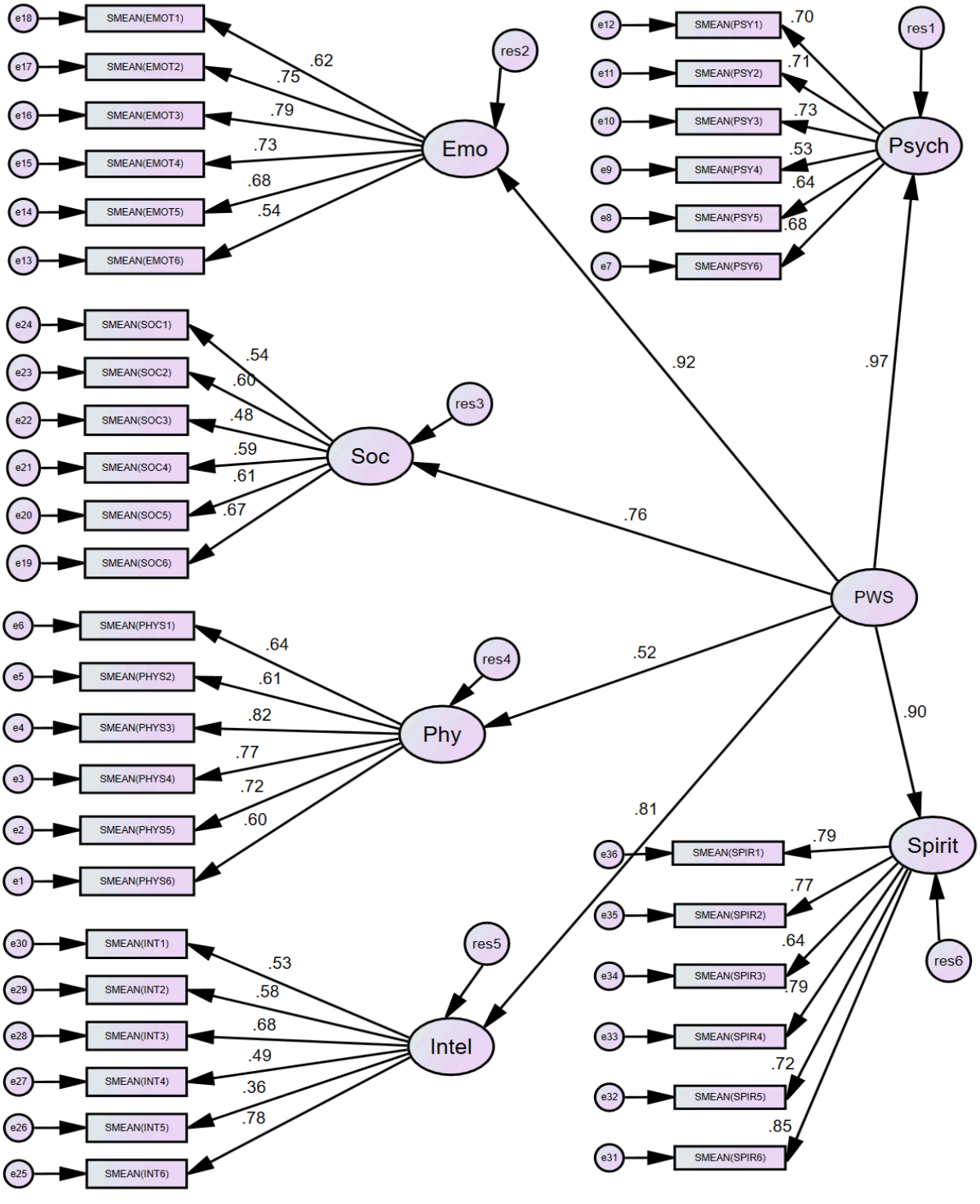
Appendix E. Adams's (n.d.) Original Syntax

```
RECODE PSY2 PSY5 PSY6 EMOT1 EMOT3 EMOT4 SOC2 SOC5 PHYS1 PHYS6 SPIR2
        SPIR3 SPIR5 INT2 INT6
        (1=6) (2=5) (3=4) (4=3) (5=2) (6=1).
COMPUTE PSYWELL = PSY1+PSY2+PSY3+PSY4+PSY5+PSY6.
COMPUTE SOCWELL = SOC1+SOC2+SOC3+SOC4+SOC5+SOC6.
COMPUTE PHYSWELL = PHYS1+PHYS2+PHYS3+PHYS4+PHYS5+PHYS6.
COMPUTE SPIRWELL = SPIR1+SPIR2+SPIR3+SPIR4+SPIR5+SPIR6.
COMPUTE INTWELL = INT1+INT2+INT3+INT4+INT5+INT6.
COMPUTE EMOTWELL = EMOT1+EMOT2+EMOT3+EMOT4+EMOT5+EMOT6.
COMPUTE PSYMEAN = PSYWELL/6.
COMPUTE SOCMEAN = SOCWELL/6.
COMPUTE PHYSMEAN = PHYSWELL/6.
COMPUTE SPIRMEAN = SPIRWELL/6.
COMPUTE INTMEAN = INTWELL/6.
COMPUTE EMOTMEAN = EMOTWELL/6.
COMPUTE MAGNITUD =PSYMEAN+INTMEAN+SOCMEAN+PHYSMEAN+SPIRMEAN+
        EMOTMEAN.
COMPUTE XBAR = MAGNITUD/6.
COMPUTE EMOTDEV = (EMOTMEAN-XBAR)*(EMOTMEAN-XBAR).
COMPUTE PSYDEV = (PSYMEAN-XBAR)*(PSYMEAN-XBAR).
COMPUTE SOCDEV = (SOCMEAN-XBAR)*(SOCMEAN-XBAR).
COMPUTE PHYSDEV = (PHYSMEAN-XBAR)*(PHYSMEAN-XBAR).
COMPUTE SPIRDEV = (SPIRMEAN-XBAR)*(SPIRMEAN-XBAR).
COMPUTE INTDEV = (INTMEAN-XBAR)*(INTMEAN-XBAR).
COMPUTE SUMDEV = PSYDEV+SOCDEV+PHYSDEV+SPIRDEV+INTDEV+EMOTDEV.
COMPUTE VARIANCE = SUMDEV/5.
COMPUTE BALANCE = SQRT(VARIANCE)+1.25.
COMPUTE WELLNESS = MAGNITUD/BALANCE.
EXECUTE.
```

Appendix F. Diagram of CFA of PWS



Appendix G. Standardized Estimates of the CFA



Appendix H. Re-specified PWS Model